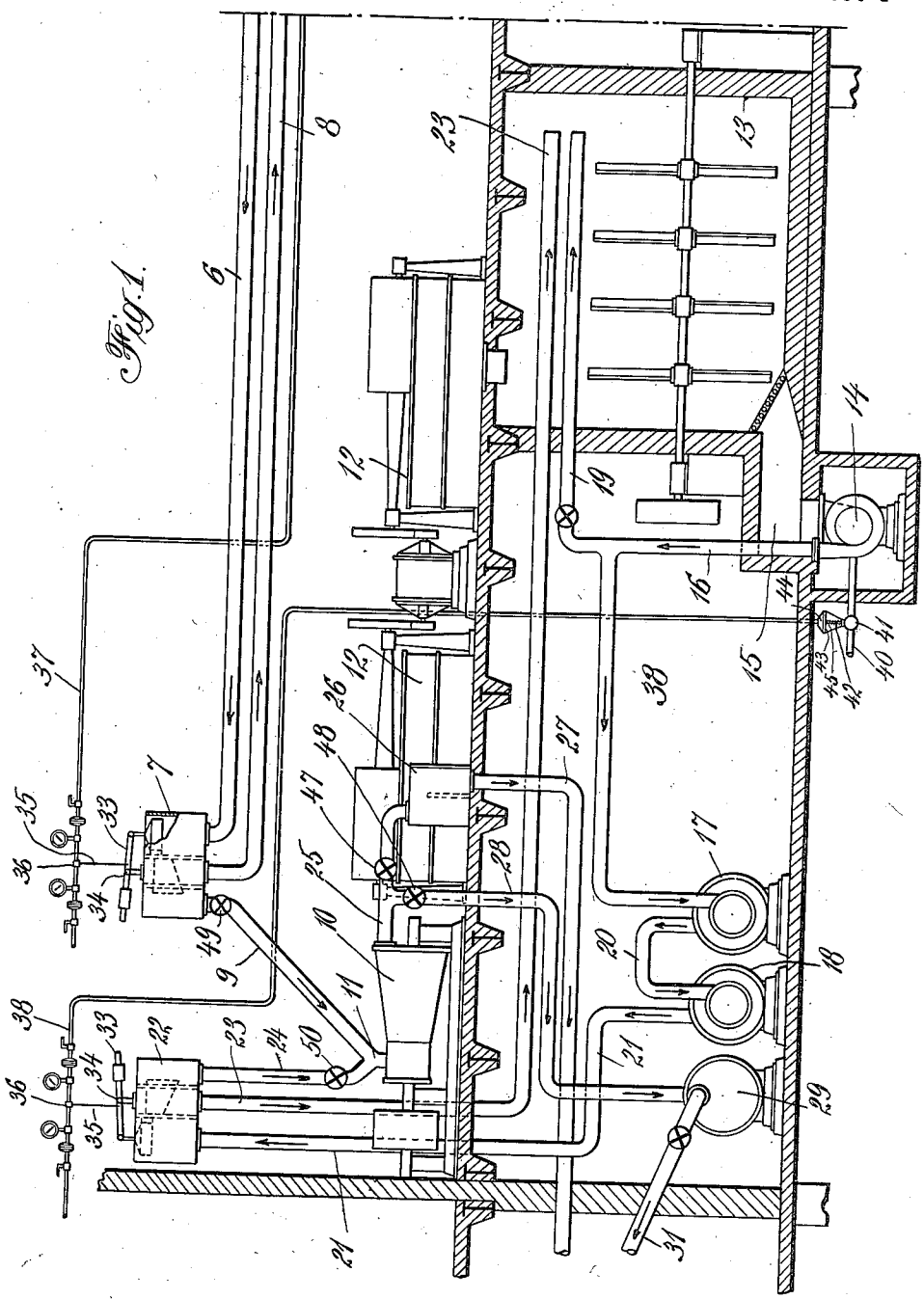
Feb. 12, 1924. 1,483,149

G. S. WITHAM, JR

STOCK BLENDING MECHANISM

Filed Feb. 17, 1921 3 Sheets-Sheet 1

Fig. 1.



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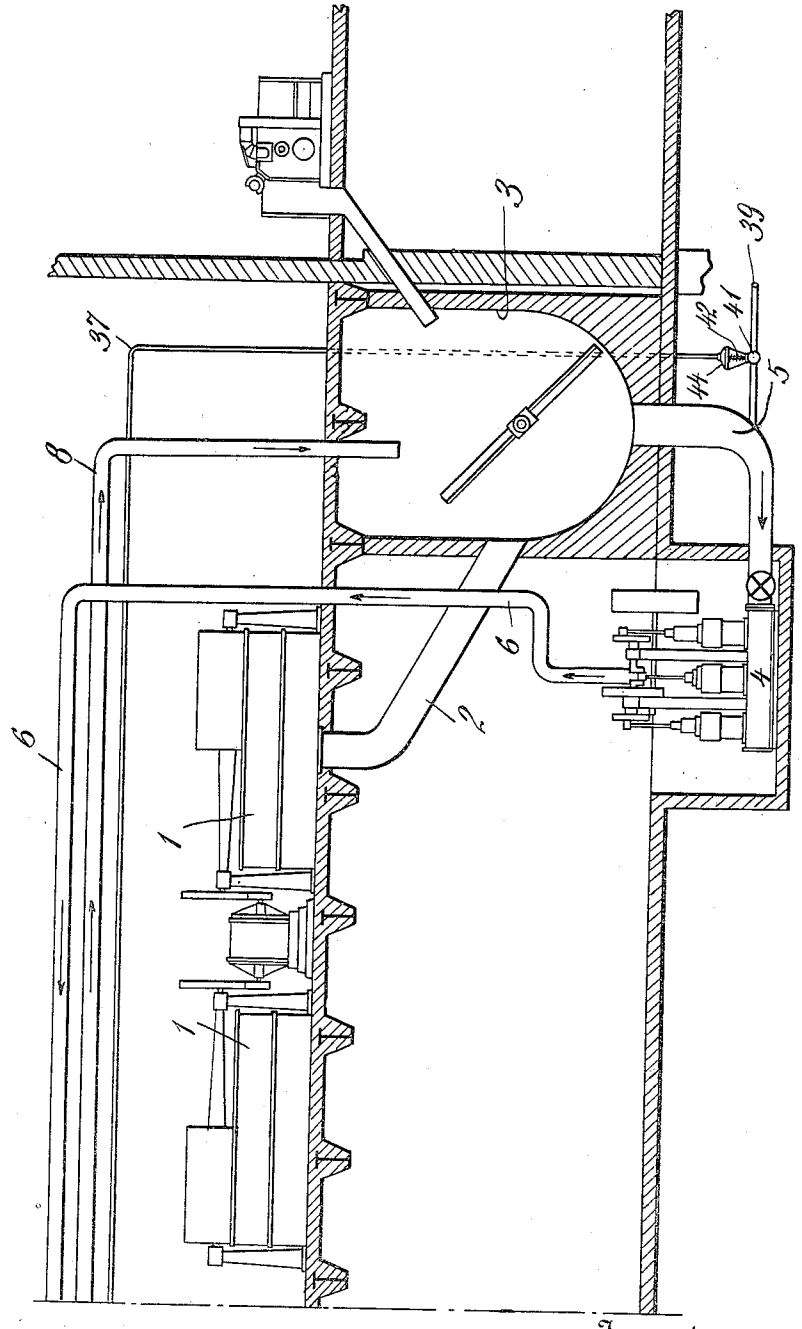

Fig. 2.

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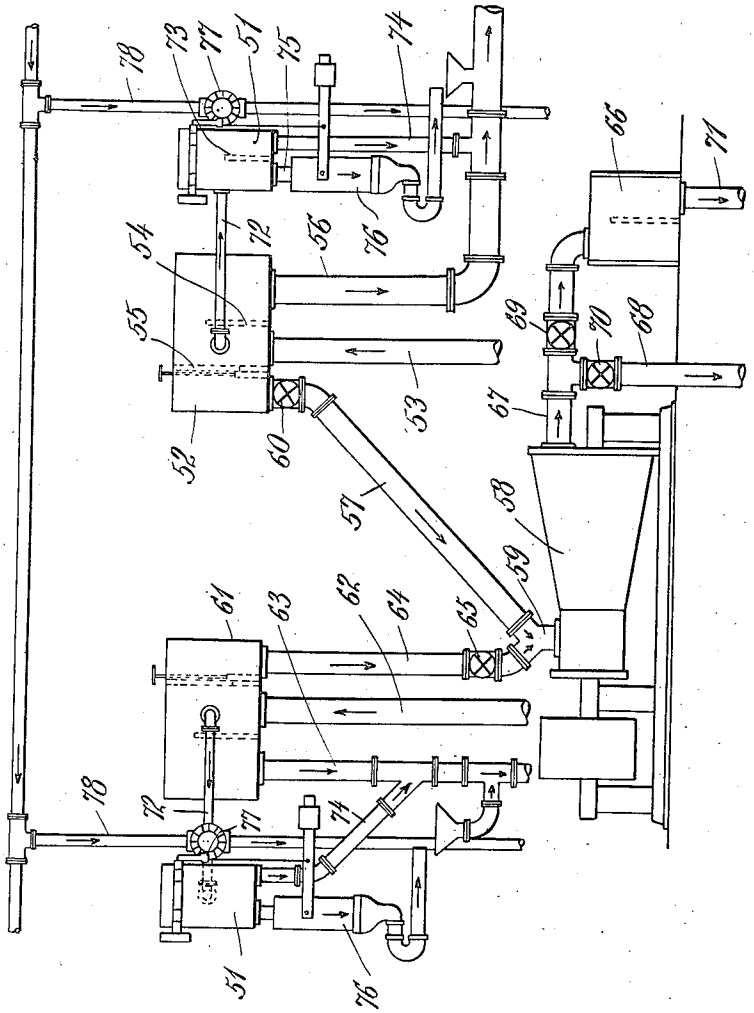
Fig. 3.



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Patented Feb. 12, 1924. 1,483,149

UNITED STATES PATENT OFFICE.

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STOCK-BLENDING MECHANISM.

Application filed February 17, 1921. Serial No. 445,589.

To all whom it may concern:

Be it known that I, GEORGE S. WITHAM, Jr., a citizen of the United States, residing at Hudson Falls, in the county of Washington, State of New York, have invented certain new and useful Improvements in Stock-Blending Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improvement in paper stock handling apparatus, and relates to that character of apparatus designed to receive the stock from the decker chest and to put it into condition to be run upon the paper wire.

An object of the invention is to provide an apparatus of the character specified wherein known types of stock handling machines are so combined and connected, that paper stocks of widely different character, as for instance soft and hard stocks, may be treated in the same apparatus and brought to that degree of hydration which will give the best results in paper making for that character of stock.

Another object is to provide in such apparatus, means for blending stocks of different character into a stock having a definite and constant proportion of each, and wherein each stock will be of a predetermined and uniform consistency before it is blended with the other stock.

In the drawings;

Figures 1 and 2 together constitute a front elevation conventionalized and diagrammatic of the improved apparatus,

Figure 3 is a similar view of another arrangement.

As is known, each kind of paper stock requires a particular treatment. As for instance, soft stock, such as sulphite or ground wood requires but a few minutes treatment in the beaters now in use, while hard stock, as for instance kraft requires a treatment of several hours, in order to fit it for the machine chest. A mill making paper from the two stocks must have an apparatus for each character of stock, and for this reason it is necessary that a large number of beaters and accessories be provided. In the present invention either character of stock can be treated in the same apparatus. Furthermore, some mills practice combining two different stocks, as for instance soft and hard, in the same beater, giving them the same treatment. With this method, when the soft stock is hydrated to the proper degree, the hard will still be in the first stage of treatment and consequently raw. On the other hand if the hard stock is properly hydrated, the soft will be gelatinized and its properties destroyed. The present invention is designed to permit stocks of different hardness to be combined into a stock suitable for the paper wire, with each stock receiving the proper treatment to insure the best results for that character of stock on the paper wire.

In the present embodiment of the invention the soft stock and the hard stock are fed from the decker chest to a Jordan engine, each of the feeding means having means in connection therewith for insuring a predetermined and uniform consistency of the stock controlled by the stock itself, there being interposed between the Jordan engine and the decker chest for the hard stock a series of beater engines for providing additional treatment for such stock.

In the embodiment of the invention as shown in Figures 1 and 2, the soft or sulphite stock from the beaters 1 is fed through the chute 2 to the decker chest 3 which is of usual construction. A centrifugal pump 4 is connected with the discharge outlet 5 of the decker chest, and the delivery pipe 6 of the pump delivers into the float compartment of a Feeney regulator 7, of the character shown and described in Patent No. 1,134,831, granted April 6, 1915. These regulators have three compartments, namely, the float compartment just mentioned, an overflow compartment, and a flow compartment from which the stock passes to the Jordan engine. An overflow pipe 8 leads from the overflow compartment of the soft stock regulator to the decker chest 3, for carrying the overflow from the regulator to the said chest. A pipe 9 leads from the remaining compartment of the regulator to a Jordan engine 10 of usual construction, the pipe 9 being connected with one of the branches of a Y 11 which is the inlet of the Jordan engine.

The hard stock is fed from the hard stock beaters 12 into a chest 13. A centrifugal pump 14 is connected with the discharge 15 of the chest, and the delivery pipe 16 of

the pump delivers to the first of a series of Jordan engines indicated at 17 and 18. An overflow pipe 19 is provided for carrying the surplus stock from the pump back to the chest 13. The first Jordan engine 17 of the series delivers by a pipe 20 to the second Jordan engine 18 of the series, and a pipe 21 leads from the second Jordan engine of the series to the float chamber of a Feeney regulator 22. An overflow pipe 23 leads from the overflow chamber of the Feeney regulator to the chest 13, and a pipe 24 leads from the float chamber of the Feeney regulator to the Jordan engine 10 common to both stocks, connecting with the other branch of the Y 11. The Jordan engine 10 delivers by means of a pipe 25 to a flow box 26, and a pipe 27 leads from the flow box to the machine chest of the paper making machine. A branch pipe 28 leads from the pipe 27 to a second Jordan engine 29, common to both stocks, and this Jordan engine delivers by a pipe 31 to the machine chest.

The regulators 7 and 22 control the consistency of the stocks in whose feed lines they are interposed, and each regulator is controlled by the stock. The float 32 of each regulator is connected to one end of a lever 33 pivoted intermediate its ends as at 34 to the casing of the regulator. A link 35 connects each lever to a valve 36 which is interposed in a fluid pressure supply pipe 37 and 38. The pipe 37 extends to near the centrifugal pump 4 while the pipe 38 extends to near the pump 14. Fresh water supply pipes 39 and 40 respectively, are connected with the suction lines of the pumps 4 and 14, and a valve 41 is interposed in each of these fresh water supply pipes adjacent to the pump. Each valve has a stem 42 which is connected with a diaphragm 43 arranged within a casing 44. The diaphragm with the casing forms a closed compartment, with which the adjacent fluid pressure line 37 or 38 as the case may be communicates. These valves are normally held closed by springs 45 which encircle the stems, between the same and the casing 44. When the stock in either of the regulators becomes too thick the float will be lifted, and the valve 36 will be opened. This opens the fluid pressure line 37 or 38 as the case may be, and admits fluid under pressure to the diaphragm of the valve controlling the fresh water supply of the stock which is too thick. This increased supply of fresh water will thin the stock, and the stock will thus be maintained uniformly at the proper consistency.

A pair of pressure gages is arranged within each fluid pressure pipe line 37 and 38, the members of each pair being on opposite sides of the valve 36. These gages indicate the pressure in the line on each side of the valve.

The above described apparatus may be used for treating soft stock, or it may be used for treating hard stock, and if desired the apparatus may be used to blend hard and soft stock in the proper proportions. Each of the pipes 9 and 24 is provided with a valve 49 and 50 respectively, and when it is desired to treat either stock alone, that valve controlling the flow of the other stock to the Jordan engine is closed. In treating soft stock for instance the valve 50 is closed. The stock is now fed from the decker chest to the Feeney regulator, and passes from the regulator to the Jordan engine 10. From here the stock passes to the flow box and from thence to the machine chest. When hard stock is being treated, the valve 50 is opened, and the valve 49 is closed. The hard stock now passes from the decker chest through the series of Jordan engines 17–18, to the Feeney regulator 22, and from thence by way of the pipe 24 to the Jordan engine 10. In either case if the stock is not sufficiently treated in the Jordan engine 10, it may be diverted from the flow box to the Jordan engine 29. In the operation of blending, the soft stock is fed by the pump from the chest to the float compartment of the regulator 7. From the overflow compartment of the regulator the surplus stock flows back to the chest. A definite proportion of the said stock is fed to the common Jordan engine. The hard stock is fed by the pump 14 to the regulator 22, passing through the Jordan engines 17 and 18 which prepare the stock for blending with the soft stock, giving it the additional treatment needed. A portion of the stock is returned as surplus to the decker chest, and a portion thereof is fed to the Jordan engine 10, where such portion is combined with the portion of the stock fed the regulator 7. The combined stock may be fed directly to the flow box 26, from whence it passes by way of the pipe 27 to the machine chest, or it may be diverted through the second common Jordan engine 29. Valves 47 and 48 are arranged in the pipes 25 and 28, and by closing one and opening the other, the stock may be caused to flow to the flow box or to the Jordan engine.

In Figure 3 there is shown a construction, wherein the regulation of the density of the stock is by means of Trimbey consistency regulators. This construction of regulator which is shown and described in Patent No. 1,178,193, granted April 4, 1916, includes a stuff box 52 to which the beating mechanism for the soft stock delivers, by means of a pipe 53. The stuff box has two transverse partitions 54 and 55 as shown, one of which, 54, is of less height than the stuff box. The pipe 53 opens into the central compartment, and the overflow which passes over the partition 54 is returned by a pipe 56 to the

beater. The partition 55 has a hand operated gate for controlling the flow of the stock into the adjacent lateral compartment, and this compartment delivers by a pipe 57 to a Jordan engine 58, the pipe 57 connecting with one of the branches of a Y 59. A valve 60 is interposed in the length of the pipe 57, for controlling the flow of the stock through the same. The beating mechanism for the hard stock delivers to a similar stuff box indicated generally at 61, by means of a pipe 62, the overflow returning to the beater by a pipe 63. The delivery pipe 64 from the stuff box connects with the other branch of the Y 59, and a valve 65 is interposed in the said pipe for controlling the flow of the stock therethrough. The Jordan engine delivers either to a flow box 66 by means of a pipe 67, or to a second Jordan engine by means of a pipe 68, which leads from the pipe 67 between the Jordan engine and a valve 69. The pipe 68 is provided with a valve 70 and by closing the proper valves, the stock may be made to flow from the Jordan engine to the flow box, or to the second Jordan engine, by way of the pipe 68. A pipe 71 connects the flow box with the machine chest not shown. It will be understood that a series of beater engines is arranged in the pipe 62 which carries the stock from the decker chest to the stuff box, in the same manner as in the construction of Figures 1 and 2.

Each regulator includes in addition to the stuff box a constant level chamber 51, which takes a sample of the stuff from the central chamber of the stuff box, by means of a pipe 72. This constant level chamber 51 has an overflow partition 73 dividing the chamber into two compartments. From one of these compartments a pipe 74 leads to the overflow pipe 56, and the other chamber has a discharge spout 75. The said spout delivers to a variable level chamber 76, which is mounted to move vertically, and which controls through pawl and ratchet mechanism indicated at 77 a valve in a water supply pipe 78 which connects with the suction of the stock pump, in the same manner as shown in Figures 1 and 2. The variable level chamber discharges into the overflow pipe 56. The variable level chamber has a discharge orifice through which the discharge is relatively constant, due to the constant head under which the discharge takes place. The variations in the head of the stock within the chamber will correspond substantially with the variations in the stock consistency, and the movement of the variable level chamber will operate the valve to increase or diminish the water supply to the stock, whereby to maintain a substantially uniform density. The operation of this construction is precisely the same as that in the construction shown in Figures 1 and 2, so far as regards the treating of the stock, and the ultimate results attained. In the one construction the Feeney regulator is used, while in the other the Trimbey regulator is made use of.

I claim:

1. Apparatus for treating hard or soft stock, comprising a Jordan engine, a density regulator for each character of stock to be treated, each regulator delivering to the Jordan engine, and means for disconnecting any regulator from the Jordan engine.

2. Apparatus for treating hard or soft stock, comprising a Jordan engine, a density regulator for each character of stock to be treated, each regulator delivering to the Jordan engine, means for disconnecting any regulator from the Jordan engine, a flow box to which the Jordan engine delivers, the flow box delivering to the paper making machine, a second Jordan engine, and means for delivering the stock from the first engine to the flow box or to the second engine.

3. Apparatus for treating hard or soft stock, comprising a Jordan engine, a density regulator for each character of stock to be treated, each regulator delivering to the Jordan engine, means for disconnecting any regulator from the Jordan engine, means for preparing each character of stock and feeding it to the proper regulator, and a series of beater engines through which the stock passes from the hard stock preparing means to the regulator.

4. Apparatus for treating hard or soft stock, comprising a beating engine, a plurality of means for preparing stock for the engines, and means for delivering stock from either or both of the said means to the engine, means controlled by the density of the stock interposed between each of the said means and the beating engine for regulating the density of the stock and for maintaining the said density substantially uniform.

5. Apparatus for treating paper stocks of different character, comprising a common beater engine, means for delivering the said stocks to the engine in definite proportions, a series of supplementary beater engines through which one of said stocks must pass to the common engine, and a density regulator for regulating the density of each stock and controlled by the stock.

6. Means for blending paper stocks, comprising a beater engine, means for delivering the stocks to the engine in definite proportions, a supplementary engine through which one of the said stocks passes, and means controlled by the flow of each stock for maintaining said stock of substantially uniform density.

In testimony whereof I affix my signature.

GEORGE STANFORD WITHAM, Jr.