Jan. 14, 1930. J. D. BEATTY 1,743,953

PAPER SCREEN CLEANING DEVICE

Filed March 12, 1929 2 Sheets-Sheet 1

Fig. 1.

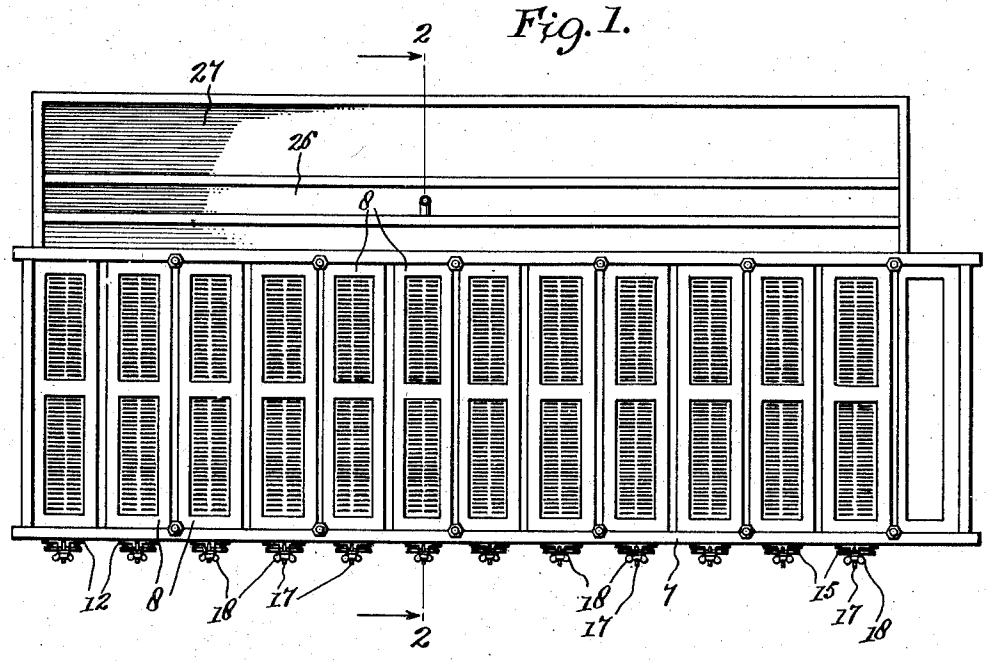
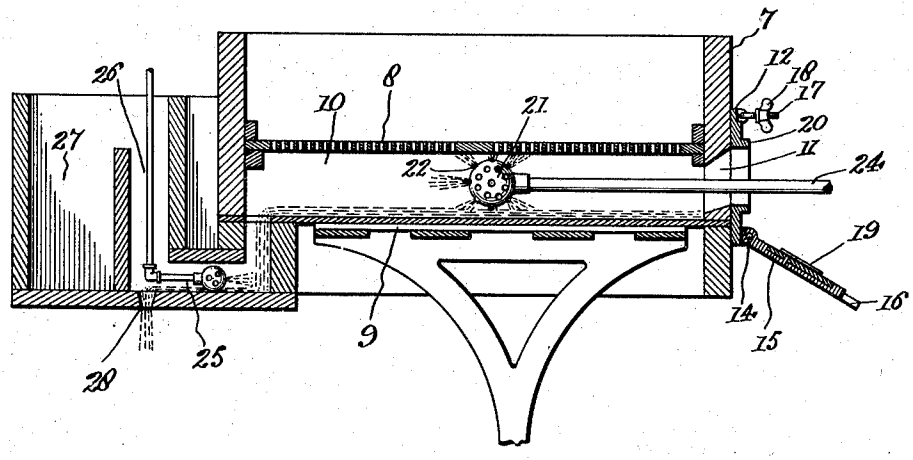


Fig. 2.



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Fig. 3.

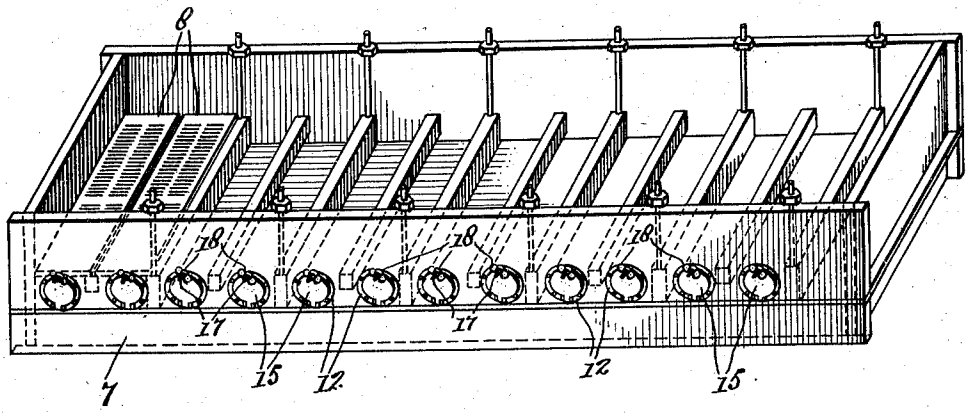


Fig. 4.

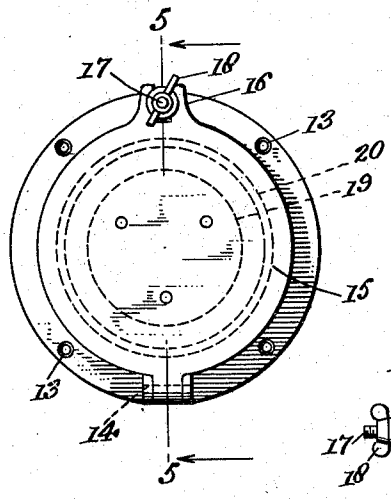
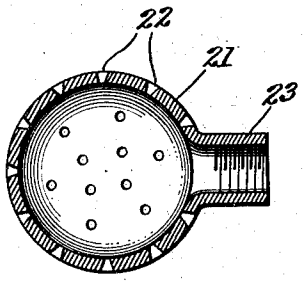


Fig. 6.



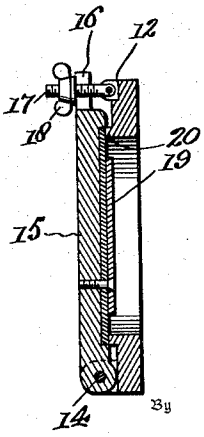


Fig. 5.

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UNITED STATES PATENT OFFICE

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PAPER-SCREEN-CLEANING DEVICE

Application filed March 12, 1929. Serial No. 346,390.

The present invention relates to improvements in paper screen cleaning devices, and has for an object to provide an improved device for removing the slime from the screens of paper making machines.

Another object of the invention is to save a considerable amount of time in which the mill is required to be shut down during the cleaning operation and to furthermore render the operation easier, and capable of being carried out by a less amount of workmen and in a shorter period of time.

A further object of the invention is to provide an improved cleaning device, which will have the effect to secure a more thorough cleaning than has been heretofore possible, with the result that the sheets of paper produced are of uniformly better grade.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a top plan view of a screen box showing one type of construction equipped with the improved device according to the present invention.

Figure 2 is a cross section taken on the line 2—2 in Figure 1 and showing the cleaning device in operation.

Figure 3 is a perspective view of a screen frame of an older type equipped with the invention.

Figure 4 is a front elevation of the improved door and door frame.

Figure 5 is a transverse section taken on the line 5—5 in Figure 4, and

Figure 6 is a longitudinal section taken through the spray head.

Referring more particularly to the drawings 7 designates the screen box; 8 the screens therein; 9 the rubber diaphragm, and 10 the chamber disposed between the diaphragm and the screens. In the front wall 7 in front of each chamber 10 is an opening 11 surrounded by a door frame or ring 12 secured by screws or other fastenings 13, shown in Figure 4, to the front wall 7. To the ring is pivoted, as indicated at 14, a door 15 in the form of a disc or other form having a slotted lug 16 diametrically opposite the pivot point 13 for receiving the hinge bolt 17 having the winged nut 18 for securing the door in closed position. The door is provided with the gasket 19 for making a tight joint about the outstanding flange 20 of the door frame or ring 12.

In Figures 2 and 6 is shown the spray head 21, preferably in the form of a hollow sphere having numerous perforations 22 therein and provided with a hollow threaded neck 23 projecting radially therefrom to receive and connect with the hose 24. The hose connects with a source of water or other fluid supply not shown and a valve will be provided in the hose to control the flow of the water.

In the use of the device, the paper screens may be cleaned without removing the screen plates 8 from their frame in the newer type screens; or without removing the upper section of the screen box 7 in the older type, where the screen plates are screwed down to the cross bars, as shown in Figure 3. Heretofore the washing was accomplished with a hose after the parts had been removed. There is much valuable time lost in this operation regardless of which type of screen plates happen to be in use. In the removable plate type, each plate must be removed, and in the fixed type the upper half of the screen box 7 must be lifted clear of the diaphragm rubbers 9. The screens are then washed from beneath with a hose in order to remove the slime accumulation from the meshes of the screens, from the rubber diaphragm and from the wood sides adjacent thereto. It is this slime, when loosened, that floats out on the paper stock flowing to the cylinder mold and forms the slime spots or holes in the paper sheet. In the average plant the operator has this situation to contend with at all times. The grade of paper and the condition of paper stock determines how much washing must be done. This means the mill must be shut down and given

a general washing with a hose at least once or twice a week. Seldom, if ever, will a plant operate over one hundred and twenty hours and make a good commercial sheet.

Lost time plays an important part in cleaning operations. Under present methods, washing a screen requires from one to one and a half hours for each screen unit; necessitating the time of one man and a helper to carry on this work; or on an average, it will take three men two and a half to three hours to wash a set of screens and replace the plates ready for operation again.

In other words two hours' production on a hundred ton mill is lost once or twice a week. It is the object of the present invention to materially cut down this lost time. The chamber 10 between the screen plate 8 and the diaphragm 9 is the place where eighty per cent of the washing is done. This includes the outlet passage 25 and the compartments 26 and 27. Each of these compartments 10 is provided with a door 15 which is opened by unscrewing the winged nut 18 and swinging the bolt 17 upwardly to disengage the slotted lug 16 and permit the door 15 to drop or open as illustrated in Figure 2. The hose is thereupon introduced into the chamber 10 with the perforated spray head 21 in advance, and water or other fluid is thereupon turned into the hose. The spherical shell may be of brass, cast iron, steel, copper or any other appropriate material. It will preferably be approximately three inches in diameter and its side walls are preferably from one-eighth to three-sixteenths of an inch in thickness.

The walls are drilled radially at an angle of approximately forty-five degrees with the axis passing through the hollow boss 23. These holes are so arranged on the surface of the ball that every portion of the chamber 10 is sprayed with water supplied to the ball through the hose 24. All the jets or streams of water issuing from the various orifices strike the interior walls at forty-five degrees, thereby giving a cutting and washing action at the same time and forcing the slime down the passage 25 and out the waste hole 28 to the sewer as the ball is pushed and pulled over the rubber diaphragm 9. The operator is at all times out of the way of the splashing water such as results from a hose nozzle used at close range. There are twelve doors shown in the drawings, one door being opposite each plate or chamber. The gaskets 19 on the doors provide for an air-tight joint, which is necessary as any air leakage into the chamber 10 while the machine is in operation reduces its capacity.

It will be understood that while the spherical form of the cleaner is preferred, this shape is not essential. The curved surface can be drilled in such a manner as will direct the water jets to reach the entire surface of the chamber and in so doing effect a cutting action of the slime.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:—

1. In an improved paper screen cleaning device, in combination with a screen box having a screen plate, diaphragm and chamber between the plate and diaphragm, said box having an opening therethrough communicating with the chamber space, an air-tight door for normally closing said opening, a spray head introducible through the opening when the door is open, and means for supplying fluid to the spray head and for pushing and pulling the spray head back and forth on the diaphragm.

2. In an improved paper screen cleaning device, in combination with a screen box having a screen plate, diaphragm and chamber between the plate and diaphragm, said box having an opening therethrough communicating with the chamber space, an air-tight door for normally closing said opening, a spray head introducible through the opening when the door is open, and means for supplying fluid to the spray head and for pushing and pulling the spray head back and forth on the diaphragm, said spray head being substantially spherical and having numerous small orifices therein.

3. In an improved paper screen cleaning device, in combination with a screen box having a screen plate, diaphragm and chamber between the plate and diaphragm, said box having an opening therethrough communicating with the chamber space, an air-tight door for normally closing said opening, spray head introducible through the opening when the door is open, and means for supplying fluid to the spray head and for pushing and pulling the spray head back and forth on the diaphragm, said spray head having numerous small orifices drilled therein on the angle whereby to cause jets of fluid to issue therefrom and impinge against the walls of the chamber at angles of substantially forty-five degrees.

4. In an improved paper screen cleaning device, in combination with a screen box having a screen plate, diaphragm and chamber between the plate and diaphgram, said box having an opening therethrough communicating with the chamber space, an air-tight door for normally closing said opening, a spray head introducible through the opening when the door is open, and means for supplying fluid to the spray head and for pushing and pulling the spray head back and

forth on the diaphragm, said spray head being substantially spherical and having numerous minute orifices therein and provided with a hollow boss extending from one end for connection to the fluid supplying means.

5. In combination with a paper screen box having screen plates therein, rubber diaphragms and chambers between the diaphragm and plates, said screen box having openings in the front wall thereof opposite said chambers, rings extending about said openings, doors hinged to the rings, means between the doors and rings for securing the doors in the closed position, means between the doors and the rings for effecting an air-tight seal when the doors are closed, a spray head introducible through the rings and openings and into said chambers, and a flexible hose connected to said spray head for supplying the same with fluid and for pushing and pulling the spray head back and forth on the diaphragms.

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