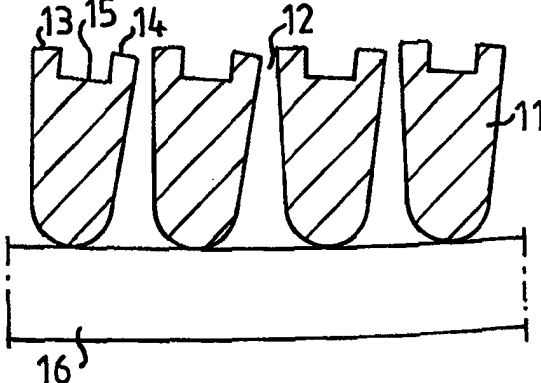




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<p>(54) Title: SCREENING CYLINDER</p>		
<p>(57) Abstract</p>		
<p>A screening cylinder for screening sus- pensions of lignocellulosic fiber material. The screening cylinder (10) is formed of rods (11), which between themselves form gaps (12) ex- tending along the entire length of the cylinder (10). The rods (11) are held together by a number of overall rings (16) arranged on the cylinder. In order to improve the efficiency of the screening cylinder, the upper surface of the rods (11) is provided with at least one depression (15) between edge portions (13, 14) of the rods (11).</p>		

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Screening cylinder

This invention relates to a screening cylinder for an apparatus for screening suspensions of lignocellulosic fiber material.

At screening suspensions of fiber material the intention is to separate coarse particles in the form of shives, fiber bundles and other impurities from the fiber material or to fractionate, i.e. separate long from short fibers. The screening usually is carried out in screening means with a screening cylinder, which can be stationary or rotary. The screening cylinder is provided with holes or slits, through which the fibers, but not the impurities, can pass.

Screening cylinders of this kind usually are manufactured by drilling holes or milling slits in a metal sheet, which is then formed to a cylinder. In order to obtain an open area as great as possible, i.e. that portion of the surface of the screening cylinder which is perforated, the holes or slits must be placed densely.

Another way of forming a screening cylinder is to manufacture it of rods, which are held together by support rings, so that between the rods gaps are formed, which extend along the whole length of the cylinder. Such a screening cylinder has many advantages over a conventionally slitted screening cylinder, for example a greater open area and a higher selectivity in respect of shives separation and fractionating. Alternatively, the rods can be formed of a metal sheet by making a great number of parallel grooves in the sheet.

It can also be advantageous to form the screening surface of the screening cylinder in such a way, that the upstream edges of the gaps are located on a higher level than the downstream edges, seen in the relative flow direction of the suspension. This results in many screening technical advantages. Screening cylinders with gaps of this kind have a.o. a high capacity and high shives separation capability. This design, however, implies

that the higher located edges of the rods forming the gaps are worn more rapidly than the opposed rod edge.

Thereby the geometry around the gaps changes rapidly, so that the screening surface becomes more or less plain. The advantages of this configuration of the screening surface of the screening cylinder are thereby lost.

The present invention offers a solution of this problem, and at the same time more advantages are obtained. According to the invention, every rod is provided with a depression whereby the geometry is maintained for a longer time in spite of wear. Moreover, the turbulence creating geometry is improved, and thereby the capacity and efficiency as well as the runability of the screening means are improved.

The characterizing features of the invention are apparent from the attached claims.

The invention is described in greater detail in the following with reference to the accompanying Figures illustrating different embodiments of the invention.

Fig. 1 shows a screening cylinder according to the invention.

Figs. 2-7 are cross-sections through a portion of a screening cylinder according to different embodiments.

According to the embodiments shown, the screening cylinder 10 is formed of a great number of substantially axial rods 11, which between themselves form gaps 12 extending along the entire length of the cylinder. The rods 11 are placed in such a way that a screening surface is formed where the edge portions 13, 14 of the rods 11 which define the gaps 12, are located at the same or different heights. If the edge portions are located at different heights, the edge portions on both sides of a gap preferably are arranged so, that the upstream edge is higher than the downstream edge, seen in the intended flow

direction of the suspension relative to the screening cylinder. This can be achieved by bevel grinding or inclination of these portions.

The upper surface of these rods 11 shall be provided with at least one depression 15 between the edge portions 13, 14. This depression 15 can have different configuration, as appears from the embodiments shown in Figs. 2-7. The depression, in a cross-sectional view, can be rectangular, U-shaped, V-shaped, etc. It is also possible to provide several depressions between the edge portions 13, 14 of the rods 11.

The upper surface of the rods 11 preferably is oblique so as to form an angle α with the circumferential direction of the screening surface, where α is between 0-45°, preferably 10-30°. The difference in level between opposed edge portions 13, 14 should be between 0 and 5 mm. The width of the gaps 12 shall be 0,05 - 1,0 mm, preferably 0,1 - 0,5 mm, and the width of the rods shall be 0,5 - 7 mm.

The depressions 15 should have a depth of between 0,5 and 5 mm, preferably 1 and 2 mm, and leave edge portions with a width of between 0 and 3 mm, preferably 1 and 2 mm.

At the embodiments shown, which refer to screening cylinders for screening from the inside outward, the rod-shaped portions 11 are held together by a number of overall support rings 16 arranged on the outside of the cylinder. When the screening cylinder is intended for screening from the outside inward, the overall support rings 16 are arranged on the inside of the cylinder.

Due to the design of the upper surfaces of the rods 11, the turbulence creating geometry is improved, which promotes the capacity and efficiency of the screening cylinder. The geometry is maintained substantially even when the edge portions 13, 14 of the rods 11 get worn.

The turbulence created by the design and location of the rods also implies, that smaller gap widths can be used with maintained capacity, which yields a cleaner pulp without using more or greater screens.

The invention, of course, is not restricted to the embodiments shown, but can be varied within the scope of the claims.

Claims

1. A screening cylinder for screening suspensions of lignocellulosic fiber material, which screen cylinder (10) is formed of rods (11), which between themselves form gaps (12) extending along the entire length of the cylinder (10), where the rods (11) are held together by a number of overall support rings (16) arranged on the cylinder, characterized in that the upper surface of the rods (11) is provided with at least one depression (15) between edge portions (13, 14) of the rods (11).
2. A screening cylinder as defined in claim 1, characterized in that the depression (15) has rectangular cross-section.
3. A screening cylinder as defined in claim 1, characterized in that the depression (15) has U-shaped cross-section.
4. A screening cylinder as defined in claim 1, characterized in that the depression (15) has V-shaped cross-section.
5. A screening cylinder as defined in any one of the preceding claims, characterized in that the depression has a depth of between 0,5 and 5 mm, and the edge portions (13, 14) have a width of between 0 and 3 mm.
6. A screening cylinder as defined in any one of the preceding claims, characterized in that the upper surfaces of the rods (11) which form the screening surface of the cylinder (10), are oblique and form an angle (α) with the circumferential direction, and that this angle (α) is between 0 and 45°, preferably 10-30°.

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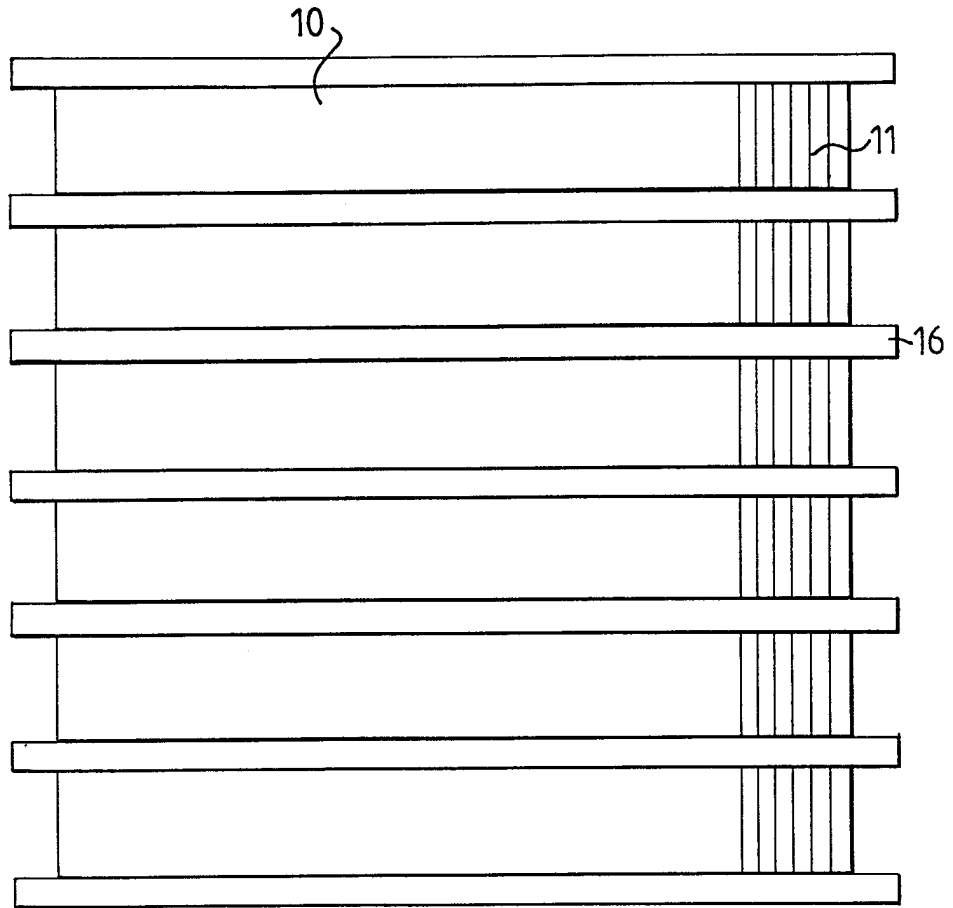


FIG.1

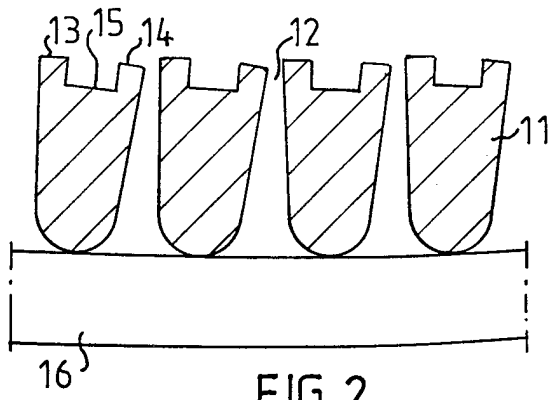


FIG. 2

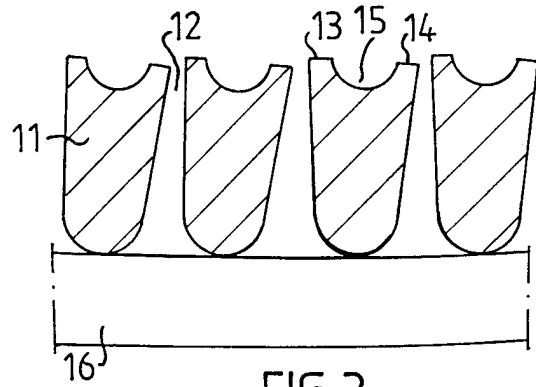


FIG. 3

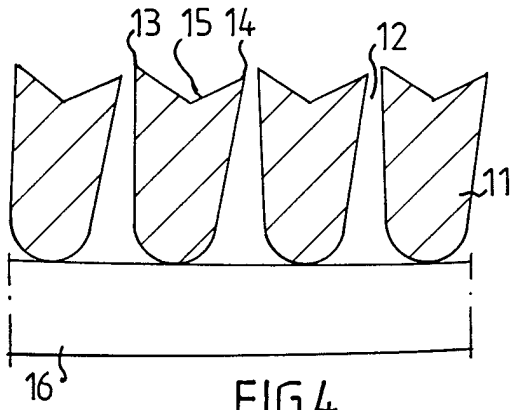


FIG. 4

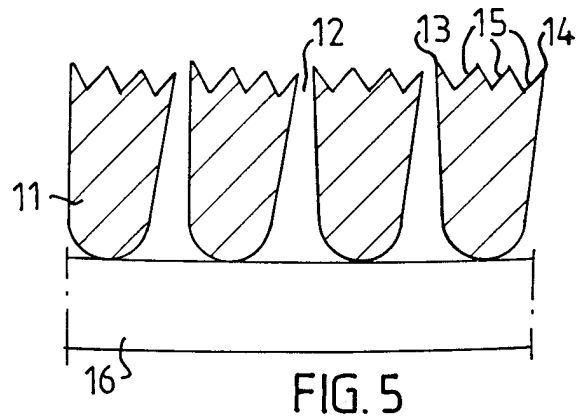


FIG. 5

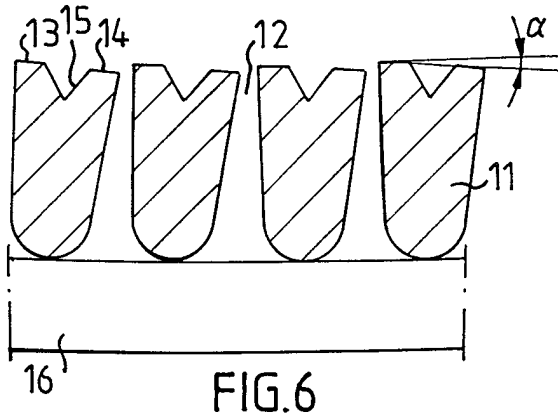


FIG. 6

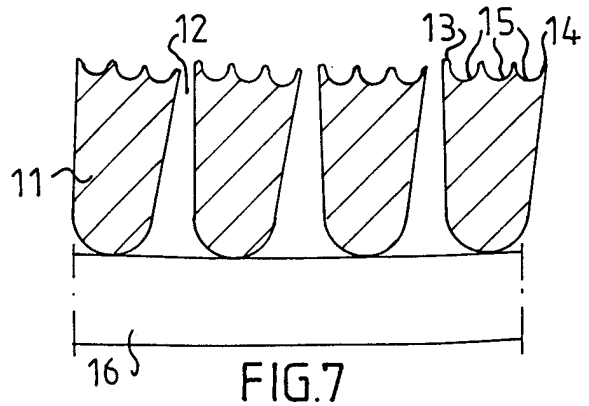


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/01038

A. CLASSIFICATION OF SUBJECT MATTER		
IPC6: D21D 5/16 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0624684 A1 (AKTIEBOLAGET KNUTSILPLATAR), 17 November 1994 (17.11.94) --	1-6
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20 October 1998		25 -10- 1998
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INTERNATIONAL SEARCH REPORT

Information on patent family members

27/07/98

International application No.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0624684 A1	17/11/94	SE 0624684 T3 CA 2122191 A DE 69406184 D,T FI 942234 A JP 7300784 A SE 501273 C SE 9301661 A US 5472095 A	15/11/94 12/02/98 15/11/94 14/11/95 19/12/94 15/11/94 05/12/95
DE 3327422 A1	07/02/85	NONE	