

No. 630,309.

A. ÅBERG.

Patented Aug. 8, 1899.

APPARATUS FOR CLEANING PAPER PULP.

(Application filed Dec. 24, 1897.)

(No Model.)

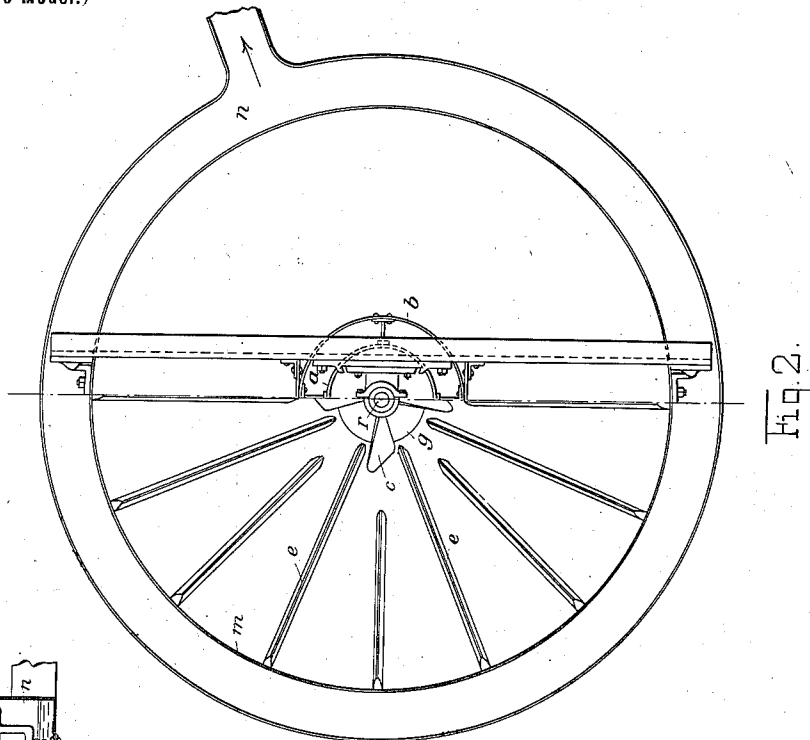


Fig. 2.

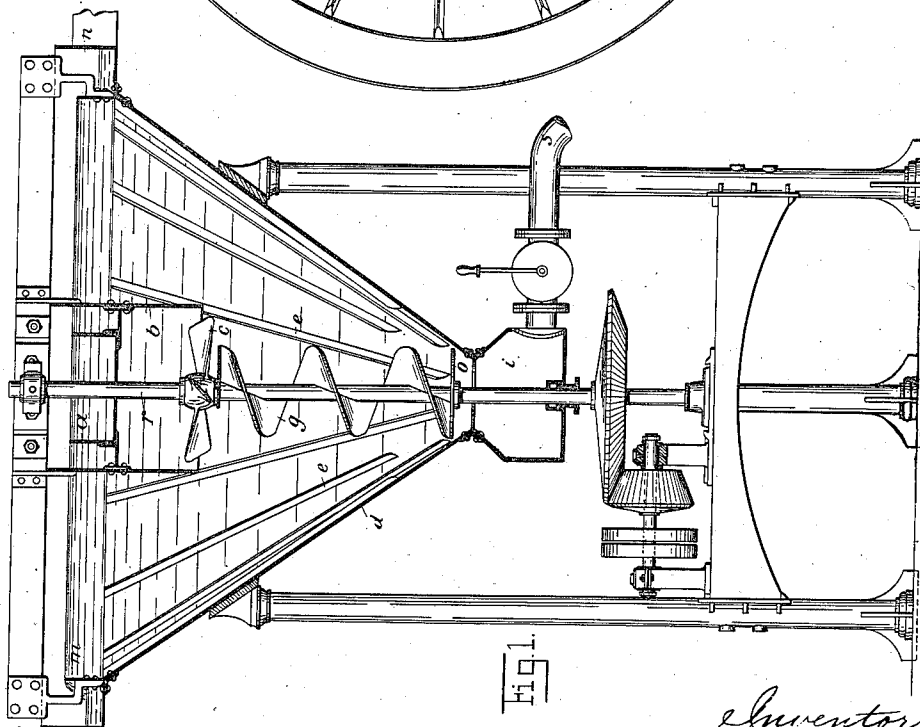


Fig. 1.

Witnesses:
H. H. Boneter
R. H. H. H.

Inventor:
Albert Åberg
By Wm. E. Fowler,
attorney

UNITED STATES PATENT OFFICE.

ALBERT ÄBERG, OF PODGORA, AUSTRIA-HUNGARY.

APPARATUS FOR CLEANING PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 630,309, dated August 8, 1899.

Application filed December 24, 1897. Serial No. 663,341. (No model.)

To all whom it may concern:

Be it known that I, ALBERT ÄBERG, manager of the Cellulose Works at Podgora, country of Goerz, Austria, and a resident of Podgora, Empire of Austria-Hungary, have invented certain new and useful Improvements in Apparatus for Cleaning Paper-Pulp or Wood-Pulp, of which the following is a specification.

The object of the present invention is a dresser for cleaning or purifying paper or wood pulp, and comprises a downwardly-tapering or conical vessel into which the paper or wood pulp to be purified is introduced and caused to rotate by any suitable means. In consequence of this rotary motion the good fibers, with which are mixed the chips, twigs, knots, or other impurities, become gradually released and, being of smaller specific gravity than water, rise and overflow at the overflow-outlet at the upper edge of the vessel.

The wood or paper pulp to be purified differs from other mixtures of substances in that the chief constituent parts of the impurities—the chips, twigs, or knots—have only a slightly greater specific gravity than that of the fibers themselves. The knots are of course so light that as long as they are surrounded with fibers they also have the same tendency to rise upward as the fibers. It is only by freeing or separating the fibers that the difference in the specific gravity of knots, twigs, and chips on one hand and fibers on the other hand becomes noticeable. This difference is, however, so small that the knots, &c., would rotate around the walls of the vessel and a part of them would even rise unless prevented from so doing. For this purpose I secure battens, baffles, or ribs to the inner surface of the vessel at suitable distances apart. The mass directly in front of the baffles is stopped by the latter, the flow of the liquid being impeded and eddy-currents formed behind the baffles, and so-called “dead-spaces” being formed in which the specifically-heavier substances are deposited. Particles of the wood or paper pulp that may have descended to the lower portion of the apparatus are caused to rise by means of a rotating worm.

An apparatus according to the present invention is illustrated by way of example in the accompanying drawings, in which—

Figure 1 shows the apparatus in longitudi-

nal section, Fig. 2 being a plan, partly in section, through Fig. 1.

The mass is introduced at the top, preferably at the center, into a stone or sand trap *a*, (having preferably the shape of a box,) and from which it overflows into the main vessel, stones and heavy foreign substances being deposited in the trap. The mass then passes into a lower chamber or deflector *b*, arranged concentrically below the trap, a mixing device *c*, rotating in a horizontal plane, causing the fluid mass to rotate. This mixing device may consist of a screw propeller or disk secured on a rotating central spindle *r*. The funnel-shaped main vessel *d* is provided on its inner walls with slightly-projecting longitudinal ribs or baffles *e*, converging toward the center, said baffles producing eddy-currents and causing the heavier particles or impurities contained in the pulp to settle. The fibers of the wood or paper pulp are thus separated from the twigs, chips, knots, and other specifically-heavier impurities which collect behind the baffles and descend to the bottom, the lighter fibers at the same time being caused to rise upward. These fibers rise and are discharged over the overflow edge *m* into a discharge-conduit *n*. The upward tendency of the fibers on the one hand and the sinking of the knots and impurities on the other hand would, however, owing to the small difference of their specific weights, not take place without the addition of a rotating screw or worm *g*, which again directs the fine fibers upward that may have been carried downward and unless the baffles *e* intercepted the movement of knots, twigs, chips, and other impurities. These impurities slide down the baffles into the lower portion *i* of the vessel. If the latter is to be emptied, a pipe *s*, arranged in the lower compartment, is quickly opened by means of any well-known device and impurities removed. The impurities already collected in the lower portion escape at once, in consequence of which suction is produced only along the oblique wall *d* owing to the rotating disk *o*, mounted on the spindle *r* and nearly touching the baffles *e*, preventing a direct suction on the inner remaining portion of the fluid mass in the upper vessel. The apparatus would, however, work, although

not so well, even if there were no worm *g* or disk *o*.

The important feature of the invention is the baffles *e*, arranged on the inner wall of the vessel *d*, and these baffles or ribs form an essential feature of the invention, as the lighter fibers having naturally a tendency to rise upward can be separated from the impurities of very slightly greater specific gravity only when there are such baffles. The whole mass of fluid, fibers, and impurities (knots, chips, and twigs) being driven against the inner walls of the vessel *d* and against the projecting baffles *e* by the rotating mixing device *c* rotary motion is impeded and there are formed behind the baffles *e* eddy-currents and within those the so-called "dead-spaces," the heavier parts collecting in said spaces or settling against the walls of the vessel *d* and the baffles *e* and sliding down them to the bottom, while only the specifically lighter fibers rise upward. The worm *g*, mounted in the lower portion of the vessel on the spindle *r*, assists the action of the apparatus, as it causes the substances which have reached the lower portion of the vessel and ceased to rotate to rise again, and the fibers that may have descended are carried upward and the heavier particles mixed with them driven against the wall and baffles of the vessel, where the already-described process of separation is repeated.

The spindle *r* is driven by any suitable means—such for instance, as bevel-gearing, as illustrated in Fig. 1.

The material introduced into the pulpdresser according to the present invention could be also caused to rotate without the use of the central stirring device by introducing the fluid at the center and causing the whole apparatus to rotate about a vertical central axis.

I claim—

1. In an apparatus of the character described, the combination with a conical vessel, of a series of baffles arranged longitudinally of the vessel upon the inner wall thereof, said baffles converging toward the lower end of the vessel and forming "dead-spaces" which converge toward said end of the vessel and said spaces being adapted to intercept and collect heavier particles during the rotation of the contents of the vessel and prevent such particles rising to the top.

2. In an apparatus of the character described, the combination with a conical vessel, of a series of baffles arranged longitudinally of the vessel upon the inner wall thereof, said baffles converging toward the lower end of the vessel and forming "dead-spaces" which converge toward said end of the vessel, said spaces being adapted to intercept and collect heavier particles during the rotation of the contents of the vessel and prevent such particles rising to the top, and a rotatable shaft arranged centrally of the vessel and a

disk secured thereto below but adjacent to the lower ends of the baffles and above the lower open end of the vessel.

3. In an apparatus of the character described, the combination with a conical vessel, of a series of baffles arranged longitudinally of the vessel upon the inner wall thereof, said baffles converging toward the lower end of the vessel and forming "dead-spaces" which converge toward said end of the vessel, said spaces being adapted to intercept and collect heavier particles during the rotation of the contents of the vessel and prevent such particles rising to the top, a shaft arranged centrally of the vessel, a worm carried by said shaft, and a disk also carried by the shaft below but adjacent to the lower ends of the baffles and above the lower open end of the vessel.

4. In an apparatus of the character described, the combination with a conical vessel, of baffles arranged longitudinally of the vessel upon the inner wall thereof, said baffles converging toward the lower end of the vessel and forming "dead-spaces" which converge toward said end of the vessel, said spaces being adapted to intercept and collect heavier particles during rotation of the contents of the vessel, and prevent such particles rising to the top, a vessel, *z*, arranged below the lower open end of the conical vessel, a discharge therefor, a shaft arranged centrally of the conical vessel, a worm carried by said shaft, and a disk also carried by the shaft below but adjacent to the lower ends of the baffles and over the lower open end of the conical vessel.

5. In an apparatus of the character described, the combination with a conical vessel, of baffles arranged longitudinally of the vessel upon the inner wall thereof, said baffles converging toward the lower end of the vessel and forming "dead-spaces" which converge toward said end of the vessel, said spaces being adapted to intercept and collect heavier particles during rotation of the contents of the vessel and prevent such particles rising to the top, a vessel, *z*, arranged below the lower open end of the conical vessel, a discharge therefor, a shaft arranged centrally of the conical vessel, a worm carried by said shaft, a disk carried by the shaft below but adjacent to the lower ends of the baffles, and over the lower open end of the conical vessel, a trap *a*, the chamber *b*, arranged below the trap having an open lower end, and a mixing device carried by the shaft within the open end of said chamber *b*, all arranged for cooperation as and for the purposes set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ALBERT ÅBERG.

Witnesses:

HENRY SCHMOLKY,
ADOLPH FISCHER.