

June 19, 1923.

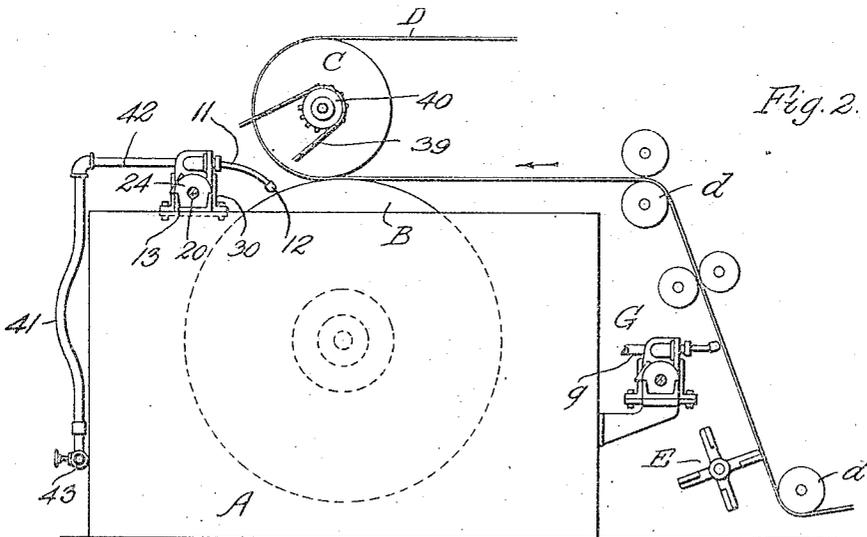
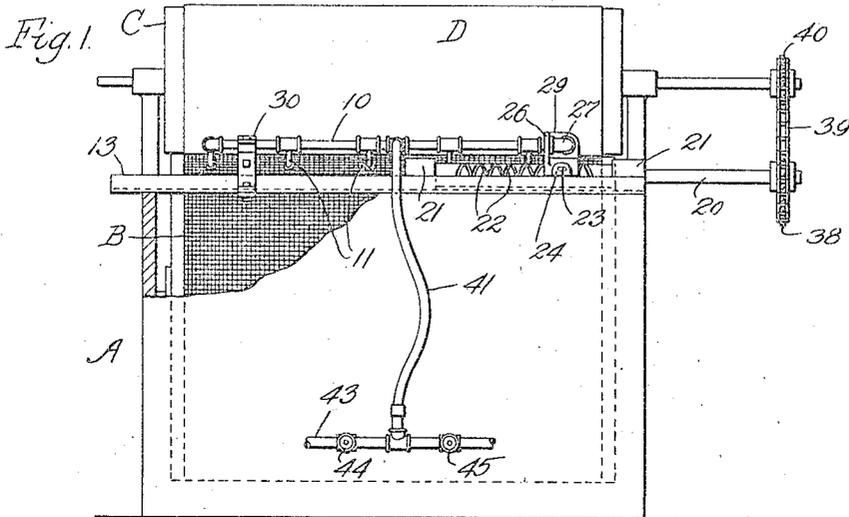
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C. F. ROBERTS

CLEANING DEVICE FOR PAPER MAKING MACHINES

Filed Nov. 17, 1919

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3

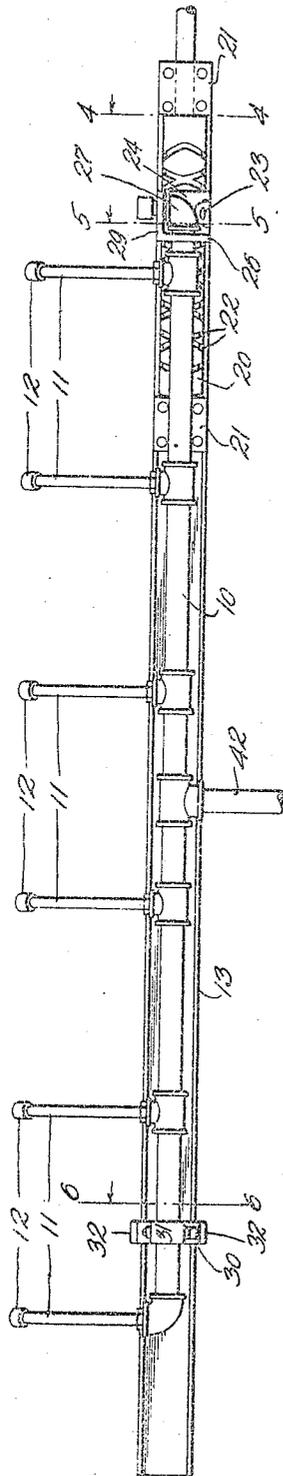


Fig. 6.

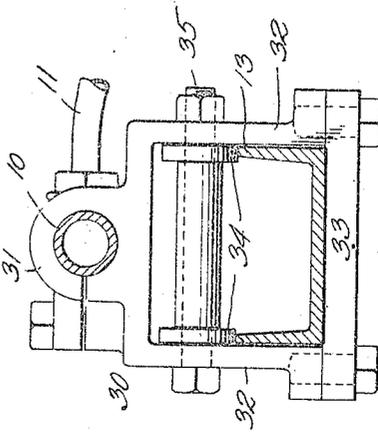


Fig. 5.

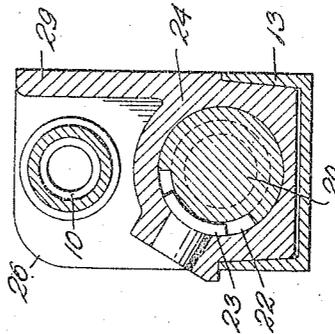
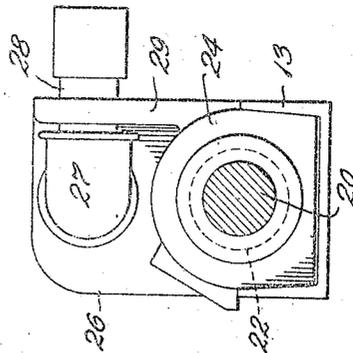


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES F. ROBERTS, OF LOCKPORT, NEW YORK, ASSIGNOR TO ROBERTS MANUFACTURING CO., OF LOCKPORT, NEW YORK.

CLEANING DEVICE FOR PAPER-MAKING MACHINES.

Application filed November 17, 1919. Serial No. 328,653.

To all whom it may concern:

Be it known that I, CHARLES F. ROBERTS, a citizen of the United States, residing at Lockport, in the county of Niagara and State of New York, have invented a new and useful Improvement in Cleaning Devices for Paper-Making Machines, of which the following is a specification.

This invention relates to shower pipes or analogous devices used in connection with paper making machinery for the purpose of cleaning the rotary pulp screens employed in "wet machines" to separate the pulp stock from the water and transfer it to the felt on which the paper is couched, or for cleaning the felts or other carriers used in paper making machinery.

In devices of this sort as heretofore constructed, a pipe substantially as long as the rotary screen is generally employed, in which numerous small holes are drilled along one side thereof through which the spray water or other fluid is ejected onto and through the screen. This method is objectionable in that a large quantity of water is used and this water added to that which is introduced with the pulp into the machine, causes such an excess of water in the discharged matter that it is difficult to reclaim much of the pulp contained therein. Another objection is that some of the holes in the pipe become clogged up so that the screen is not properly cleaned, causing imperfections in the paper produced.

One object of this invention is to overcome these objections, by producing a shower pipe having a relatively small number of discharge apertures or nozzles and to so construct the device that the shower pipe can be moved to and fro in front of the screen so as to thoroughly spray all parts of the surface thereof.

Another object is to construct the device so that the water, steam or other fluid may be discharged onto the screen from the relatively few moving nozzles at a greatly increased pressure sufficient to thoroughly cleanse the screen and free it from all foreign substances.

Another object is to construct the device so that it may be used to force steam or other fluid through the felt to keep it in

proper condition to take up an even coating of pulp.

Other objects are to improve shower pipes of this sort in other respects hereinafter set forth.

In the drawings:

Fig. 1 is a front elevation partly in section of a paper making machine of the "wet" type provided with a shower pipe embodying the invention.

Fig. 2 is a fragmentary side elevation thereof, partly in section.

Fig. 3 is a plan view, on an enlarged scale, of the shower pipe and its actuating and supporting devices.

Figs. 4, 5 and 6 are transverse sectional elevations, thereof, on an enlarged scale on lines 4—4, 5—5, and 6—6 respectively Fig. 3.

The paper making machine shown in the drawings, and hereinafter called the "wet" machine, preferably includes a vat or tank A for receiving the mixture of pulp and water; a rotary cylinder or screen B, which revolves in the tank A and gathers the pulp and allows the water to pass to the inside, from whence it is discharged in any suitable way: a couch roll C over which passes a felt D on which the pulp is deposited by the cylinder B; guide rolls *d* for the felt, and a beater E which to a certain extent cleans the felt before it reaches the cylinder B to take up the pulp. The wet machine as described forms no part of the invention and may be of any usual or suitable construction.

One embodiment of the shower pipe for discharging water or other fluid for washing the cylinder B is shown in the drawings and is preferably constructed as follows:

A main pipe 10 somewhat shorter in length than the cylinder B, is provided with a plurality of short lateral branch pipes 11 having discharge nozzles 12 at their outer ends disposed adjacent to and directed towards the cylinder B.

This main pipe 10 with its nozzles 12 is adapted to be moved to and fro in front and approximately parallel with the revolving cylinder B in such a manner that all parts of the screen surface thereof will be subjected to the action of the jets of water or other fluid and will be kept thoroughly

clean and free from foreign matter and for this purpose the shower pipe is preferably movably mounted upon a suitable base 13, which, in the construction shown, is substantially channel shaped and which can be readily secured to the vat or washer A or in any other desired position.

The means shown in the drawings for moving the main pipe 10 and the nozzles 12 relatively to the cylinder may be of any suitable construction, that shown in the drawings including a shaft 20 preferably journaled in bearings 21 secured to the base 13 and provided with spiral grooves 22 extending around the shaft in opposite directions and having their ends connected to form a continuous thread in which a key or part 23 is adapted to engage and travel. This key is pivotally connected to or swivelled in a nut or sleeve 24 which surrounds the shaft 20 and is slidable thereon and which serves to hold the key in proper engagement in the grooves 22. Consequently when the shaft 20 is rotated about its axis, the spiral grooves will cause the key 23 to move back and forth lengthwise of the shaft, carrying the nut 24 with it. The nut is suitably connected with the shower pipe 10, thus causing the shower pipe to reciprocate lengthwise of the base 13. Any other suitable means for moving the shower pipe to and fro relatively to the screen may be employed.

The connection between the shower pipe 20 and the reciprocatory nut 24 may be of any suitable kind. In the construction shown for this purpose, one end of the shower pipe 10 passes through an aperture in an upstanding flange 26 on the nut 24 and this end of the pipe is provided with an elbow or part 27 and a nipple 28 secured thereto and which extends at an angle to the axis of the pipe and passes through an aperture in a flange 29 disposed at an angle to the flange 27. The other end of the nipple is closed by a cap or other suitable closure. This construction provides a simple means for preventing the shower pipe 10 from rotating or turning relatively to the nut 24. The nut is preferably provided with shoulders or parts which slidably engage the edges of the flanges of the base 13, and thus hold the nut against turning and acts to guide the same in its movement lengthwise of the base.

The end of the shower pipe remote from the nut 24 is preferably supported by a carriage or support 30 comprising a clamp or head 31 engaging the pipe 10 to secure the same to the carriage, and opposite downwardly extending legs 32 which straddle the support or base 13. The lower ends of the legs are connected by a transverse strap 33 which passes under the base 13. Rollers 34 journaled on a shaft 35 having bearings in

the legs 32, are adapted to bear and travel on the upper edges of the flanges of the base 13.

It will be seen from the foregoing that if the shaft 20 is rotated, the shower pipe will be moved to and fro in front of the cylinder B by the engagement of the key 23 with the spiral grooves 22 and it will be guided on the base 13 at one end by the nut 24 and at the other end by the carriage 30.

Any suitable means may be used to rotate the shaft 20, such for instance, as a sprocket wheel 38 which is secured on the outer end of the shaft 20 and is connected by a sprocket chain 39 to another sprocket wheel 40 on the shaft of the couch roll C.

For supplying water or other fluid to the shower pipe 10 and nozzles 12, a flexible pipe or conductor 41 is used which is connected to the shower pipe by a pipe section 42 and to a supply pipe 43 which preferably supplies water under considerable pressure. The supply pipe 43 may be connected either to a water or other fluid supply by means of a valve 44 or to a steam supply under control of a valve 45, as desired.

In order to obtain the best results by means of the apparatus described, the water should be discharged from the nozzles and against the screen at a relatively high velocity. This is accomplished by greatly increasing the pressure of the water supplied to the cleaning device. For example, shower pipes usually receive water at a pressure of about 20 pounds, but in the movable cleaning device described water may be admitted at a pressure of 60 pounds or more. By moving the jets of fluid to and fro as described and by the use of high pressure a very thorough cleaning of the screen is effected and this result is accomplished by a very materially smaller quantity of water than is used by the stationary shower pipes heretofore used. The use of high pressure in the cleaning device also prevents clogging of the nozzles and ensures the operation of the device at all times.

In wet machines of the sort described it is very necessary that the felt on which the pulp is deposited be kept in a condition in which it will readily and uniformly pick up the pulp from the cylinder. To accomplish this result the wet machine shown in the drawings (see Fig. 2) is provided with a second cleaning device G which is constructed and actuated substantially similarly to the one just described for cleaning the cylinder B. The second cleaning device is preferably connected to a steam supply (not shown) by a pipe *g* and the nozzles are arranged adjacent the felt D at a convenient point between the beater E and the cylinder B. By this arrangement the felt receives a final steam cleaning after it has been subjected to the action of the beater. These

jets of steam or other fluid remove most of the foreign matter and fragments of pulp from the felt, and also raise the nap of the felt, thereby ensuring the proper and efficient operation of the machine.

The cleaning device described has the advantage of greatly increasing the efficiency of the wet machine by effecting a great saving in the amount of water required. This not only reduces the cost of supplying the water, but also makes it possible to save a greater quantity of pulp from the waste water. The cleaning device is thoroughly reliable in operation and effects a more thorough cleaning of the screen than was done by shower pipes heretofore used and the construction of the cleaning device and its actuating devices is such that it can be economically manufactured.

I claim as my invention:

1. In a showering device for use on paper making machines, the combination of a pipe having a number of discharge nozzles through which a fluid may be ejected, and which are spaced at intervals along said pipe, a rotatable shaft, a part connected to and movable along said shaft and to which said pipe is connected, a spiral groove on said shaft, and a key connected to said part and engaging in said groove, whereby said part will slide along said shaft when said shaft is rotated and cause said pipe to reciprocate.

2. In a showering device for use on paper making machines, the combination of a pipe having a number of discharge nozzles through which a fluid may be ejected, and which are spaced at intervals along said pipe, a base on which said pipe is mounted and relatively to which the pipe may reciprocate, a shaft having a double spiral groove and which is mounted on said base, and means connected with said pipe and engaging in said groove and which cause said pipe to reciprocate relatively to said base.

3. In a showering device for use on paper making machines, the combination of a pipe having a number of discharge nozzles through which a fluid may be ejected, and which are spaced at intervals along said

pipe, a rotatable shaft, a supporting member on which said shaft is journaled, a part connected to and movable lengthwise of said shaft by the rotation thereof, and to which one end of said pipe is connected, and a carriage secured on the other end of said pipe and adapted to move relatively to said supporting member.

4. In a showering device for use on paper making machines, the combination of a pipe having a number of discharge nozzles through which a fluid may be ejected, and which are spaced at intervals along said pipe, a rotatable shaft, a horizontal supporting member, bearings for said shaft on said supporting member, a sliding nut on said shaft to which one end of said pipe is connected, a support on the other end of said pipe adapted to move on said supporting member to form a guide for said pipe, a spiral groove extending in opposite directions around said shaft, and a key pivotally connected to said sliding nut and having a part engaging and adapted to slide in said spiral groove when said shaft is rotated, whereby said pipe is reciprocated.

5. In a showering device for use on paper making machines, the combination of a pipe having a number of discharge nozzles through which a fluid may be ejected, and which are spaced at intervals along said pipe channel shaped, a base on which said pipe is mounted and relatively to which the pipe may reciprocate, and which may be secured to said paper making machine, carriages on which said pipe is mounted and which are adapted to slide lengthwise of said base, mechanism on said base and engaging a carriage for causing said pipe to move to and fro in a direction substantially lengthwise of said base, and a driving connection between said paper making machine and said mechanism.

Witness my hand this 14th day of November, 1919.

CHARLES F. ROBERTS.

Witnesses:

M. M. GOMESKY,
O. C. SEIFERT.