

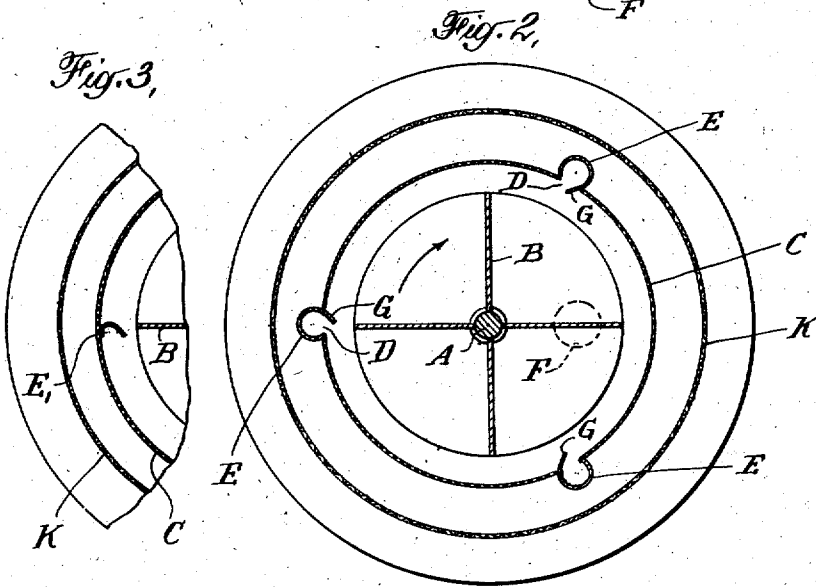
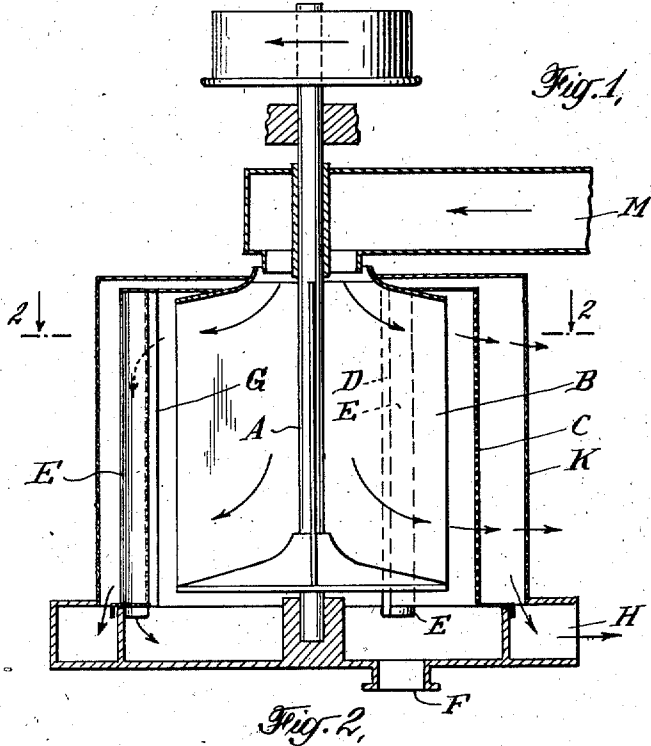
Sept. 12, 1933.

A. LAMPÉN

1,926,546

METHOD AND APPARATUS FOR REMOVAL OF MECHANICAL IMPURITIES
FROM CELLULOSE AND OTHER SIMILAR FIBER PULPS
Filed: April 2, 1932

Filed: April 2, 1932



INVENTOR!
Aleksander Lampén;
BY
Pennie Davis, Marvin Edmonds
HIS ATTORNEYS

UNITED STATES PATENT OFFICE

1,926,546

METHOD AND APPARATUS FOR REMOVAL
OF MECHANICAL IMPURITIES FROM CEL-
LULOSE AND OTHER SIMILAR FIBER
PULPS

Aleksander Lampén, Imaira, Finland

Application April 2, 1932, Serial No. 602,738, and
in Finland April 9, 1931

8 Claims. (Cl. 92—34)

The commercial cellulose produced from wood always contains mechanical impurities. Amongst these is found the so-called pitch present in the sulphite cellulose, which pitch is a mixture of resinous acids and fats and is often very troublesome at the making of paper. Hitherto, however, no economical method for its removal has been known.

I have found, that the harmful pitch as well as other impurities present in the shape of small particles can for a major part or completely be removed by vigorously flinging, ejecting or in other suitable way conducting the diluted pulp in form of a liquid layer or jets against or over a screen surface, the openings of which are chosen in such a manner, that the water together with the impurities pass freely through the same, whereas the pulp fibers remain on the screen surface. In order that the process shall be carried out successfully it is essential in an effective manner to prevent the formation of a fixed (permanent) layer of pulp on the screen surface, as this would act as a filter retaining the impurities. The layer of the pulp fibers formed temporarily on the screen surface must be so thin and open that the water together with the impurities are separated freely from the fibers, and the layer must be removed before a new layer is formed. For removal of the pulp layer either the movement of the pulp proper, gravity, centrifugal force, a water jet, an air current or some other suitable means may be resorted to. The screen can be stationary or moveable, and the liquid layer or the jet can be produced through pressure, centrifugal force or in other suitable manner.

Warming or heating of the diluting water for the pulp enhances the removal of the pitch.

In the drawing annexed is shown an apparatus invented by me for reducing this method to practice.

Figure 1 shows a vertical section,
Figure 2 a horizontal section and
Figure 3 a detail of a modification.

The wings B fixed to the shaft A form a wing cross which when rotating with a suitable speed flings the diluted pulp against the screen surface C. The pulp is admitted to the apparatus through the admission pipe M. The holes in the screen C are chosen in such a manner, that the water and the impurities pass freely through the same, but the pulp fibers remain on the screen surface. The screen surface C is interrupted by small openings D, which at the same time form inlets to the conduits E and through which the

pulp retained on the screen surface is conducted away. This pulp is mainly owing to the rotating movement effected by the wings B and to the sweeping effect of the liquid film streaming out from the edges of the wings, sliding along the screen surface in circumferential direction until it arrives at the opening D through which it enters into the conduit E and finally leaves the apparatus through the opening F. By arranging the openings D in suitable distances from each other, the screen surface C can be kept completely free from pulp in order to permit pitch and other similar impurities to pass through the screen. In order to conduct the pulp into the opening D, obliquely placed strips G can be fastened at their edges.

The cellulose always contains also short fibers which in practice cannot be prevented from penetrating through the screen C. For assisting the collecting of these fibers the apparatus can be provided with a mantle K of for instance metal wire gauze of a fine mesh which allows the water flung out through the holes in the screen C to pass but retains the fibers contained therein which are let off through the opening H. Through the mantle K also a considerable amount of the pitch and the like are discharged.

The openings D and the conduits E can be substituted by inwardly directed strips E', Figure 3, which catch and deflect the pulp.

The shaft A of the apparatus can also be arranged horizontally or sloping.

Instead of the wing cross any other suitable arrangement for the flinging or ejection of the mass against the screen surfaces can be used.

The construction of the apparatus can also be modified in that way, that the screen surface is made moveable and the pulp being flung or ejected against the same by means of fixed or in opposite direction moving nozzles.

The apparatus can also be combined with common pulp screeners so that the pulp penetrating through the screening plate is conducted directly into contact with the screen surface C or the mantle K respectively.

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

1. The method of removing impurities from pulp fibers which comprises forcibly and rapidly projecting a jet-like stream of pulp fiber carrying liquid against and at an acute angle to a surface pervious to the liquid but impervious to the pulp fibers whereby the pulp fibers are retained on the surface and moved along the surface by

the force of the projected stream while the liquid and impurities carried thereby pass through the surface and collecting the moving pulp fibers from the surface to prevent the formation of a pulp layer impervious to the liquid.

2. The method of removing impurities from pulp fibers which comprises heating a mixture of liquid and pulp fibers, rapidly projecting a stream of the heated pulp fiber carrying liquid against and at an acute angle to a surface pervious to the liquid but impervious to the pulp fibers whereby the pulp fibers are retained on the surface and moved along the surface by the force of the projected stream while the liquid and impurities carried thereby pass through the surface and collecting the moving pulp fibers from the surface to prevent the formation of a pulp layer impervious to the liquid.

3. The method of removing impurities from pulp fibers which comprises forcibly and rapidly projecting at least one continuous jet-like stream of pulp fiber carrying liquid against and at an acute angle to a continuous surface pervious to the liquid but substantially impervious to the pulp fibers whereby the pulp fibers are retained on the surface and moved along the surface by the force of the projected stream while the liquid and impurities carried thereby pass through the surface, and continuously collecting the moving pulp fibers from spaced points along the surface to prevent the formation on the surface of a pulp layer impervious to the liquid.

4. Apparatus for removing impurities from pulp fibers comprising a screen pervious to pulp liquid and impurities and substantially impervious to pulp fibers, means for forcibly and rapidly projecting a jet-like stream of pulp carrying liquid against said screen and at an acute angle thereto whereby the pulp collecting on the surface of the screen is moved along such surface by the force of the projected stream and the liquid and impurities carried thereby pass through the screen, and means on said screen for removing therefrom the moving pulp fibers.

5. Apparatus for removing impurities from pulp fibers comprising a screen pervious to pulp liquid and impurities and substantially impervious to pulp fibers, means for rapidly projecting a stream of pulp carrying liquid against said screen and at an acute angle thereto whereby the pulp collecting on the surface of the screen is moved along such surface by the force of the

projected stream and the liquid and impurities carried thereby pass through the screen, and spaced openings in said screen for permitting the removal of the pulp fibers so moved along said screen.

6. Apparatus for removing impurities from pulp fibers comprising a screen pervious to pulp liquid and impurities and substantially impervious to pulp fibers, means for rapidly projecting a stream of pulp carrying liquid against said screen and at an acute angle thereto whereby the pulp collecting on the surface of the screen is moved along such surface by the force of the projected stream and the liquid and impurities carried thereby pass through the screen, and pulp impervious strips at spaced points along the surface of said screen in the path of movement of the pulp fibers thereon for collecting and removing the pulp fibers from said surface.

7. Apparatus for removing impurities from pulp fibers comprising a screen pervious to pulp liquid and impurities and substantially impervious to pulp fibers, means for rapidly projecting a stream of pulp carrying liquid against said screen and at an acute angle thereto whereby the pulp collecting on the surface of the screen is moved along such surface by the force of the projected stream and the liquid and impurities carried thereby pass through the screen, spaced means on said screen for removing the moving pulp fibers thereon and a second screen having a finer mesh than the first mentioned screen, disposed beyond said first screen with respect to the direction of projection of said pulp and liquid stream, and adapted to retain any pulp fibers which pass through said first screen.

8. Apparatus for removing impurities from pulp fibers comprising a substantially cylindrical screen pervious to pulp carrying liquid but substantially impervious to pulp fibers, means for admitting a pulp fiber carrying liquid to the interior of said cylindrical screen, a rotary impeller within said screen for rapidly projecting the pulp carrying liquid spirally against said screen whereby the pulp fibers collecting on said screen are moved around the cylindrical surface thereof and means at spaced points around the interior surface of said screen extending longitudinally across the cylindrical surface thereof for collecting and removing the moving pulp fibers therefrom.

ALEXSANDER LAMPÉN.