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METHOD OF SCREENING FIBROUS SUSPENSIONS

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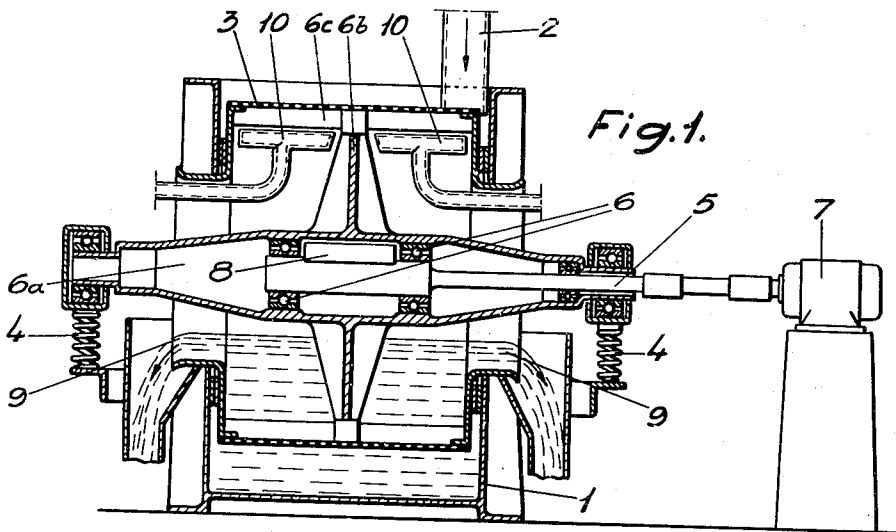
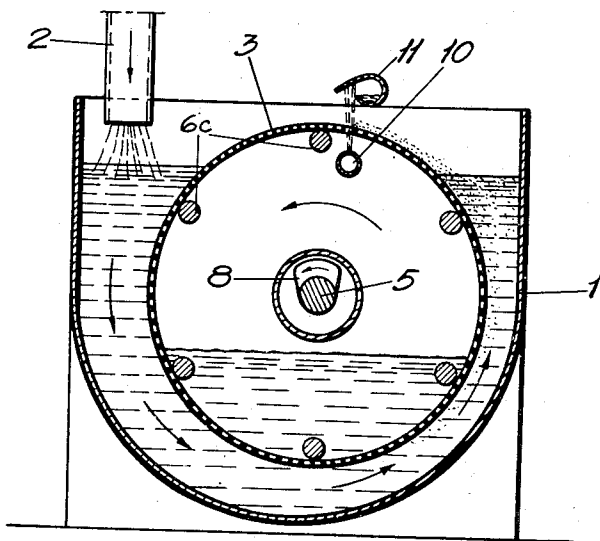


Fig. 2.



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METHOD OF SCREENING FIBROUS
SUSPENSIONSKarl Roland Lindblad, Sundsbruk, near Sunds-
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1 Claim. (Cl. 92—36)

1

The present invention is concerned with the screening of fibrous suspensions and more particularly it relates to a method of screening using vibratory screens of the kind in which a rotatably and elastically mounted screening drum is wholly or partly immersed in a fibrous suspension in a trough and combined with at least one vibratory and rotary shaft provided with at least one unbalanced member eccentrically mounted thereon, said shaft being caused to rotate in a direction coinciding with the direction of flow of the fibrous suspension in the trough.

The essential characteristic of the new method resides in causing not only the shaft but also the screening drum to rotate in a direction coinciding with the direction of flow of the fibrous suspension in the trough. According to one preferred way of carrying out the invention the vibratory forces, generated upon rotation of the shaft, are caused to be transferred to the screening drum in such a manner that also the screening drum is thereby set into rotation in the same direction as the shaft and in the direction of flow of the fibrous suspension in the trough. In the apparatus set forth in the following description and shown on the accompanying drawing in order to exemplify one way of carrying the invention into effect—the invention being, however, by no means restricted to this embodiment—the transfer of the vibratory forces from the rotating shaft to the screening drum may be achieved without the use of any special driving or coupling means whatever.

In the drawing:

Figure 1, diagrammatically, shows a longitudinal sectional view of the screening device and

Figure 2 shows the screening device, diagrammatically, in cross section, including those parts only of the device necessary to illustrate the principle of the new screening method.

The exemplified screening device comprises a trough 1, into which the fibrous suspension to be screened is introduced through, for example, a pipe 2. In the trough a screening drum 3 is mounted in such a manner that it will be entirely or partially immersed in the fibrous suspension. The screening drum 3 is elastically mounted, for example, by means of springs, rubber members or equivalent bodies, as at 4, and is also combined with a shaft 5, rotatably mounted in bearings 6. The bearings 6 are secured to the inside of the hollow body or hub member 6a extending through the drum. The hollow body 6a is connected with the drum by means of radially extending members 6b, which are pro-

2

vided with members 6c extending longitudinally of the drum and secured to the ends of the drum thus connecting the ends of the drum with the radially extending members 6b. On the shaft 5, which may be rotated, for example, by means of an electric motor 7, which is elastically connected with the shaft 5, there is at least one eccentrically mounted, unbalanced member (weight) 8. In the following the shaft 5 will be termed the "unbalanced" shaft.

When the "unbalanced" shaft 5 is set into rotation the drum 3 will via the bearings 6, the hollow body 6a and the radially extending members 6b, receive a vibratory motion with circular or substantially circular vibrations, the drum simultaneously receiving a slow rotary motion. Such rotary motion is created by the vibratory (centrifugal) forces generated by the unbalanced member 8 upon the rotation of the shaft 5 and the friction existing in the bearings 6 and also by the fact that the vibratory (centrifugal) forces are caused to be transferred from the rotating shaft to an interior surface in the screening drum, for example an interior surface of the bearing 6. The rotation of the drum is facilitated if there is a certain play in the bearing. After its passage through the shell of the drum the screened material is led away through, for example, openings 9 in the ends of the drum 3. For the purpose of spraying away the impurities in the fibrous suspension which are not able to pass through the shell of the screen there are provided spraying pipes 10 and a chute 11 for collecting and leading away spray water and the impurities removed by the spraying.

It has proved of advantage, for the capacity and cleansing ability of the screen, to cause the unbalanced shaft to rotate in the same direction as the direction of flow of the fibrous suspension in the trough and, moreover, to cause the screening drum to rotate in the same direction as the unbalanced shaft. The impurities accompanying the fibrous suspension will thereby be rapidly conveyed to that portion of the surface of the fibrous suspension in the trough at which the ascending part of the screening drum is located. This rapid conveyance of impurities is due to the fact that the direction of rotation of the screening drum and the direction of vibration coincide with the direction of flow of the fibrous suspension in the trough, by which cooperation between the same is created. Furthermore, due to the fact that the direction of rotation of the drum and the direction of vibration are the same and cooperate, the impurities will be more easily

3

caught by the shell of the screening drum at the level of the fibrous suspension and be moved on above the fibrous suspension to the place at which they are then sprayed away. If the content of impurities is considerable, the impurities may, of course, also be removed by overflow means provided on the trough.

In a known device the ends of the screening drum are mounted in elastically supported yokes set in vibratory motion by means of rotating shafts provided with eccentric weights. In said screening device the vibratory motion is transmitted to the screening drum from outside inwards, the screening drum thereby receiving a rotary motion in a direction opposite to the direction of rotation of the shafts and opposite to the direction of flow of the fibrous suspension. According to said arrangement, the said motions will counteract each other, resulting in a concentration of impurities throughout the trough. The screening is made more difficult thereby, which will be followed by a low screening capacity and a bad cleansing effect.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

A method of treating fibrous suspensions by means of vibratory and rotary forces generated

4

in screening devices of the kind in which a rotatably and elastically mounted screening drum is wholly or partly immersed in the fibrous suspension in a trough and is vibrated by means of at least one vibratory and rotary shaft having at least one unbalanced member eccentrically mounted thereon, consisting in leading the fibrous suspension at least along part of the outside circumference of the screening drum while subjecting said suspension to the vibratory and rotary forces of said drum, generating said vibratory and rotary forces to proceed in a direction coinciding both with the direction of rotation and vibration of the unbalanced shaft member and coinciding also with the direction of flow of the suspension in the trough.

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