April 10, 1928. 1,665,425

C. R. VAN DE CARR, JR

METHOD AND APPARATUS FOR REGULATING THE CONSISTENCY OF PULP STOCK AND THE LIKE

Filed Jan. 10 1927 2 Sheets-Sheet 1

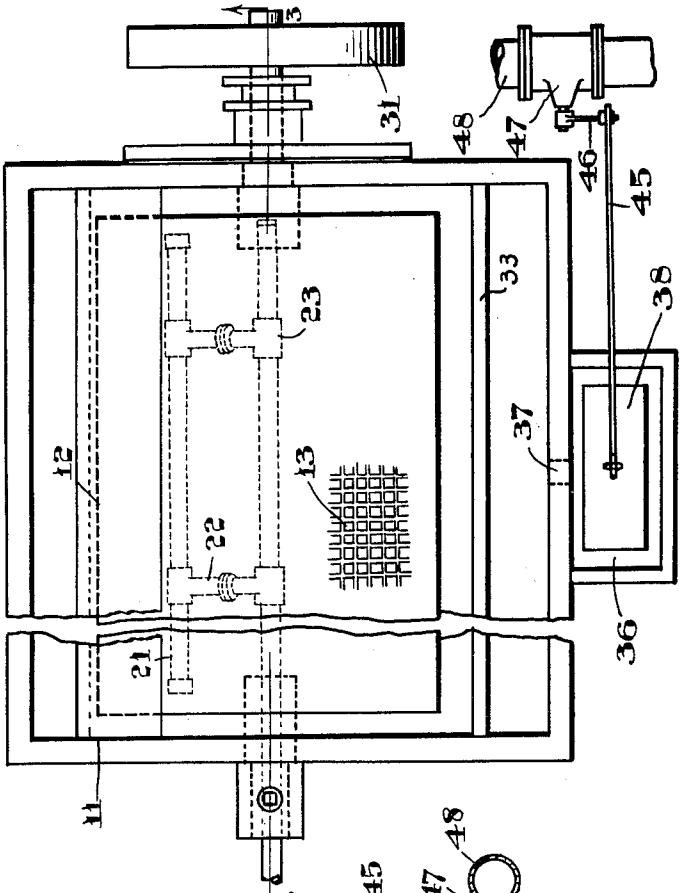


FIG. 1

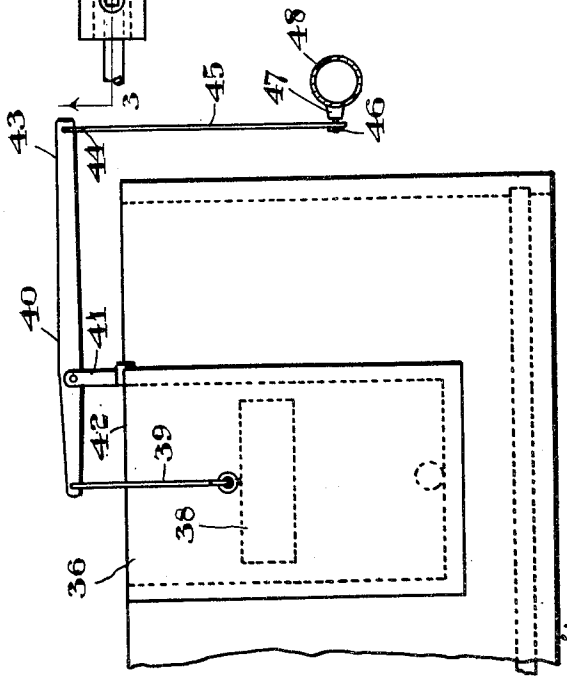


FIG. 2

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METHOD AND APPARATUS FOR REGULATING THE CONSISTENCY OF PULP STOCK AND THE LIKE

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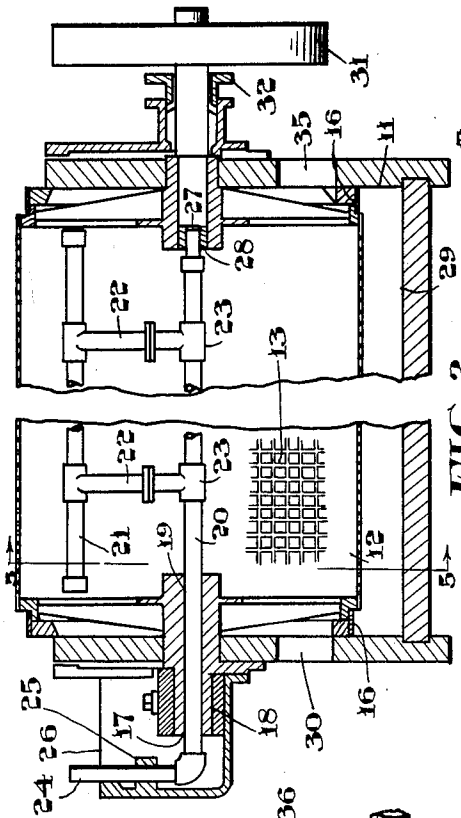


FIG. 3

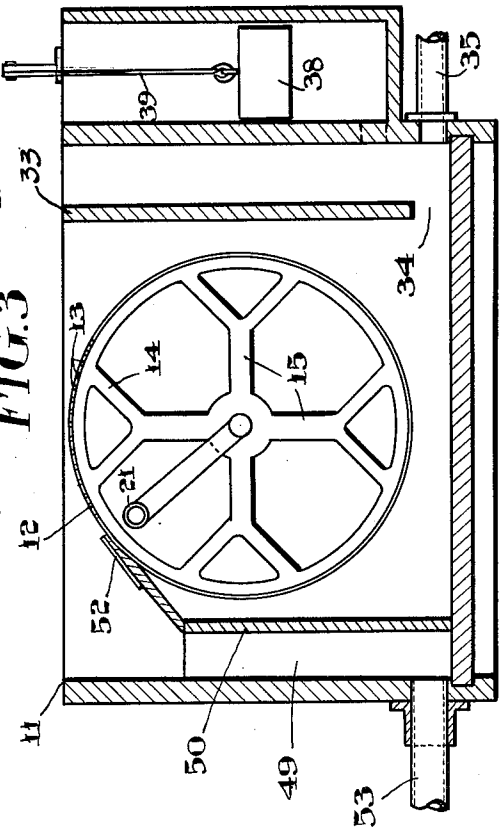


FIG. 5

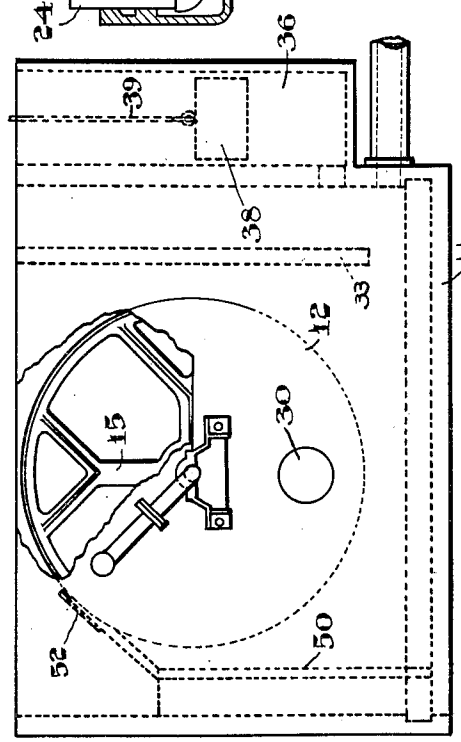


FIG. 4

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Patented Apr. 10, 1928. 1,665,425

UNITED STATES PATENT OFFICE.

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METHOD AND APPARATUS FOR REGULATING THE CONSISTENCY OF PULP STOCK AND THE LIKE.

Application filed January 10, 1927. Serial No. 160,249.

This invention relates to new and useful improvements in the art of paper making, and particularly to a method and apparatus for regulating the pulp stock. The main object of the invention is to provide a simple and efficient means and method for controlling the supply of liquid to the pulp stock, so that the consistency of the pulp stock can be maintained within very close limits, thereby providing a method of controlling the density of the pulp in its various uses in the art of pulp and paper manufacture.

In carrying out my invention, I provide a vat or reservoir, within which is mounted a screening device, preferably in the form of a rotatable hollow cylinder, the outer wall of which is made of mesh wire or screening material. Communicating with the interior of the cylinder is a discharge outlet. The stock to be regulated is withdrawn from any suitable part of the pulp system, and is fed into the vat through an orifice, preferably positioned near the bottom of the vat. Between the end of the vat wall and the perforated wall of the cylinder, is located a baffle, adapted to prevent eddying of the material within the vat. The lower edge of the baffle is spaced from the bottom of the vat. Mounted between spaced guides, is a float which is adapted to regulate a source of fluid supply connected to that part of the system from which the stock is taken. Suitable means are provided for taking off the stock adhering to the walls of the cylinder and returning same to the stock supply.

In the drawings which illustrate my invention in its application to the manufacture of pulp;

Figure 1 is a partial plan view of the stock regulating device.

Figure 2 is a partial side elevation of the device showing the float chamber and the float.

Figure 3 is a partial sectional side elevation of the device taken on the line 3—3 Figure 1.

Figure 4 is an end elevation of the device.

Figure 5 is a sectional end elevation of the device taken on the line 5—5 Figure 3.

Referring more particularly to the drawings, 11 designates a vat within which is mounted the hollow cylinder 12. The wall of the cylinder is made of screen material 13, such as mesh wire or perforated sheeting secured to end supports or spiders 14, between the arms 15 of which, fluid may flow from the interior of the cylinder. Between the ends of the cylinder and the adjacent walls of the vat, suitable sealing rings or segments 16 may be fitted. The cylinder supports have outwardly extending journals 17 which rotate in suitable bearings 18, secured to or formed integral with the vat. The journals are provided with centrally disposed apertures 19 which form supports for the shower feed pipe 20. The shower pipe 21 is connected to the feed pipe 20, by means of the radially extending pipes 22 and the T connections 23. One end 24 of the feed pipe extends through the bearing, and is held from rotation therein by means of lugs 25, formed in the vat extension 26. This end 24 may be connected to a source of fluid supply, not shown. The other end 27 of the shower feed pipe extends into the hollow portion of the bearing, adjacent thereto, and may be supported by means of the bushing 28. This end 27 is plugged to prevent water from passing therethrough. The outer face of the wall of the cylinder is spaced from the bottom 29 of the vat. Communicating with the interior of the cylinder and formed in the vat walls are the discharge openings 30. One of the journals is provided with driving means, such as the pulley 31, which may be driven from a source not shown. A suitable sealing medium, such as the stuffing box 32, may be placed around one of the journals to prevent the passage of fluid therethrough from the vat. The vat is provided with a baffle 33 which extends parallel to the screen, but is spaced therefrom. The baffle extends from side to side of the vat but does not extend the full depth of same, but leaves a space 34. An inlet pipe 35 is provided in the end of the vat in proximity to the baffle and remote from the screen, so that stock may be delivered to the vat in such a manner that there is very little disturbance of the material in the vat. Secured to the side of the vat is the float chamber 36, which communicates with the vat through the orifice 37 formed in the end of the vat. The float 38, which may be of any desired construction, is pivotally secured by means of a rod 39, to one end of a lever 40 pivotally mounted on a bearing 41 secured to the upper edge 42 of the vat. The other end 43 of the lever is secured to one end 44 of a

connecting rod 45, the other end of which may be secured to a lever 46 controlling the valve 47 in the pipe line 48. Formed in the end of the vat is the discharge chamber 49, and the end 50 of the vat is provided with a doctor 52, which contacts with the perforated wall of the cylinder to release matter adhering to said walls and to guide same towards the discharge chamber which is provided with a discharge outlet 53. The shower pipe is provided with a plurality of perforations and is so positioned that it is substantially in alignment with the edge of the doctor and in proximity thereto, but in the inner side of the cylinder. The fluid loosens the stock adhering to the face of the cylinder so that the doctor will remove the stock and clean the screen during its rotation. It will be readily understood that the connection between the float and the pipe line 48 is only illustrative of one type of connection which may be used, and modifications may be made therein. When the pipe line 48 is positioned some distance from the vat, some form of remote valve controlling means may be used, other than the mechanical means shown. The float may be adapted to control the valve through electrical, pneumatic, or hydraulic means, not shown, but well-known in the art of valve control.

The device is used in the manufacture of pulp and paper, and in the manufacture of other products, where stock is carried in solution or suspension, and where the consistency of the stock must be maintained within close limits. In my invention this is accomplished in the following manner.

A relatively constant quantity of the stock to be regulated is fed into the machine through the inlet pipe, and the level of the stock in the vat builds up outside the cylinder due to the fact that the liquid containing minute particles of the stock, must pass through the perforated or filtering wall of the cylinder and out of the vat discharge pipe. In passing through said wall, a film of stock is deposited thereon in a more or less continuous web. The cylinder is rotated and the film removed by coming in contact with the doctor, assisted by the shower pipe, which cleans said wall of the cylinder and guides the released material into the discharge chamber, and through the discharge pipe, from where it may be allowed to run to waste or returned to the source of supply. The supply of stock fed into the vat is of relatively constant volume and if the fibre, or solid content of the stock is constant, the level of the stock in the vat will be constant, but if the proportion of fibre or solid material in the stock fed into the vat varies, the film on the cylinder varies, and the level of the water or liquid in the vat will vary. The float in the float chamber is provided to regulate or correct this condition. When the level of the liquid varies, the float rises and falls and is adapted to regulate the flow of liquid passing through the valve 47 in the pipe line 48, which may be connected to that part of the system (not shown) from whence the stock in the vat is taken, or to a part of the system (not shown) which controls or feeds the aforementioned part. It will be readily seen that if the proportion of fibre or solid material in the system falls off, the film on the cylinder will be lighter, giving less hindrance to liquid getting through the screened face of the cylinder, so that the level of liquid in the vat will drop and will act on the float which in turn operates the valve 47 to cut down the supply of liquid to the system under regulation. If the stock supplied to the vat contains a heavier proportion of fibre or solid material, the float rises and opens the valve to allow more diluting fluid to be supplied to the system.

The device is very simple in its operation and provides an easy means for controlling the supply of stock within a system, so that the consistency of same remains within predetermined limits.

Having thus described my invention, what I claim is:—

1. A method of regulating the consistency of stock in a system, which consists in passing a relatively small quantity of the stock from the system into a vat, screening the stock as it passes through the vat, allowing the deposit on the screen to regulate the level of the fluid in the vat and utilizing the differences in the levels of the fluid in the vat to regulate the supply of fluid to the system.

2. A method of regulating the consistency of stock in a system, which consists in passing a relatively small quantity of the stock from the system into a vat, passing the stock through a rotating screen, utilizing the deposit of stock on the screen to regulate the level of the fluid in the vat, doctoring off the deposit on said screen during its rotation and utilizing the variation in levels of the fluid in the vat to regulate the supply of diluting fluid to the system.

3. A method of regulating the consistency of stock in a system, which consists in passing a relatively constant quantity of stock from the system into a testing chamber, passing the stock through a rotating screen, and from thence to a discharge outlet, utilizing the deposit of stock on the screen to control the level of the stock in the chamber, utilizing the variations in levels of stock in the chamber to regulate the supply of diluting fluid to the system and returning the stock to the system.

4. A method of regulating the consistency of stock in a system, which consists in passing a relatively constant quantity of stock from the system through a rotating screen,

allowing the deposit of solids from the stock on the screen to regulate the level of fluid in the screen chamber, and utilizing the variation of levels of fluid in the chamber to regulate the supply of diluting fluid to the system.

5. In a pulp stock regulating device, a vat, means for supplying test stock from a system in approximately constant volume to the vat, screening means for regulating the discharge of fluid from the vat, and a float in said vat adapted to regulate the supply of diluting fluid to the system from which the test stock was taken.

6. In a pulp stock regulating device, a vat, means for supplying a relatively constant quantity of stock from a system to the vat, a screening device for regulating the discharge of fluid from the vat, and means operated by the variations in levels in the vat to regulate the supply of diluting fluid to the system.

7. In a pulp stock regulating device, a vat, means for supplying test stock in approximately constant volume thereto, a screening device for regulating the discharge of liquid through the vat, means for removing material deposited on the screen device by the passage of stock therethrough, and a float controlled by the levels of the stock in the vat, adapted to operate a valve controlling the liquid supply to the system from which the test stock was taken.

8. In a pulp stock regulating device, a vat, means for supplying a constant volume of the stock to be tested to the vat, perforated means for regulating the discharge of liquid from the vat, means for removing material deposited on the perforated means in its passage through the vat, means within the vat to prevent eddying of the stock therein, and a float controlled by the levels of the stock in the vat to operate a valve controlling the liquid supply to the system from which the supply to the vat was taken for regulation.

9. In a pulp stock regulating device, a vat, a perforated cylinder rotatably mounted therein, a discharge from said vat communicating with the interior of the cylinder, means for supplying stock from a system in constant volume to the vat, a float chamber formed in the vat, a float mounted therein and adapted to control a valve mounted in the liquid supply line to said system, and a doctor contacting with the surface of the cylinder to remove a film of material deposited thereon through the passage of the liquid of the stock therethrough.

10. In a pulp stock regulating device, a vat, a perforated hollow cylinder rotatably mounted in the vat, means for supplying a relatively small quantity of stock from a system in constant volume to the vat, baffle means within the vat to prevent eddying of the material therein, a float chamber secured to one end of the vat and communicating therewith, discharge means communicating with the interior of the cylinder a float in said float chamber, means for connecting said float to a valve controlling the supply of diluting liquid to the system, so that it will be operated by the rise and fall of the float, means for removing material deposited on the cylinder through the passage of stock therethrough, and means for discharging the material collected by the removing means.

In witness whereof, I have hereunto set my hand.

CHARLES R. VAN DE CARR, JR.