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54 Sieving device.

57 The invention is relating to a sieving device comprising a pervious sieve surface (22) adapted to rotate about an upwardly rotary axis, whereby the sieve surface (22) has a curved sectional area in a manner such that parts of the sieve surface located near the rotary axis and near the outer periphery are at a higher level than the parts of the sieve surface located there between.

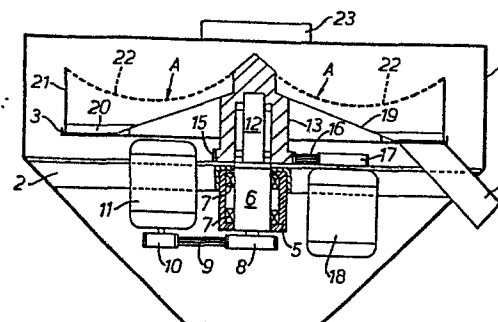


FIG. 1.

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SIEVING DEVICE

The invention relates to a sieving device comprising a pervious sieve surface adapted to rotate about an upwardly extending rotary axis.

5 Such a sieving device is known from Dutch Patent Application 7605572. In this known sieving device the sieve surface forms part of the outer surface of a cone, in which the part nearest the rotary axis at the lower level and the part of the sieve surface furthest remote from the rotary axis being at the higher level. During operation the material to be
10 sieved has to move outwardly along the sieve surface, the fine particles to be separated have to fall down through the sieve surface and the coarse particles have to be ejected from the outer periphery of the sieve surface.

In this known construction the velocity of the material to be sieved increases according as the material gets further away from the rotary axis, whilst also the size of the sieve surface increases quadratically with the distance from the rotary axis.
15

When the speed of rotation is chosen low, the speed of movement of the material to be sieved towards the outer periphery of the sieve is proportionally low near the rotary axis so that comparatively only a small
20 amount of material can be processed per unit time. However, when the speed of rotation of the sieve is raised, the product will pass through the major part of the sieve surface at a distance from the rotary axis with such a

velocity that an effective sieving is out of the question.

A further disadvantage of this known sieving device is that particles can easily stick in the perforations of the sieve surface, from which they can no longer part, since on the contrary due to the effect of
5 the centrifugal force or force of gravity they clamp tight in the perforations.

The invention has for its object to provide a sieving device of the kind set forth by which the disadvantages inherent to the known sieving device can be avoided.

10 According to a first aspect of the invention this can be achieved by shaping the sieve surface with a curved sectional area so that parts of the sieve surface located near the rotary axis and near the outer circumference of the sieve surface are located at a higher level than the intermediate parts of the sieve surface. By this design it can be ensured that
15 in the proximity of the rotary axis the centrifugal force acting on the particles of the material is strengthened by the component of the force of gravity affecting the particles extending parallel to the sieve surface, whereas near the outer circumference of the sieve surface the centrifugal force is counteracted by the component of gravity extending parallel to the
20 sieve surface. In this way by the design of the curved sieve surface the velocity of the movement of the particles of material along the sieve surface can be influenced to an extent such that the optimum sieving effect is obtained.

According to a second aspect of the invention the sieve surface
25 is rotatable about two at least substantially parallel rotary axes. As a result an additional rotational movement is superimposed on the conventional rotation of the sieve surface so that the sieve surface performs, so to say, small circular movements below the material to be sieved, which counteracts obturation of the sieve due to particles sticking in the perforations of
30 the sieve surface.

According to a third aspect of the invention means are provided for causing the sieve surface to perform a tilting movement about a pivotal axis extending transversely of the rotary axis of the sieve surface. As a result the sieve surface moves up and down, the deflection of the sieve
35 surface increasing with the distance from the rotary axis. Also in this way

obturation of the sieve surface is effectively counteracted.

The invention will be described more fully hereinafter with reference to the accompanying Figures.

Fig. 1 is a schematic cross-sectional view of an embodiment of a
5 sieving device in accordance with the invention.

Figs. 2 to 4 show different embodiments of shafts with the aid of which the sieve surface can be supported.

The sieving device shown in Fig. 1 comprises a circular-section housing 1, the lower part of which is tapering in downward direction. In the
10 housing 1 is arranged a supporting assembly 2 as well as a stationary, continuous gutter 3. With the gutter communicates the top end of an outlet pipe 4, which extends beyond the housing 1.

To the frame 2 is secured a housing 5, in which a vertical shaft 6 is journaled with the aid of bearings 7. The lower end of the shaft 6 is
15 provided with a gear wheel 8, which is coupled with the aid of a toothed rope 9 with a toothed wheel 10 fastened to the shaft of a motor 11 supported by the supporting frame 2. The shaft 6 is integral with a shaft 12 extending above the shaft 6, on which shaft 12 a hood 13 is rotatably journaled with the aid of bearings 14. The hood 13 is integral with a toothed
20 wheel 15, which is coupled with the aid of a toothed belt 16 with a toothed wheel 17 fastened to the output shaft of an electric motor 18, which is also secured to the supporting frame 2.

To the hood 13 is fastened a plate 19 forming part of a conical surface and being downwardly and outwardly inclined away from the hood 13.
25 The lower rim of the conical plate 19 is secured by means of a few strips 20 to a continuous sheath 21. Between the top rim of the sheath 21 and the hood 13 is provided a sieve surface 22. From Fig. 1 it will be apparent that this sieve surface is curved so that the rim of this annular sieve surface fastened to the hood 13 and the circumferential rim of this sieve surface
30 22 fastened to the top rim of the sheath 21 are located at a higher level than the part of the sieve surface in between the former.

On the top side the housing has a central inlet port 23 for the introduction of the material to be sieved.

Potential dispositions of the shafts 6 and 12 forming one unit
35 are shown in detail in Figs. 2, 3 and 4.

Fig. 2 shows that the centre lines of the shafts 6 and 12 may be parallel to one another and be spaced from one another by a distance e. Preferably said distance e is, for example, 2 mms.

As an alternative the centre lines of the two shafts may be at an angle α to one another, said angle α preferably being 35° . The centre line of the shaft 12 may intersect the centre line of the shaft 6 in the plane in which the two shafts join one another as is shown in Fig. 3 or in this plane the shafts may again be spaced apart by a distance e as shown in Fig. 4.

10 In operation material will be fed through the inlet port 23 and arrive at the sieve surface. With the aid of the motor 18 the sieve surface is rotated about the rotary axis of the shaft 12 so that the material striking the sieve surface is subjected to a centrifugal force and will move outwardly along said sieve surface. The fine particles of the material
15 can pass through the perforations of the sieve surface and be guided or not guided by the conical plate 19 to the gutter 4. With the aid of the strips 23 this material is displaced towards the opening where the pipe 4 adjoins the gutter 4 so that the fine material can be conducted away through the pipe. The coarse particles of the material is displaced outwardly along the
20 sieve surface 22, be ejected across the outer rim of the sieve surface and be conducted away through a delivery port 24 in the underside of the housing 1.

Since initially the supplied material moves along a downwardly inclined part of the sieve surface 22, the movement of this material is
25 further accelerated by the action of the resolved component of gravity extending parallel to the sieve surface. This component of gravity thus supports the centrifugal force which brings about an outward displacement of the material.

After having passed beyond the lowermost point of the sieve surface, designated by A, the material moving along the sieve surface has to
30 move upwards towards the outer rim of the sieve surface. During this upward movement the component of the force of gravity extending parallel to the sieve surface will counteract the centrifugal force. Therefore, by a suitable design of the curved sieve surface 22 a most effective displacement of
35 the material along the sieve surface can be ensured, preferably in a manner

such that the velocity with which the particles of the material move outwards away from the centre line of the sieve surface remains at least substantially constant, viewed in a horizontal direction.

In the preferred embodiment of the invention described and illustrated herein the sieve surface rotates not only about the rotary axis formed by the centre line of the shaft 12, but also the shaft 6 carrying the shaft 12 is rotated with the aid of the electric motor 11. When the shafts are disposed as is shown in Fig. 2, the sieve surface will perform a swinging movement in a horizontal sense, the amplitude of the sieve surface being equal to twice the distance e between the centre lines of the two shafts. Preferably the speed of rotation of the shaft 6 appreciably exceeds that of the sieve surface about the shaft 12 so that the sieve surface will perform a strong rocking movement, which will counteract obturation of the pores of the sieve surface.

When the shafts are disposed as is shown in Figs. 3 and 4, the sieve surface will, in addition, perform a tilting movement about an imaginary tilting axis at right angles to the centre line of the shaft 6. It will be obvious that as a result the sieve surface will perform upward and downward movements during operation, the deflection of the sieve surface increasing with a growing distance from the rotary axis. This will intensify the sieving effect and contribute to avoidance of clogging of the sieve surface.

The figures used in the claims are only meant to explain more clearly the intention of the invention and are not supposed to be any restriction concerning the interpretation of the invention.

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CLAIMS:

1. A sieving device comprising a pervious sieve surface adapted to rotate about an upwardly extending rotary axis characterized in that the
5 sieve surface has a curved sectional area in a manner such that parts of the sieve surface located near the rotary axis and near the outer periphery are at a higher level than the parts of the sieve surface located there between.
2. A sieving device as claimed in Claim 1 characterized in that the sieve surface is curved in a manner that, when the sieve surface is
10 rotating with the normal operational speed the displacement of the material to be sieved by the action of the centrifugal force and the component of the force of gravity extending parallel to the sieve surface takes place with at least substantially constant speed in a radial direction outwards from the middle of the sieve surface.
- 15 3. A sieving device comprising a pervious sieve surface adapted to rotate about an upwardly extending rotary axis characterized in that the sieve surface is adapted to rotate about two at least substantially parallel rotary axes.
4. A sieving device comprising a pervious sieve surface adapted to

rotate about an upwardly extending rotary axis characterized in that means are provided with the aid of which a tilting movement about a pivotal axis extending transversely of the rotary axis of the sieve surface can be imparted to the sieve surface.

- 5 5. A sieving device as claimed in anyone of the preceding Claims characterized in that the sieve surface is rotatably mounted on a shaft supporting the sieve surface and is coupled with a driving source, whilst the shaft supporting the sieve surface is fastened to a second shaft which is also coupled with a driving source.
- 10 6. A sieving device as claimed in Claim 5 characterized in that the interconnected shafts extend parallel to one another.
7. A sieving device as claimed in Claim 5 characterized in that the interconnected shafts are at an angle to one another.

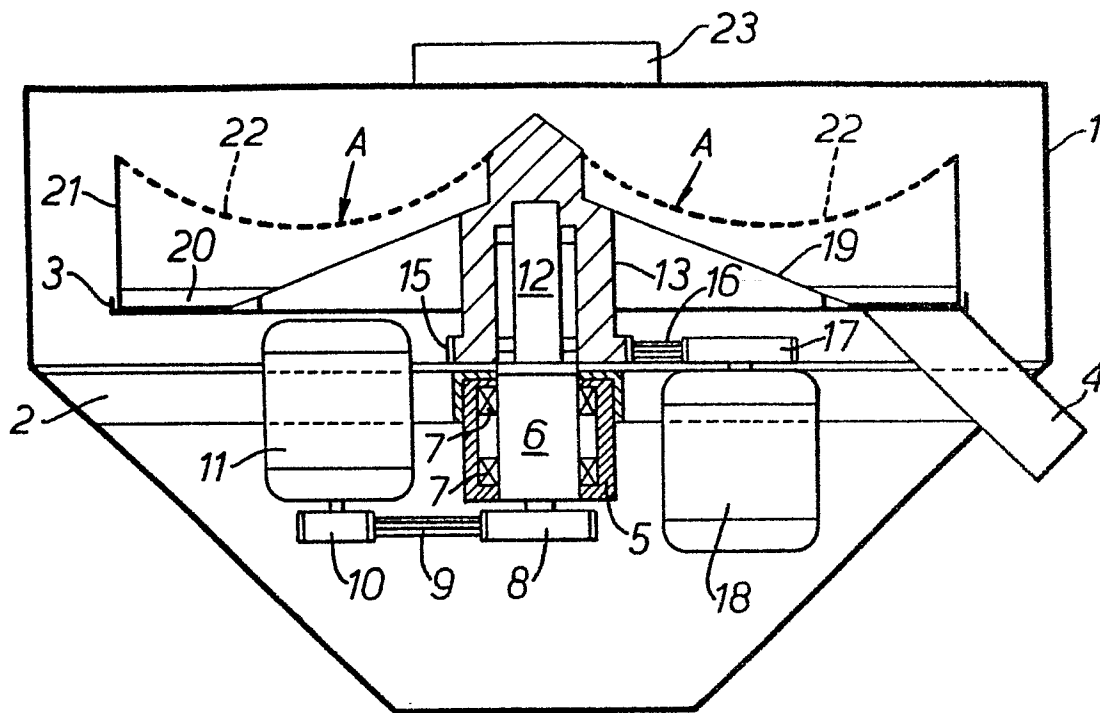


FIG. 1.

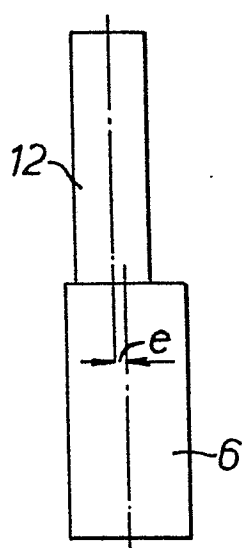


FIG. 2.

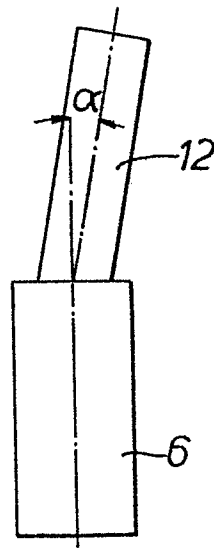


FIG. 3.

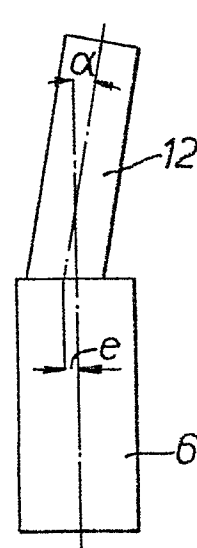


FIG. 4.



European Patent
Office

EUROPEAN SEARCH REPORT

0085458
Application number

EP 83 20 0109

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
A	DE-C- 862 996 (H.MÜLLER) *The whole document*	1	B 07 B 1/08 B 07 B 1/46 B 07 B 1/42
A	DE-C- 71 863 (P.TAFEL) *The whole document*	3, 5, 6	
A	GB-A- 308 530 (OTTO WIENCKE) *Page 1, line 40 - page 2, line 47; figures 1-7*	4, 7	
A	DE-C- 440 697 (OTTO WIENCKE)		
A, D	NL-A-7 605 572 (COOPERATIEVE LANDBOUW)		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			B 07 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-04-1983	Examiner LAVAL J.C.A
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