(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 085 462 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
01.01.2020 Bulletin 2020/01

(21) Application number: **16166548.4**

(22) Date of filing: **22.04.2016**

(51) Int Cl.:
B07B 1/15 *(2006.01)* ***A01D 17/06*** *(2006.01)*
D21B 1/02 *(2006.01)*

(54) DISK SCREEN FOR SEPARATING SOLID MATERIALS

SCHEIBENSIEB ZUM TRENNEN VON FESTEN MATERIALIEN

TAMIS À DISQUES DE SÉPARATION DE MATIÈRES SOLIDES

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **23.04.2015 IT PD20150086**

(43) Date of publication of application:
26.10.2016 Bulletin 2016/43

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EP 3 085 462 B1

Description

Field of application

[0001] The present invention regards a disk screen for separating solid materials, according to the preamble of the main independent claim.

[0002] The present disk screen is intended to be employed, in a *per se* conventional manner, for separating solid materials of various type, such as: solid urban waste, inert fluvial material, products of the organic fractions of the separate waste collection, compost (for the refining thereof), recycled wood, biomass, inert material, demolition material, land drainage material and dump material, glass, plastic, scrap metal and still other materials.

[0003] The disk screen according to the invention is therefore inserted in the industrial field of treating solid residues and is advantageously intended to be installed downstream of plants for crushing and grinding the same residues.

State of the art

[0004] Hereinbelow, the term "residues" refers - in an undifferentiated manner and for the sake of brevity - to any one solid material which requires being separated into its components based on size or mass.

[0005] Known on the market are numerous different apparatuses intended to be employed for separating solid residues in multiple fields of application, as well as employing different structural and functioning principles. Among such apparatuses, there are for example the following: mesh screens, screw screens, disk screens, ballistic separators, drum screens, fluid bed separators, electrostatic separators, magnetic separators and still other apparatuses.

[0006] The present invention regards a screen of disk type, for example described in the patent US 4972959.

[0007] More in detail, the disk screens usually comprise a support structure, which carries, rotatably mounted thereon, numerous equidistant shafts in succession, parallel to each other and rotating in a same rotation direction. A group of disks is axially fixed on each shaft, such disks separated from each other by a distance less than the thickness of the single disks, in order to allow interposing the disks mounted on the contiguous shafts such that each disk of any one shaft is interposed between two disks of the adjacent front and rear shafts.

[0008] In the present field of the art, one thing that marks the characteristics of the disk screen is the screening surface. The latter is defined as the area of the openings delimited between the disks and the rotating shafts and is therefore indicative of the size of the residues that are separated by the screen, falling by gravity below the surface of the screening surface.

[0009] A screen is known from the model DE 29711724 in which the disks mounted on the rotating shafts are maintained spaced from each other by spacer rollers directly fit on the disks, so as to rotate together therewith.

[0010] The disk screens of the above-described type have in practice proven that they do not lack drawbacks.

[0011] The main drawback lies in the fact that the presence of filiform elements between the residues to be screened, such as the presence of cables, strips, rags, plastic bags and similar materials, jeopardizes the correct operation of the screen. Such filiform elements in fact tend to be twisted around the disks and shafts of the screen and to obstruct the spaces between the disks, modifying the screen area and in the end compromising the screening operations.

[0012] Consequently, repeated maintenance operations are frequently necessary for these screens, for cleaning operations, with consequent undesired stops of production.

[0013] In order to overcome such drawbacks, a disk screen is known from the patent EP 1106264 on behalf of the same Applicant that is provided with idle sleeves interposed between the disks, such sleeves having the function of preventing or at least limiting the obstruction of the screen area.

[0014] More in detail, each sleeve is axially mounted on the shaft between two disks with clearance adapted to allow it to freely idly rotate on the shaft or on a tubular body provided externally with respect to the shaft.

[0015] In operation, possible filiform elements that twist externally with respect to the idle sleeves, until they affect the disks mounted on the adjacent shafts, would not compromise the functioning of the screen nor would they cause stoppage since each sleeve, being idle with respect to the shaft on which it is mounted, would be driven in rotation without constraining the rotation of the shafts.

[0016] Also known, from the patent application WO -A-2011045656 on behalf of the same Applicant, is a screen of the above-described type, in accordance with the preamble of claim 1, in which a stabilizing mass is arranged within the idle sleeves in order to prevent or at least limit, during screen operation, the sleeves from being driven in rotation by the filiform elements, facilitating the twisting of the latter. Patent DE 102007027846 describes a further example of a disk screen of the known type, which is provided with a plurality of sleeves, each comprising a tubular body mounted idle on a corresponding rotating shaft between two disks in succession. Each lateral face of the disks has a central depression of circular form, which is intended to receive in abutment the terminal edge of the tubular body of the corresponding sleeve.

[0017] The disk screens with idle sleeves of the above-described known type have in practice the drawback of allowing small-size material (such as sand, dust etc.) to be inserted in the clearance existing between the idle sleeves and the disks fit on the shafts, so as to create a mechanical connection between the rotating shafts and the sleeves themselves, coming to drive in rotation the sleeves to the detriment of their anti-twisting action.

Presentation of the invention

[0018] In this situation, the problem underlying the present invention is therefore that of eliminating the problems of the abovementioned prior art, by providing a disk screen in accordance with claim 1 for separating solid materials which is entirely reliable in operation over time.

[0019] Another object of the present invention is to provide a disk screen for separating solid materials which prevents repeating maintenance operations due to the twisting of filiform elements.

[0020] Another object of the present invention is to provide a disk screen for separating solid materials which is capable of maintaining the idle rotation of provided sleeves mounted on rotation shafts.

[0021] Another object of the present invention is to provide a disk screen for separating solid materials which is simple and inexpensive to attain and entirely reliable in operation.

[0022] Another object of the present invention is to provide a disk screen for separating solid materials which can be employed in a versatile manner in different application areas.

Brief description of the drawings

[0023] The technical characteristics of the finding, according to the aforesaid objects, can be clearly seen in the contents of the below-reported claims and the advantages thereof will be clearer in the following detailed description, made with reference to the enclosed drawings, which represent a merely exemplifying and non-limiting embodiment of the invention, in which:

- figure 1 shows a perspective image of the disk screen for separating solid materials, according to the present invention;
- figure 2 shows an enlarged detail of the screen of figure 1 in plan view, relative to several rotation shafts with a plurality of disks mounted thereon;
- figure 3 shows the detail of figure 2 in a side view;
- figure 4 shows a section view carried out along the lines IV - IV of figure 2;
- figure 5 shows an enlarged detail of the screen of figure 1 relative to a disk with a sleeve associated therewith, in perspective view;
- figure 6 shows an enlarged detail of the screen of figure 1 relative to a disk with a spacer associated therewith together with a rotation shaft portion, with the sleeve of figure 5 depicted in exploded view.

Detailed description of a preferred embodiment

[0024] With reference to the enclosed drawings, reference number 1 indicates a disk screen for separating solid materials, subject of the present invention.

[0025] The screen 1 according to the invention is adapted to be employed for separating solid materials of various type, such as: solid urban waste, inert fluvial material, products of the organic fractions of the separate waste collection, compost (for the refining thereof), recycled wood, biomass, inert material, demolition material, land drainage material and dump material, glass, plastic, scrap metal and still other materials.

[0026] The disk screen 1 as schematically represented in the enclosed figures comprises a support structure 2, intended to abut against the ground, and on which a plurality of rotation shafts 3 - parallel to and spaced from each other - are rotatably mounted, as in particular can be appreciated in the image of figure 2 which represents a plan view of the screen.

[0027] The rotation shafts 3 have longitudinal extension axes, indicated with Y, which define a preferably horizontal position, as illustrated in the drawings, but which can also assume a tilt without departing from the protective scope of the present patent.

[0028] Driving means 4 are provided that are adapted to carry the shafts 3 in rotation, in the rotation direction indicated by the arrow and marked with the reference R.

[0029] The shafts 3 all rotate in the same rotation direction R in order to move the residues between an inlet port and an outlet port in a *per se* entirely conventional manner, for this reason not described in more detail.

[0030] In accordance with a preferred embodiment of the invention illustrated in figures 2 and 3, the driving means 4 comprise an electric motor 4a and motion transmission means 5 mechanically connected to the electric motor 4a. Such transmission means 5 in turn comprise a chain 6 wound as a closed loop and engaging with a pinion 7 fixed to the shaft of the motor 4a and to gear wheels 70 fit on each rotation shaft 3.

[0031] The screen 1 also comprises a plurality of disks 8, which are axially mounted in succession along the rotation shafts 3 in order to receive the rotation motion therefrom.

[0032] More in detail, on each rotation shaft 3, a group of disks 8 is mounted which, for example, in accordance with the enclosed figure 2, can be formed by nine and ten disks on adjacent shafts in succession.

[0033] The disks 8 of each group of disks are mounted spaced from each other along the extension of the longitudinal axis Y of the rotation shaft 3.

[0034] The screen 1 is also provided with a plurality of sleeves 10, each of which comprising a tubular body 11, which is mounted externally idle on a respective rotation shaft 3 between two disks 8 in succession, and is provided with an inner surface 11A, oriented toward the rotation shaft 3, and with an outer surface 11B oriented in a opposite direction with respect to the inner surface 11A.

[0035] The disks 8 are instead otherwise mechanically rotatably coupled to the rotation shaft 3 in order to receive the rotation motion thereof.

[0036] For such purpose, the rotation shaft 3 for example has a male shaped profile 30, defined by the form of its external surface and in particular by its cross section, and the disk 8 has a female shaped profile 80 joined to

the aforesaid male shaped profile 30, and in particular defined by a through hole adapted to receive the aforesaid male shaped profile 30.

[0037] More in detail, the male shaped profile 30 has a polygonal (e.g. hexagonal) cross section, and the disks 8 have a female shaped profile 80 defined by a through hole 80 with corresponding polygonal shape traversed, to size, by the rotation shaft 3 which, due to the aforesaid form engagement, is thus susceptible to rotate the group of disks 8.

[0038] Preferably, each disk 8 has the shape of a hexagonal polygonal prism having six flat faces 8C that facilitate the advancement of the residues to be screened during the rotation of the shafts 2. In other embodiments of the present invention, the disks 8 can also have external profiles of different shape, advantageously adapted for facilitating the advancement of the residues between the inlet port and the outlet port.

[0039] Functionally, when the screen 1 is operating, the motor 4a - by means of the chain 6 wound as a ring on the pinion 7 of the motor shaft and on the gear wheels 70 of the rotation shafts 3 - rotates the rotation shafts 3 in the same direction, indicated with R, and the hexagonal profile with flat face 8C of the disks 8 impacts with the residues, facilitating the advancement thereof via thrust along the screening plane in the advancement direction indicated with A in figure 1.

[0040] During such advancement of the residues, those with size smaller than the openings defined between the disks 8 and the sleeves 10 fall via gravity below the screening plane, obtaining the selection of the materials as a function of their size.

[0041] During screening, the presence of the sleeves 10 prevents, or at least limits, the winding of filiform residues around the rotation shafts 3. Indeed, the sleeves 10 do not follow the rotation shafts 3 during their rotation and are not integrally moved with the residues.

[0042] Each disk 8 is provided with two lateral faces 8A and 8B orthogonal to the longitudinal axis Y of the respective rotation shafts 3.

[0043] Such faces 8A and 8B are preferably substantially parallel and oriented in opposite directions. In accordance with the present invention, the lateral faces 8A and 8B of the disks 8 have each a central depression 12 of circular form and each sleeve 10 in turn comprises two annular shoulders 13 which are fixed to the ends of the tubular body 11, and project radially from the outer surface 11B of the tubular body 11 itself.

[0044] In particular, each annular shoulder 13 is provided with an external section 13' which projects from the outer surface 11B of the tubular body 11 of the corresponding sleeve 10, extending outside the tubular body 11 itself, and in particular extending substantially orthogonally to the outer surface 11B of the tubular body 11.

[0045] Each annular shoulder 13 is inserted, preferably substantially to size, within the central depressions 12 of the corresponding lateral face 8A, 8B of the disk 8.

[0046] Advantageously, the annular shoulders 13 of each sleeve 10 are fixed to the ends of the tubular body 11 by means of fixing means, such as welding or screw means.

[0047] While the disks 8 rotate, moved by the rotation shaft 3, the sleeves 10 with their annular shoulders 13 remain mainly stopped, given that they are idly mounted on the rotation shafts 3. The provided object of the invention - to insert the annular shoulders 13 within the central depressions 12 - allows obtaining the necessary clearance between the two moving parts at a position in which it is improbable that there will be an insertion of undesired material that would lead to connecting the sleeve 10 to the disk 8 and to the shaft 3, i.e. bringing in rotation also the sleeve 10, as if it were not idly mounted.

[0048] Otherwise, in the screens of the known type, the clearance between sleeve and disks is obtained on the tubular body, i.e. on the bottom of the space enclosed between the disks, and involves the undesired penetration of material with the consequent formation of a mechanical drive constraint between sleeves and disks that leads to the twisting of the filiform material. As can be observed in the enclosed figures 4, 5 and 6, the depressions 12 are situated on a lying plane that is more retreated and within the disk 8 than the plane defined by the remaining annular portions 9 of the lateral faces 8A, 8B, to which the depressions 12 are connected by means of a sunken edge 120. Such sunken edge 120 peripherally delimits the depressions 12 and is therefore extended with an axial component within the thickness of the disk 8.

[0049] Advantageously, the sunken edge 120 of the depressions 12 of each lateral face 8A, 8B of each disk 8 faces, preferably to size, the circumferential profile 113 of the corresponding annular shoulder 13 inserted in the depression 12 itself.

[0050] In particular, the term "to size" means that the sunken edge 120 of each depression 12 faces the circumferential profile 113 of the corresponding annular shoulder 13 with a clearance (defined as the distance between the circumferential profile 113 and the sunken edge 120) of about 1-5 centimeters and preferably of about 3-4 centimeters.

[0051] Consequently, the lateral areas of the annular shoulders 13, i.e. the most external faces directed towards the opposite shoulder 13 of the same sleeve 10, are embedded within the central depressions 12, i.e. they are slightly recessed in the disk 8 by a thickness S illustrated in figure 4.

[0052] In addition, advantageously, the annular shoulders 13 of each sleeve 10 are radially extended for an inner section 23 towards the longitudinal axis Y of the shaft 3 and are each provided with a through hole 130 traversed by the same rotation shaft 3.

[0053] In particular, the inner section 23 of each annular shoulder 13 projects from the inner surface 11A of the tubular body 11 of the corresponding sleeve 10, and is preferably provided with an inner edge defining the above mentioned through hole 130.

[0054] In accordance with a preferred embodiment of

the present invention, the annular shoulders 13 of each sleeve 10 obtained with shaped metal plates, are ring shaped, centrally provided with the through hole 130 for traversing the shaft 3.

[0055] The screen 1 also comprises preferably a plurality of spacer tubular bodies 14, each of which is externally mounted on the rotation shaft 3 and is interposed and in abutment between the lateral faces 8A and 8B of two disks 8 in succession. Therefore, the disks 8 are inserted in succession on the rotation shaft 3, alternating them with the spacer tubular bodies 14 which, being pressed between the contiguous disks, rotate together therewith.

[0056] In addition, externally with respect to each spacer tubular body 14, a corresponding sleeve 10 is externally mounted with clearance.

[0057] Therefore, the longitudinal length D of each spacer tubular body 14 defines the distance between each pair of disks 8 in succession and is slightly greater than the longitudinal length d of each sleeve 10, in order to ensure the axial clearance of such sleeve between the pair of disks 8, between which it is comprised.

[0058] In such a manner, each sleeve 10 can be rotatably moved in a free manner around the corresponding spacer tubular body 14 on which it is mounted.

[0059] In order to allow an entirely idle rotation of the sleeves 10 on the spacer tubular bodies 14, a radial clearance G is provided therebetween, illustrated as an example in figure 4, and defined in particular between the inner edge of the inner section 23 of each annular shoulder 13 and the lateral external surface of the corresponding spacer tubular body 14.

[0060] The finding thus conceived therefore attains the pre-established objects.

Claims

1. Disk screen for separating solid residues, which comprises:

- a support structure (2);
- a plurality of rotation shafts (3) parallel to each other and rotatably mounted on said support structure (2);
- means (4) for driving said rotation shafts (3) in order to rotate them around their longitudinal extension axis (Y);
- a plurality of disks (8) axially mounted in succession, spaced from each other along said rotation shafts (3), provided with two lateral faces (8A, 8B) orthogonal to the longitudinal extension axis (Y) of the corresponding said rotation shafts (3);
- a plurality of sleeves (10), each comprising a tubular body (11), which tubular body (11) is mounted externally idle on a corresponding said rotation shaft (3) between two disks (8) in succession, and is provided with an inner surface (11A), oriented toward said rotation shaft (3), and with an outer surface (11B) oriented in a opposite direction with respect to said inner surface (11A); wherein, said disks (8) are instead otherwise mechanically rotatably coupled to said rotation shaft (3) in order to receive the rotation motion thereof;

the lateral faces (8A, 8B) of said disks (8) having a central depression (12) of circular form;
said disk screen being **characterized in that** each said sleeve (10) comprises two annular shoulders (13), which are fixed to the ends of said tubular body (11), radially project from the outer surface (11B) of said tubular body (11) and are inserted inside the central depressions (12) of the lateral faces (8A, 8B) of said disks (8);
wherein the annular shoulders (13) of each said sleeve (10) are obtained with shaped metal plates.

2. Disk screen for separating solid residues according to claim 1, **characterized in that** said depressions (12) are perimetrically delimited by a sunken edge (120) facing, to size, the circumferential profile (113) of said annular shoulders (13).

3. Disk screen for separating solid residues according to claim 1, **characterized in that** the lateral areas of said annular shoulders (13) are embedded within said central depressions (12).

4. Disk screen for separating solid residues according to claim 1, **characterized in that** the annular shoulders (13) of each said sleeve (10) are radially extended towards the axis (Y) of said rotation shaft (3) and are each provided with a through hole (130) traversed by said rotation shaft (3) in order to allow the idle rotation of said sleeve (10) on said rotation shaft (3).

5. Disk screen for separating solid residues according to claim 1, **characterized in that** the annular shoulders (13) of each said sleeve (10) are fixed to the ends of said tubular body (11) by means of fixing means.

6. Disk screen for separating solid residues according to claim 1, **characterized in that** it comprises a plurality of spacer tubular bodies (14), each of which is externally mounted on a corresponding said rotation shaft (3), is interposed and in abutment between the lateral faces (8A, 8B) of two disks (8) in succession, and externally carries a corresponding said sleeve (10) idly mounted thereon.

7. Disk screen for separating solid residues according to claim 6, **characterized in that** the longitudinal

length (D) of said spacer tubular bodies (14) is greater than the longitudinal length (d) of said sleeves (10).

8. Disk screen for separating solid residues according to claim 6, **characterized in that** between said spacer tubular bodies (14) and said sleeves (10), a radial clearance (G) is present.

Patentansprüche

1. Scheibensieb zum Trennen von festen Materialien, das Folgendes umfasst:

- eine tragende Struktur (2);
- eine Vielzahl von zueinander parallelen und auf der genannten tragenden Struktur (2) drehbar montierten Drehwellen (3);
- Elemente für den Motorantrieb (4) der genannten Drehwellen (3), um diese um ihre Längsverlaufsachse (Y) herum in Drehung zu versetzen;
- eine Vielzahl von axial nacheinander im Abstand zueinander entlang der genannten Drehwellen (3) montierten, mit zwei rechtwinklig zu der Längsverlaufsachse (Y) der entsprechenden genannten Drehwellen (3) liegenden Seitenflächen (8A, 8B) ausgestatteten Scheiben (8);
- eine Vielzahl von jeweils einen Rohrkörper (11) umfassenden Muffen (10), wobei dieser Rohrkörper (11) gleitend außen auf einer entsprechenden genannten Drehwelle (3) zwischen zwei aufeinanderfolgenden Scheiben (8) montiert und mit einer zu der genannten Drehwelle (3) gerichteten Innenfläche (11A) und einer im Verhältnis zu der genannten Innenfläche (11A) in entgegengesetzte Richtung gewandten Außenfläche (11B) ausgestattet ist; wobei die genannten Scheiben (8) dagegen mechanisch drehbar mit der genannten Drehwelle (3) gekuppelt sind, um die Drehbewegung derselben zu übernehmen;

wobei die Seitenflächen (8A, 8B) der genannten Scheiben (8) eine kreisförmige mittige Vertiefung (12) aufweisen;
wobei das genannte Scheibensieb **dadurch gekennzeichnet ist, dass** jede der genannten Muffen (10) zwei an den Enden des genannten Rohrkörpers (11) befestigte ringförmige Seitenteile (13) umfasst, die radial vorstehend von der Außenfläche (11B) des genannten Rohrkörpers (11) verlaufen und in das Innere der mittigen Vertiefungen (12) der Seitenflächen (8A, 8B) der genannten Scheiben (8) eingesetzt sind;
wobei die ringförmigen Schultern (13) jeder Muffe (10) aus Formmetallplatten erzielt werden.

2. Scheibensieb zum Trennen von festen Materialien nach Anspruch 1, **dadurch gekennzeichnet, dass** die genannten Vertiefungen (12) umlaufend von einem maßgerecht dem Umfangsprofil (113) der genannten ringförmigen Schultern (13) gegenüberliegenden Senkungsrand (120) begrenzt werden.

3. Scheibensieb zum Trennen von festen Materialien nach Anspruch 1, **dadurch gekennzeichnet, dass** die Seitenbereiche der genannten ringförmigen Schultern (13) in die genannten mittigen Vertiefungen (12) eingesenkt sind.

4. Scheibensieb zum Trennen von festen Materialien nach Anspruch 1, **dadurch gekennzeichnet, dass** die ringförmigen Schultern (13) jeder der genannten Muffen (10) radial zur Achse (Y) der genannten Drehwelle (3) vorstehen und jeweils mit einer von der genannten Drehwelle (3) überquerten Durchgangsöffnung (130) ausgestattet sind, um die Leerlaufdrehung der genannten Muffe (10) auf der genannten Drehwelle (3) zu gestatten.

5. Scheibensieb zum Trennen von festen Materialien nach Anspruch 1, **dadurch gekennzeichnet, dass** die ringförmigen Schultern (13) jeder genannten Muffe (10) an den Enden des genannten Rohrkörpers (11) mittels Befestigungselementen angebracht sind.

6. Scheibensieb zum Trennen von festen Materialien nach Anspruch 1, **dadurch gekennzeichnet, dass** er eine Vielzahl von Abstandshalter-Rohrkörpern (14) umfasst, von denen jeder außen auf einer entsprechenden Drehwelle (3) montiert, anschlagend zwischen den Seitenflächen (8A, 8B) von zwei aufeinanderfolgenden Scheiben (8) eingefügt ist und außen gleitend montiert eine entsprechende genannte Muffe (10) trägt.

7. Scheibensieb zum Trennen von festen Materialien nach Anspruch 6, **dadurch gekennzeichnet, dass** die Längslänge (D) der genannten Abstandshalter-Rohrkörper (14) größer ist als die Längslänge (d) der genannten Muffen (10).

8. Scheibensieb zum Trennen von festen Materialien nach Anspruch 6, **dadurch gekennzeichnet, dass** zwischen den genannten Abstandshalter-Rohrkörpern (14) und den genannten Muffen (10) ein radiales Spiel (G) vorhanden ist.

Revendications

1. Tamis à disques de séparation de matières solides, comprenant :

- une structure de support (2) ;
- une pluralité d'arbres de rotation (3) parallèles entre eux et montés de façon tournante sur ladite structure de support (2) ;
- des moyens de motorisation (4) desdits arbres de rotation (3) pour les mettre en rotation autour de leur axe de développement longitudinal (Y) ;
- une pluralité de disques (8) montés axialement l'un après l'autre et écartés l'un de l'autre le long desdits arbres de rotation (3), munis de deux faces latérales (8A, 8B) orthogonales à l'axe de développement longitudinal (Y) desdits arbres de rotation (3) correspondants ;
- une pluralité de manchons (10) chacun d'eux comprenant un corps tubulaire (11), ledit corps tubulaire (11) étant monté extérieurement de façon folle sur un correspondant arbre de rotation (3) entre deux disques (8) successifs; et étant muni d'une surface interne (11A), tournée vers ledit arbre de rotation (3) et d'une surface externe (11B) tournée dans le sens opposé par rapport à ladite surface interne (11A) ; dans lesquels lesdits disques (8) sont par contre différemment mécaniquement accouplés de façon tournante audit arbre de rotation (3) pour en recevoir le mouvement de rotation ;

les faces latérales (8A, 8B) desdits disques (8) présentant une dépression centrale (12) de forme circulaire ;
ledit tamis à disques étant **caractérisé en ce que** chacun desdits manchons (10) comprend deux épaulements annulaires (13), lesquels sont fixés aux extrémités dudit corps tubulaire (11), s'étendent radialement en saillie de la surface externe (11B) dudit corps tubulaire (11) et sont insérés à l'intérieur des dépressions centrales (12) des faces latérales (8A, 8B) desdits disques (8) ;
dans lequel les épaulements annulaires (13) de chacun desdits manchons (10) sont obtenus au moyen de plaques métalliques façonnées.

2. Tamis à disques de séparation de matières solides selon la revendication 1, **caractérisé en ce que** lesdites dépressions (12) sont délimitées sur le périmètre par un bord d'enfoncement (120) placé en vis-à-vis sur mesure du profil circonférentiel (113) desdits épaulements annulaires (13).

3. Tamis à disques de séparation de matières solides selon la revendication 1, **caractérisé en ce que** les zones latérales desdits épaulements annulaires (13) sont enfoncées dans lesdites dépressions centrales (12).

4. Tamis à disques de séparation de matières solides selon la revendication 1, **caractérisé en ce que** les épaulements annulaires (13) de chacun desdits manchons (10) s'étendent radialement vers l'axe (Y) dudit arbre de rotation (3) et chacun d'eux est muni d'un trou traversant (130) traversé par ledit arbre de rotation (3) pour permettre la rotation folle dudit manchon (10) sur ledit arbre de rotation (3).

5. Tamis à disques de séparation de matières solides selon la revendication 1, **caractérisé en ce que** les épaulements annulaires (13) de chacun desdits manchons (10) sont fixés aux extrémités dudit corps tubulaire (11) à l'aide de moyens de fixation.

6. Tamis à disques de séparation de matières solides selon la revendication 1, **caractérisé en ce qu'**il comprend une pluralité de corps tubulaires entretoises (14) chacun desquels est monté extérieurement sur ledit arbre de rotation (3) correspondant, est interposé et en butée entre les faces latérales (8A, 8B) de deux disques (8) successifs et porte extérieurement monté de façon folle ledit manchon (10) correspondant.

7. Tamis à disques de séparation de matières solides selon la revendication 6, **caractérisé en ce que** la longueur longitudinale (D) desdits corps tubulaires entretoises (14) est supérieure à la longueur longitudinale (d) desdits manchons (10).

8. Tamis à disques de séparation de matières solides selon la revendication 6, **caractérisé en ce que**, entre lesdits corps tubulaires entretoises (14) e lesdits manchons (10), est présent un jeu radial (G).

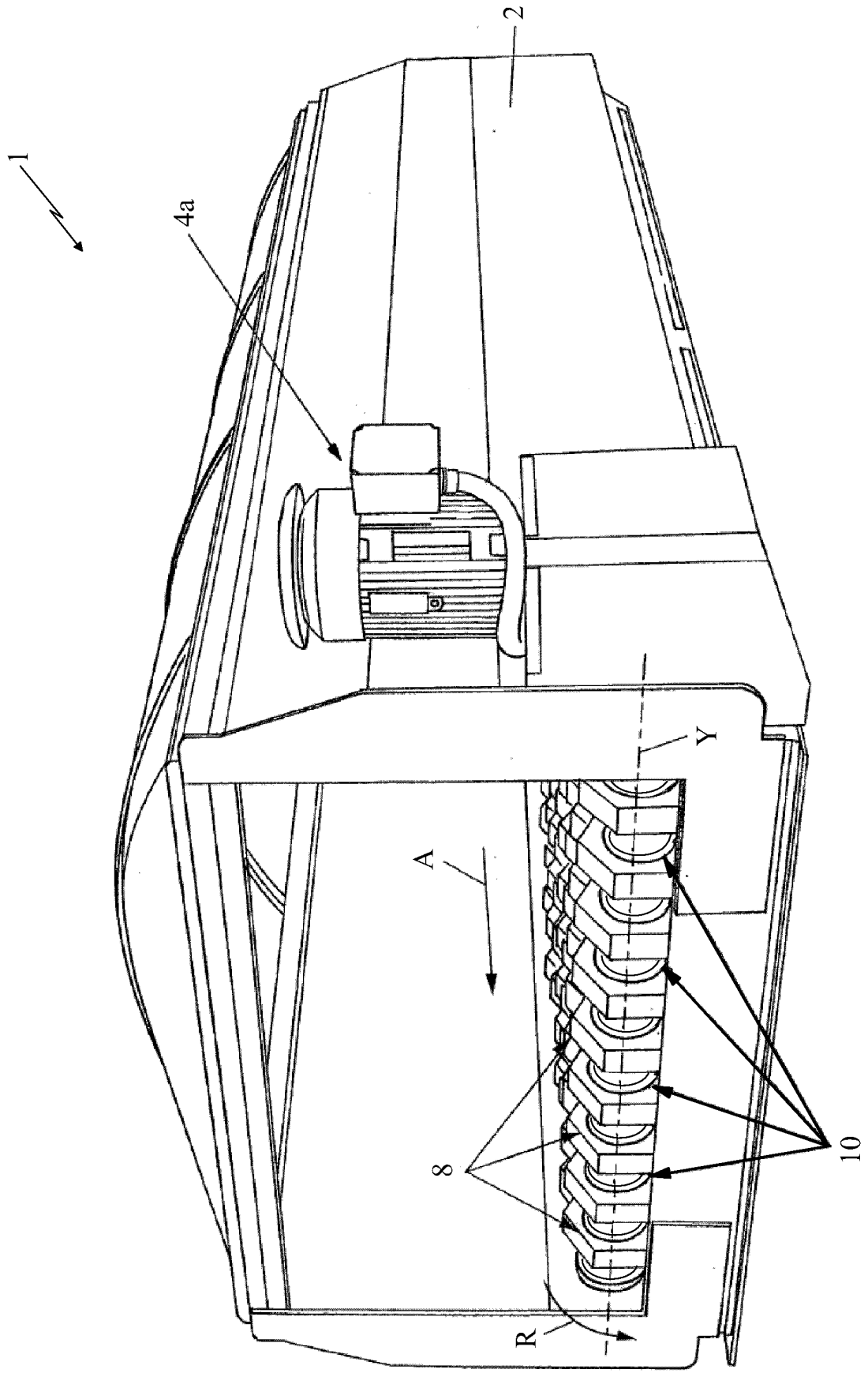

Fig. 1

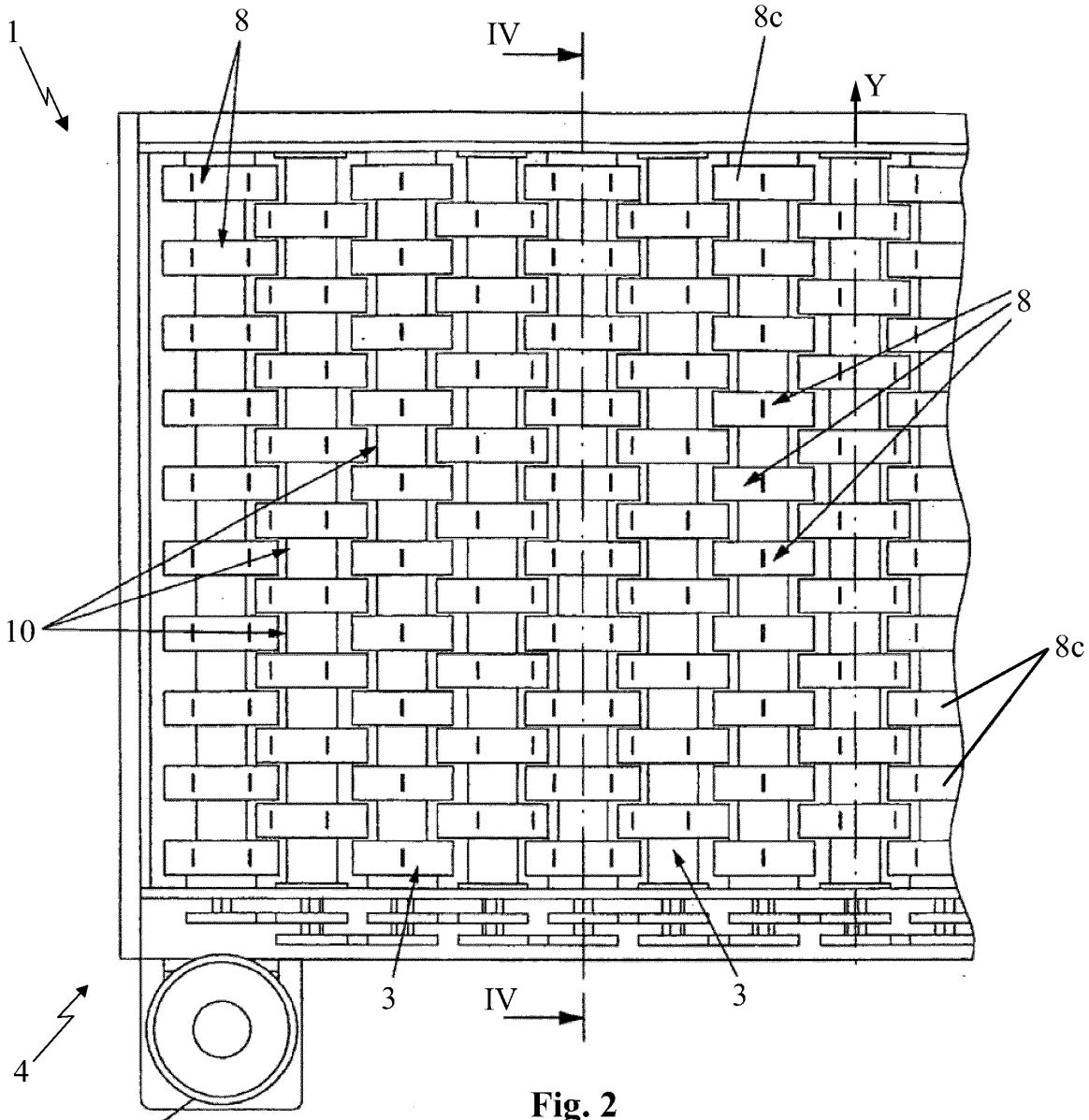

Fig. 2

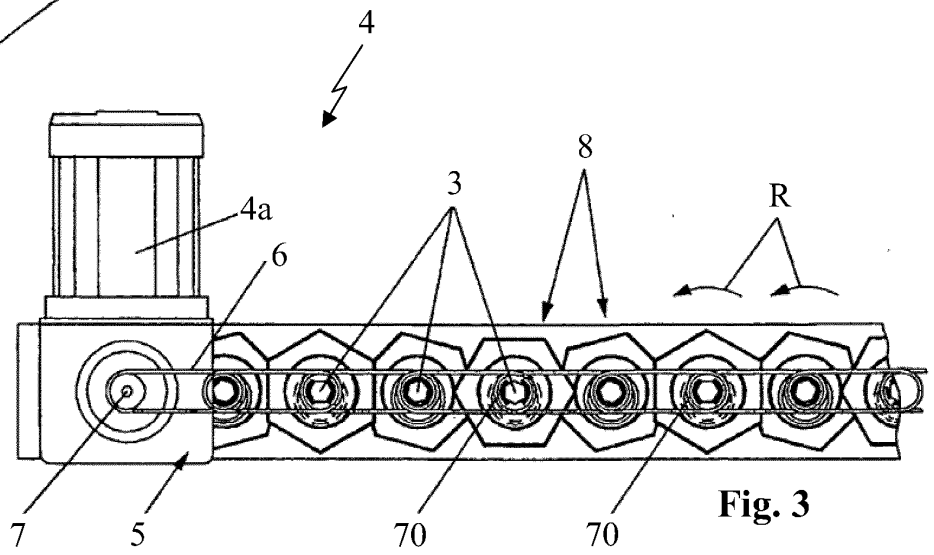

Fig. 3

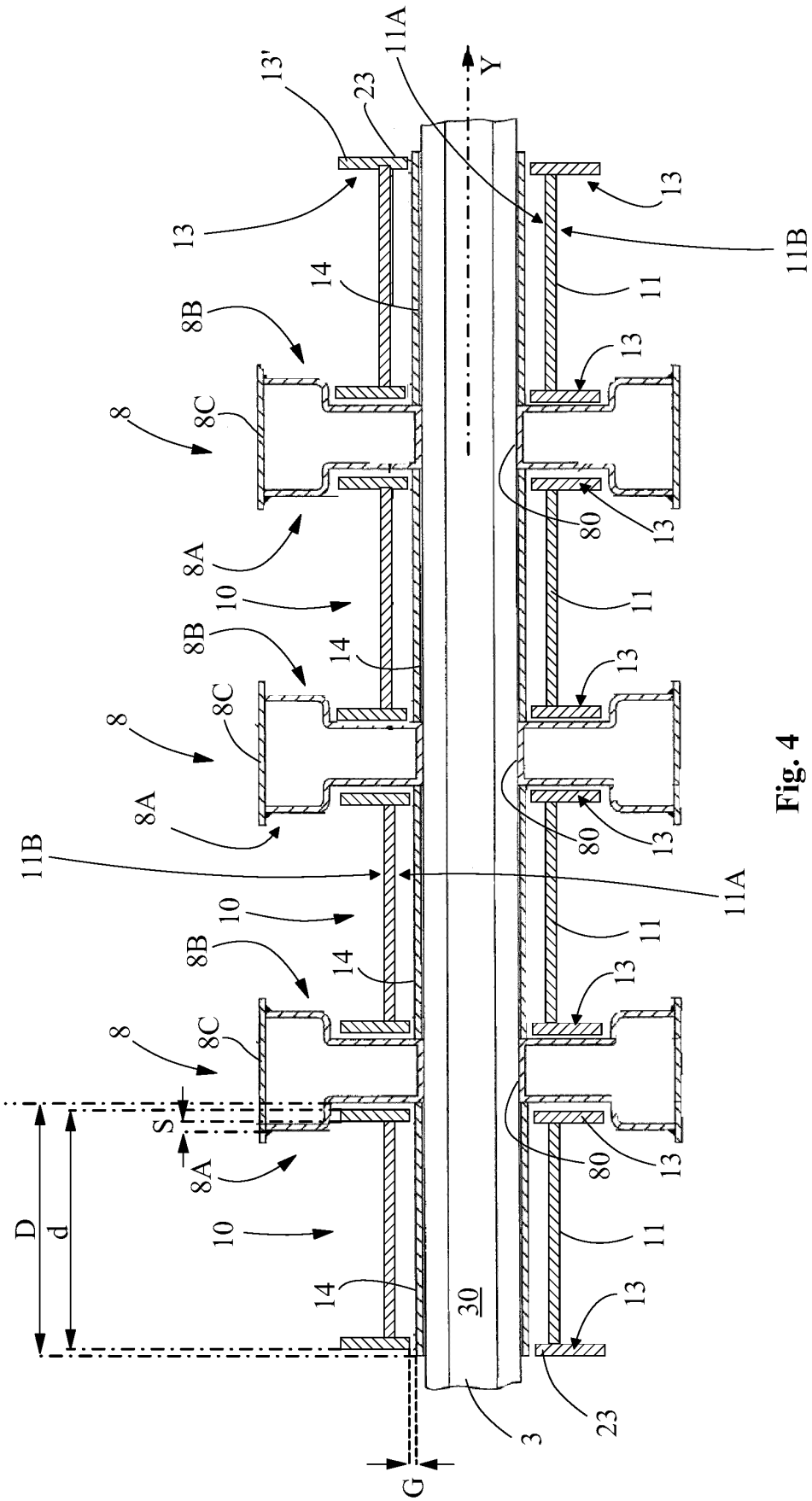

Fig. 4

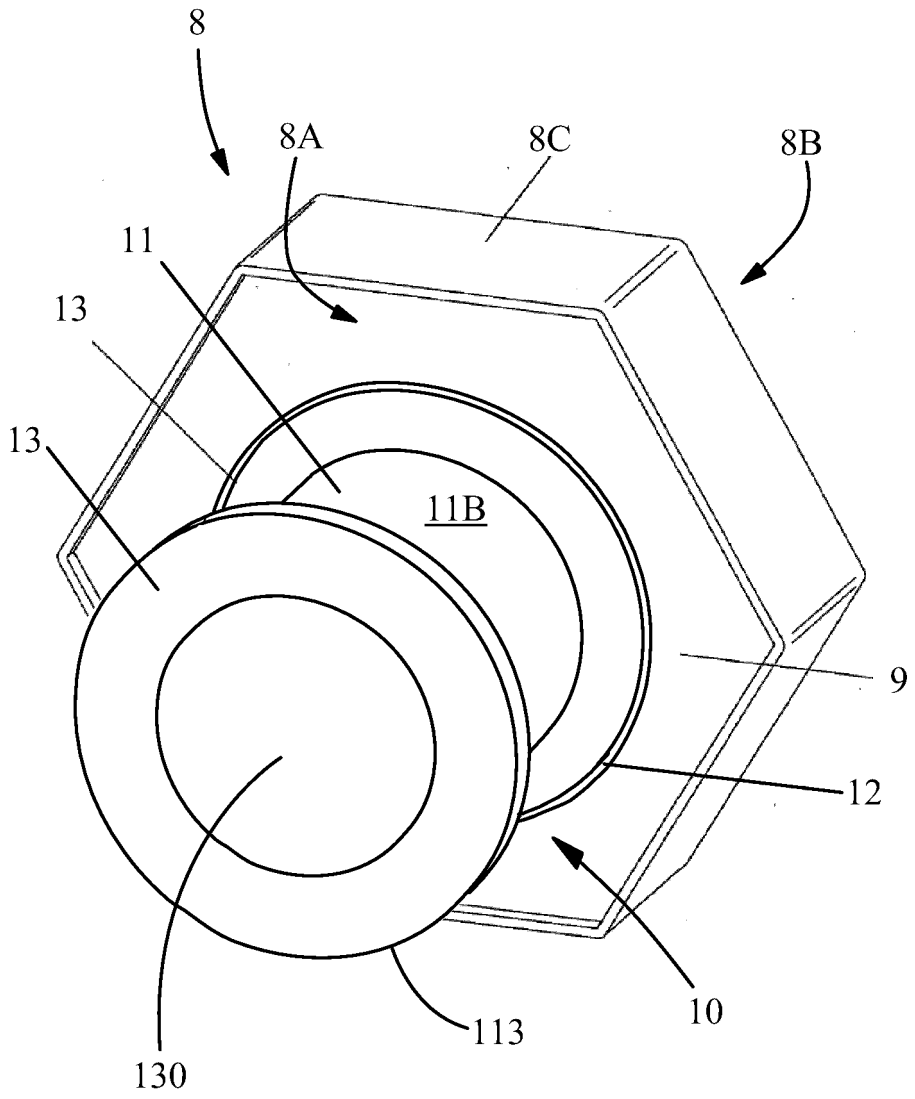

Fig. 5

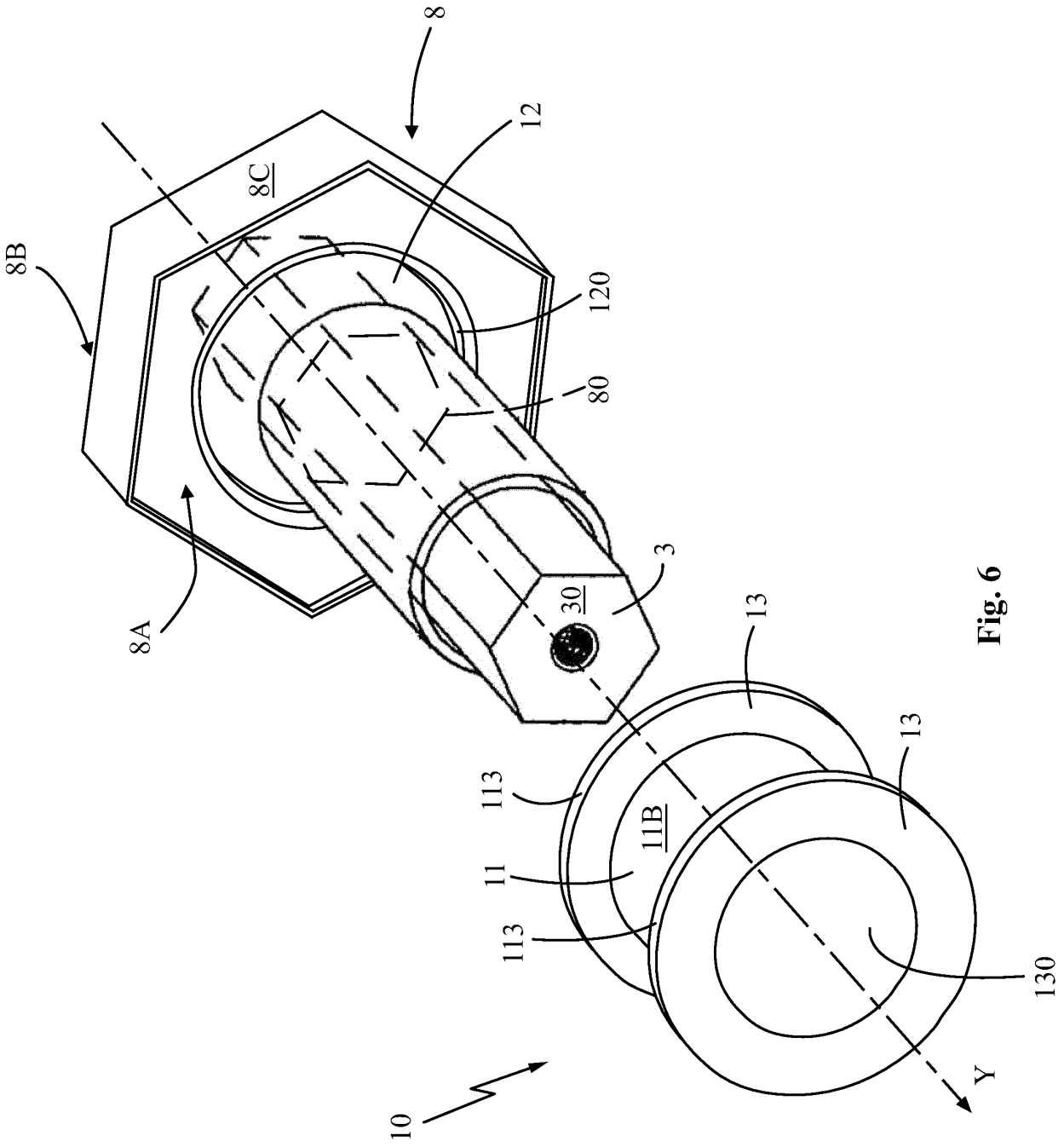

Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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