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METHOD OF CLEANSING SPRAY TUBES

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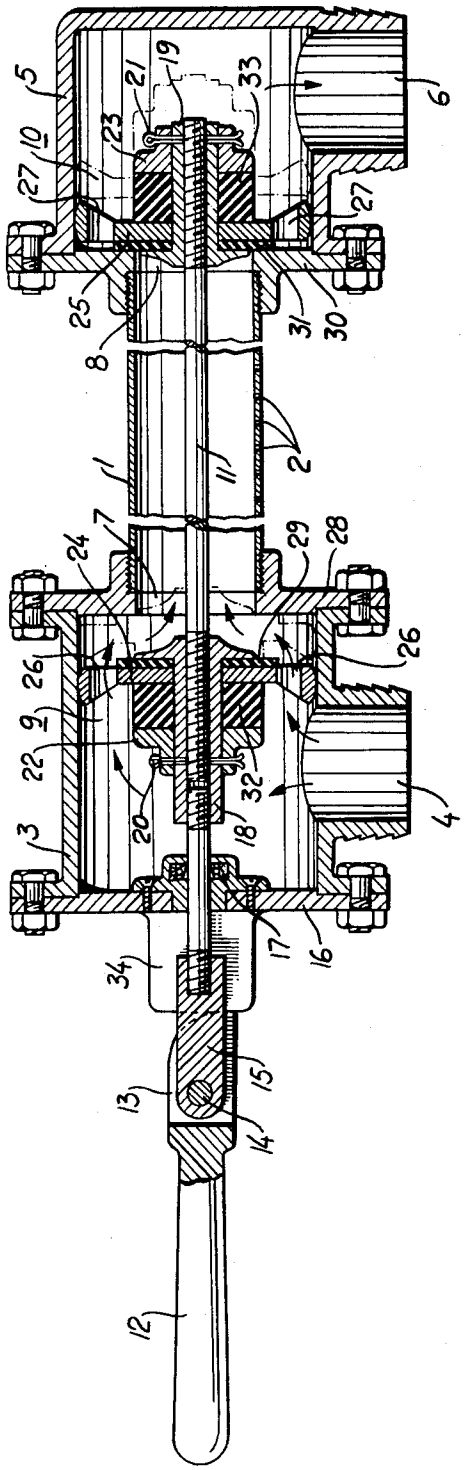


Fig. 1

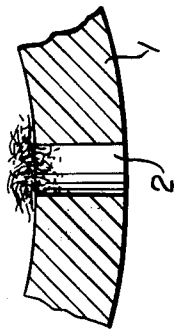


Fig. 2

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METHOD OF CLEANSING SPRAY TUBES

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The present invention refers to a method for the cleansing of spray tubes, particularly such as are used for the scavenging of strainers, endless wire rolls and the like in paper and cellulose machines. It is desirable in connection with such spray tubes to be able to use water already employed for other purposes in the production of cellulose as a flushing liquid. This surplus water, such as the backwater from paper machines, contains rather large quantities of fibers, which accumulate about the spray holes in the spray tube and stick inside the holes causing the spray holes to be clogged up thereby reducing the working capacity of the spray tube. It is necessary therefore to cleanse the spray tubes from time to time, which heretofore would generally be effected manually with the aid of a cleansing brush introduced into the spray tube, after the entrance to the spray tube has been uncovered for this purpose.

The present invention has for its object to simplify the cleansing of the spray tube and to reduce to a minimum the manual work required for this purpose, or to eliminate entirely this work by means of an electrically operated, for instance motor-driven, operating member.

The invention particularly relates to spray tubes having a valve controlled inlet for the liquid at one end of the tube and a valve controlled outlet at the opposite end thereof. According to the invention the cleansing is effected by closing the inlet and opening the outlet simultaneously so as to create a pressure below atmosphere in the spray tube, whereby air is sucked in through the spray holes. The vacuum is preferably created through the influence of the motive energy possessed by the liquid current, when the entrance to the spray tube is cut off. If desired, the vacuum may be brought about in the outlet by a sucking effect created by means of a pump, ejector or a suction siphon.

The invention is illustrated in the accompanying drawing, which in FIG. 1 shows a longitudinal section through a spray tube with appertaining valves and actuating members. FIG. 2 shows how the fibers occurring in the flushing water may accumulate and clog up the spray holes.

In the example shown, the spray tube consists of a cylindrical tube **1** provided on the lower side thereof with a number of spray holes **2**. The inlet end of the spray tube is connected to a valve housing **3** provided with an inlet **4** for the flushing water. The outlet end of the spray tube is connected to a valve housing **5** provided with an outlet **6**. The inlet and outlet openings **7** and **8** may be cut off by means of valves **9** and **10** respectively, which are rigidly mounted on a common valve rod **11**. This rod is displaceable in its longitudinal direction and adapted to be actuated for the purpose of shifting the valves by means of a handle **12** and a bifurcate cam member **13** arranged on the handle, said cam member being swingable by means of the handle about a transversely extending pin **14** in an extension **15** of the valve rod **11**. The latter extends through the end wall **16** of the valve housing **3** and is tightened against this wall by means of a packing **17**. The valves are secured to the rod **11** by means of hubs **18** and **19** respectively and cotters **20** and **21** respectively inserted through holes in the rod and the hub and supporting plates **22** and **23** respectively arranged on the hub. Arranged on the hub are valve bodies **24** and **25** respectively in the

form of disks bearing at their outer rounded edge surfaces against the cylindrical intermediate portion of the valve housing, said disks being provided with through-holes **26** and **27** respectively for the flushing liquid. The valve **9** is adapted to tighten against the end wall **28** of the valve housing by means of a disk-shaped tightening member **29** arranged on the hub **18**, said tightening member consisting of rubber, for example. The valve **10** is adapted in a similar manner to tighten against the end wall **30** of the valve housing **5** by means of a rubber disk **31**. Inserted between the supporting plate **22** and the valve disk **24** is a rubber plate **32** composed of a plurality of disks, said rubber plate **32** serving as a shock absorber in the closing of the valve. In a similar manner the valve **10** is provided with a rubber plate **32** inserted between the supporting plate **23** and the valve disk **25**, the thickness of which plate **33** may be varied to compensate for measure deviations in an axial direction.

In normal operation, the valves and the operating contrivance take the positions shown in the drawing, wherein the cam member **13** bears with its plane end surfaces against two supporting abutments **34** extending from the end wall. The flushing water supplied through the inlet **4** flows into the spray tube through the holes **26** in the valve disk **24** and flows out through holes **2** in the spray tube, the fibers suspended in the water accumulating after some time around the spray holes **2**, as shown in FIG. 2. According to the invention the spray holes may be cleansed effectively and the fibers be removed by the fact that a vacuum is created in the spray tube for a short time. In the example of embodiment shown in the drawing, this is effected by the fact that the handle **12** is swung up into a vertical position, the cam member **13** sliding off the end surfaces on the supporting abutments **34**, against which the handle **12** and thus the valve rod **11** are normally locked. After the valve rod **11** has thus been released, the outlet valve **10** is shifted into the opening position under the influence of the liquid pressure in the spray tube. At the same time the inlet valve **9** is shifted into a closing position. On the condition that the shifting of the handle **12** takes place rapidly, the shifting of the valves will take place practically instantly. As soon as the valve **9** has been closed, the quantity of liquid in the spray tube will therefore continue its already started exit to the outlet **6** under the influence of the motive energy of the liquid. A vacuum will then be created in the spray tube, which involves that air of atmospheric pressure flows in through the spray holes. On account of this the spray holes will be cleansed from the fibers accumulated therein, which are thus entrained by the liquid current toward the outlet. When the handle **12** is then returned to the initial position, the valve **9** will be opened, whereas the valve **10** is closed. During the time interval between the opening of the valve **9** and the closure of the valve **10**, the flushing liquid flowing into the spray tube will escape to the outlet **6**, whereby any fibers remaining in the spray tube will be removed. To attain this effect, it is suitable therefore to return the handle **12** comparatively slowly to the initial position. The kinetic energy of the liquid flowing to the outlet **6** may be increased, if required, by an extension of the outlet **6** by a suitable length of piping.

What is claimed is:

1. A method of cleansing spray tubes from impurities occurring in the flushing liquid, such as fibers and the like that may cause clogging up of the spray holes, in which the liquid enters through an inlet provided at one end of the spray tube and flows out through an outlet provided at the opposite end of the tube, characterized in that the inlet is closed simultaneously with the opening

of the outlet, a pressure below atmosphere being then created in the spray tube, whereby air will be sucked in through the spray holes.

2. A method according to claim 1, characterized in that the vacuum required for the intake of the air is created through the influence of the motive energy possessed by the liquid current at the moment of closing the inlet.

3. A method according to claim 1, characterized in that the outlet is closed with a delay after the inlet has been opened, such delay permitting the impurities to be removed together with the flushing liquid escaping through the outlet.

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