

UNITED STATES PATENT OFFICE.

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SORTER FOR PAPER-PULP AND THE LIKE.

1,042,724.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN MAGNUS LARSSON SPANGENBERG, civil engineer, subject of the King of Sweden, residing at Forshaga, in the Kingdom of Sweden, have invented certain new and useful Improvements in Sorters for Paper-Pulp and the Like.

The present invention relates to such sorters for paper pulp and the like which consists of a cylinder rotatably arranged in a receptacle, the sidewalls of said cylinder consisting of a perforated mantle through which the fibers pass from without inward, and the interior of which is in communication with a suction or exhaust pipe, and which sorters are provided with members movable within the said cylinder serving to cause a flow of liquid through the mantle in the direction from within to without at the places where the said members pass in order by this change in the direction of flow of the current to prevent the holes in the mantle or casing being clogged by fibers and the like. In previously known devices for this purpose the said members arranged within the cylinder have been constructed to have an oscillating motion, *i. e.* a backward and forward motion. In accordance with the present invention, on the contrary the said change in the direction of the current is produced by suitable members as shovels, blades or the like arranged within the cylinder which do not oscillate but rotate continuously, whereby a better effect is produced, while at the same time the device for driving the said members will be considerably simpler and cheaper than if the members in question were made to oscillate.

In the accompanying drawing is illustrated by way of example a form of construction of the invention.

Figure 1 is a longitudinal section of the apparatus, and Fig. 2 shows the same in cross section along the dotted line in Fig. 1.

The sorter consists of a straining drum 4 rotating in the well known manner in a receptacle 3 provided with an inlet opening 1 for the material to be treated consisting of pulp suspended in water, and a suction exit 2. The circumference of said drum 4 consists of a casing or mantle of perforated plate or metal wire tissue. Within the said drum 4 are arranged the above-mentioned members for producing changes in the direction of current, which members, according to the form of construction shown in the draw-

ing, consist of longitudinal blades or vanes 7, carried by radial arms 8, mounted on a rotatable shaft 9. The shaft 9 can be arranged concentrically with the shaft of the drum 4; but according to the form of construction illustrated in the drawing it is arranged eccentrically in relation to the axis of the drum, in order to provide a space between the rotating vanes 7 and the casing of the drum 4 at the top part of the same for a spurt pipe 10 arranged within the drum, which pipe 10 at its upper side facing the casing of the drum is provided with a number of apertures or perforations, so that when water is supplied to the said pipe 10 through the inlet 11, the water spurts out in a fine spray against the perforated mantle of the drum, whereby the perforations in said mantle are free from fibers and the like fastened in it. The drum 4 is at one of its ends provided with a hollow axle-journal 12, which axle-journal 12 passes through the end of the receptacle 3 and is rotatably carried by bearings 13. In order to bring about a tight fit between the said shaft and the end wall of the receptacle 3, packing devices 14 of some suitable construction are provided. At the opposite end of the prolonged part 14 the drum 4 is rotatably carried by wooden blocks 16 or the like arranged in the receptacle 3. The shaft 9 passes through the hollow axle-journal 12 and is rotatably carried at this end by a bearing 17 and at the opposite end said shaft is journaled in a bearing 18. For driving the shaft 9 and the vanes or shovels 7 carried by it, there is arranged at one end of the shaft 9 a belt-pulley 19, which is set in rotation in the usual manner by means of a belt (not shown). The drum 4 is also driven from the said shaft by means of a toothed wheel 20 mounted on the shaft 9, which toothed wheel 20 engages with a toothed wheel 21, mounted on one end of a rotatable shaft 22, on the other end of which shaft 22 there is a toothed wheel 23, engaging with a toothed wheel 24 mounted on the axle-journal 12 of the drum. The gearing is arranged in such a manner that the shaft 9 rotates at a comparatively great speed, *e. g.* 80 revolutions per minute, while the drum 4 rotates comparatively slowly, *e. g.* 4 revolutions per minute.

In order to bring about a tight fit of the outer end of the hollow axle-journal 12 there is a ringshaped disk 25 tightly mount-

ed on the shaft 9, which disk 25 is pressed against the end of the said axle-journal by means of a ring 28 and springs 26 fitted onto the screw-bolts 27, which screw-bolts 27 are at one of their ends screwed into the nave of the wheel 24 and at their other ends are provided with nuts, between which nuts and the ring 28 the springs are located. The said springs press against the ring 28, which ring 28 bears against and slides on the disk 25 and presses the latter against a packing-ring 29 arranged between the end of the axle-journal and the disk 25. As will be obvious from the above, the ring 28, through its connection with the screw-bolts 27, takes part in the rotation of the drum, while on the other hand the disk 25 is prevented from taking part in the said rotation by means of an arm 31 engaging with it, which arm 31 is attached to the standard 30 supporting the bearing of the shaft 9. In this way the open axle-journal 12 is tightly closed in spite of the fact that the rotating shaft 9 passing through it is eccentrically located in relation to the same. As the other parts of the apparatus do not relate to this invention, a description of them and of the manner in which the apparatus otherwise works is considered unnecessary, especially as the invention is shown adapted to an apparatus of previously known type.

The device in question works in the following manner: While the fibers or paper pulp deposited in the water, which nearly completely covers the straining drum, is being sucked through the perforated walls of the slowly rotating drum 4, the shaft 9 and the blades or vanes 7 rotate at a comparatively high speed. Hereby are brought about by the blades or vanes 7, at the places where they pass, occasional flows of the fluid through the casing in the direction from within to without, so that at the places along the circumference of the drum which are passed by the vanes 7, a change in the direction of flow of the liquid is brought about, *i. e.* there occurs at these places along the drum a flow of the current from within to without instead of the normal flow from without to within, whereby a stoppage of the openings of the perforated walls of the drum is prevented. The effect of this stirring is increased thereby that, as the blade 7 passes besides the flowing of liquid in the direction from without to within which oc-

curs at the foresides of the vanes also a suction of liquid from without to within is caused at the rear side of the vanes when they are rotated. As there are a number of vanes (according to the form of construction illustrated here, four, though the number may, of course, vary, and, as the shaft 9 rotates with a much greater angular velocity than the drum, it is obvious that every part of the circumference of the drum during each revolution made by the drum is repeatedly exposed to such a change in the direction of current, that an amassment of fibers or pulp on the perforated mantle of the drum is prevented, whereby the capacity of the apparatus is considerably increased.

Having thus described my invention, I declare that what I claim is:

1. In an apparatus of the class described a receptacle, a perforated drum, rotatably arranged in the same, stirring devices arranged within said drum near the walls of the same, means for rotating said drum and means for rotating the stirring devices, said stirring devices consisting of longitudinal vanes supported by a shaft rotatably arranged within said drum.

2. In an apparatus of the class described a receptacle, a perforated drum, rotatably arranged in the same, stirring devices arranged within said drum near the walls of the same, means for rotating said drum and means for rotating the stirring devices, said stirring devices consisting of longitudinal vanes supported by a shaft rotatably arranged within said drum, said shaft being eccentrically located in relation to the axis of the drum.

3. In an apparatus of the class described a receptacle, a perforated drum, rotatably arranged in the same, stirring devices arranged within said drum near the walls of the same, said stirring devices consisting of longitudinal vanes supported by a shaft rotatably arranged within said drum, means for rotating said shaft and gearings by which said shaft and said drum are thus connected with each other so that the drum will be rotated when said shaft is rotated.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHN MAGNUS LARSSON SPANGENBERG.

Witnesses:

N. PALMERTZ,
JOHN REAICY.