

March 20, 1934.

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1,951,684

CONTINUOUS PULP SELECTOR

Filed Sept. 3, 1932

2 Sheets-Sheet 1

Fig. 1.

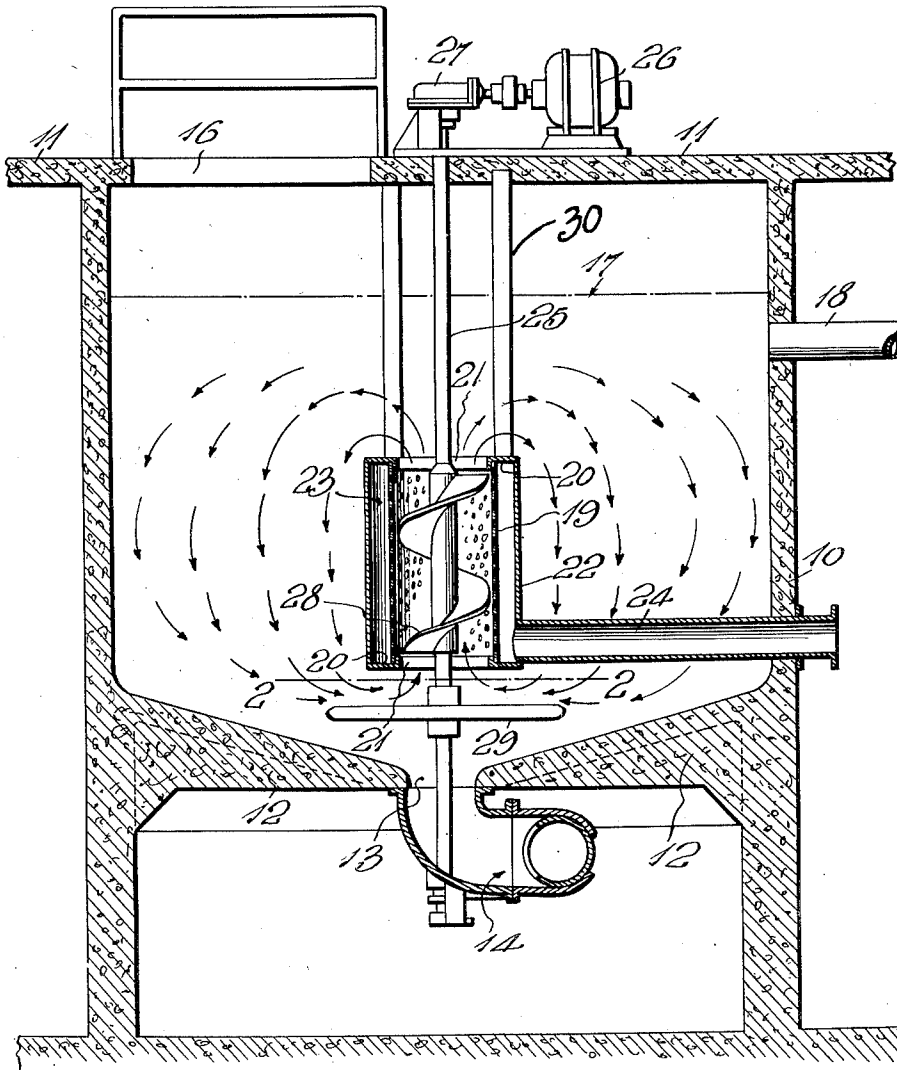


Fig. 2.



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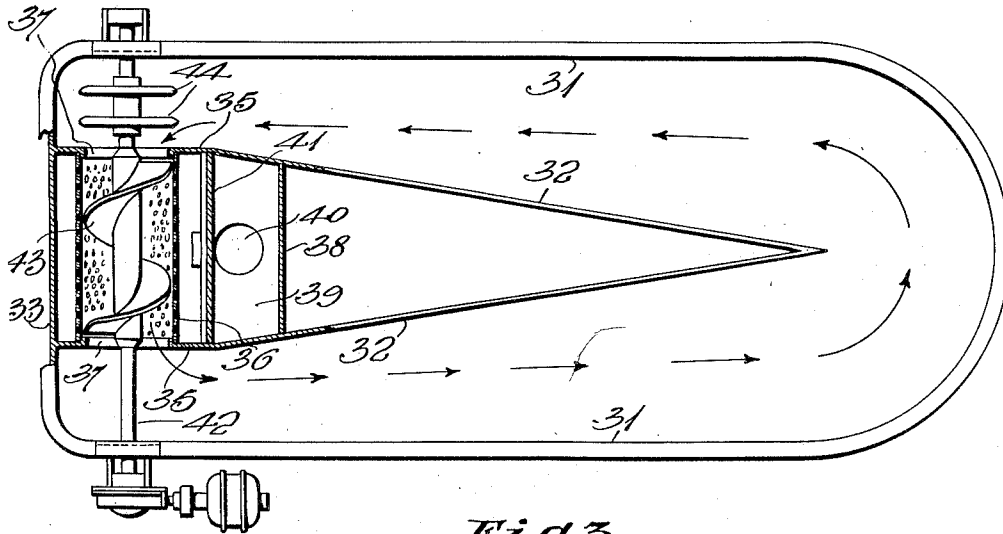
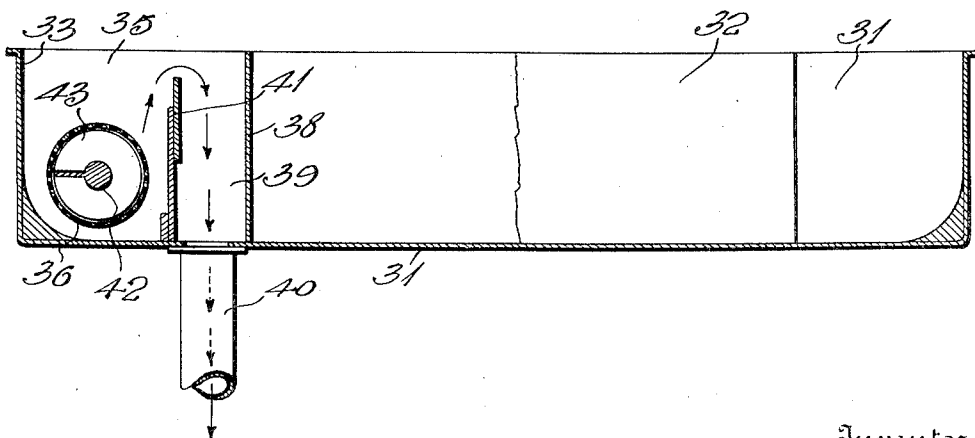


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE

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CONTINUOUS PULP SELECTOR

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Application September 3, 1932, Serial No. 631,712

3 Claims. (Cl. 92-29)

The invention relates to paper making apparatus and more particularly to a novel unit for continuously selecting pulp having a predetermined degree of fineness, and passing it on to other units for properly treating it preparatory to manufacture into paper. While I have referred to the invention as a continuous pulp selector, it also performs the additional steps of continuously beating and brushing, agitating and circulating, shredding, and storing.

The apparatus is particularly adaptable for use in de-fibering and de-inking waste paper and preparing the pulp for re-use in paper manufacture, but is not restricted to this particular field.

The principal object of the invention is to provide an apparatus of the class set forth which is comparatively simple and inexpensive, may be advantageously and continuously operated at little expense, will require only a comparatively small enclosure in which to operate, and will be capable of large output.

With the foregoing and minor objects in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Fig. 1 is a vertical sectional view through one form of pulp selector constructed in accordance with the invention.

Fig. 2 is a detail horizontal sectional view on line 2-2 of Fig. 1.

Fig. 3 is a top plan view of a different form of the invention with the cover of the tank removed.

Fig. 4 is a central longitudinal sectional view on line 4-4 of Fig. 3.

The two forms of construction selected for illustration, will be rather specifically described, with the understanding however, that variations may be made.

In Fig. 1, the numeral 10 denotes a pulp tank whose top 11 may well be formed by a portion of the floor of a paper factory. The bottom 12 of the tank preferably declines to a central opening 13 which communicates with a trash settler 14 having an appropriate rotary trash trap which can be cleaned whenever desired. The top 11 is formed with an appropriate feed hole 16 into which waste paper or other fibrous material may be discharged into a body of liquid 17 held in the tank, said liquid consisting of a chemical solution, a detergent solution, etc., according to the treatment which the fibrous material requires. At 18, I have shown a liquid supply pipe leading to the tank.

A tubular open-ended screen 19 having perforations, slits or the like of any desired dimensions, is disposed vertically in the tank 10, below the liquid level, and jacket means surrounds said screen to provide a receiving chamber 23 for the selected pulp passing through the screen. In the preferred construction, the jacket means comprises end walls 20 of annular form, provided at their inner edges with ribs 21 fitting into the open ends of the screen, and a vertical tubular wall 22 connected with said end walls 20. From the chamber 23, I provide a screened pulp outlet pipe 24 which extends to the exterior of the tank 10. This outlet is below the level of liquid in the tank 10 so that continuous discharge of screened pulp, takes place by gravity.

A vertical shaft 25 passes through the screen 19 and is co-axial therewith, any desired driving means such as a motor 26 and gear 27, being provided for said shaft. Upon this shaft is a pulp impelling screw 28 which is disposed within the screen 19 in sufficiently close relation with the latter to continually wipe the screen and therefore prevent clogging thereof. Also secured on the shaft 25 is a beater 29 which is disposed at the inlet end of the screen 19. When waste paper or the like is being de-fibered and treated in the apparatus, this beater assists materially in disintegrating the same and obviously such disintegration will be aided by the continual soaking of the paper or the like in the liquid within the tank. The beater 29 serves to disintegrate any large masses of wet paper or the like which might otherwise become jammed between the screw 28 and the screen 19 with danger of injuring both thereof. This beater operates directly over and in close proximity to the trash outlet 13 and serves to keep said trash outlet clear of any masses of wet paper or the like which might otherwise clog the same.

The impeller 28 causes continuous rapid circulation of the liquid pulp in the tank and longitudinally through the tubular screen 19, and during the travel of the pulp through this screen, any pulp in sufficiently fine state, flows through the perforations or the like of the screen into the chamber 23, from which it discharges through the outlet 24. All pulp which does not immediately pass through the screen 19, is re-circulated and re-beaten until it will eventually reach the desired fineness for discharge through the screen.

For fixedly mounting the assemblage of screen 19 and walls 20 and 22, any desired means may be provided, but I have shown a plurality of rods 30 suitably secured to the tank top 11 and to the uppermost of the walls 20.

In the form of construction shown in Figs. 3 and 4, 31 denotes a horizontally elongated tank. Disposed within this tank is a divider 32 which extends from one end 33 of said tank to a point near the other end thereof. The end of the divider 32 toward the end wall 33, is relatively wide and is hollow and is provided with parallel longitudinal walls 35. Between these walls, a tubular open-ended screen 36 extends, said walls being provided with openings 37 so that the ends of the screen 36 may directly communicate with the tank 31. A transverse partition wall 38 co-acts with the walls 35 and portions of the tank walls, in forming a chamber 39 around the tubular screen 36, said chamber being adapted to receive all pulp passing through said screen. A gravity outlet 40 is provided for this chamber 39, and a vertically adjustable dam 41 is preferably provided across said chamber between the screen 36 and said outlet. By vertically adjusting this dam 41, with respect to the level of liquid in the tank 31, the head acting to force the pulp through the screen 36 may be varied, as occasion may demand.

A suitably mounted and appropriately driven shaft 42 passes longitudinally through and is coaxial with the tubular screen 36. Upon this shaft are a screw 43 and beaters 44 which correspond to the screw and beater above described.

It will be seen from the foregoing that novel provision has been made for carrying out the objects of the invention, and while preferred features of construction have been illustrated, attention is again invited to the fact that variations may be made within the scope of the invention as claimed.

I claim:

1. A beater and pulp selector comprising a pulping tank, a fixed tubular pulp-selecting screen whose ends both communicate with said tank, means for receiving the pulp passing through said screen, said pulp-receiving means being segregated against communication with said tank except through said tubular screen, a pulp outlet from said pulp-receiving means, a driven shaft passing longitudinally through said tubular screen, a pulp impelling and screen clearing screw on said shaft within said tubular screen for effecting continuous circulation of the pulp in said tank and longitudinally through said tubular screen, and a beater on said shaft disposed at the inlet end of said tubular screen, to disintegrate large masses of pulp before allowing entrance thereof into the screen, preventing such masses from becoming jammed between said

screw and said screen with danger of injury thereto.

2. A pulp beater and selector comprising a pulp tank having a central trash outlet in its bottom and a trash settler communicating with said outlet, said bottom being declined to said trash outlet, a vertical tubular pulp selecting screen spaced above said bottom and having both of its ends in open communication with said tank, said screen being alined with said opening, jacket means providing a chamber around said screen, said chamber communicating with the tank only through said screen, a pulp outlet pipe for said chamber extending to the exterior of said tank, rigid supporting means for the assemblage of screen and jacket means, a vertically mounted driven shaft extending through said screen coaxially with the same, a pulp circulating and screen clearing screw fixed to said shaft within said tubular screen and extending substantially throughout the length of the latter, and a beater secured to said shaft between said screen and said tank bottom and in close proximity to both thereof; whereby said beater serves to disintegrate large masses of pulp to prevent jamming thereof between said screw and said screen, and serves further to prevent accumulation of large masses of pulp in and over said trash outlet.

3. A pulp beater and selector comprising a horizontally elongated pulp tank, two vertical longitudinal walls in said tank, said longitudinal walls extending from one end wall of said tank into spaced relation with the other end wall thereof, said longitudinal walls having laterally spaced end portions secured to said one end wall and converging into juncture with each other at their other ends, a fixed transverse partition extending between said laterally spaced end portions and spaced inwardly from said one end wall, a vertically adjustable transverse dam located between said fixed partition and said one end wall, a pulp outlet from the space between said dam and said partition, a tubular screen between said dam and said one end wall and connected at its ends to said laterally spaced end portions, the latter having openings placing the ends of said screen in communication with the tank, a driven shaft extending transversely of the tank and extending through said screen along the axis of the latter, a pulp circulating and screen clearing screw secured to said shaft and extending substantially throughout the length of said screen, and a pulp beater secured on said shaft at the inlet end of said screen.

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