Aug. 8, 1944. L. J. SCHEID 2,355,243

PAPER PULP STOCK WASHER

Filed March 27, 1942 2 Sheets-Sheet 1

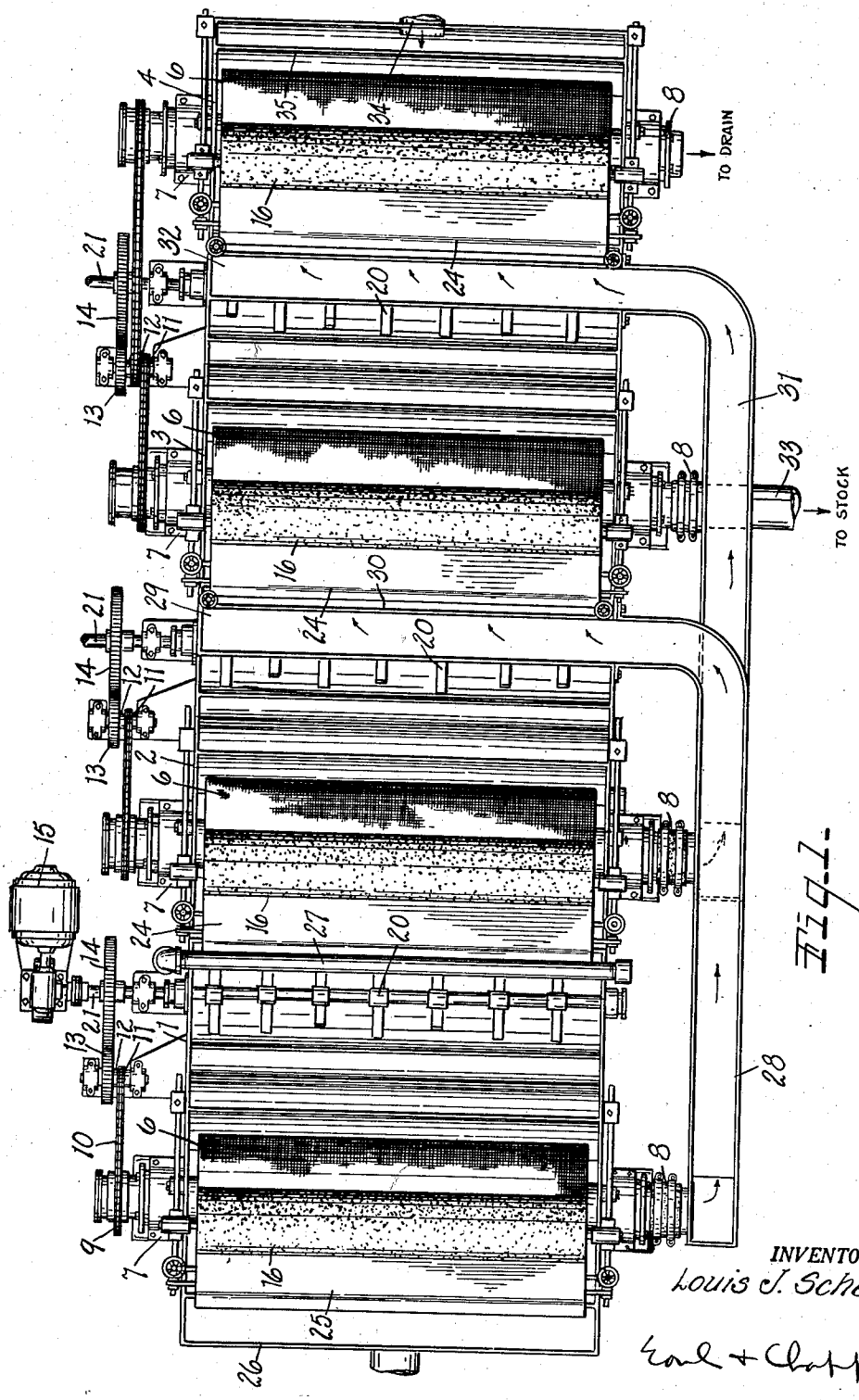



FIG. 1.

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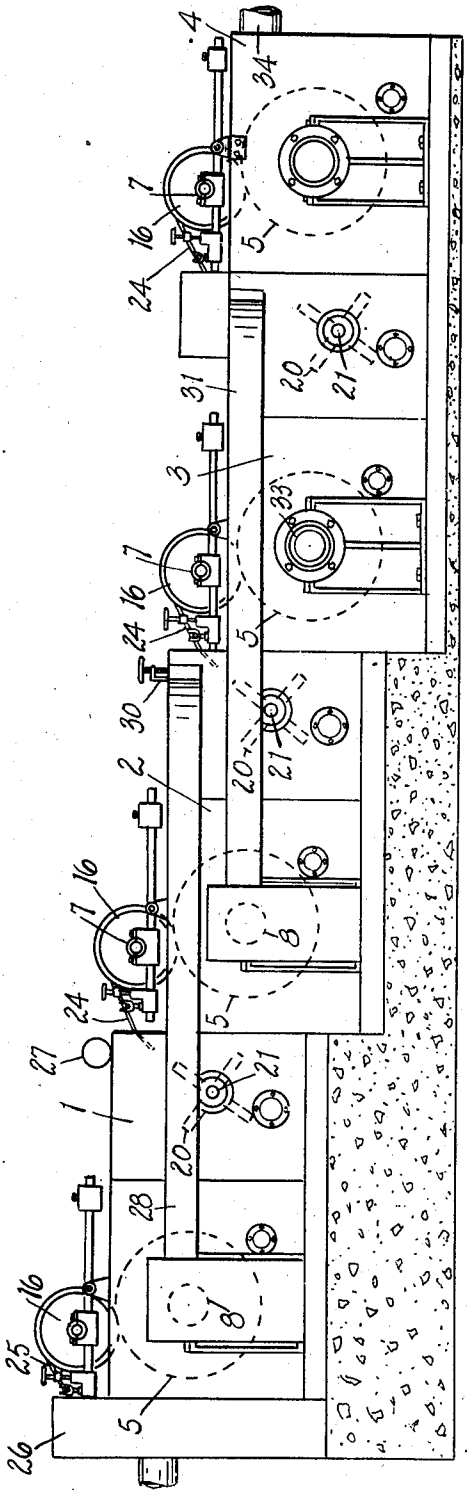


FIG. 2.

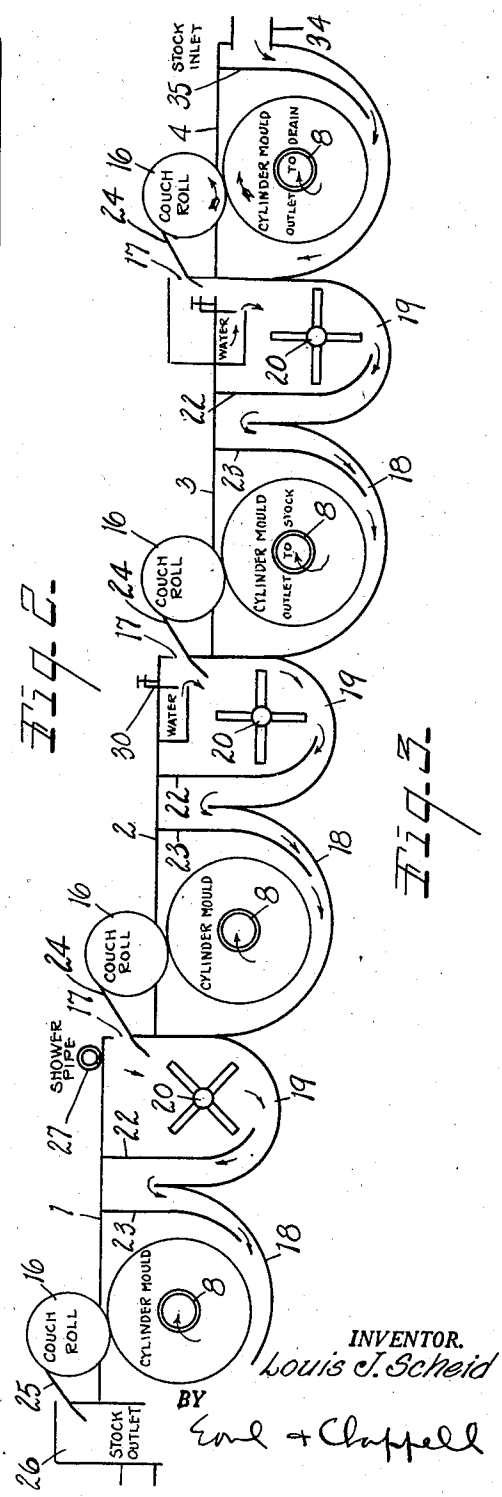



FIG. 3.

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Patented Aug. 8, 1944 2,355,243

# UNITED STATES PATENT OFFICE

2,355,243

## PAPER PULP STOCK WASHER

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Application March 27, 1942, Serial No. 436,487

1 Claim. (Cl. 68—182)

This invention relates to improvements in paper pulp stock washers.

This invention relates to paper pulp stock washers. Heretofore paper pulp stock has been washed in washing machines which consist of a plurality of tanks. The paper pulp stock has been washed in one tank, separated from the washing water and then passed on to another tank where it is again washed. The water used in the final washing has been transferred to the next tank for washing and has thereafter passed to the next tank. The separation of the paper pulp stock from the washing water in each tank has been accomplished with a cylinder mould and couch roll which also transfers the stock from tank to tank and the water has been transferred from tank to tank by means of pumps.

In operating such a washer, considerable difficulty has been encountered in maintaining uniformity of transfer of water from tank to tank since it has been necessary to carefully control each individual pump and the quantity of water transferred by it from tank to tank. Considerable power has been expended in this operation and considerable sums have been spent in equipment and maintenance.

The objects of this invention are:

First, to provide a new and improved washer for paper pulp stock which obviates the aforesaid difficulties.

Second, to provide such a washer in which the flow of washing water from tank to tank can be easily and simply controlled.

Third, to provide such a washer which eliminates the pumping equipment for transferring the water from tank to tank.

Fourth, to provide such a washer in which a series of vertically stepped tanks are provided and in which a cylinder mould and couch roll are used to elevate and transfer the pulp stock from the lowermost to the highest tank and in which gravity is employed to carry the water from tank to tank.

Other objects and advantages pertaining to details and economies of construction and operation will appear from the description to follow. Preferred embodiments of my invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a top plan view of a washer embodying my invention.

Fig. 2 is a side elevational view of such a washer.

Fig. 3 is a diagrammatic view showing how the stock and water flow through the machine.

The washer of my invention comprises a plurality of washer tanks 1, 2 and 3 in vertically stepped relationship and a further washer tank 4. Each of the tanks is provided with a cylinder mould 5 of standard construction which is provided with a wire mesh surface 6 and which is journaled in suitable bearings 7 and is provided with an axial outlet 8. Each cylinder is provided with a suitable driving mechanism for rotating it in a clockwise direction as viewed in Figs. 2 and 3, consisting of a sprocket 9, a chain 10, a sprocket 11 on shaft 12, a gear 13 on said shaft meshing with a gear 14 which is suitably driven by an electric motor 15.

Above and rotatable on an axis parallel with the axis of each cylinder mould 5 is a couch roll 16 which is disposed in cooperating relationship with the cylinder mould 5 to take stock therefrom and elevate it.

Each tank is provided with a stock inlet 17 which lies above the water level of the tank.

Each tank is divided into two sections 18 and 19. The section 18 contains the cylinder mould and the section 19 a suitable agitator 20 whose shaft 21 is connected to the motor 15. Suitable baffles 22 and 23 define passages through which the stock passes to the cylinder mould.

The cylinders 1, 2 and 3 are in vertical stepped relationship to one another and the couch roll of each tank is located at a point higher than the inlet 17 of the next higher tank. A doctor 24 is provided for removing stock from each couch roll and it slants downwardly to the inlet of the next higher tank so that the stock may fall under the influence of gravity in the next tank.

The doctor 25 of the couch roll of the highest tank discharges the stock from the couch roll into a stock outlet 26.

A shower pipe 27 is provided above the inlet and agitator of the highest tank 1. Clean washing water is introduced from this shower into the tank and it is mixed with the pulp stock in the tank 1. The cylinder mould removes the stock from this water in the conventional manner and the water flows from the outlet 8 of the cylinder mould of tank 1 through a conduit 28 to a trough 29 provided with a suitable adjustable weir 30 disposed over the agitator and the inlet of the next lower tank 2.

A similar conduit 31 conveys the water from the cylinder mould of tank 2 to the trough 32 which is similar to the trough 29 and is located above the agitator of tank 3.

The conduits 28 and 31 are so arranged that the water will flow by gravity from the highest tank to the next lower tank and so on.

The water from tank 3 passes from a suitable conduit 33 and it is preferred to mix this water with the stock which is being prepared for washing. When this water is thus mixed with the stock, it is introduced into the tank 4 through a suitable stock inlet 34 through a passage defined by the baffle 35 to the cylinder mould of tank 4. The water passing from the cylinder mould of tank 4 being dirty is passed to a suitable disposal drain.

The tanks 3 and 4 are not in vertical stepped relationship since the water from tank 3 is preferably passed to a trough and screening system to remove foreign material from which it is pumped to the unwashed stock.

In operation, the stock to be washed, mixed with the water from conduit 33 or any suitable water, is introduced into tank 4 through the inlet 34. The cylinder mould picks up the stock and separates it from the water. The couch roll of tank 4 carries the stock around and the doctor 24 takes the stock from the couch roll and transfers it to tank 3. Here it is mixed with the water from tank 2 and the cylinder mould of tank 3 then separates the stock from the washing water and the couch roll of tank 3 elevates the stock and deposits it in tank 2 where it is mixed with the water from tank 1. The cylinder mould of tank 2 separates it from this water and elevates it and transfers it to tank 1 where it is mixed with the clean water. After this final washing, the cylinder mould of tank 1 and the couch roll thereof transfer it to the stock outlet.

With this arrangement of the various elements of the washer, the stock and the water flow counter to one another and as the stock is progressively cleaned, it is subjected to the cleansing action of progressively cleaner water until the final washing. The cylinder mould and couch roll separate the stock from the washing water and elevate it and pass it from tank to tank. The water flows from tank to tank under the influence of gravity and it is not necessary to provide any pumping apparatus for transferring the water from tank to tank. This eliminates the necessity for any pumping apparatus and the consequent expenditure, maintenance cost, and the consumption of floor space. It also eliminates the necessity for careful adjustment of series of pumping units and assures adequat flow of water at all times through merely adjusting the flow at the shower pipe of the highest tank and the adjustment of the weirs of the lower tanks.

In the preferred form of the invention, the cylinder moulds of the various tanks are disposed on parallel axes since this is the most economical arrangement for conservation of space.

The terms and expressions which have been herein employed are used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions of excluding any equivalents of the features shown and described. It is recognized that various modifications are possible within the scope of the invention claimed.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

In a washer for paper pulp stock, a plurality of washer tanks each having a stock inlet above the water level thereof and a cylinder mould therein, and a cooperating couch roll extending parallel to and above the mould to remove stock therefrom and elevate it, said washer tanks being disposed in vertically stepped relationship with the top of the couch roll of each tank extending above the inlet of the next higher tank, each couch roll having means for removing stock therefrom and for conveying it by gravity to the inlet of the next higher tank, means for supplying wash water to the highest tank, and a conduit extending from the interior of the cylinder mould of each elevated stepped tank to the next lower tank and adapted to convey entirely by gravity used wash water from said cylinder mould to said next lower tank for washing the pulp stock therein, means for conveying water from the interior of the cylinder mould of the lowest of said stepped tanks, and means for supplying stock to said lowermost tank for washing, and means for driving said cylinder moulds and couch rolls to separate stock from wash water and convey it from each tank to the next higher tank.

LOUIS J. SCHEID.