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(54) APPARATUS FOR CONTINUOUS DEWATERING
 IN THE PROCESS OF HYDROMECHANICAL AND
 MECHANICAL TREATMENT OF FLOCCULATED
 SLUDGES

(71) We KOPALANIA WEGLA KAMIENNEGO "BOLESLAW SMIALY" of Laziska Górne, Poland, and UNIWERSYTET MARII CURIE SKLODOWSKIEJ of Lublin, Sq. Litewski 5, Poland both State Enterprises recognised under the laws of Poland do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to apparatus for continuous dewatering in the process of hydromechanical and mechanical treatment of flocculated sludges.

Known apparatuses include filters, sifters, centrifuges and sludge dewatering presses. However, these widely known facilities are disadvantageous because of their small capacity or complicated technological process.

It is an object of the present invention to obviate or mitigate these disadvantages.

The present invention is an apparatus for continuous dewatering in the process of hydromechanical and mechanical treatment of flocculated sludges, comprising a rotatable cylinder fitted inside with an upwardly-conveying worm, the cylinder being inclined at an angle to the horizontal and having a surface in the form of a sieve the size of the openings of the mesh of which increases from the lower end to the upper end of the cylinder.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a side view of dewatering apparatus according to the invention;

Fig. 2 is a longitudinal section of the dewaterer cylinder; and

Fig. 3 is a cross-section of the cylinder.

Referring to the drawings, the apparatus includes a rotatable cylinder 3 closed at its lower end 2 and made of a sieve with a mesh suited to the degree of viscosity of the sludge to be dewatered. The cylinder is inclined at an appropriate angle to the horizontal, and the size of the openings of the mesh of the sieve increases from the lower end to the upper end of the cylinder. Within the cylinder 3 is an upwardly-conveying worm 5 for conveying sludge to an outlet at the upper end of the cylinder, from which dewatered sludge in the form of a shapeless mass is poured on to a belt conveyor 9. The inner surface of the sieve is fitted with ribs 4 parallel to its axes for intensifying the dewatering process.

In the course of the transport by means of the worm 5 the mixture undergoes separation into two components: clear water which flows out through the sieve openings and a gradually densening shapeless mass. The size of the openings of the sieve of the cylinder is dependent upon the degree of viscosity of the mixture and should be such as to render impossible penetration of the floccules of the sludge mixture through the sieve and at the same time ensure an unobstructed outflow of water through the sieve. The greater the size of the openings of the sieve mesh, the higher is the degree of viscosity and the degree of draining off of water.

In the upper part of the cylinder there are installed compressed air blowing nozzles 8 adjacent or embracing its outer surface. The air stream blown from these nozzles 5 cleans the sieve and thus ensures an intensified dewatering. The outflow of water through the sieve passes to a tank 7 located below the cylinder and the water from the tank is recirculated. A flange 6, located on 10 the circumference of the revolving cylinder at the inlet end thereof, is provided to direct sludge water into the tank. The quality of the dewatered sludge is dependent on the length of the path of travel and the inclination 15 of the cylinder.

As may be seen in Figs. 1 and 2, the flocculated mixture is supplied into the cylinder 3 through a tube 1 in axial communication with the cylinder through the 20 lower end 2 of the revolving cylinder 3. The mixture is carried by the worm 5 and the ribs 4 to the upper outlet of the cylinder, the flange 6 directing the outflow of water to tank 7. Sludge which is de- 25 watered in the course of transport by the worm, falls in the form of a solid product on to a conveyor belt 9.

Apparatus as hereinbefore described is advantageous in that it provides a solid 30 product with small water content, sufficiently compact so that it could be transported by means of conveyors and ensuring at the same time reduced consumption of flocculant and recovery of pure water which may be 35 re-used .

WHAT WE CLAIM IS:

1. Apparatus for continuous dewatering in the process of hydromechanical and mechanical treatment of flocculated sludges, comprising a rotatable cylinder fitted inside 40 with an upwardly conveying worm, the cylinder being inclined at an angle to the horizontal and having a surface in the form of a sieve the size of the openings of the mesh of which increases from the lower end 45 to the upper end of the cylinder.

2. Apparatus as claimed in Claim 1, in which hot air blowing nozzles are located against or adjacent to the upper part of the cylinder. 50

3. Apparatus as claimed in Claim 1 or 2, in which ribs are provided on the inner surface of the cylinder and parallel to the axis thereof.

4. Apparatus as claimed in Claim 1, 2 55 or 3, in which a tank is located below the cylinder to receive water from the cylinder.

5. Apparatus for continuous dewatering in the process of hydromechanical and mechanical treatment of flocculated sludges, 60 substantially as hereinbefore described with reference to the accompanying drawings.

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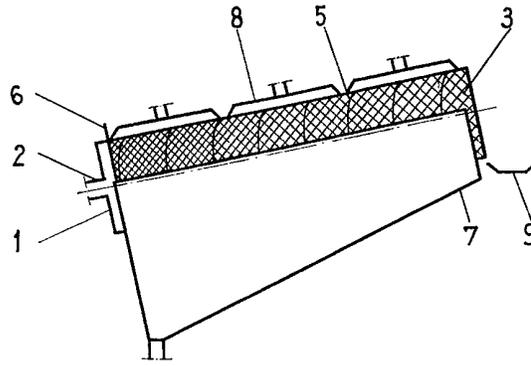


Fig. 1.

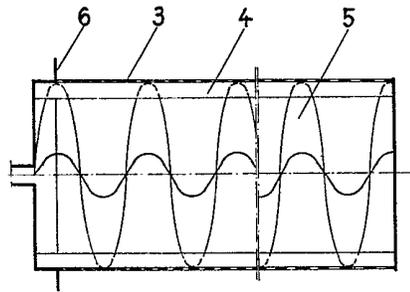


Fig. 2.

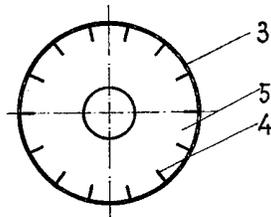


Fig. 3.