May 19, 1942. F. SCHUELER 2,283,768

SHOWER PIPE CLEANING DEVICE

Filed April 29, 1938

FIG. 1.

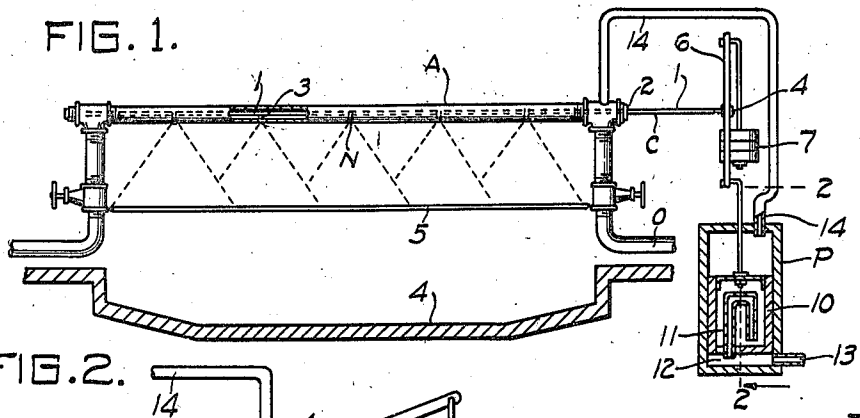


FIG. 2.

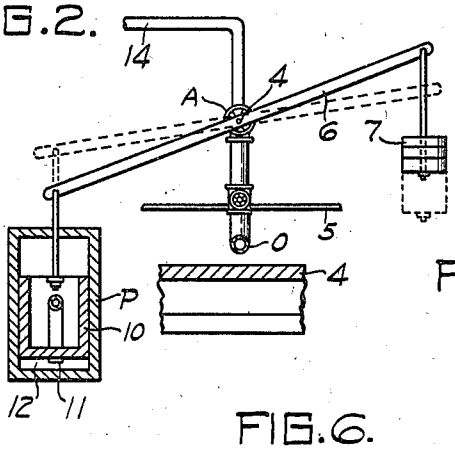


FIG. 3.

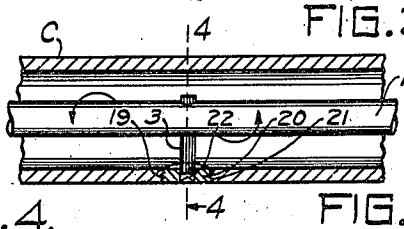


FIG. 4.

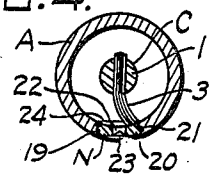


FIG. 5.

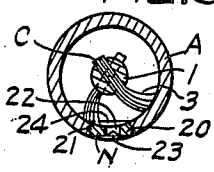


FIG. 6.

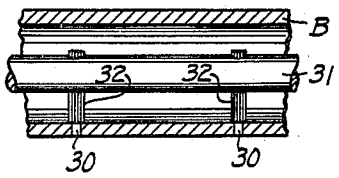


FIG. 7.

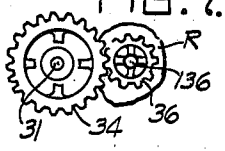


FIG. 8.

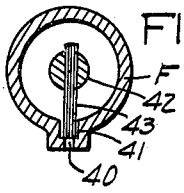


FIG. 9.

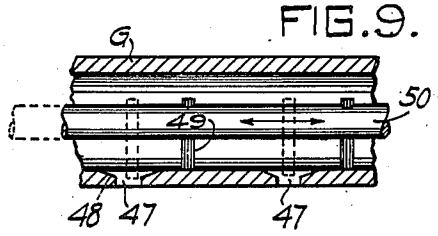


FIG. 10.

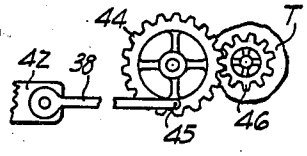


FIG. 11.

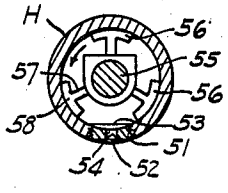


FIG. 12.

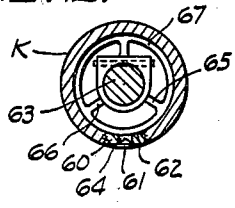


FIG. 13.

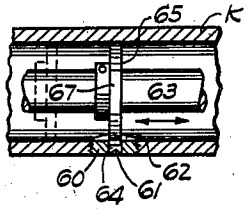
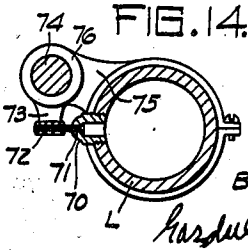


FIG. 14.



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UNITED STATES PATENT OFFICE

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SHOWER PIPE CLEANING DEVICE

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Application April 29, 1938, Serial No. 205,126

5 Claims. (Cl. 299—59)

This invention relates to washing devices which are known as "shower pipes" such as are used for washing or cleaning strainers, felts, etc., in paper and pulp mills. It is particularly adapted for cleaning shower pipes similar to those shown in the patent to Witham, Shower pipe, August 28, 1934, No. 1,972,001 and those shown in the patent to Paramor, Washing device comprising shower pipes, April 16, 1935, No. 1,997,651.

In this class of shower pipes, there is a longitudinal pipe through which the water flows and this pipe has a plurality of openings or nozzles spaced longitudinally.

In some cases, projecting nozzles are used, in other cases radial cylindrical holes are used and in the case of Witham, there are aligned orifices which connect on the outside with one groove and on the inside with another groove.

As the stock contains a good deal of solid material, it is necessary that these nozzles, holes or orifices should be cleaned from time to time and it is desirable that the liquid which flows through them should be spread out in fan shape.

It is also desirable that the cleaning device should not obstruct the flow of water to any extent.

There are now various types of disks or segments carried by a rod extending axially through such a pipe, such rod sticking out through the end of the pipe so that it can be either revolved by a crank on the outside or pushed back and forth manually.

I find that by using a groove on the inside of the pipe associated with an orifice and by moving a radially disposed cleaning member such as a flexible but stiff brush at regular intervals through the groove and proximate the orifice, the whirling action which is relied upon in other devices for cleaning the holes is replaced by an actual sweeping action which thoroughly cleans the groove and the orifice.

Preferably I also arrange these brushes or other cleaning devices in such a position that most of the time they do not obstruct the flow of the water either longitudinally or through the nozzles or orifices but at pre-determined intervals by automatic devices outside the pump, they are caused to sweep through a groove, thus cleaning it and the orifice.

In the drawing:

Fig. 1 is a diagrammatic transverse sectional view of a paper machine with my device attached, parts being shown in full lines and parts in section.

Fig. 2 is an end elevation as from the right of Fig. 1, parts being shown in section.

Fig. 3 is a vertical lengthwise sectional view of a shower pipe with my cleaning device in position.

Fig. 4 is a vertical section on the line 4—4 of Fig. 3 looking in the direction of the arrow.

Fig. 5 is a view similar to Fig. 4 with the cleaning rod and brush in a different position.

Fig. 6 is a view similar to Fig. 3 of my cleaning device in a shower pipe having slightly different orifices.

Fig. 7 is an end elevation showing one type of driving mechanism outside the shower pipe with connections.

Fig. 8 is a view similar to Fig 4 showing another type of shower pipe with my cleaning device.

Fig. 9 is a view similar to Fig. 6 of a shower pipe with a modification of my cleaning device.

Fig. 10 is a front elevation of another type of outside power driving mechanism with connections.

Fig. 11 is a view similar to Fig. 4 of a modification of my cleaning device.

Fig. 12 is a view similar to Figs. 4 and 11 of another modification of my cleaning device.

Fig. 13 is a view similar to Fig. 9 of another modification.

Fig. 14 is a transverse vertical sectional view of another type of shower pipe with a modification of my cleaning device in position.

In the drawing, 4 is the wire pit of a Fourdrinier machine and 5 is the wire. Over this extends the spray pipe A in which are the aligned nozzles N, each of which, as shown, in Figs. 3 and 4, comprises a threaded hole or opening 19 in which is a button 20 threaded at 21 to fit the threads in opening 19 and having on the inside a groove 24 and on the outside a groove 23 at the intersection of which is the orifice 22, substantially as shown in the patent to Witham on Shower pipes, No. 1,972,001, of August 28, 1934.

C represents my cleaner which comprises a rod 1 which extends axially through pipe A and through a passage 2 in one end and which carries a plurality of brushes 3. Preferably these brushes are of stiff wire and they are in position on rod 1 in the same transverse plane as the openings 19, 19 and orifices 22, 22 and preferably each is substantially in the same plane with an inside groove 24 so that when the rod 1 is turned or reciprocated, each brush 3 will sweep through an inside groove 24 and thus clean the orifice 22.

P represents power means which, as shown in Figs. 1 and 2, comprises an arm 6 fixed to the end

4 of rod 1 and having a weight 7 on one branch and a bucket 10 suspended on the other end. In bucket 10 is fixed a siphon 11 which extends down through the bottom so as to discharge into a waste receiving pan 12 which empties into a waste pipe 13. As shown, the liquid from the main feed pipe O which feeds the pipe A is conducted by a small pipe 14 into the bucket 10 so that it gradually fills up until the liquid reaches the top of the siphon 11, upon which the siphon empties the bucket.

The result of this is that the weight 7 normally overcomes the weight of the liquid in the bucket and normally keeps each brush 3 out of the way of an orifice 22 and its inside groove 24, but when the liquid overbalances the weight 7, it causes the brush to sweep through groove 24 and clean the orifice 22. As the liquid continues to run out through pipe 13, the parts are so balanced that very soon the siphon clears the bucket of liquid and the weight acts again and brings the brush back to its usual position, as shown in dotted lines in Fig. 2.

I prefer this intermittent action in which the sweeping through the groove is quickly done as thereby there is little obstruction to the passage of the liquid through the nozzles and of the pipe A.

However, I may use a continuous in place of an intermittent rotary motion such as shown in Figs. 6 and 7, or a reciprocal axial motion such as shown in Figs. 9 and 10, and I may use any of the various types of motors outside the shower pipe, such as shown in Figs. 7 and 10.

In Fig. 6, I show a pipe B in which are holes or nozzles 30 which are of cylindrical form and the rod 31 carries brushes 32, 32. In Fig. 7, is shown the drive mechanism for rod 31 which includes a large gear 34 driven by a small gear 36 and motor R. In this case, each brush moves continuously around 360°, passing each outlet 30 on its way.

Motor R may be electric, water, or any type, or gear 36 might be run by its shaft 136 being connected by belts or otherwise to any revolving part of the paper mill machinery.

In Figs. 8, 9 and 10, I show how a reciprocal axial motion instead of a rotary motion can be used.

In Fig. 8, I show a pipe F with a single, long groove 41 through which are the cylindrical orifices 40, 40. 42 is an axially disposed rod which carries brushes 43, the normal position of which is between two holes such as 40. As shown in Fig. 10, this rod 42 is reciprocated by a connecting rod 38 from a large gear 44 in which is a pin 45, the pin 45 being the pivot for connecting rod 38, so that as the small gear 46 meshes with the large gear 44 and is revolved by any suitable driving mechanism such as a motor T, the rod 42 and the brushes are caused to reciprocate, thus cleaning the openings.

As shown in Fig. 9, I may use a pipe G with aligned orifices 47, each with a lengthwise, inside, individual groove 48 and a rod 50 carrying cleaning members shown as brushes 49, the rod being reciprocated by any power means outside the pipe G such as a motor T and connecting rod 38 as shown in Fig. 10.

Instead of brushes, I may, as shown in Fig. 11, use a shower pipe H with inserted nozzles 51, each having an inside groove 53 and an outside groove 52 with the orifice 54 between them and a shaft 55 which carries the rigid cleaning members 56. Each member 56 is shown as having three arms such as 57 and each of which carries a shoe such as 58 which fits inside pipe H, each of these cleaning members being in the same transverse plane with the orifice 54. As shown, this cleaning rod and member may be reciprocated circumferentially, as shown by the arrows, by any suitable power means.

As shown in Figs. 12 and 13, I can use in connection with a pipe K inserted nozzles 60, each with an inside groove 62 and an outside groove 61 with an orifice 64 between them and cleaning members such as 65, each carried by a cleaning rod 63 and each including supporting arms 66 which support the rigid, annular cleaning members 67. As shown in Fig. 13, the cleaning rod and cleaning members can be reciprocated axially of pipe K by any suitable motor.

As shown in Fig. 14, I can use with a shower pipe L having projecting nozzles 70, each with an orifice 71, a cleaning rod 74. This rod 74 is slidable in bearings 76 in a bracket 75 in a direction parallel with the axis of pipe L, and is provided with projections 73 which carry brushes 72, each brush in a position to clean an orifice 71 when rod 74 is reciprocated axially by power means outside of pipe L.

I claim:

1. The combination in a shower adapted for use in a paper mill of a pipe provided with a plurality of openings spaced longitudinally, each opening forming a nozzle with a central discharge orifice of substantial size, whereby to prevent clogging, and two angularly disposed grooves, one on the outside and one on the inside, the inside groove being angularly disposed to the axis of the pipe and sloping from each end out to the central orifice; with a cleaner including a rod axially disposed in the pipe and a plurality of cleaning members each of such character as to permit water to flow past it, each carried by the rod proximate one of said inside grooves; and power means outside the pipe to cause each cleaning member to move at intervals through said inside groove and past its central orifice.

2. The combination in a shower adapted for use in a paper mill of a pipe provided with a plurality of openings spaced longitudinally, each opening forming a nozzle with a central discharge orifice of substantial size, whereby to prevent clogging, and two angularly disposed grooves, one on the outside and one on the inside, the inside groove being angularly disposed to the axis of the pipe and sloping from each end out to the central orifice; with a cleaner including a rod axially disposed in the pipe and a plurality of radially disposed cleaning brushes, each carried by the rod proximate one of said inside grooves; and power means outside the pipe to cause each brush to move at intervals through said inside groove and past its central orifice.

3. The combination in a shower adapted for use in a paper mill of a pipe provided with a plurality of openings spaced longitudinally, each opening forming a nozzle with a central discharge orifice of substantial size, whereby to prevent clogging, and two angularly disposed grooves, one on the outside and one on the inside and sloping from each end out to the central orifice; with a cleaner including a rod axially disposed in the pipe and a plurality of cleaning members, each carried by the rod proximate one of said inside grooves; and power means outside the pipe to cause each cleaning

member to move at intervals past said inside groove and past its central orifice.

4. The combination in a shower adapted for use in a paper mill, of a pipe provided with a plurality of openings, each opening having a discharge orifice and there being on the inside a recess which slopes outward to said orifice; with a cleaner including a rod axially disposed in the pipe and a plurality of flexible radially disposed cleaning members, each carried by the rod proximate one of said discharge orifices; and power means outside the pipe to cause each radial cleaning member to move at intervals through its adjoining recess and past the discharge orifice to which the recess leads.

5. The combination in a shower pipe adapted for use in a paper mill, of a pipe provided with a plurality of discharge orifices of substantial size, there being for each orifice an inside groove which slopes from each end outward to said orifice; with a cleaner including a rod which passes through the pipe and a plurality of flexible radially disposed cleaning members, each carried by the rod proximate one of said inside grooves, said rod being so supported by bearings carried by the pipe that it can be moved from outside of the pipe so as to cause each cleaning member to pass through one of said inside grooves and past the discharge orifice associated therewith.

FRED SCHUELER.