

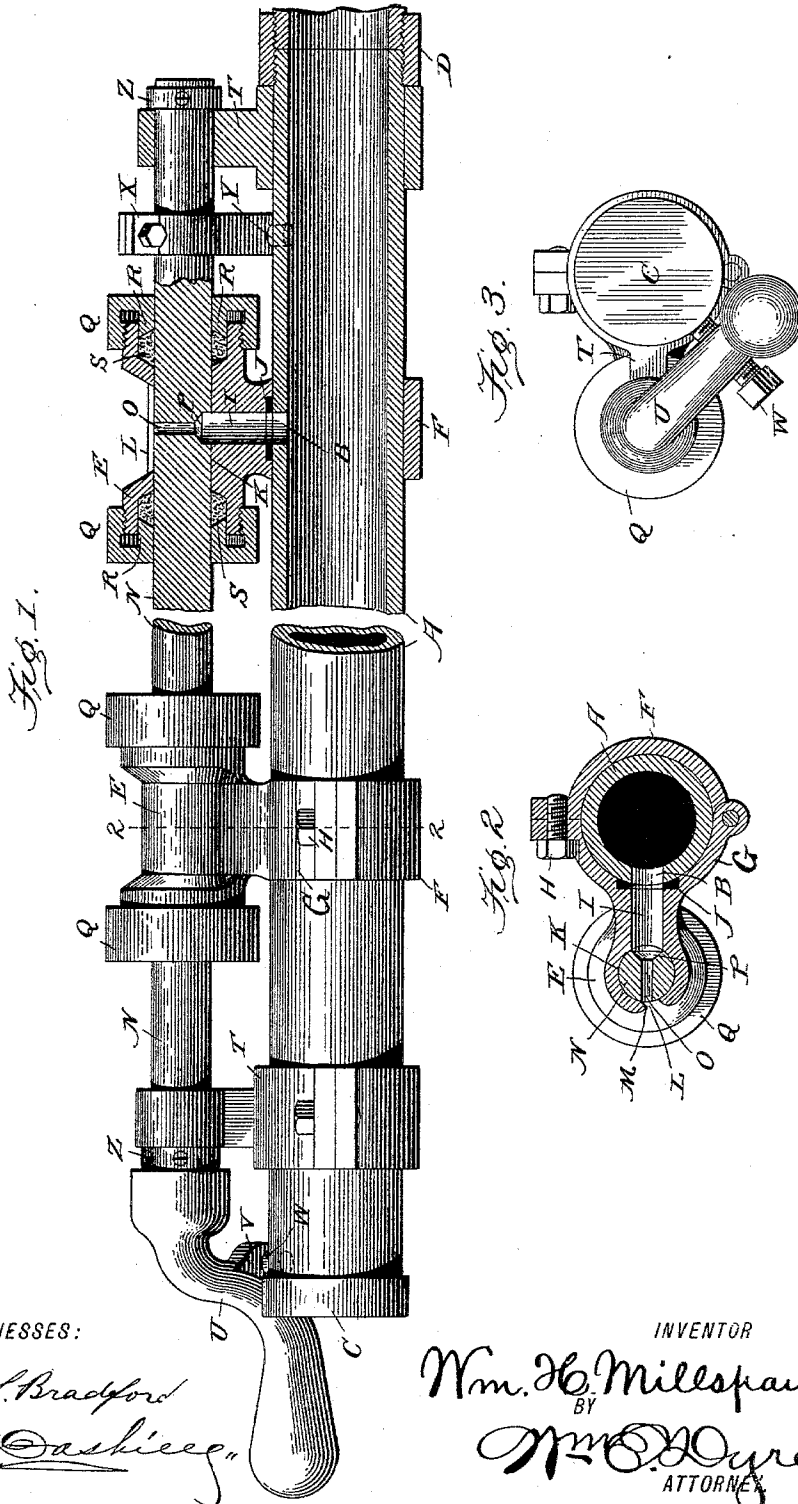
(No Model.)

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CLEANSING APPARATUS FOR PAPER MAKING MACHINES.

No. 596,939.

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WITNESSES:

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CLEANSING APPARATUS FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 596,939, dated January 4, 1898.

Application filed September 22, 1896. Serial No. 606,650. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MILLSPAUGH, a citizen of the United States, residing at Pulteney, in the county of Steuben and State of New York, have invented certain new and useful Improvements in Cleansing Apparatus for Paper-Making Machines; 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.

My invention relates to the art of paper-making, having more particular reference to machines used in this connection, and especially to cleansing apparatus constituting part of such machine.

In the manufacture of paper by modern methods and means it is essential that the machine employed should be rapid, continuous, and practically automatic in its operation, an example of such machine being furnished in that known as the "Fourdrinier" type. In this class of paper-making machines is employed a continuously-operated system of strainers, agitators, conveyers, guide tension, and couch rolls, together with presses, drivers, calendering and cutting appliances for operating successively upon wood-pulp or other fibers previously converted into the semiliquid condition. Highly important, if not the chief element of such system, is its making-wire, consisting of an endless web of wire-cloth having a horizontal or working face traveling upon suitable transverse bearings from the breast-roll to the couch-rolls, while in train with the latter and similarly supported is a first or wet felt and a second or dry press-felt, also of great importance, each being endless and serving to convey paper-pulp to suitable rolls used for compressing the web and extracting water therefrom. A "dandy-roll" is also employed, consisting of a wire cylinder, located above the making-wire, revolved by contact with the web beneath and bearing upon its surface letters, figures, or designs in relief for the purpose of impressing or water-marking the web as it passes. In the operation of such machines it is a matter of prime importance that the meshes of the making-wire, the texture of the felt-conveyers, the wires of the dandy-roll, and any other

cylinders or parts which come in contact with the pulp should be kept scrupulously clean and clear from adhering pulp and the various foreign substances, such as resin or clay contained in pulp made from wood and other fibrous materials. Otherwise the parts aforesaid would shortly become coated or clogged by such deposits and their efficiency seriously impaired. To overcome this difficulty, washing by hand has been resorted to. Likewise a solution of sulfuric acid has been used upon the making-wire, followed generally by the application of a brush, this being necessarily a tedious and unsatisfactory operation at best, the acid when used having a deleterious effect upon the wire and all parts with which it comes in contact. Heretofore it has also been the practice to locate at suitable points upon the machine transversely-arranged shower-pipes perforated so as to direct water in a multiplicity of independent streams upon the parts to be cleansed. This system, however, is known to require a large volume of water, necessitating the use of correspondingly large centrifugal pumps and filtering apparatus of proportionate size. Furthermore, such shower-pipes are necessarily superficial in their action, since their internal pressure, and consequently their safety, demands that perforations therein must not occur more frequently than about four or five to the inch, while the meshes of an ordinary making-wire number no less than seventy to the inch, and the felt conveyers are even more closely woven.

The main object of my invention, therefore, is to facilitate the removal of all extraneous and foreign substances or deposits from making-wires, felts, screens, rolls, or other pulp-bearing and pulp-contacting parts of a paper-making machine without retarding or interrupting their continuous use and operation. This I accomplish by the employment of a sheet of water or other fluid forcibly directed through or against parts operated upon in an unbroken sheet or spray as distinguished from a multiplicity of streams.

Further, my invention contemplates and includes the employment of a series of independent spraying-nozzles, a supply-pipe communicating with each, a valve-plug common

to all of the nozzles, a consequent reduction in the volume of water used, a proportionate decrease in the size and power of pumps required, and a more efficient system generally.

5 The invention will be hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings, which form part of this specification, and whereon corresponding letters of reference indicate same parts in the several views, Figure 1 represents in plan view the closed end of a common supply-pipe, the handle end of a continuous valve-plug, a hanger or support for the latter, and one attached nozzle, while
15 broken away, but in alinement therewith, is shown in horizontal section similar parts, including a secondary stop for valve-plug at opposite or inlet end of the apparatus. Fig. 2 is a central vertical section through the supply-pipe, one attached nozzle, and valve-plug for the latter, taken on the line 2 2 of Fig. 1; and Fig. 3 is an end view of the invention, showing its supply-pipe, valve-rod handle, and an adjustable stop in the latter
25 for limiting its relation.

Reference being had to the drawings and letters thereon, A indicates a supply-pipe broken at intervals in its longitudinal center by a series of outlets B, closed at one end by
30 a screw-cap C, and at its opposite end provided with a coupling or an elbow D, communicating with a source of water-supply. Throughout the length of pipe A and immediately over its outlets B are mounted a series of corresponding spraying-nozzles E, each
35 having a flanged base F and an opposite hinged member G, constituting a coupling that surrounds said pipe, and is secured by a set-screw H. The body of nozzle E is bored
40 centrally by a water way or channel I, communicating at one end with outlet B aforesaid, at this point surrounded by a packing-gland J and at its opposite end opening into a cylindrical valve-chamber K. The surface
45 of valve-chamber K is broken by a discharge-port L, formed by a milling-tool directed to one side of its longitudinal center and at an angle to its cutting-line, thus producing the spraying-lip M, which presents an acute angle to action of the stream when in use.

Passing directly through valve-chamber K in each of the nozzles E is a continuous valve rod or plug N, common to all nozzles in the series. At suitable intervals this plug N is
55 perforated by ports O, the inlet ends of which are somewhat enlarged, as at P, and are adapted to register with channels I of the nozzles. At each end of all nozzles E is provided a stuffing-box consisting of a screw cap or
60 follower Q, bearing an internal gland-anulus R, for acting upon and compressing an elastic or other packing-gland S, surrounding the valve-rod. This rod or continuous valve-plug N is thus supported in the nozzles E,
65 but receives additional support in suitable hangers T near its ends or at intermediate points, and is rotated by a handle or crank

U, fixed to one end. In a boss V, upon the handle U, is located an adjustable screw-stop W, adapted to engage the surface of pipe
70 A, and thus limit rotation of the valve-plug, while near its opposite end same rod carries a secondary stop X, also provided with an adjusting-screw Y, for engaging the surface of pipe A with like effect, the rod itself being
75 retained against longitudinal movement by collars Z, secured thereon, abutting against hangers T.

This being substantially a description of my invention it will be noted that the apparatus
80 may be transversely located upon the frame of a paper-making machine at any or all points where needed, being at all times in connection with a piston or plunger pump for throwing clean water or other fluids, and especially efficacious in the following uses:
85 first, when located in connection with the return portion of the making-wire in position to spray through its meshes; secondly, when similarly located with reference to the wet
90 and dry press-felts; thirdly, when arranged above the dandy-roll and sometimes the couch-rolls; and, fourthly, when placed above the gathering-cylinder of a wet machine, the washing of rolls or cylinders mentioned being
95 from the outside in rather than from the inside out.

It will be noted also that the nozzles E employed may be increased or decreased in number, according to the width of the machine
100 and their special requirements. They are generally equidistant, however, and are by preference spaced about five inches apart, but two being shown in the drawings for purposes of clearness.

The operation of this invention is the same whether applied to a Fourdrinier machine, to a particular portion thereof, to a cylinder machine, or to any other service wherein a
110 similar sheet or spray of fluids is desired, and it will therefore suffice to describe its use and operation in one connection only, selecting for the purpose an endless making-wire, although the saving effected by the use of my invention upon the expensive felt conveyers
115 made of pure wool is even greater.

Water, either hot or cold, pumped into main supply-pipe A under a pressure from forty to fifty pounds instantly enters all channels I through the registering outlets B, each
120 throttled by the imperforate portion of common valve rod or plug N. A partial rotation of said rod or plug through the agency of its handle V now serves to simultaneously open all ports O, establishing communication between them and their respective spraying-lips
125 M, against which latter the several streams forcibly impinge and from which they are discharged in as many thin sheets having diverging sides. These sheets of coarse spray
130 are thus projected directly upon and through the meshes of the making-wire as it returns after having delivered its web to the couch-rolls, with the effect of thoroughly removing

all adhering fibers, sediment, or foreign matter and preparing the wire for a fresh supply of stuff as it continues on its circuit.

The position and location of nozzles E with relation to each other and with relation to the work imposed upon them determine the point at which the outer edges of their respective discharges meet to form one unbroken sheet, such point by preference being the surface sprayed. With reference to rod N it is obvious that a partial rotation one way or the other, limited by its graduated stops W X, regulates the quality of spray produced, permitting a coarse or a fine discharge, according to requirements. A complete half-rotation of same rod also serves when desired to reverse the normal position of constricted ports O for the purpose of clearing them at times from sediment which may accumulate therein and tend to choke them.

Having thus described the construction and operation of my invention, what I claim is—

1. In a paper-making machine means for delivering to parts thereof a cleansing fluid in one continuous sheet, substantially as described.
2. In a paper-making machine a nozzle for delivering a cleansing fluid in one continuous sheet, substantially as described.
3. In a paper-making machine a series of valved nozzles for delivering a cleansing fluid

in one continuous sheet, substantially as described.

4. In a paper-making machine a series of nozzles controlled by a common valve rod or plug for delivering a cleansing fluid in one continuous sheet, substantially as described.

5. In a paper-making machine the combination with a common supply-pipe, of a series of nozzles for delivering a cleansing fluid in a plain continuous sheet, substantially as described.

6. In a paper-making machine the combination with a common supply-pipe, of a series of nozzles communicating therewith, a continuous rotatable valve rod or plug bisecting said nozzles, and a graduated stop for limiting such rotation, substantially as described.

7. In a paper-making machine the combination with a common supply-pipe, of a series of nozzles communicating therewith, a continuous rotatable valve rod or plug bisecting all nozzles, a handle for rotating said rod or plug having a graduated stop, and a secondary stop, substantially as described.

In testimony whereof I subscribe my signature in presence of two witnesses.

WILLIAM H. MILLSPAUGH.

Witnesses:

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FRED J. EMENY.