

I. J. WITHAM & G. E. MAYO.
PULP FEED REGULATOR.
APPLICATION FILED SEPT. 1, 1917.

1,248,972.

Patented Dec. 4, 1917.

Fig. 1.

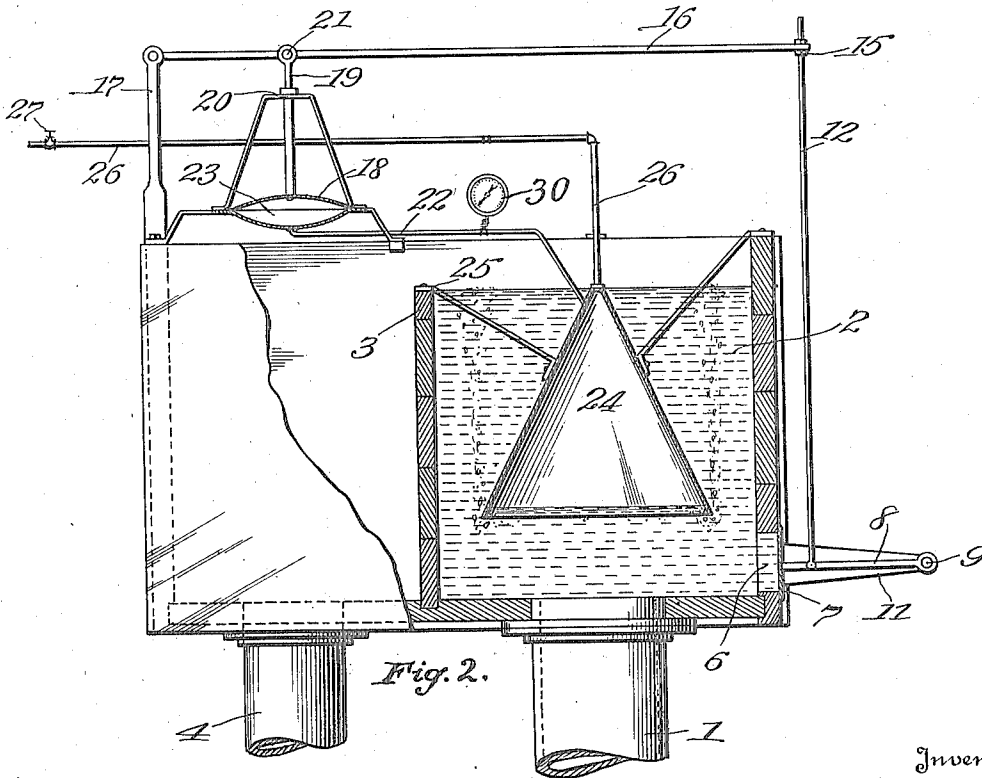
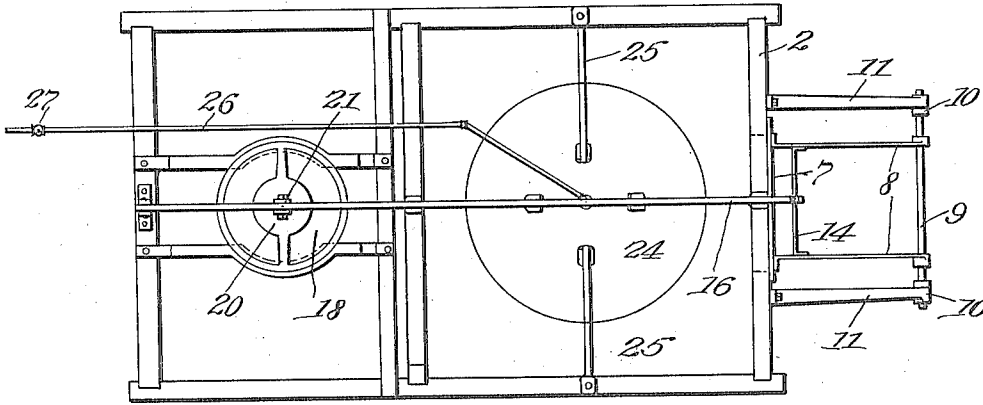


Fig. 2.

Witness

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ISAAC J. WITHAM AND GEORGE E. MAYO, OF CHEBOYGAN, MICHIGAN.

PULP-FEED REGULATOR.

1,248,972.

Specification of Letters Patent.

Patented Dec. 4, 1917.

Application filed September 1, 1917. Serial No. 189,334.

To all whom it may concern:

Be it known that we, ISAAC J. WITHAM and GEORGE E. MAYO, both citizens of the United States, and both residing at Cheboygan, in the county of Cheboygan and State of Michigan, have invented certain new and useful Improvements in Pulp-Feed Regulators, of which the following is a specification.

10 This invention relates to an improved device for regulating and controlling the flow of liquid and semi-liquid pulp, and is especially adaptable for regulating the flow of paper pulp from stuff boxes or chests
15 onto a Fourdrinier screen.

The object of the invention is to control the feed of the pulp according to its density, or consistency, whereby variations are compensated for by a greater or less amount of
20 pulp fed, so that no matter what the proportion of solid and water in the pulp, the amount of solid material being fed is the same. This result is especially useful in the manufacture of paper where the stream of
25 pulp delivered to the Fourdrinier screen must contain the same amount of fibrous material irrespective of the density of the pulp in order to insure proper thickness of the finished product.

30 A further object of the invention is to provide an improved means for measuring the density of the pulp.

Our invention as used, for instance, in the manufacture of paper, comprises an air container, open to the pulp on the lower side
35 only, rigidly suspended in the stuff box. The air container is connected with a source of compressed air from which it is kept constantly supplied. The pulp is prevented
40 from entering the container by reason of the air pressure therein, while air is allowed to continually escape from the bottom of the container into the pulp. A second air pipe communicating with the container and con-
45 nected with an air-operated mechanism for opening and closing the valve controls the feed from the stuff box to the Fourdrinier screen. As pulp of varying density offers
50 greater or less resistance to the escape of air from the container, pressure in the container will be less or great and this pressure will be communicated to the air-controlled valve-operating device to close or open the valve.

55 In the accompanying drawings, which show our invention in use in connection with paper stuff feeding mechanism, Figure

1 is a plan view of a stuff box equipped with a practical embodiment of our device; and Fig. 2 is a side view partly in section and partly in elevation of the construction
60 shown in Fig. 1.

In the drawings, 1 is a pulp supply pipe, connected, as usual, with a pump (not shown) through which the stuff box 2 is kept constantly supplied. The stuff box
65 2 is provided with an overflow 3 from which excess pulp is led back to the source of supply through pipe 4, the level of the pulp in the box always remaining uniform, irrespective
70 of the amount of pulp being used, in order to maintain a constant pressure within the box. The stuff box 2 is further provided with a stuff feed opening 6, controlled by a valve gate 7 supported on arms 8 secured
75 to shaft 9 journaled in bearings 10 on the supports 11 carried by the stuff feed box. In the present instance we have shown the gate adapted to be rocked downwardly to open the feed opening 6, and to be raised to
80 close it.

The gate 7 is operated by a rod 12 the lower end of which is pivotally connected with a cross-bar 14 connected to the arms 8 which support the gate. The rod 12 at its upper end is secured at 15 to the end of a
85 lever 16 having its opposite end fulcrumed on a support suitably connected to the frame of the pulp box. The connection 15 if desired may be adjustable on the rod 12.

The means for controlling movement of
90 the lever 16 to operate the valve-gate is a diaphragm 18, which may be of known construction, and to which is secured a connecting rod 19 slidably supported by a frame 20 and pivotally connected to lever 16 as at
95 21. Beneath the diaphragm 18 is an air chamber 23 with which communicates an air pipe 22 leading from an air container 24 rigidly suspended in the stuff box 2 by means of suitable supports 25. We have
100 shown the air container 24 as of inverted cone form and open at the bottom, although it may be of other shape. A pipe 26, provided with a valve 27, and connected with a source of air supply, not shown, leads to
105 the interior of the air container. By this means air under uniform pressure is constantly supplied to the container. The air pressure in the container prevents it from
110 being filled by the pulp, while air is permitted to constantly escape through the open bottom of the container into the pulp. As

pulp of various densities will offer more or less resistance to the escape of air, a varying pressure in the air container will result which will in turn be communicated to the air chamber 23 and act on the diaphragm 18 to rock lever 16 to operate the gate.

In operation, pulp of normal consistency is introduced into the stuff feed box. Air is then supplied through pipe 26 to the air container 24 to create a proper pressure therein to operate diaphragm 18 sufficiently to rock lever 16 to open gate 7, the latter moving downwardly, to feed a proper stream of pulp of normal density to produce the desired thickness of paper. The necessary pressure to keep the gate opened the desired distance having been determined this pressure is maintained, and introduction of air at this pressure is then continued. Any excess air in the container will escape therefrom through the pulp. If the pulp gets thinner the air will escape from the container more freely and the pressure in the container and beneath the diaphragm 18 will accordingly decrease the weight of lever 16 causing it to rock slightly downward to open the gate 7 to a greater extent so that more pulp is fed. If the density of the pulp increases, its resistance to the escape of the air also increases and a greater pressure results in the air container 24 and beneath the diaphragm 18, with the result that the lever 16 is moved upwardly to close the valve. For varying the thickness of the paper the amount of air supplied to the air chest 24 can be varied, or the connection 15 adjusted on rod 12.

By placing a gage 30, preferably a recording gage of any kind well known in the art, in communication with the pressure in the air container, as by connecting it to pipe 22, the density of the pulp may be noted and recorded, the dial of the gage being appropriately marked to indicate in terms of density.

From what has been stated it is obvious that our device may be used in connection with the feeding of substances other than paper pulp with equal success.

We claim as our invention:

1. In a pulp feed receptacle, an air container within said receptacle connected with a source of supply, the pressure in said con-

tainer being controlled by the density of the pulp in said receptacle, and a gage connected with said container for recording the density of the pulp through the instrumentality of the air pressure in said container.

2. In a pulp feed receptacle, an air container within said receptacle connected with a constant source of supply, and having an opening through which air may escape to the pulp in said receptacle, controlled by the pressure in said container for recording the density of the pulp.

3. In a pulp feed regulator, a pulp receptacle having a feed opening, a valve for controlling said opening, an air container suspended in said pulp receptacle, and means operated by the air pressure in said container for effecting the movement of said valve.

4. In a pulp feed regulator, a pulp receptacle having a feed opening, a valve for controlling said opening, an air container connected with a source of air supply and suspended in said receptacle, the latter having an outlet to permit escape of the air into the pulp in said receptacle, and means operated by the pressure in said container for effecting the movement of said valve.

5. In a pulp feed regulator, a pulp feed receptacle having a feed opening, a valve for controlling said opening, an air container within said receptacle connected with a source of air supply and having an outlet for the escape of air into the pulp, a member adapted to be operated by variations of pressure in said air container, and a lever connected with said member and said valve for effecting the movement of the valve.

6. In a pulp feed regulator, a pulp feed receptacle having a feed opening, a valve for controlling said opening, an air container within said receptacle connected with a source of air supply and having an outlet for the escape of air into the pulp, an air chamber having communication with said air container, a diaphragm in said chamber adapted to be operated by variations of pressure in said air container, and a lever connected with said diaphragm and said valve for effecting the movement of the valve.

In testimony whereof we have hereunto subscribed our names.

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