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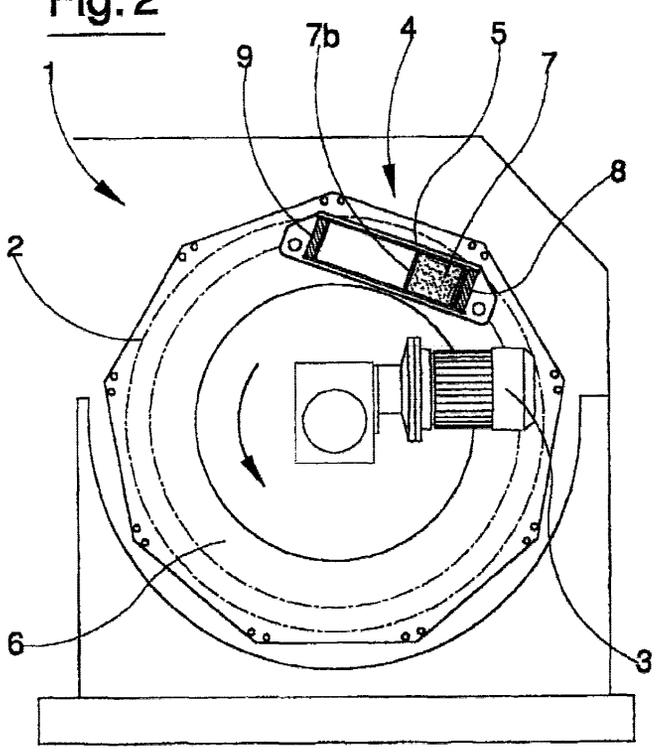
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(54) A rotary tubular sieve for powder materials

(57) A sieve for powder materials comprises a screen (2) which is commandably rotatable about a horizontal rotation axis (x-x). The sieve is provided with a hammer device (4) for inducing vibrations on the screen (2). During the screen rotation, a striker mass (7) moves alternatingly between two extreme endrun positions, striking alternatingly against two endrun stops (8,9) which are solid with the screen and which are located at the extreme endrun positions. At each revolution of the screen, the striker mass completes a full back-and-forth run. When the striker mass strikes the endrun stops (8,9) the screen (2) is shocked by vibrations which cause the powder materials to dislodge from perforations in the screen (2) and therefore clogging of the perforations is prevented.

Fig. 2



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Description

[0001] Specifically, though not exclusively, the invention can be used for screening dry-ground clayey materials.

[0002] Special reference is made to a sieve realised according to the preamble of the first claim appended hereto.

[0003] A sieve of the above type is already known and is used for screening powder material, such as for example dry-ground clayey material. A problem with sieves of this type is that the powder material tends to adhere to the tubular screen of the sieve, leading to at least a partial clogging of the perforations in the screen itself. This problem is made worse if the powder material to be screened is electrostatically charged, as is the case with dry-ground clayey material. In known sieves, in order to prevent total clogging of the perforations, the perforations themselves are made relatively large, which leads to a reduction in the screening capacity of the screen.

[0004] The main aim of the present invention is to obviate the above-cited limitations and drawbacks in the prior art, by providing a sieve which enables even a partial clogging of the perforations in the screen to be prevented.

[0005] An advantage of the invention is that it provides a sieve in which the dimensions of the perforations can be relatively small without their clogging. A further advantage is that a sieve is provided which is functionally simple and reliable.

[0006] These aims and advantages and more besides are fully achieved by the present invention as it is characterised in the claims that follow.

[0007] Further characteristics and advantages of the present invention will better emerge from the detailed description that follows of some preferred but non-exclusive embodiments of the invention, illustrated purely by way of nonlimiting example in the accompanying figures of the drawings, in which:

figure 1 is a lateral view in vertical elevation of a sieve made according to the invention;
figure 2 is a side view from the left of figure 1;
figure 3 is the view of figure 2, with the sieve in a different operative configuration;
figures 4, 5 and 6 schematically show three more embodiments of the invention.

[0008] With reference to the figures from 1 to 3, 1 denotes in its entirety a sieve for powder materials of various granulometry. In particular the powder material is constituted by dry-ground clayey material.

[0009] The sieve 1 comprises at least one screen 2 of known type, perforated, rotatable about a rotation axis x-x and driven by a motor 3. In the illustrated embodiment the screen 2 is cylindrical, with a horizontal axis x-x, and is rotatable about its own axis.

[0010] The sieve 1 is equipped with a hammer device 4 to cause vibrations of the screen 2. The hammer device 4 comprises at least one rectangular guide 5 which is solid in rotation with the screen 2. The guide is of a closed-box shape, with a rectangular section. The guide 5 is mounted on a frontal wall 6 which closes an end of a cylinder created by the tubular screen 2.

[0011] At least a part of the guide 5 is located at a distance other than zero from the rotation axis x-x of the screen 2. In the illustrated embodiment the guide 5 is arranged in a lie plane which is normal to the rotation axis x-x and extends lengthwise according to a chord of an arc of circumference having a centre at the rotation axis x-x.

[0012] A striker mass 7 is mobile along the guide 5 and can displace between at least two extreme endrun positions. The striker mass 7 displaces in a direction which has at least one non-axial component with respect to the rotation axis x-x of the screen 2. In the illustrated embodiment, the displacement direction of the striker mass 7 along the guide 5 has at least one tangential component with respect to the rotation axis x-x of the screen 2.

[0013] The striker mass 7 is slidably coupled to the guide 5. The striker mass 7 slides internally of the box structure of the guide in a straight sliding direction. The striker mass 7 exhibits two opposite and parallel faces which slide on two corresponding flat sliding surfaces situated reciprocally opposite and parallel to the sliding direction.

[0014] The striker mass 7 displaces between the above-described endrun positions by effect of their weight force and the displacements of the guide 5 determined by the rotation of the screen 2. The striker mass 7 alternatingly strikes against two striker surfaces 8 and 9 incorporated in the guide 5 and located at endrun positions of the striker mass 7 run. The striker surfaces 8 and 9 are constituted by two walls which border at either end the box structure of the guide, inside which the striker mass 7 moves. The striker mass 7 exhibits two opposite faces 7a and 7b, each of which strikes frontally against a respective striker surface 8 and 9.

[0015] During operation, the screen 2 is set in rotation about axis x-x. The hammer device 4 rotates solidly with the screen 2. During rotation the guide 5 and the striker mass 7 assume various positions, with the result that the striker mass 7, by effect of its own weight, slights alternatingly between one end and the other of the guide 5. For each complete revolution of the screen 2, the striker mass 7 makes one back-and-forth run along the guide 5. In figures 2 and 3 two different configurations assumed by the striker mass 7 are shown, according to the position of the guide 5 during rotation of the screen 2.

[0016] At the end of each run of the striker mass 7 from one end of the guide 5 to the other, one of the faces 7 aor 7b of the striker mass 7 strikes against a striker surface 8 or 9 of the screen 2. The impact of the strike causes a shaking or induces vibrations on the screen 2,

by effect of which any powder material stuck to the screen 2, especially any material clogging up the perforations thereof, is dislodged. The impact, and the consequent shaking, occurs twice for each revolution of the screen 2.

[0017] Thanks to the hammer device 4 the screen perforations do not clog up and the screening capacity of the screen is not compromised.

[0018] In a second embodiment, schematically represented in figure 4, the sieve 21 equipped with a hammer device comprises a plurality of guides 25 (in the example five), all closed box-shaped (with straight rectangular section, as in the first embodiment, or with a straight cylindrical section), each of which defines a chamber internally of which slides a striker mass 27. The guides 25 are arranged circumferentially about the rotation axis x-x of the screen 22.

[0019] In the third embodiment, see figure 5, the hammer device comprises four striker masses 37 arranged circumferentially about the rotation axis x-x of the screen 32. Each striker mass 37 slides on a straight guide 35 which at opposite ends exhibits two endrun stops 38 and 39.

[0020] In the fourth embodiment shown in figure 6, the hammer device comprises three striker masses 47, arranged circumferentially about the rotation axis x-x of the screen 42. Each striker mass 47 is mounted on an end of an arm 50 which arm 50 is hinged (with freedom to rotate) at another end thereof to a pivot which is preferably coaxial with the axis x-x of the screen 42. Each striker mass 47 is oscillatingly mobile between two endrun positions identified by two striker surfaces 48 and 49.

[0021] The functioning of the screens in figures 4, 5 and 6 is the same as that of figures 1, 2 and 3, and needs no further explanation.

Claims

1. A sieve for powder materials comprising at least one tubular perforated screen (2, 22, 32, 42), which screen (2, 22, 32, 42) is rotatable on command about a rotation axis (x-x), **characterised in that** the sieve is provided with a device (4) for inducing vibrations on the screen (2, 22, 32, 42), which device comprises at least one mobile striker mass (7, 27, 37, 47) which moves alternatingly between at least two endrun stop positions, striking alternatingly against two striker surfaces (8, 9; 38, 39; 48, 49) which are solidly constrained to the screen (2, 22, 32, 42) and located at the two endrun stop positions; the alternating motion of the at least one striker mass (7, 27, 37, 47) being determined by an action produced by a weight thereof as the at least one striker mass (7, 27, 37, 47) is shifted in position with respect to a vertical, a shifting being caused by a rotation of the screen (2, 22, 32, 42).

2. The sieve of claim 1, **characterised in that** the device for inducing vibrations comprises at least one guide (5, 25, 35) which is solid in rotation with the screen (2, 22, 32, 42), along which guide (5, 25, 35) the striker mass (7, 27, 37) is mobile alternatingly in a direction at least one component of which is not axial with respect to the rotation axis (x-x) of the screen (2, 22, 32, 42).

3. The sieve of claim 2, **characterised in that** at least one part of the guide (5, 25, 35) is situated at a distance which is greater than zero from the rotation axis (x-x) of the screen (2, 22, 32).

4. The sieve of claim 2 or 3, **characterised in that** the striker mass (7, 27, 37) is slidably coupled to the guide (5, 25, 35).

5. The sieve of claim 4, **characterised in that** the striker mass (7, 27) slides along the guide (5, 25) in a straight sliding direction and exhibits at least two parallel opposite faces which slide on two corresponding flat sliding surfaces of an opposite guide which sliding surfaces are opposite and parallel to the sliding direction.

6. The sieve of any one of claims from 2 to 5, **characterised in that** the guide (5, 25) is box-shaped and **in that** the striker mass (7, 27) slides therein.

7. The sieve of any one the preceding claims, **characterised in that** the direction of displacement of the striker mass (7, 27, 37, 47) has at least one component which is tangential with respect to the rotation axis (x-x) of the screen (2, 22, 32, 42).

8. The sieve of any one of the preceding claims, **characterised in that** the striker mass (47) is borne on an arm (50) which arm (50) can oscillate about a rotation pivot.

9. The sieve of claim 2 or 3, **characterised in that** the striker surfaces (8, 9; 38, 39; 48, 49) are mounted on a frontal wall (6) which closes an end of the tubular screen (2, 22, 32, 42).

Fig.1

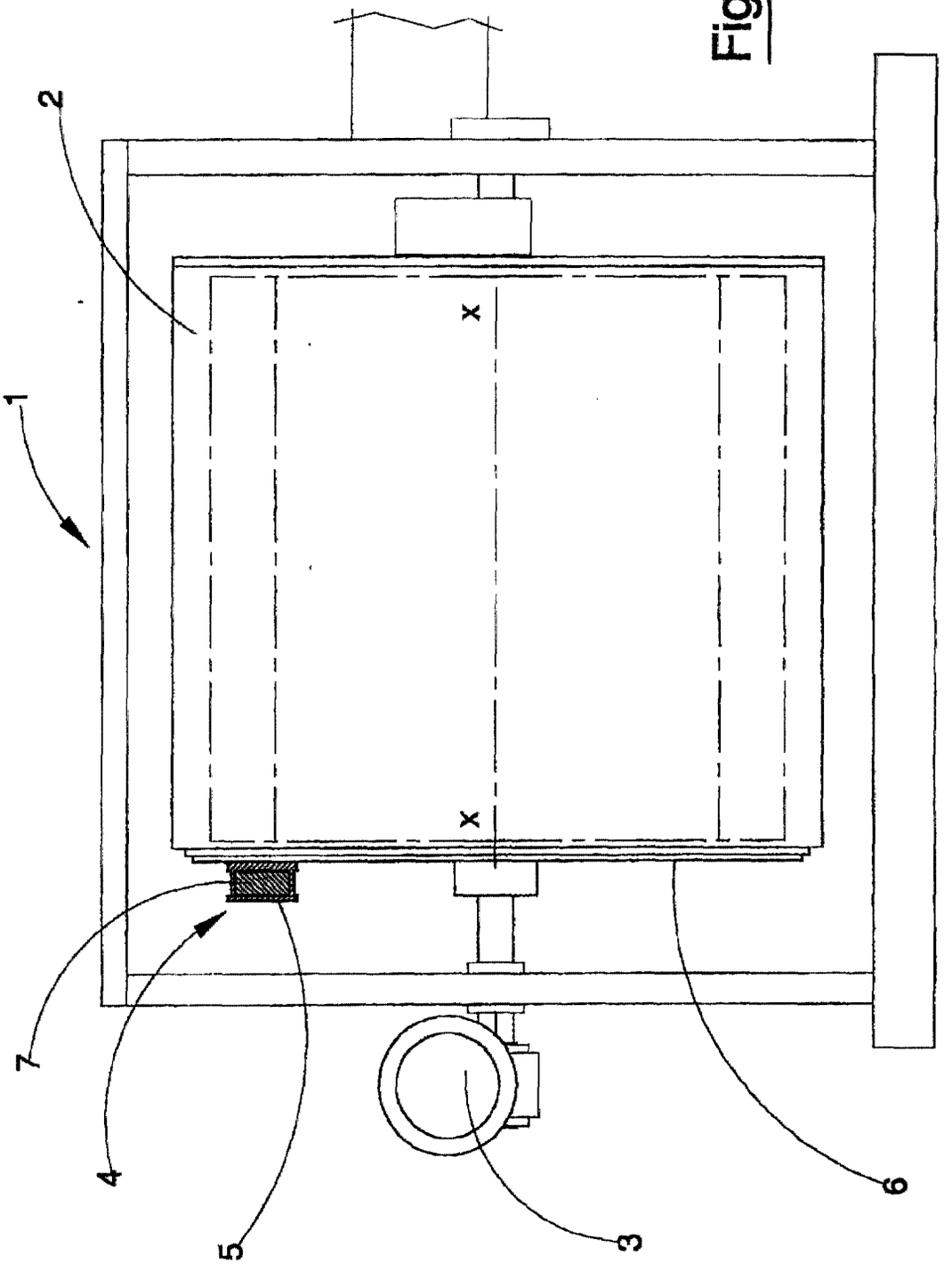


Fig.3

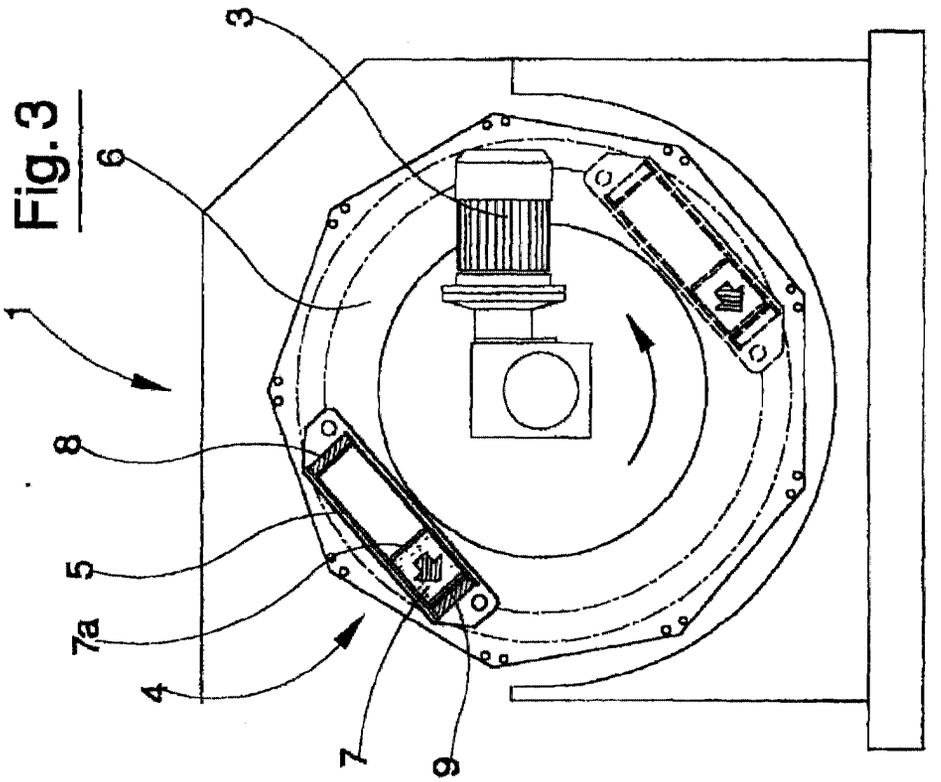
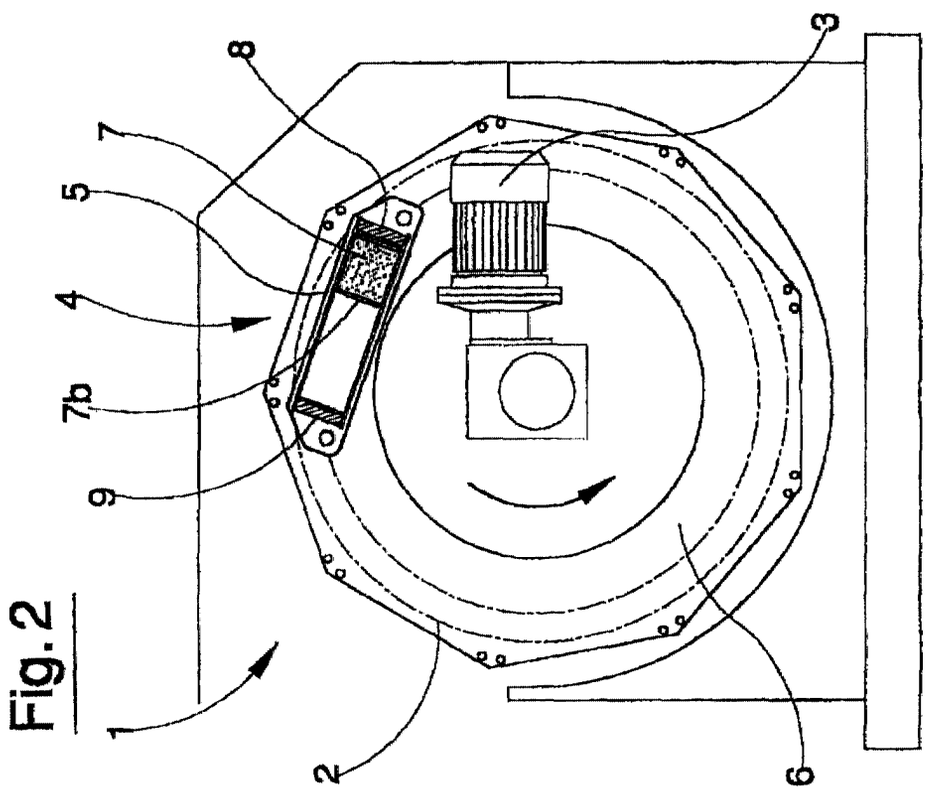
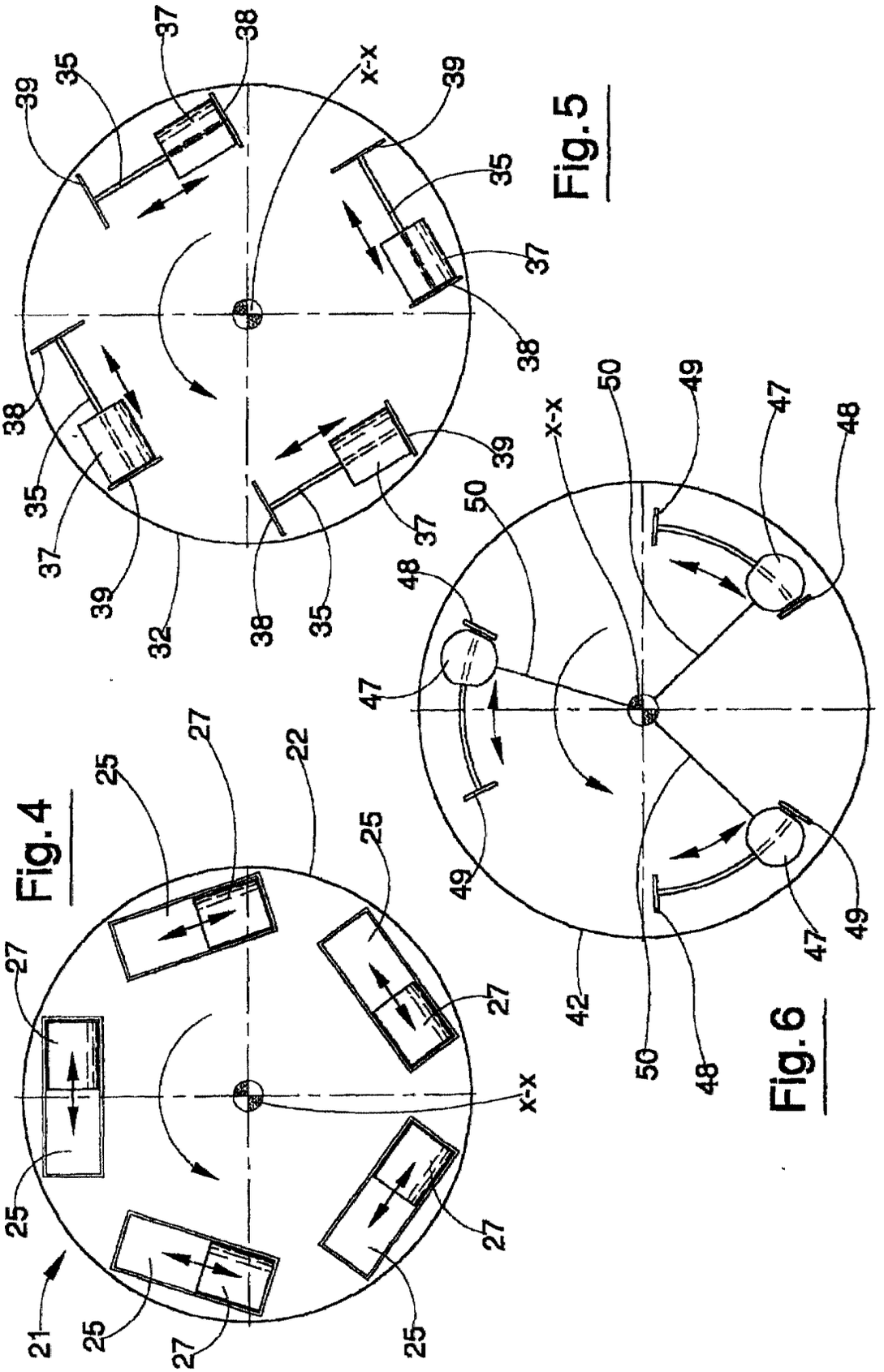


Fig.2




21
22
25
27
x-x
Fig.4
32
35
37
38
39
x-x
Fig.5
42
47
48
49
50
x-x
Fig.6

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EUROPEAN SEARCH REPORT

Application Number
EP 00 83 0417

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.7)
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B07B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	24 October 2000	Laval, J

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