Nov. 15, 1932. L. V. REESE ET AL 1,887,955

PAPER PULP EXTRACTOR

Filed March 2, 1931

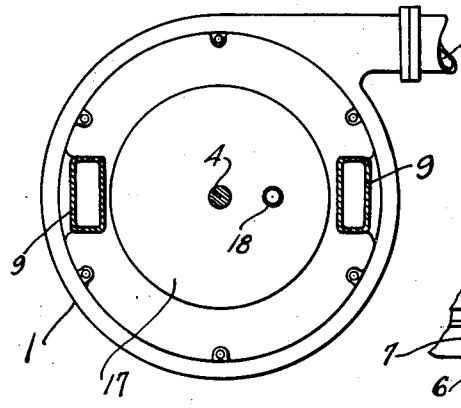


Fig. 2.

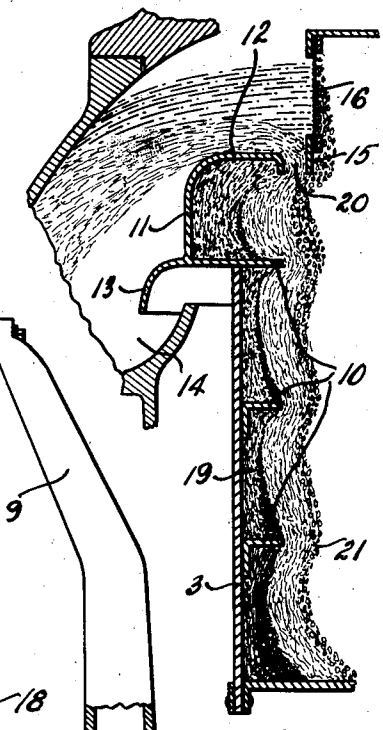


Fig. 3

Fig. 1

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PAPER PULP EXTRACTOR

Application filed March 2, 1931. Serial No. 519,443.

Our invention relates to centrifugal extractors and, particularly, to an apparatus embodying centrifugal action for freeing paper pulp from impurities according to the specific gravity of the impurities, and delivering the paper pulp in a purified state to the paper making machines.

Centrifugal machines of this character usually embody a rotatable basket having a solid wall with means provided thereon for retarding the normal tendency of the pulp to flow upwardly in order to subject the pulp to centrifugal action over such period of time that the impurities and pulp will be separated and a skimming ring that is employed for skimming off the lighter weight impurities forming the inner stratum of the mass within the basket, the purified pulp made up of fibres only forming the center stratum and being delivered continuously into a volute as untreated pulp is fed into the basket. It is well understood that centrifugal action divides the mass up into the heavier stratum or those parts having the greatest specific gravity, an intermediate stratum which is normally the purified paper pulp, and an inner stratum made up of impurities of less specific gravity than the paper pulp. In previous machines, the skimmer ring, while functioning to skim off the lighter weight impurities has embodied no means for holding such impurities, the impurities finally overflowing at the inner edge of the skimmer ring into the volute or delivery conduit to intermingle with the purified stock and flow outwardly therewith.

It is the object of our invention to provide a means for trapping the lighter weight impurities that form the inner stratum of the layer of pulp being purified as well as a means for filtering out the impurities under centrifugal force and permitting the water intermingling with them to flow over into or be thrown outwardly by centrifugal force into the purified pulp in the volute, thus finally delivering completely purified pulp having the proper water content.

Various other objects and advantageous features will be seen in the following description and one embodiment thereof may be seen in the accompanying drawing wherein similar characters of reference designate corresponding parts, and wherein

Fig. 1 is a view, partly in section and partly in elevation showing an apparatus constructed in accordance with our invention; Fig. 2 is a top plan view of the apparatus shown in Fig. 1 with the power unit and supporting means therefor removed; and Fig. 3 is a sectional view showing the position taken by the various stratum having different specific gravities during the operation of the apparatus and the delivery of the purified stratum to the volute.

Referring to the drawing, we have shown a centrifugal extractor consisting of the usual curb 1 supported by suitable base members 2 and adapted to receive a rotatable basket 3 mounted on a spindle 4 that rotates in a bearing 5 carried by the curb 1 and has its opposing end attached to the drive shaft 6 of the suitable motor or power means 7. As shown, this motor or power means is pivotally mounted in a pivoted gimble ring 8 supported by suitable uprights 9 which will permit precession of the spindle 4 during operation of the apparatus.

As is customary in such apparatus, suitable circumferential baffle flanges 10 are disposed within the basket 3 for the purpose of retarding the upward flow of pulp and also for building up a pulp mat into which the heavy impurities extracted from the pulp during the centrifugal operation of the basket will be imbedded and thereby retained in the basket. The top of the basket is provided with an annular ring 11 having an overhanging portion 12 adapted to retain the pulp mat and heavier impurities and prevent their flow out of the basket and an overhanging portion 13 that acts as a guide for directing the extracted paper pulp into a volute 14 and as a means for preventing the paper pulp from falling downwardly between the curb and the basket.

In accordance with our invention, a vertically extending annular skimmer ring 15 is provided at the upper end of the basket and is spaced a sufficient distance from the innermost edges of the overhanging portion

12 to skim off or separate the lighter impurities from the paper pulp. An annular screen or filter means 16 extends vertically upwardly from the skimmer ring 15 and is of such nature as to have filtering qualities sufficient to hold all impurities and permit the passage of clarified liquid therethrough and over into the volute 14, the liquid being separated and thrown outwardly by centrifugal action. The curb 1 is shown as being provided with a suitable cover 17 although this is not absolutely essential.

In the operation of the apparatus, wood pulp from the usual beaters is fed into the basket 3 through a pipe 18 which has its outlet opening near the bottom of the basket. Then, the basket is rotated at a speed which will produce a centrifugal force effective on impurities heavier than the weight of the fiber in the pulp to cause them to be imbedded in a mat of fiber formed on the inner periphery of the basket wall and between the circumferential flanges 10 as shown at 19 in Fig. 3 while a stratum of purified fiber will form adjacent the mat of fiber containing the heavier impurities as shown at 20, this stratum of fiber tending to move upwardly as the pulp is fed into the basket. Speed of rotation of the basket is such that the impurities of the lighter weight than that of the paper pulp fibers are unaffected by the centrifugal action to the extent that they will rise by the action of flotation and with the stratum of pulp fibers 20, as untreated pulp is fed into the basket forming an inner stratum that is skimmed off by the skimming ring 15 and pushed upwardly on the surface of the screen or filter 16. The centrifugal action will be effective on the lighter impurities to separate the water therefrom and throw the water outwardly into the volute 14 into which the stratum 20 of the purified paper pulp fiber passes. Thus, a means is provided for purifying the paper pulp by removing both the heavier and the lighter impurities therefrom by centrifugal action, while, at the same time, not forever alienating the normal water content from the pulp whereby the purified pulp will be delivered from the delivery end 22 of the volute 14 with the proper water content. This is a highly advantageous and very desirable feature.

What we claim is:

1. Apparatus of the class described, comprising a rotatable basket wherein material is subjected to centrifugal action for separating the material into different strata in accordance with the specific gravity of the different parts of the material, means for delivering one stratum from the basket, and means for segregating another stratum of the material, extracting liquid from said segregating stratum, and delivering such liquid to the stratum delivered from the basket.

2. Apparatus of the class described, comprising a casing, a basket mounted for rotation within said casing, means for rotating said basket, means for delivering material thereto for treatment by centrifugal action whereby the material will be separated into strata according to the specific gravity of the parts thereof, means for delivering one stratum from said basket, means for separating a stratum of lesser specific gravity from the material prior to delivery of the first named stratum from the basket, and means for extracting liquid from said separated stratum and delivering it to the stratum delivered from said basket.

3. Apparatus of the class described, comprising a casing, a basket mounted for rotation within said casing, means for rotating said basket, means for delivering material thereto for treatment by centrifugal action whereby the material will be separated into strata according to the specific gravity of the parts thereof, means for delivering one stratum from said basket and into a volute, a skimming ring for separating stratum of lesser specific gravity from the delivered stratum prior to delivery thereof, and strainer means for retaining said last named strata within said basket whereby liquid may be extracted therefrom by the centrifugal action of said basket and delivered to the delivered stratum.

4. Apparatus of the class described, comprising a casing, a basket mounted for rotation within said casing, means for rotating said basket, means for delivering material thereto for treatment by centrifugal action whereby the material will be separated into strata according to the specific gravity of the parts thereof, means on said basket for retarding the upward flow of the material and trapping the stratum having the greatest specific gravity, means for delivering an intermeditae stratum out of said basket, means for separating a stratum of lesser specific gravity than said last named stratum prior to delivery of the said stratum from the basket and segregating such lighter stratum from said delivered stratum, and means for extracting liquid from said segregated lighter stratum and delivering it to the stratum delivered from said basket.

In testimony whereof we hereby affix our signatures.

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