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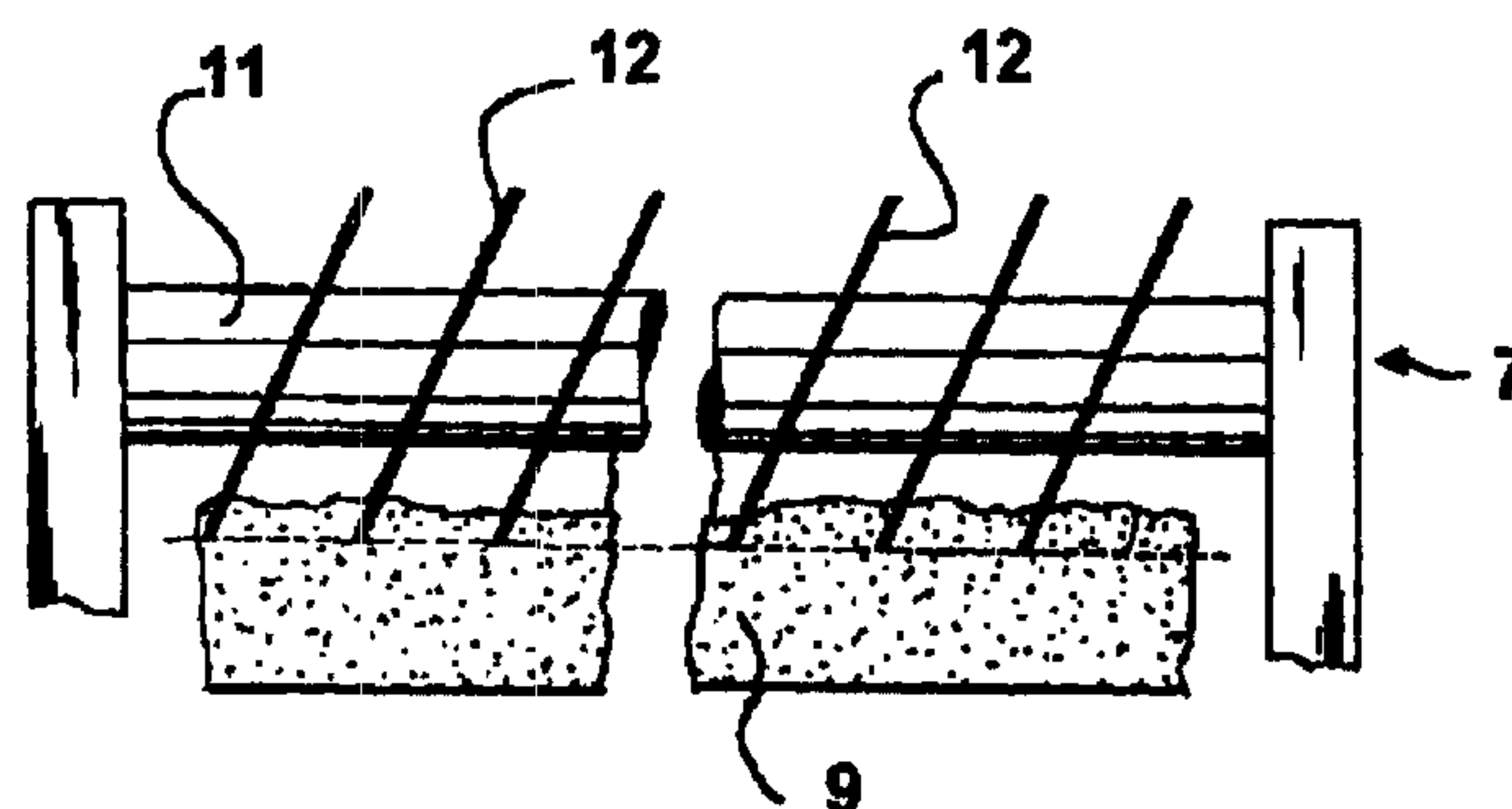
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(54) **DISPOSITIF POUR ETALER ET REPARTIR DES PARTICULES
SUR UNE BANDE DE MATERIAU**

(54) **DEVICE FOR SPREADING AND DISTRIBUTING PARTICLES
ON A MATERIAL WEB**



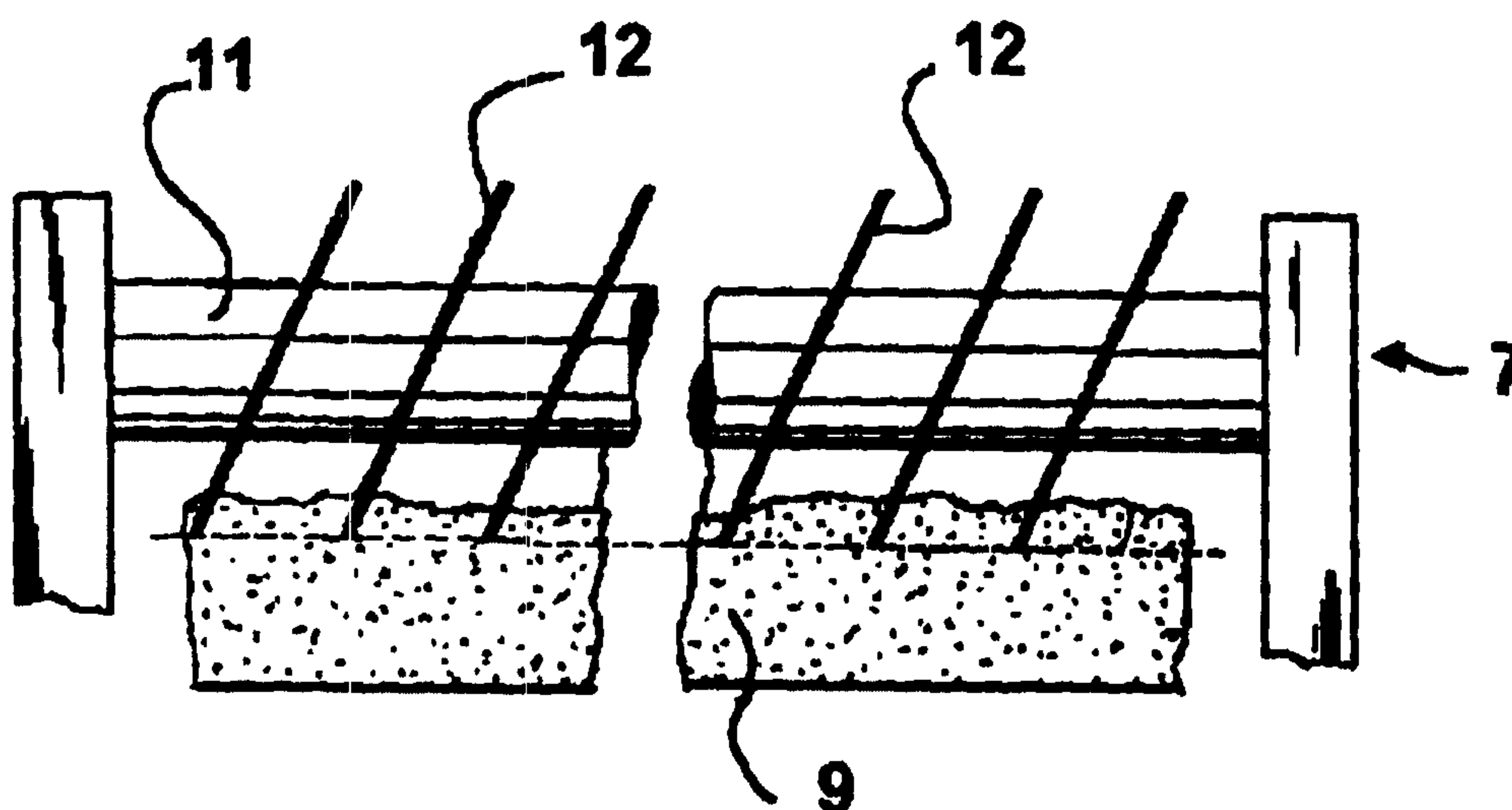
(57) L'invention concerne un dispositif pour étaler et répartir des particules une bande de matériau (9), telles que des fibres de bois recouvertes de colle sur une table ou un convoyeur à bande pour la production de panneaux de fibres de bois. Ladite bande de matériau (9) est déplacée par rapport audit dispositif, lequel comprend des rouleaux de formation (7) à plusieurs moyens de répartition sensiblement obliques, disposés le long d'un axe de rotation (11), transversaux par rapport au sens de déplacement de la bande de matériau et tournant avec ledit axe (11). Le dispositif selon l'invention se caractérise en ce que plusieurs rouleaux de formation (7) sont placés successivement à des hauteurs croissantes et sont disposés de sorte que les moyen de répartition (12) s'étendent vers la bas dans la bande de matériau, alors que les particules au niveau de chaque axe (11), sont étalées sur la bande de matériau (9) pour former une couche régulière de particules réparties de manière homogène, sous l'effet de la rotation des moyens de distribution.

(57) The present invention refers to a device for spreading and distributing particles on a material web (9), such as glue-coated wood fibres on a wire or a conveying belt for production of wood-fibre boards, which material web (9) being moved relative said device, comprising forming rollers (7) with several, transverse the direction of movement of the material web, arranged and along a rotating axle (11) distributed, essentially oblique distributing means (12), which rotate with said axle (11). The essential with the invention is that several forming rollers (7) are arranged successive after each other on increasing height and are arranged in such a way that the distribution means (12) extends down into the material web, whereas the particles at each axle (11), by the rotation of the distribution means, spread across the material web (9) to an even layer of homogenous distributed particles.

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(54) Title: DEVICE FOR SPREADING AND DISTRIBUTING PARTICLES ON A MATERIAL WEB**(57) Abstract**

The present invention refers to a device for spreading and distributing particles on a material web (9), such as glue-coated wood fibres on a wire or a conveying belt for production of wood-fibre boards, which material web (9) being moved relative said device, comprising forming rollers (7) with several, transverse the direction of movement of the material web, arranged and along a rotating axle (11) distributed, essentially oblique distributing means (12), which rotate with said axle (11). The essential with the invention is that several forming rollers (7) are arranged successive after each other on increasing height and are arranged in such a way that the distribution means (12) extends down into the material web, whereas the particles at each axle (11), by the rotation of the distribution means, spread across the material web (9) to an even layer of homogenous distributed particles.

Device for spreading and distributing particles on a material web.

The present invention refers to a device for spreading and distributing particles on a material web, such as glue-coated wood fibres on a wire or a conveying belt for production
5 of wood-fibre boards, which material web being moved relative said device, comprising several, transverse the direction of movement of the material web, arranged and along a rotating axle distributed, essentially oblique distributing means, which rotate with said axle.

10 In a forming station for producing wood-fibre boards there is today a need to distribute glue-coated wood fibres on a wire or a conveying belt to a layer with a certain thickness. The layer of wood fibres is transported by said wire or conveying belt to a pressing plant, in which the wood fibres, by influence of pressure and temperature being pressed together to a continuous board.

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Through PCT/SE95/01402 a device of introductory described kind is previously known, which has a purpose of levelling the material web after an air distribution of the particles. Another type of levelling or milling is disclosed by US 5496570 and consists of a scrape or a planing device, which, for the method shown, cut off an necessary excess of wood fibres.

20 A disadvantage with the known technique is that a large amount of wood fibres are recirculated to the process from said levelling or milling, which is unfavourable since the quality deteriorate by wearing.

US 5496570 shows also how a number of disc rollers are used for distributing of wood
25 fibres and for pulverising possible clumps among the wood fibres. Another similar device, for distributing wood fibres by aid of disc rollers, is previously known by SE 436 627. Common for the both latter references is that the disc rollers are located above the level of the wood fibres and by utilise successive different distances between the discs of the different disc rollers, one may achieve a sorting and orientation of the wood fibres in

several different layers. A disadvantage is however that the distribution is unsatisfactory across the material web.

An object with the present invention is to provide a homogenous layer of wood fibres, having a desired distribution over the width of the material web. One additional object is to provide a distributing of the wood fibres, in such way, that any considerable subsequent levelling or milling is avoided.

This object is achieved, according to the invention, with a device of the kind mentioned by way of introduction, which is characterised in that several axles, with distributing means, are arranged successive after each other on increasing height and are arranged such that the distribution means extends down into the material web, whereas particles at each axle, by the rotation of the distribution means, will be spread across the material web.

In a preferred embodiment the axis are secured to a common frame, which is arranged in angle against the material web, in such way, that several layers being formed above each other, whereas the thickness of said layers and thus the thickness of the resulting material web, is defined by said angle.

The invention will now be described closer with reference to the accompanying drawings, in which;

fig. 1 shows a schematic side view of a forming station for wood fibre board

fig. 2 shows a schematic perspective view of a device according to the present invention,

fig. 3 shows a schematic view of a forming roller,

fig. 4 shows a schematic perspective view of several forming rollers arranged according to the present invention, and

fig. 5 - 9 shows schematic different alternative embodiments of a distribution means.

The drawings show in figure 1 a forming station for wood fibre boards, comprising a cyclone 1, for supply of glue-coated wood fibres. Wood fibres are discharged through a sluice 2 to a dosing bin 3, for dosage of wood fibres. The dosing bin 3 has means 4 for feeding wood fibres to a conveyor scale 5. After the conveyor scale 5 the wood fibres pass a spreader 6, which can be provided with wings, discs, pins or other known means for disintegrating the wood fibres and distributing these over a number of forming rollers 7. The forming rollers 7 can be adjusted in different angles depending on a desired thickness of the layer of wood fibres. The forming rollers 7 feed wood fibres on a wire 8 or a conveying belt for transportation to a pressing station (not shown). The drawings show how the devices for supply of wood fibres, up to the forming rollers 7, are located in line with the wire 8 or conveying belt, but naturally, the devices may also be located such that the supply of wood fibres are performed perpendicular against the wire 8 or conveying belt.

Figure 2 shows a more detailed view of the spreaders 6, followed by the forming rollers 7 and the material web 9 discharged on the wire 8 or conveying belt. The forming rollers 7 are secured to a common frame 10, which is arranged in an angle α against the material web 9.

Figure 3 shows a forming roller 7, which is arranged transverse the direction of movement of the material web, and comprises a rotating axle 11 and a number of distributing means 12. The distributing means 12 are located along axle 11 and consist, in a first preferred embodiment, of a number of oblique, essential elliptic discs or similar disc shaped means, which rotate with said axle 11. The distributing means 12 extend down into the material web 9.

The expression oblique discs embrace also discs which in fact is arranged strait on the axle, but which by bending or similar have at least one resulting oblique surface acting in the material web 9.

The axle 11 and the distribution means 12 can be of the kind, disclosed by the international patent application No. PCT/SE95/01402, in which the distribution means 12 are mounted on an axially distance from each other for a rotation together with the axle 11, and, around its shorter diameter, arranged oblique in relation to the axle 11, in such way that they have a circular axial projection. In addition, the distribution means 12 are mounted, in such way, that the axial distance between adjacent discs overlaps each other in the axial direction, and in addition, the discs are inclined 45° - 80° , preferably 60° in relation to the axle 11. During rotation the discs 12 perform an axially backwards and forwards throwing movement of wood fibres inside a imaginary horizontal strait tube.

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Figure 4 shows several axles 11a-11f arranged successive after each other on an increasing height from the bottom of the material web 9, and being arranged such that the distribution means 12 of the axis project essential down into the material web 9. Thus, the particles at each axle 11a-11f will, by the rotation of the distribution means 12, spread across the material web 9 to an even layer 13a-13f of homogenous distributed particles.

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Figure 5 shows a second alternative embodiment of a distributing means 12, which consists of an elliptic disc provided with openings 14, through which wood fibres can be transported. The openings 14 can be of suitable form, but preferably they are shaped like spokes 15 or similar means formed between the openings 14. The spokes 15 can also be turned or shaped in another suitably way, such that some action by propeller appear, for transportation of wood fibres in a desired direction. Naturally, the disc can also be provided with protrusions or similar means along its periphery to effect said transportation.

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Figure 6 shows a third alternative embodiment of a distributing means 12, in which, an elliptic disc is provided with recesses to form a propeller blade 16 or similar means, by which wood fibres can be transported in a desired direction. Thus, the distributing means 12 according to this embodiment extend only partly around the axle 11. It is also possible to alter the shape of different distributing means 12, according to this embodiment, to provide different properties along the axle 11, in such way that a desired distribution is obtained.

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Figure 7 shows a forth alternative embodiment of a distributing means 12, in which, a elliptic disc is provided with corrugations 17 or similar surface structure, to convey the wood fibres. Also the corrugations 17 can be shaped in such way that some action by
5 propeller appear for transportation of the wood fibres in a desired direction.

Figure 8 shows a fifth alternative embodiment of a distributing means 12, in which, a number of protruding pins 18 or similar forms a elliptic plane brush, to convey the wood fibres.

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Figure 9 shows a sixth alternative embodiment of a distributing means 12, in which, propeller blades 19A - 19D or similar means are arranged along an axle 11, which in this embodiment has a rectangular cross-section. The outer edge 20 of two propeller blades 19A and 19B, and, 19C and 19D, respectively, located on opposite sides 21A and 21B,
15 and, 21C and 21D, respectively, of the axle 11, extend along a common elliptic path. In this embodiment the elliptic path of the propeller blades 19A and 19B are arranged in angle against the elliptic path of the propeller blades 19C and 19D. By this, it is possible to locate the distribution means 12 closer, and it is also possible to alter the shape of different distributing means 12, according to this embodiment, to achieve different properties along
20 the axle 11, in such way that a desired distribution is obtained.

The axis 11a-11f are arranged in angle against the material web 9, in such way that several layers 13a-13f being formed above each other, the thickness of said layers and thus the thickness of the resulting material web 9 will be defined by said angle.

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In the figures the distribution means 12 are directed in the same direction for the different axis 11, but naturally, within the frame of the present invention, they may also be directed in different directions.

It is also possible to adjust the inclination of the frame 10 in an angle transversal to the material web 9, in such way that the resulting cross-section profile of the material web will have a desired shape. By securing the axis 11a-11f in the frame 10, in an adjustable manner, in which each axle 11a-11f is individually adjustable vertically, is it possible to
5 influence the thickness of respective layer 13a-13f. This is especially important for the uppermost located forming roller, to influence the thickness of the uppermost layer 13f.

Naturally, the axis 11a-11f may also be displaced individually, longitudinally of the material web, to provide different distances between said axes 11a-11f or an inclination of
10 respective axes 11a-11f, and by that influence the distribution of the wood fibres within respective layer 13a-13f.

An additional opportunity to influence the distribution of the wood fibres within respective layer 13a-13f, is that the axis 11a-11f in itself is individually adjustable. Thus, each axle
15 11a-11f is shaped, in a per se known manner, such that the axle during operation has a deflection in a certain direction.

CLAIMS

1. Device for spreading and distributing particles on a material web (9), such as glue-coated wood fibres on a wire or a conveying belt for production of wood-fibre boards, which material web (9) being moved relative said device, comprising several, transverse
5 the direction of movement of the material web, arranged and along a rotating axle (11) distributed, essentially oblique distributing means (12), which rotate with said axle (11),
c h a r a c t e r i s e d in that several axles (11a-11f), with distributing means (12), are arranged successive after each other on increasing height and are arranged such that the distribution means (12) extend down into the material web (9), whereas particles at each
10 axle, by the rotation of the distribution means, will be spread across the material web (9).
2. Device according to claim 1, c h a r a c t e r i s e d in that the axis (11a-11f) are secured to a common frame (10), which is arranged in angle (α) against the material web (9) in such way that several layers (13a-13f) being formed above each other, the
15 thickness of said layers and thus the thickness of the resulting material web being defined by said angle (α).
3. Device according to claim 2, c h a r a c t e r i s e d in that the frame (10) can be adjusted in an angle transverse to the material web (9) in such way that the cross-
20 section profile of the resulting material web being defined by said angle.
4. Device according to claim 2 or 3, c h a r a c t e r i s e d in that the axis (11a-11f) are adjustable secured in the frame (10), and that each axle (11a-11f) is individually vertically adjustable to influence the thickness of respective layer (13a-13f).
- 25
5. Device according any of the claims 2 - 4, c h a r a c t e r i s e d in that the axis (11a-11f) are adjustable secured in the frame (10), and that each axle (11a-11f) is individually displaceable in the longitudinal direction of the material web to provide different distances between said axles (11a-11f) or to provide an inclination of respective

axles (11a-11f) to influence the distribution of the wood fibres within respective layer (13a-13f).

6. Device according to any of the claims 2 - 5, characterised in that the axis (11a-11f) are individually adjustable, in such way that each axle (11a-11f), in
5 operation, will have a deflection in a certain direction, to influence the distribution of the wood fibres within respective layer (13a-13f).

7. Device according to any of the claims 1 - 6, characterised in that at least one distributing means (12) consist of an elliptic disc.

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8. Device according to claim 7, characterised in that at least an elliptic disc is provided with openings (14), through which wood fibres can be transported.

9. Device according to claim 8, characterised in that spokes (15) or
15 similar means, between the openings (14), by twisting, or in another way, are shaped in such way, that some action by a propeller appear for transportation of the wood fibres in a desired direction.

10. Device according to any of the claims 1 - 9, characterised in that at
20 least one distributing means (12), is provided with protrusions or similar means along its periphery, which being formed, in such way, that some action by a propeller appear for transportation of the wood fibres in a desired direction.

11. Device according to any of claims 1 - 6, characterised in that at least
25 one distributing means (12), at least partly, consist of an elliptic disc provided with recesses, formed in such way that a propeller blade (16) or similar means being formed, by which wood fibres can be transported in a desired direction.

12. Device according to any of the claims 1 - 6, c h a r a c t e r i s e d in that at least one distributing means (12) consists of an elliptic disc provided with corrugations (17) or a similar surface structure, to convey the wood fibres.

5 13. Device according to any of the claims 1 - 6, c h a r a c t e r i s e d in that at least one distributing means (12) comprises a number of protruding pins (18) or similar, which are arranged in shape of an elliptic plane brush, to convey the wood fibres.

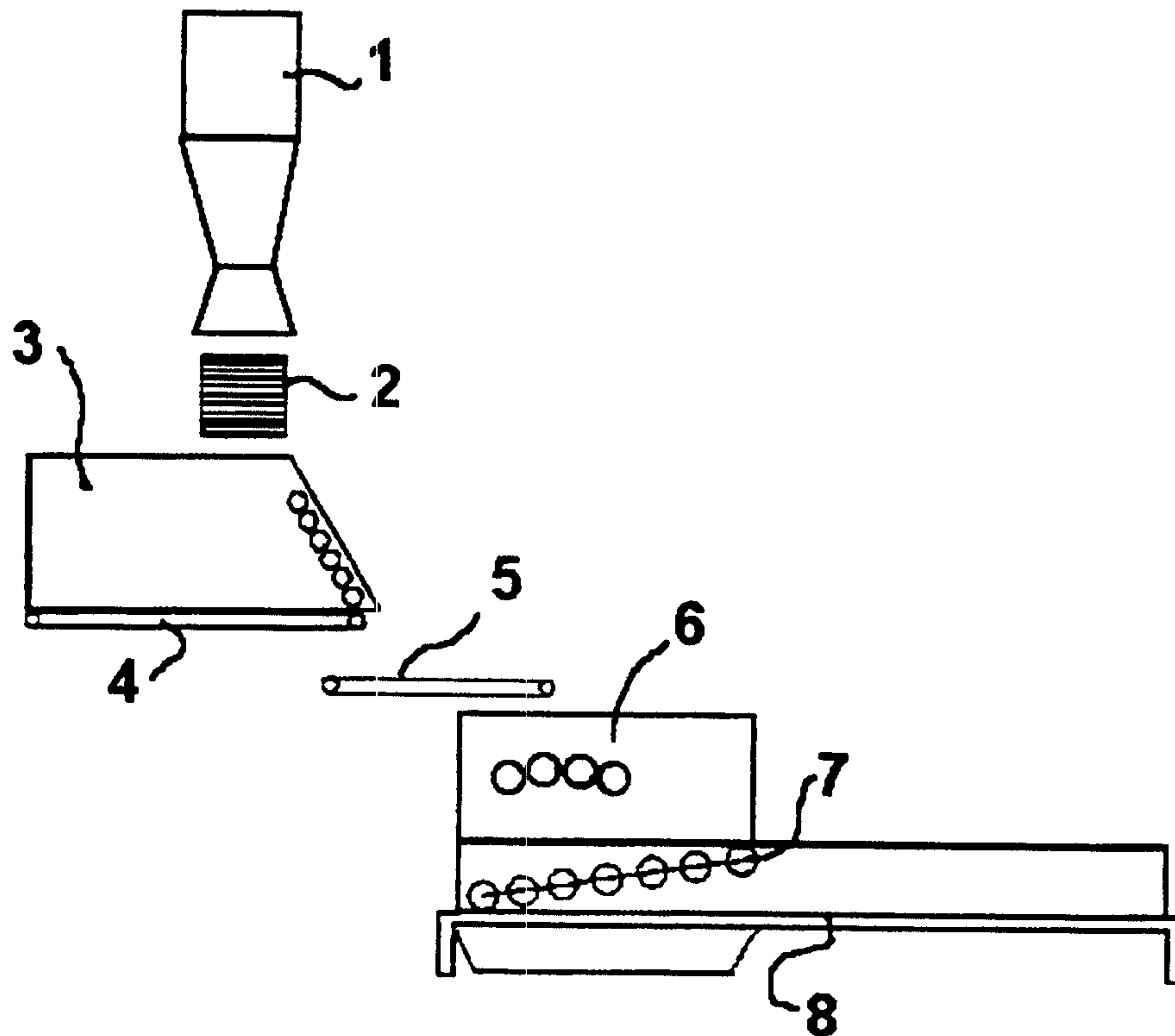


Fig 1

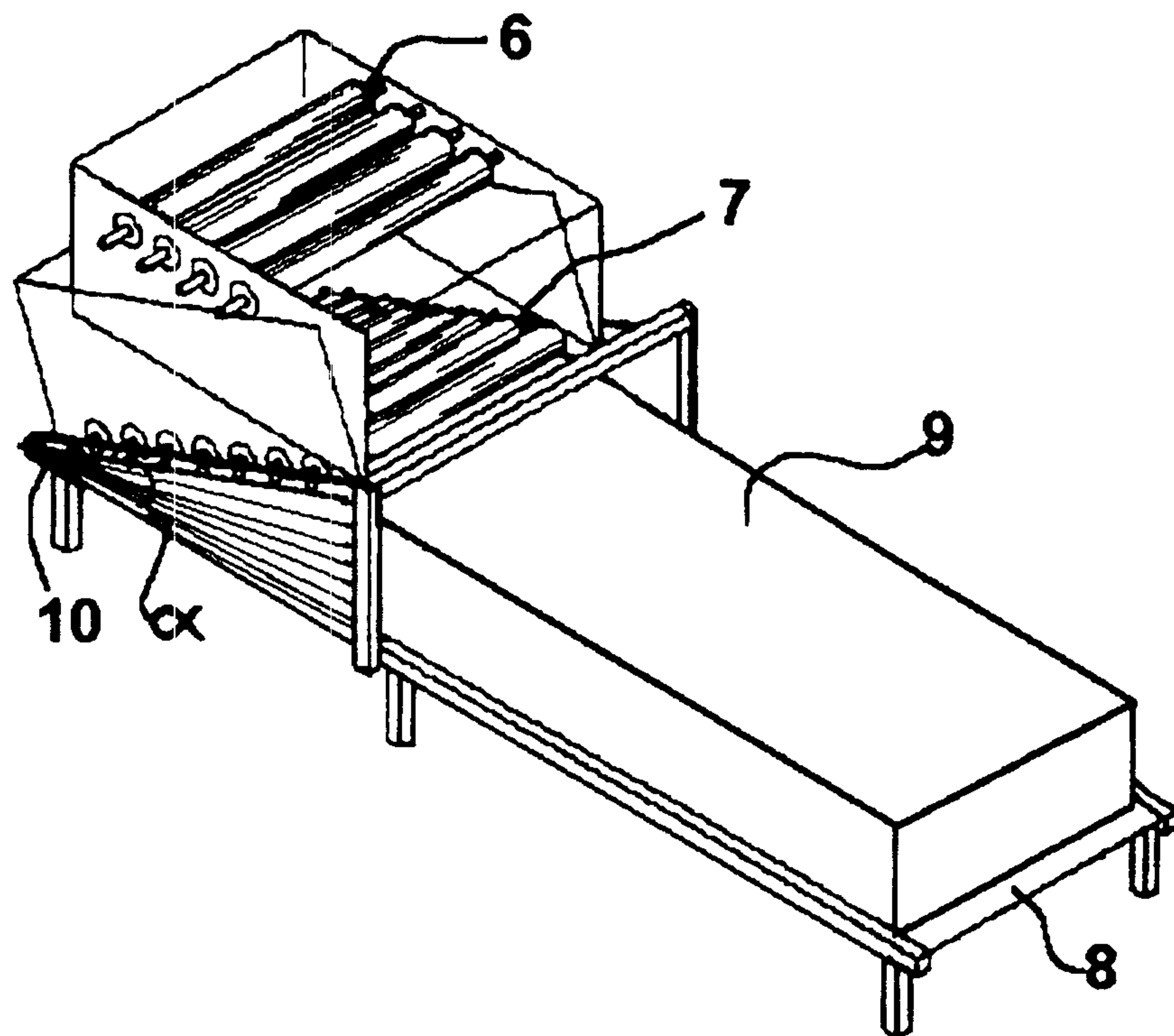


Fig 2

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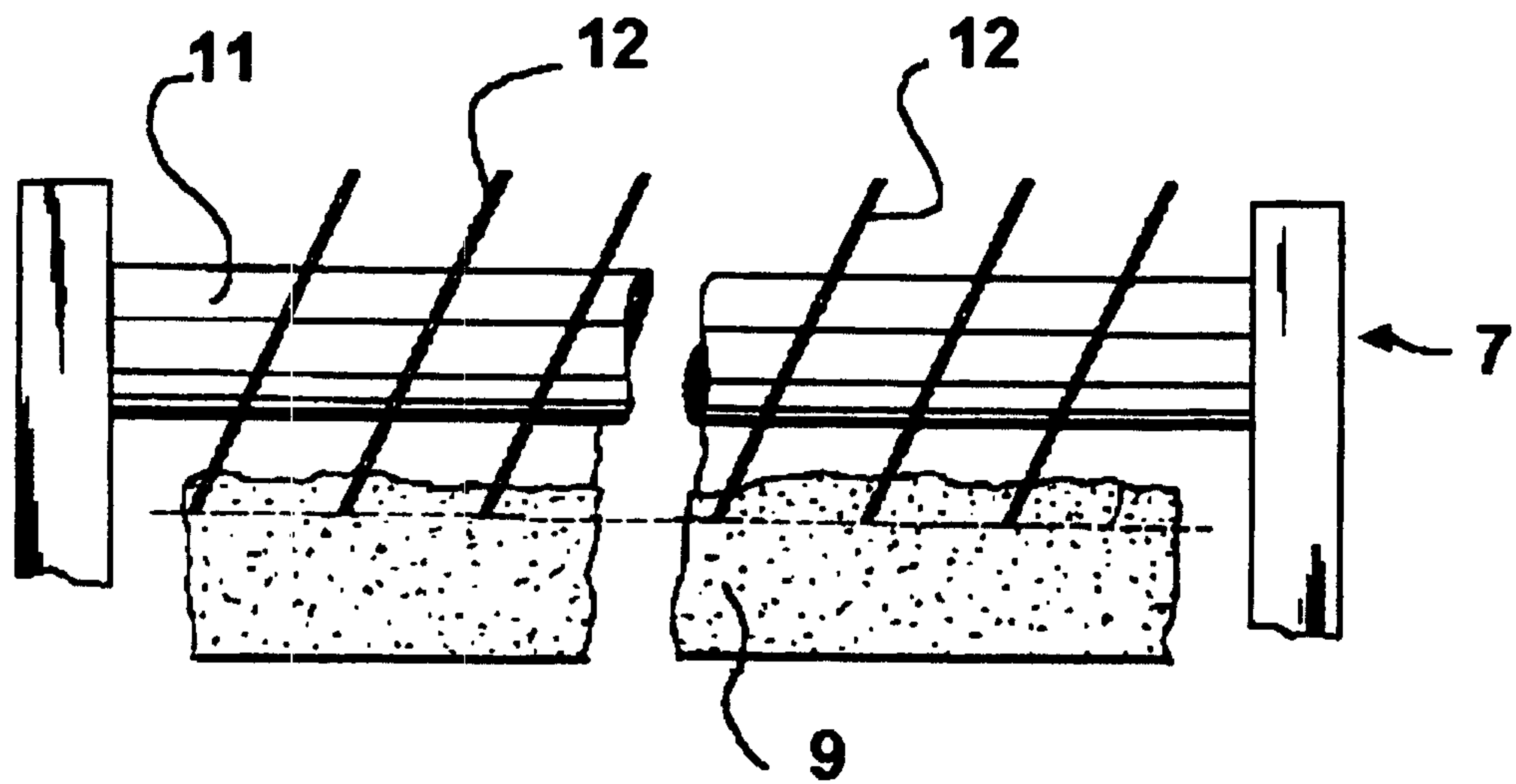


Fig 3

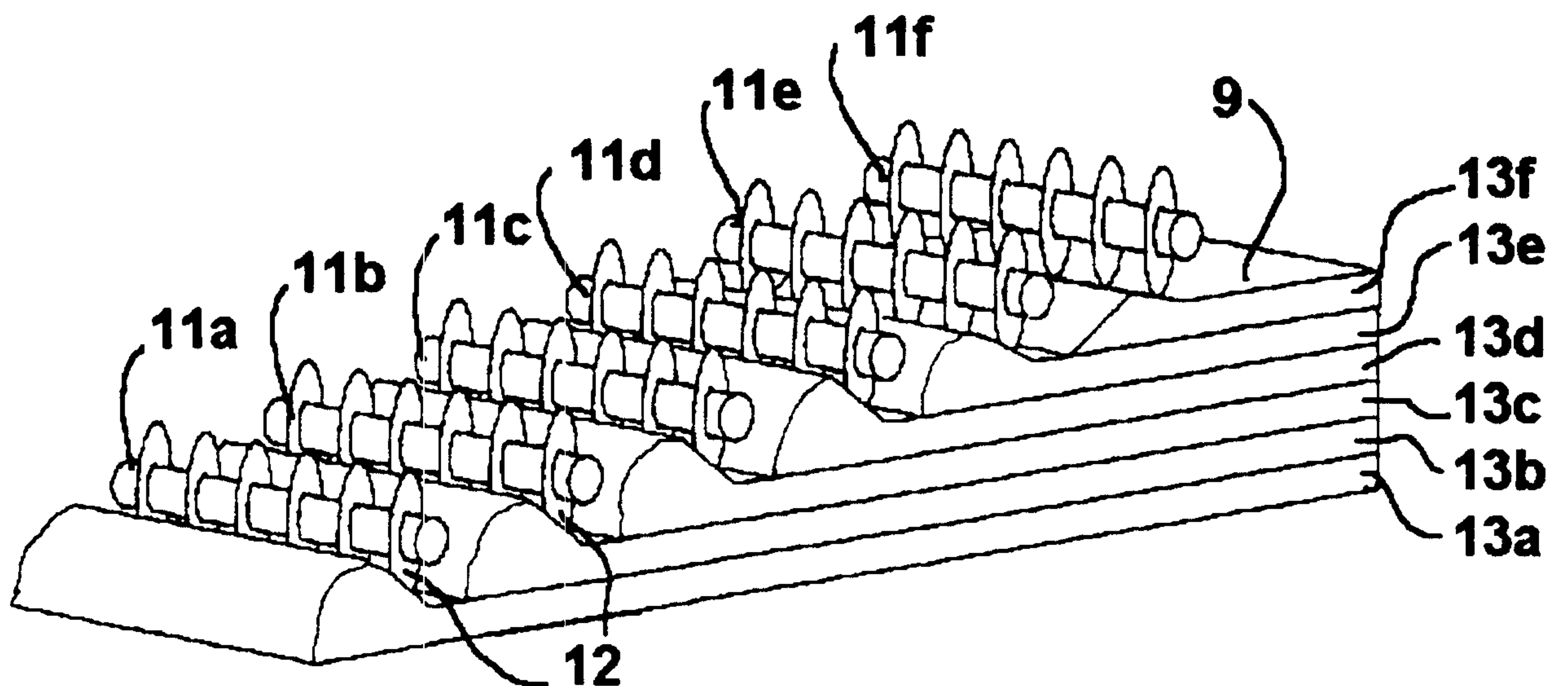


Fig 4

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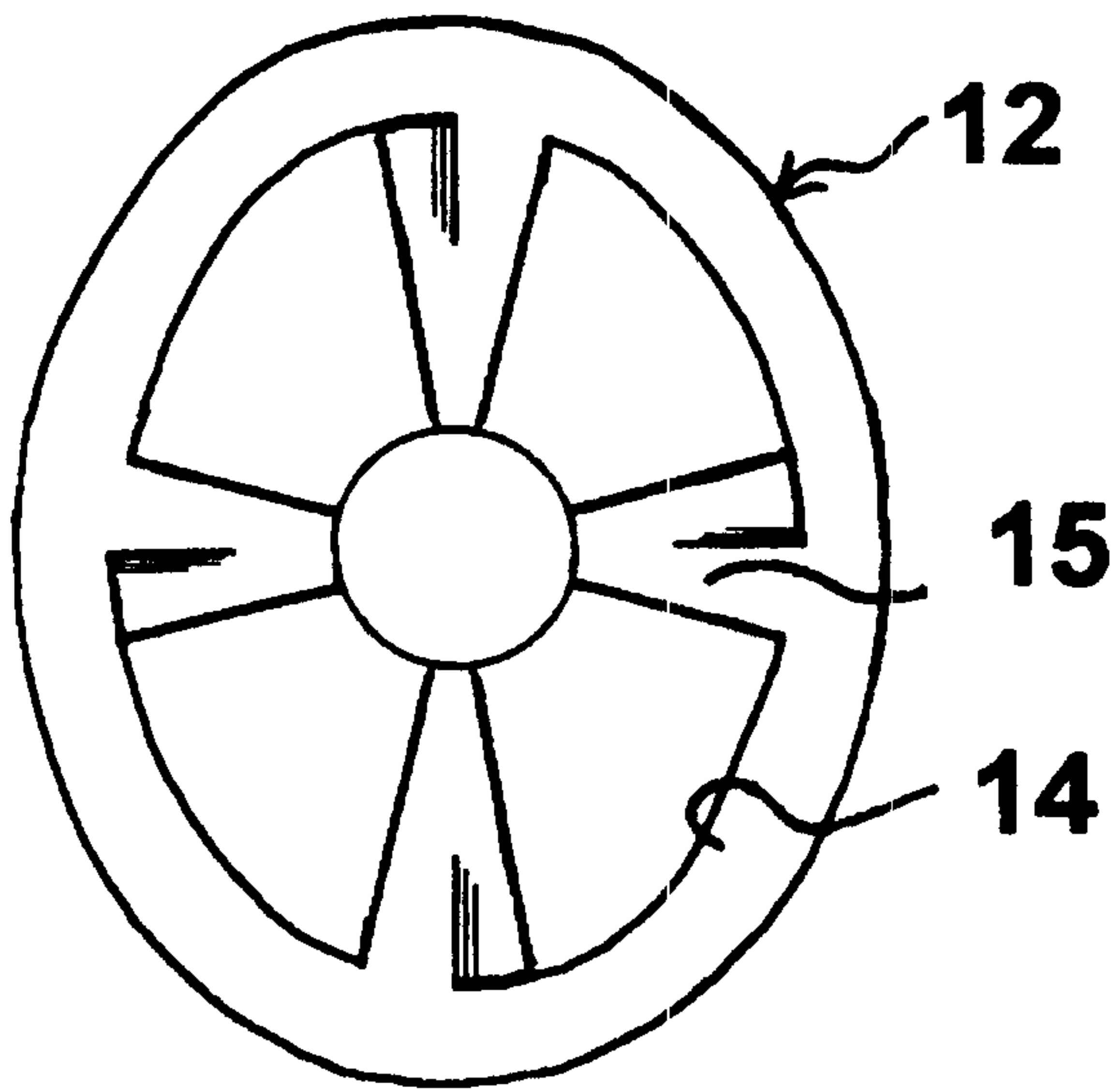


Fig 5

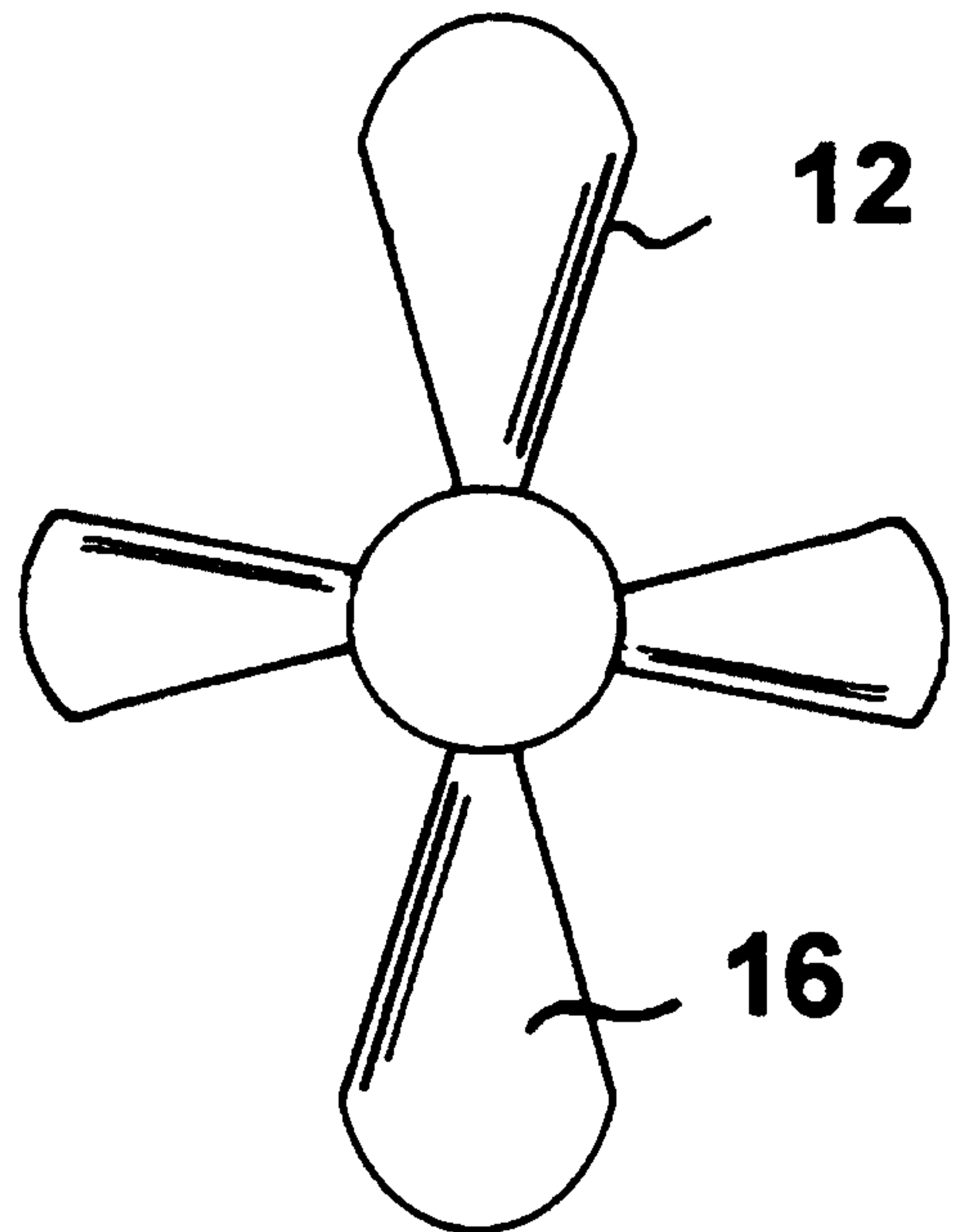


Fig 6

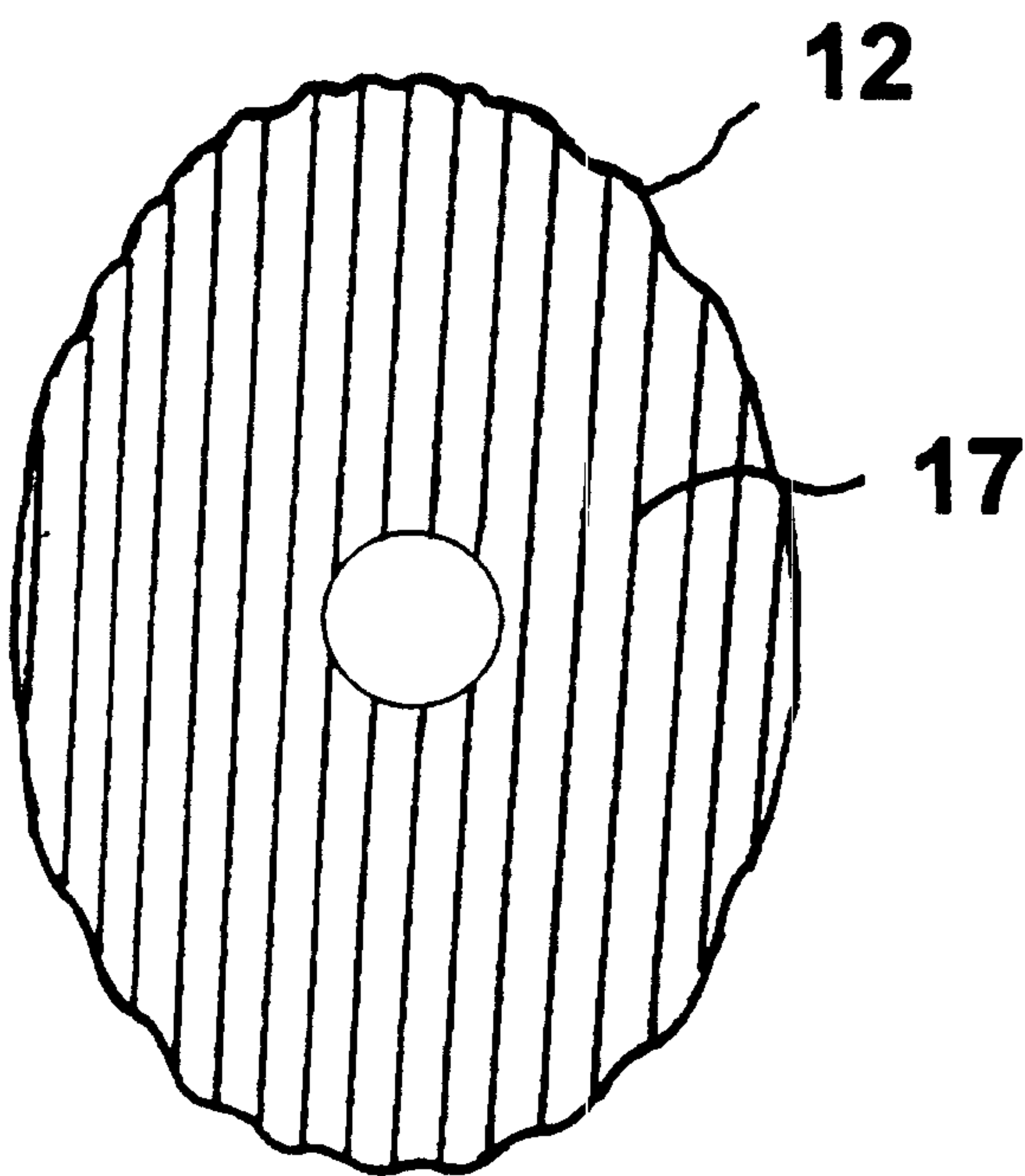


Fig 7

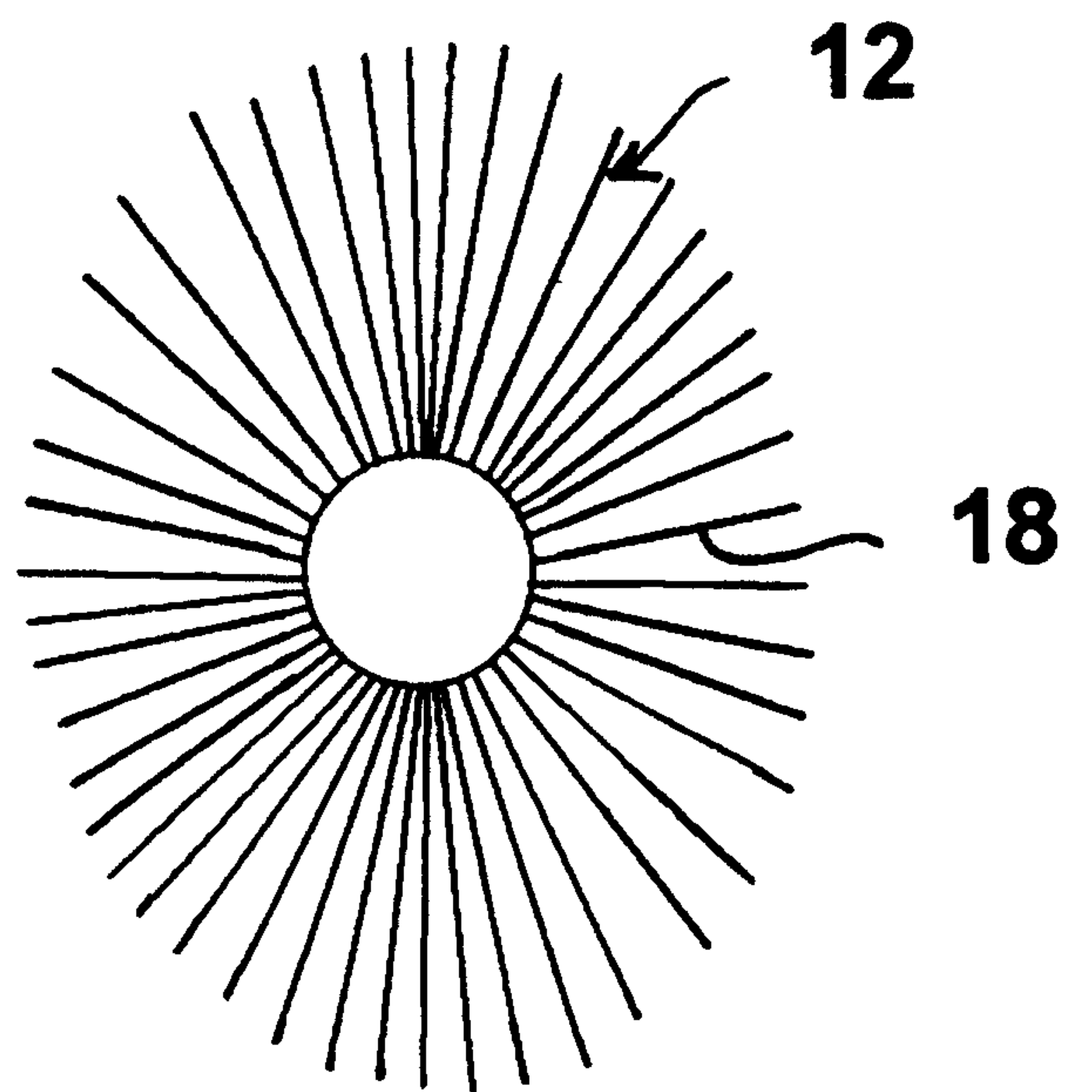


Fig 8

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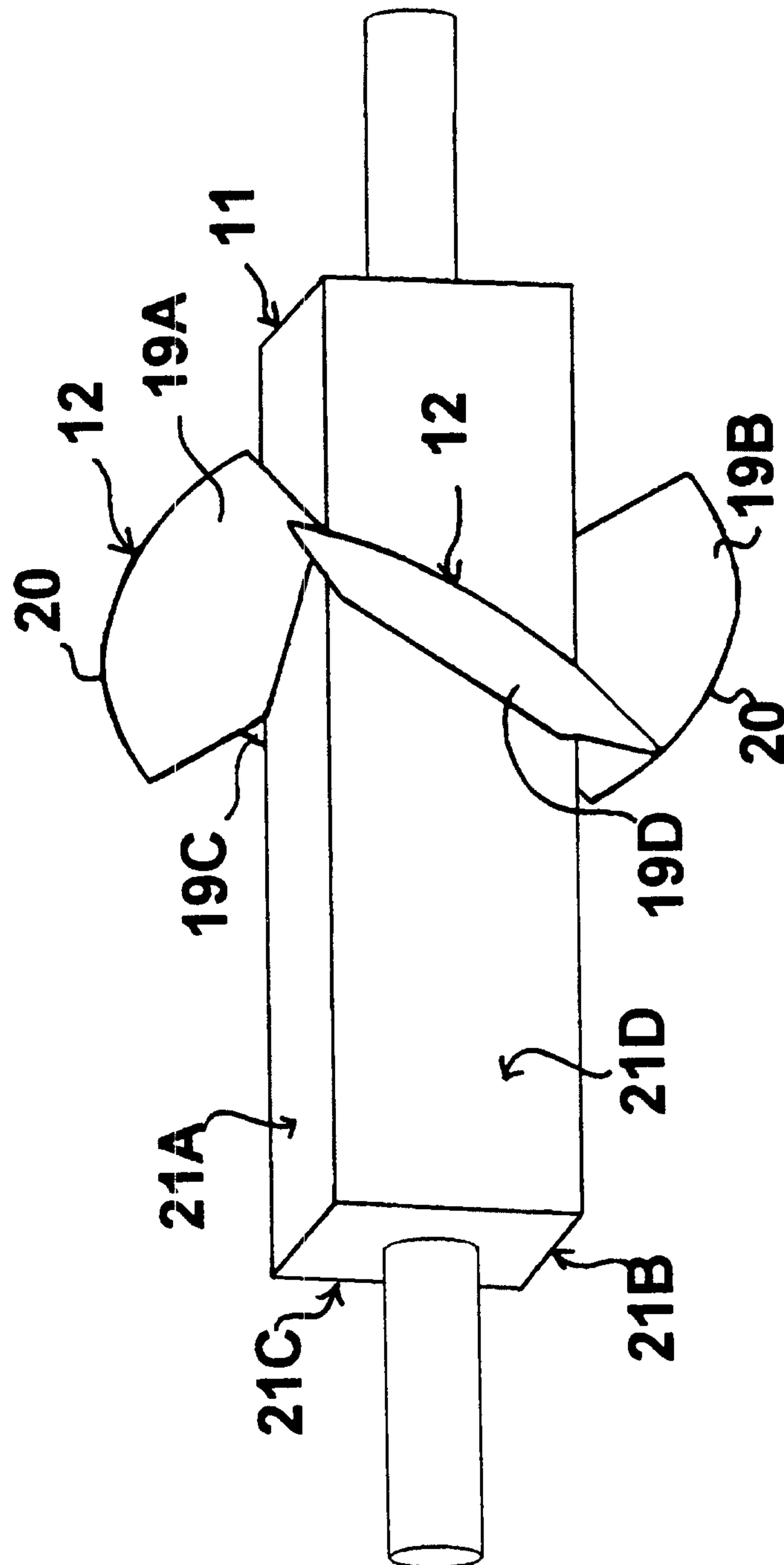


Fig 9