Sept. 9, 1924. 1,507,608

H. KIDD

SHOWER PIPE FOR PAPER MAKING AND SIMILAR MACHINES

Filed June 10, 1920

Fig. 1

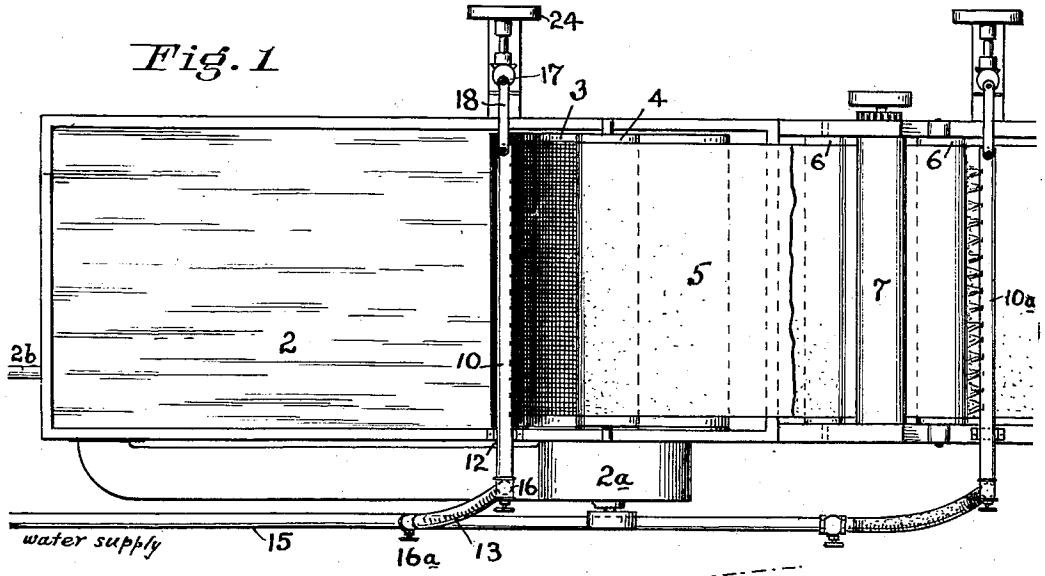
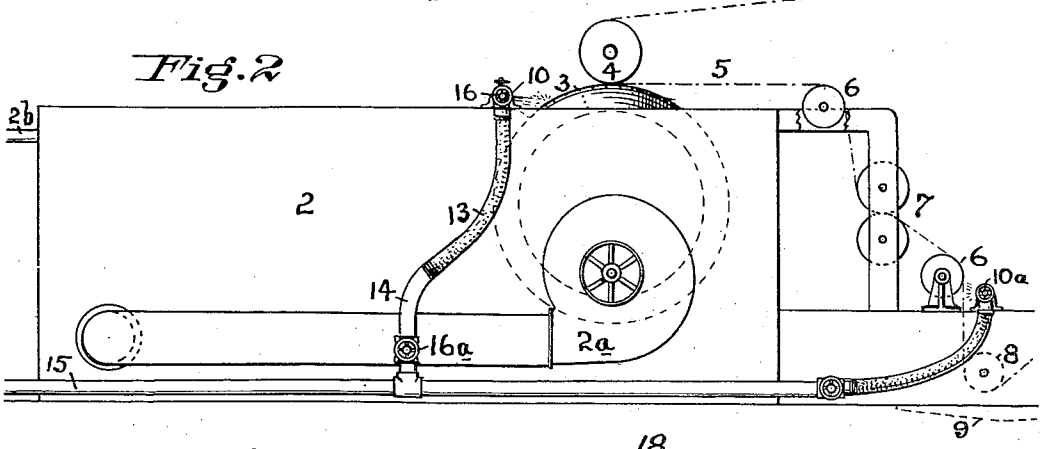


Fig. 2



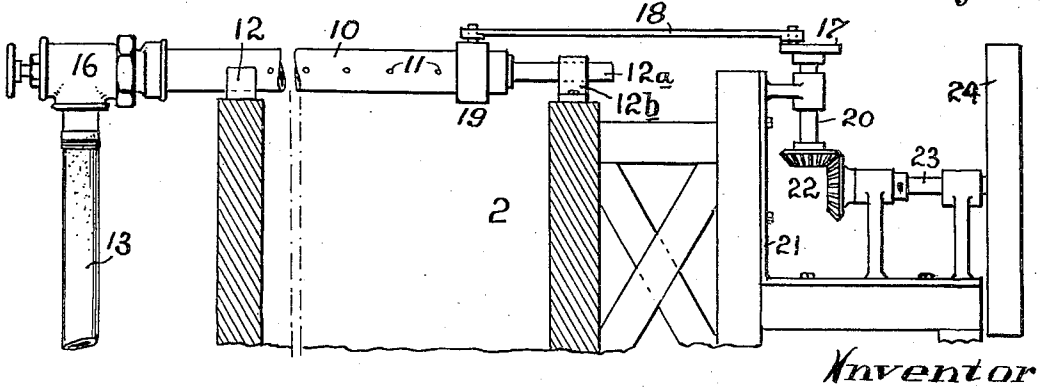


Fig. 3

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UNITED STATES PATENT OFFICE.

HENDERSON KIDD, OF CHESTER, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO SCOTT PAPER COMPANY, A CORPORATION OF PENNSYLVANIA.

SHOWER PIPE FOR PAPER-MAKING AND SIMILAR MACHINES.

Application filed June 10, 1920. Serial No. 387,852.

To all whom it may concern:

Be it known that I, HENDERSON KIDD, a citizen of the United States, and resident of Chester, county of Delaware, and State of Pennsylvania, have invented an Improvement in Shower Pipes for Paper-Making and Similar Machines, of which the following is a specification.

The object of my invention is to provide shower pipes and means for operating them in connection with the felt web and other parts of a paper making machine, which will enable said parts to be sprayed or showered with water to insure said parts being maintained in a properly cleaned condition during the normal operation of the machine. This invention is especially useful in connection with machines for making paper of very delicate lace-like structure, such as is used in the production of absorbent cotton substitute for medical bandages.

My invention consists in providing one or more spray or shower pipes arranged transversely of the paper making machine, said shower pipes being provided with aperatures for causing sprays of water which may be directed upon the meshed surface drum revolving in the pulp vat and also for spraying the felt web which is brought into contact with the surface of said roll and upon which the paper pulp fiber is transferred by its contact with the upper surface of the drum, it being important in the manufacture of this delicate lace-like paper structure that both the felt webs and also the surface of the drum, where it leaves the felt webs and enters the fluid in the vat, shall be cleared of all adhering particles which might in any manner interfere in the uniformity of the paper quality, the said spray or shower pipes being reciprocated in the direction of their lengths for the purpose of insuring the spray uniformily reaching all transverse portions of the drum and felt web.

My invention also consists of details of construction which, together with the features above specified, will be better understood by reference to the drawings, in which:

Fig. 1 is a plan view of a portion of a paper making machine embodying my improvements; Fig. 2 is a side elevation of the same; and Fig. 3 is a transverse sectional elevation taken on line x—x of Fig. 1, showing more fully the means for reciprocating the shower pipes.

2 represents a vat in which the pulp fluid is contained and which is kept in circulation by means of a suitable circular device 2^a which may comprise an exhauster communicating with the interior of the drum 3 for drawing therefrom the fluid and discharging it into the distant end of the tank 2, so that the same is kept in a state of circulation. 3 is a drum having its circumference covered with meshed wire so that the water may pass into the interior of the cylinder end of the suction of the exhauster 2^a and cause the fine floating pulp fibers to adhere to the surface of the drum. 4 is a couch roll arranged immediately above the drum 3 and supports and guides a felt web 5, causing it to return in contact with the upper surface of the said drum 3 which transfers to it the fine pulp fibers which are held to the surface of the drum during its rotation. This felt web leads to the couch roll by passing under a guide roll 8 near the floor and thence above two guide rolls 6, 6, the upper of which is approximately on a level with the upper part of the drum 3. Intermediate of the two rolls 6, 6, are arranged a pair of squeeze rolls 7, the function of which is to squeeze out the surplus water from the felt web as it passes between the couch roll 4 and drum 3, so that at that time it is damp but containing a minimum amount of water. The felt web 5 which leads the couch roll 4 is guided over suction boxes and thence in contact with the drying cylinder which receives the paper web from the felt web and after drying it delivers it in the finished condition. From the drying cylinder, the felt web is guided back to and under the lower roll 8 before referred to. The drying cylinder and suction boxes and portion of the felt web associated with them are not shown, as that portion of the paper making machine forms no particular part of my invention. All of the mechanism so far described is old and well known, and will need no further special description.

Considering now the shower pipes to which my invention is more directly related, immediately in front of the drum 3 and at the upper part of the vat 2, I arrange a transverse shower pipe 10, one end guided in a suitable U-shaped guide 12 and the

other end provided with a rod 12^a (Fig. 3) guided in a bearing 12^b on the opposite side of the vat. This pipe is provided along its length with a series of perforations through which the water is sprayed, and the end of the pipe having the rod guide 12^a is closed and the other end is provided with an angle valve 16, whose inlet is connected by a flexible hose 13 with an upright pipe 14 leading from a horizontal water supply pipe 15. This upright pipe 14 may be provided with shut-off valves 16^a in addition to the angle valve 16 upon the shower pipe. The pipes 14 and 15 are stationary and the flexible hose 13 permits longitudinal reciprocation of the shower pipe while maintaining water communication with the supply pipe. The other end of the shower pipe is provided with a collar 19 to which is pivoted a rod 18, the free end of which is journaled upon a crank 17. This crank is secured to a vertical shaft 20 journaled in a right-angled frame 21 and when rotated provides a reciprocation to the shower pipe, the extent of which reciprocation should be equal to or slightly greater than the distance between the spray apertures in the said pipe. 23 is a horizontal shaft also journaled in the frame 21 and has one end connected with the vertical shaft 20 by means of bevel gears 22 and the other end provided with a band wheel 24 by which it may be rotated by a suitable belt leading from a power shaft. The motion to be given to the shower pipe is reasonably slow so as to avoid all jarring and yet at all times to insure thorough washing of the drum, as its surface descends into the fluid of the vat. The water which is employed in the shower discharges into the vat and compensates for the water which is removed therefrom during the process of paper making. Any excess of water may pass off by a suitable overflow pipe 2^b.

In addition to the shower pipe 10 for use in connection with the drum 3, I provide a second shower pipe 10^a for spraying the surface of the felt web which is to be brought in contact with the drum 3, and as shown, this shower pipe 10^a is located between the guide roller 8 and the first guide roller 6, so that the surface of the felt web is thoroughly washed before it passes between the squeeze roll 7. The construction of the shower pipe 10, before referred to, and all the mechanism employed in connection with the said pipe 10 may be similarly applied to the shower pipe 10^a, and it will not be necessary for me to repeat the description of those parts. For convenient understanding, the corresponding parts are numbered with same numbers in both instances.

In operation, the drum 3 rotates, as indicated by the arrow, and similarly the felt web travels in the direction of the arrow. The upper part of the drum 3 travels above the water level and when the suction is produced within it, the paper fibers are sucked upon the surface in a very thin lace-like arrangement and are then lifted out of the water and transferred to the felt web in a continuous manner, so as to provide a very delicate lace-like paper web. The surface of the drum 3 on its descending side is subjected to the spray from the shower pipe 10, to wash it clear of all adhering particles and to insure the perforations or meshed openings being maintained clear, for insuring proper suction upon the floating pulp fiber while the drum is travelling through the fluid. While this operation is being performed, the shower pipe is reciprocated longitudinally, namely, in a direction parallel to the surface of the drum, and the quantity of the spray may be regulated by the valves 16 and 16^a.

On the return of the felt web from the drying cylinder (not shown) it is passed upward from under the guide roll 8 and before it is subjected to the pressure of the squeeze rolls 7, it is treated to a water spray from the shower pipe 12^a which washes from its surface all adhering particles of paper fiber, the reciprocation of the shower pipe insuring every portion of the felt surface being thoroughly washed. After the washing operation, the felt web has the surplus water squeezed out by passing between the press rolls 7 and is once more guided between the couch roll and the drum. The spray water from the shower pipe 10^a and that which may be squeezed out by the press roll 7 may be drained off from the floor and returned for use, or otherwise disposed of as desirable.

I do not restrict myself to the details of the paper making machine nor to the minor details shown in respect to the shower pipe structure, as my invention is applicable to all constructions of paper making machines or in connection with machines of a similar nature where webs or cylinders are required to be subjected to the spraying operation.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable, and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that I do not restrict myself to the details, as the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. Means for spraying a travelling surface

such as that of the drum or felt web of a paper making machine after the paper web has been removed therefrom, consisting of a longitudinally reciprocable water shower pipe having apertures along its length, a U shaped guide adjacent to one end of the shower pipe and in which the body of the pipes rests by gravity and by which it is guided, a support for the other end of the shower pipe comprising a horizontal rod in alinement with the shower pipe and slidably mounted in a stationary bearing, a flexible water supply pipe for maintaining delivery of water to the shower pipe while it is in operation, a vertical shaft having a crank at one end, a connecting rod hinged to the crank and also hinged to the shower pipe, said crank arranged in alinement with the axis of the shower pipe, a horizontal shaft geared to the vertical shaft, and means to rotate the horizontal shaft.

2. A means for spraying a travelling surface such as that of a drum or felt web of a paper making machine, consisting of a horizontal longitudinally reciprocable shower pipe having apertures along its length, guides for supporting the pipe while permitting its reciprocation, a fixed supply pipe having a connection with the reciprocable shower pipe, whereby the latter may be supplied with water during its reciprocation, power devices for reciprocating the shower pipe, said power devices consisting of two shafts at right angles to each other journaled in a suitable angular frame and connected by bevel gearing, one of said shafts provided with a band wheel for driving it and the other with a crank and connected with the shower pipe by a connecting rod, jointed at one end to the crank and the other end to the pipe.

3. A paper making machine having a rotating drum provided with a meshed circumference partly submerged in a vat of water containing paper pulp and a felt web guided in contact therewith, squeeze rolls between which the felt web passes before reaching the drum, combined with a shower pipe arranged parallel to the surface of the drum above the liquid level of the vat, a similar shower pipe arranged in front of the felt web before it passes between the squeeze rolls on its way to the drum, said shower pipes each provided with apertures along their lengths, means for reciprocating the shower pipes during the normal operation of the machine, and means for supplying water to the shower pipes during their reciprocation, and independent means for controlling the supply of water to the respective shower pipes.

In testimony of which invention, I hereunto set my hand.

HENDERSON KIDD.