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

(11) **EP 3 879 121 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
26.07.2023 Bulletin 2023/30

(21) Application number: **21152603.3**

(22) Date of filing: **20.01.2021**

(51) International Patent Classification (IPC):
F04D 29/046 *(2006.01)* ***F04D 29/049*** *(2006.01)*
F04D 29/42 *(2006.01)* ***F04D 29/62*** *(2006.01)*
F04D 29/10 *(2006.01)* ***F04D 13/06*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
F04D 29/046; F04D 29/0462; F04D 29/049; F04D 29/106; F04D 29/426; F04D 29/628;
F04D 1/06; F04D 13/06

(54) **SUPPORT FOR A BEARING FOR ELECTRIC PUMP AND ELECTRIC PUMP WITH SUCH SUPPORT**

TRÄGER FÜR EIN LAGER FÜR EINE ELEKTRISCHE PUMPE UND ELEKTRISCHE PUMPE MIT EINEM SOLCHEN LAGER

SUPPORT POUR UN PALIER DE POMPE ÉLECTRIQUE ET POMPE ÉLECTRIQUE DOTÉE D'UN TEL SUPPORT

(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: **09.03.2020 IT 202000004873**

(43) Date of publication of application:
15.09.2021 Bulletin 2021/37

(73) Proprietor: **Dab Pumps S.p.A.**
35035 Mestrino (Padova) (IT)

(72) Inventors:
- **SINICO, Francesco**
  36075 MONTECCHIO MAGGIORE VI (IT)
- **CAILOTTO, Pietro**
  36070 TRISSINO VI (IT)
- **CASAGRANDE, Mattia**
  36100 VICENZA (IT)

(74) Representative: **Tiburzi, Andrea et al**
Barzanò & Zanardo Roma S.p.A.
Via Piemonte 26
00187 Roma (IT)

(56) References cited:
EP-A1- 2 716 914
EP-A1- 3 290 712
CN-A- 106 989 031
JP-A- H0 771 397
JP-A- 2000 045 981

EP 3 879 121 B1

Description

[0001] The present invention relates to a support for a bearing for electric pump.

[0002] The invention also relates to an electric pump with such a bearing support.

[0003] An electric pump is a device for pumping a liquid, which comprises a wet region, which has intake and delivery ducts, in which one or more impellers are submerged, diffusers being interleaved between said impellers, which are keyed on a rotating shaft turned by an electric motor.

[0004] This electric motor comprises a stator and a rotor, from which the rotating shaft extends.

[0005] Usually, the electric motor, see e.g. EP 3290712 A1, is contained in a substantially tubular motor housing, which is isolated from the wet region, on the rotating shaft, by means of a mechanical seal.

[0006] This mechanical seal surrounds the rotating shaft and is carried by an annular supporting element which also surrounds the rotating shaft at the interface between the motor housing and the wet region.

[0007] The rotating shaft supports two bearings between which the rotor of the electric motor is interposed.

[0008] The two bearings are adapted to keep the rotating shaft, and therefore the rotor, in axial alignment during operation and when not in use.

[0009] In particular, one of the two bearings is arranged, inside the motor housing, proximate to the interface region between the latter and the wet region.

[0010] In order to keep this bearing in position, there is a substantially disk-like supporting element which has a receptacle for the bearing.

[0011] These known methods have some drawbacks.

[0012] First, the requirement of a supporting element for the bearing and of a supporting element for the mechanical seal, proximate to/at the interface between the wet region and the motor housing, entails the need for a considerable number of components.

[0013] Furthermore, currently the bearing supporting element proximate to the wet region is made of metallic material, usually aluminum, while the supporting element of the mechanical seal is made of plastic material.

[0014] In order to ensure the coaxiality of the holes of these two supports, for the passage of the rotating shaft, the support of the bearing, made of metal, is centered on the support of the mechanical seal, made of plastic material.

[0015] Due to the generation of deformations, over time, on the support of the mechanical seal, which is made of plastic material, the centering between the two supports may fail, compromising the proper operation of the electric pump.

[0016] Again, the support for the mechanical seal made of plastic material entails that it is impossible to achieve dimensional tolerances of the centering between the two supports that would be achieved by using other materials.

[0017] Finally, the presence of a support for the bearing and of a support for the sealing element which are separate and are proximate to/at the interface between the wet region and the motor housing can determine a non-perfect coaxiality between the two supports, also as a result of deformations on the support for the mechanical seal made of plastic material, and therefore the generation of bending moments on the rotating shaft, with consequent malfunctioning of the electric pump.

[0018] A non-perfect coaxiality between the support of the mechanical seal and the support of the bearing reduces the operating life of the seal and therefore of the electric pump.

[0019] The aim of the present invention is to provide a support for a bearing for electric pump that is capable of improving the background art in one or more of the aspects mentioned above.

[0020] Within this aim, an object of the invention is to provide a support for a bearing for electric pump that allows to reduce the number of components of the electric pump.

[0021] Another object of the invention is to devise a support for a mechanical seal for an electric pump that is less subject to deformations than similar bearing supports of a known type.

[0022] Another object of the invention is to provide a support for a bearing for electric pump that allows to achieve centering dimensional tolerances with the support for the mechanical seal which are lower than those achieved by similar supports of a known type.

[0023] A further object of the invention is to devise a support for a bearing for electric pump that allows a better coaxiality with the support of the sealing element for the wet region than similar supports of a known type and therefore allows to reduce the bending moments generated on the rotating shaft.

[0024] A still further object of the present invention is to overcome the drawbacks of the background art in a manner that is alternative to any existing solutions.

[0025] Another object of the invention is to provide a support for a bearing for electric pump that is highly reliable, relatively easy to provide and at competitive costs.

[0026] This aim and these and other objects which will become better apparent hereinafter are achieved by a support for a bearing for electric pump according to claim 1.

[0027] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the support for a bearing for electric pump according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is an exploded view of a support for a bearing according to the invention;

Figure 2 is a sectional view of an electric pump with a support for a bearing according to the invention;

Figure 3 is an enlarged-scale view of a detail of the

view of Figure 2;
Figure 4 is an exploded view of the detail of Figure 3.

[0028] With reference to the figures, a support for a bearing 12 for electric pump 50 according to the invention is generally designated by the reference numeral 10.

[0029] One of the particularities of the invention resides in that the support 10 has a contoured portion which forms in a single body:

- a receptacle 11 for a bearing 12,
- a receptacle 13 for a sealing element 14.

[0030] Considering an axis of extension X of the support 10 as:

- the central axis, which lies on the plane of symmetry of the support 10
- at right angles to the planes of arrangement of the receptacle 11 for the bearing 12 and of the receptacle 13 for the sealing element 14,

the receptacle 11 for a bearing 12 and the receptacle 13 for the sealing element 14 are arranged at two opposite ends of the support 10 along its axis of extension X.

[0031] In this manner, the invention provides a common support for the bearing and the mechanical seal.

[0032] In particular, the receptacle 13 for the sealing element 14 is arranged inside a flange element 26 which comprises a disk-like portion 15 provided with a first through hole 25 and a surface from which an annular portion 16 extends which is coaxial to the disk-like portion 15 and surrounds the first through hole 25.

[0033] In the configuration for use, the sealing element 14, which is constituted by a mechanical seal, is inserted into the annular portion 16 and is seated in the first through hole at/proximate to the disk-like portion 15.

[0034] The support 10 is made of metallic material, such as for example aluminum, and has an element 17 for covering the annular portion 16, which forms the receptacle 13 for the sealing element 14.

[0035] In particular, the sealing element 14 is accommodated inside the covering element 17 in the first through hole 25 of the annular portion 16.

[0036] The covering element 17 is made of metallic material, advantageously stainless steel, and is adapted to protect the support 10 from water, being arranged at the interface between the wet region 51 of the electric pump 50 and its motor housing 52.

[0037] The covering element 17:

- is co-molded with the flange element 26,
- is complementary to the annular portion 16,
- has a shape which duplicates the shape of the annular portion 16.

[0038] In the configuration for use, the sealing element 14 rests inside the covering element 17 and is surrounded by it.

[0039] Considering its extension axis X, the support 10 comprises, at the opposite end with respect to the end provided with the receptacle 13 for the sealing element 14, a tray element 19 which has a circular profile with a flanged perimetric rim 20.

[0040] The tray element 19 comprises a base 21 and a side wall 22 from which the flanged rim 20 is extended.

[0041] In particular, the base 21 is provided with a second through hole 23 for the insertion of the rotating shaft 18 of the electric pump 50.

[0042] Inside the tray element 19 there is a tubular portion 24 which is monolithic therewith and constitutes the lateral edge of the receptacle 11 for the bearing 12.

[0043] The inside diameter of the tubular portion 24 is comparable with the outside diameter of the bearing 12 and is greater than the diameter of the second through hole 23.

[0044] In the configuration for use, the bearing 12 is inserted in the tubular portion 24 and is substantially in contact with the base 21 of the tray portion 19.

[0045] The tubular portion 24, the tray element 19, the disk-like portion 15 and the annular portion 16 are coaxial and their axis coincides with the extension axis X of the support 10.

[0046] In particular, the flange element 26 and the tray element 19 are connected and joined by one or more bridge elements 27 which give greater stiffness to the support 10.

[0047] These bridge elements 27 have a substantially triangular profile.

[0048] Advantageously, the bridge elements 27 are four, arranged in a radial manner with respect to the extension axis X of the support 10 and mutually equidistant.

[0049] The presence of four bridge elements 27 and their distribution with respect to the extension axis X of the support 10 give stiffness to the latter.

[0050] The first through hole 25 and the second through hole 23 form a single passage for the rotating shaft 18 of the electric pump 50, around which the bridge elements 27 are arranged.

[0051] Considering the extension axis X of the support 10, the bearing 12 and the sealing element 14 are arranged at opposite ends and are directed toward the outside of the support 10, therefore toward opposite sides of the support 10.

[0052] It should be noted that, with the support 10, one provides with a single component both a support for a bearing and a support for a sealing element between the wet region and the motor housing.

[0053] Figure 2 shows a cross-section of an electric pump 50 comprising a support 10 according to the invention.

[0054] The electric pump 50 has, in the configuration for use, a vertical extension and comprises, from the bottom upward:

- a wet region 51,
- a motor housing 52.

[0055] One or more impellers 54 keyed on the rotating shaft 18 are arranged in the wet region 51.

[0056] A motor is arranged inside the motor housing 52 and comprises a rotor 55 for the movement of the rotating shaft 18, which is keyed thereon, and a stator 56 which surrounds the rotor 55.

[0057] The rotating shaft 18 is kept in axial alignment by means of two bearings arranged at the ends of the rotor 55, respectively:

- a first upper bearing 57, and
- a second lower bearing 12, arranged inside the motor housing 52, proximate to the wet region 51.

[0058] The support 10 for the bearing 12, as described above, is arranged inside the electric pump 50, at the interface between the wet region 51 and the motor housing 52.

[0059] The sealing element 14 is keyed on the rotating shaft 18, at the interface between the wet region 51 and the motor housing 52, and hinders the passage of the liquid from the wet region 51 to the motor housing 52.

[0060] In practice it has been found that the invention achieves the intended aim and objects, providing a support for a bearing for electric pump which allows to reduce the number of components of the electric pump.

[0061] The invention provides a common support to the bearing and to the mechanical seal which is completely made of metallic material.

[0062] It should be noted that the invention provides a support for a bearing for electric pump which allows to achieve centering dimensional tolerances with the support for the mechanical seal that are smaller than those achieved by similar supports of a known type, since it is provided monolithically with the support for the mechanical seal and is made of metallic material.

[0063] Furthermore, the invention provides a support for a bearing for electric pump which allows a better coaxiality with the support of the sealing element for the wet region than similar supports of a known type and therefore allows to reduce the bending moments generated on the rotating shaft, since its flange element, which defines the receptacle for the sealing element, and its tubular element, which defines the receptacle for the bearing, are coaxial.

[0064] The invention thus conceived is susceptible of numerous modifications and variations, all of which may be within the scope of the appended claims.

[0065] In practice, the materials used, so long as they are compatible with the specific use, as well as the contingent shapes and dimensions, may be any according to the requirements and the state of the art.

[0066] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A support (10) for a bearing (12) for an electric pump (50), having a contoured portion which forms in a single body; and comprising:

   - a receptacle (11) for said bearing (12),
   - a receptacle (13) for a sealing element (14) said receptacle (13) for said sealing element (14) being arranged within a flange element (26) which comprises:

     - a disk-like portion (15) provided with a first through hole (25)
     - an annular portion (16), which is coaxial to said disk-like portion (15) and surrounds said first through hole (25);

   the support (10) being provided with an element (17) for covering said annular portion (16), which forms said receptacle (13) for said sealing element (14), wherein said covering element (17):

   - is made of metallic material, preferably stainless steel;
   - is co-molded with said flange element (26),
   - is complementary to said annular portion (16),
   - has a shape which duplicates the shape of said annular portion (16).

2. The support (10) according to claim 1, **characterized in that** it is made of metallic material.

3. The support (10) according to claim 1, **characterized in that** said receptacle (11) for said bearing (12) and said receptacle (13) for said sealing element (14) are arranged at two opposite ends of said support (10) along its axis of extension (X), considering said axis of extension (X) as:

   - a central axis, which lies on the plane of symmetry of said support (10),
   - at right angles to the planes of arrangement of said receptacle (11) for said bearing (12) and of said receptacle (13) for said sealing element (14).

4. The support (10) according to claim 3, **characterized in that**, considering said axis of extension (X), it comprises a tray element (19) which has a circular profile, at the opposite end with respect to the end

provided with said receptacle (13) for said sealing element (14).

5. The support (10) according to claim 4, **characterized in that** said tray element (19) comprises a base (21) and a side wall (22), said base (21) being provided with a second through hole (23).

6. The support (10) according to claim 4, **characterized in that** inside said tray element (19) there is a tubular portion (24) which is monolithic therewith, said tubular portion (24) constituting the lateral edge of said receptacle (11) for said bearing (12).

7. The support (10) according to claim 6, **characterized in that** the inside diameter of said tubular portion (24) is larger than the diameter of said second through hole (23).

8. The support (10) according to claim 6, **characterized in that** said tubular portion (24), said tray element (19), said disk-like portion (15) and said annular portion (16) are coaxial and their axis coincides with said axis of extension (X) of said support (10).

9. The support (10) according to claim 4, **characterized in that** said flange element (26) and said tray element (19) are connected and joined by one or more bridge elements (27).

10. The support (10) according to claim 9, **characterized in that** said one or more bridge elements (27) have a substantially triangular profile and are arranged radially with respect to said axis of extension (X) of said support (10).

11. An electric pump (50), comprising:

- a wet region (51), one or more impellers (54) keyed on a rotating shaft (18) being arranged in said wet region,
- a motor housing (52),
- a motor arranged inside said motor housing (52), said motor comprising a rotor (55) for the movement of said rotating shaft (18), which is keyed thereon, and a stator (56) which surrounds said rotor (55),

said rotating shaft (18) being kept in axial alignment by means of two bearings arranged at the ends of said rotor (55):

- a first bearing (57),
- a second bearing (12), arranged inside said motor housing (52), proximate to said wet region (51),

characterized in that it comprises, at the interface between said wet region (51) and said motor housing (52), a support (10) for the support of said second bearing (12) according to one or more of the preceding claims.

Patentansprüche

1. Halterung (10) für ein Lager (12) für eine elektrische Pumpe (50), die einen konturierten Abschnitt aufweist, der in einem einzigen Körper gebildet ist, und umfassend:

- eine Aufnahme (11) für das Lager (12),
- eine Aufnahme (13) für ein Dichtungselement (14), wobei die Aufnahme (13) für das Dichtungselement (14) innerhalb eines Flanschelements (26) angeordnet ist, das Folgendes umfasst:
- einen scheibenförmigen Abschnitt (15), der mit einem ersten Durchgangsloch (25) versehen ist
- einen ringförmigen Abschnitt (16), der koaxial zu dem scheibenartigen Abschnitt (15) ist und das erste Durchgangsloch (25) umgibt;

wobei die Halterung (10) mit einem Element (17) zum Abdecken des ringförmigen Abschnitts (16) versehen ist, der die Aufnahme (13) für das Dichtungselement (14) bildet, wobei das Abdeckelement (17):

- aus einem metallischen Material, vorzugsweise aus Edelstahl, gefertigt ist;
- zusammen mit dem Flanschelement (26) geformt ist,
- komplementär zu dem ringförmigen Abschnitt (16) ist,
- eine Form aufweist, die die Form des ringförmigen Abschnitts (16) dupliziert.

2. Halterung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** sie aus metallischem Material gefertigt ist.

3. Halterung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Aufnahme (11) für das Lager (12) und die Aufnahme (13) für das Dichtungselement (14) an zwei gegenüberliegenden Enden der Halterung (10) entlang ihrer Erstreckungsachse (X) angeordnet sind, wobei die Erstreckungsachse (X) betrachtet wird als:

- eine mittlere Achse, die in der Symmetrieebene der Halterung (10) liegt,
- rechtwinklig zu den Anordnungsebenen der Aufnahme (11) für das Lager (12) und der Aufnahme (13) für das Dichtungselement (14).

4. Halterung (10) nach Anspruch 3, **dadurch gekennzeichnet, dass** sie unter Berücksichtigung der Er-

streckungsachse (X) an dem gegenüberliegenden Ende in Bezug auf das Ende, das mit der Aufnahme (13) für das Dichtungselement (14) versehen ist, ein Schalenelement (19) mit kreisförmigem Profil umfasst.

5. Halterung (10) nach Anspruch 4, **dadurch gekennzeichnet, dass** das Schalenelement (19) eine Basis (21) und eine Seitenwand (22) umfasst, wobei die Basis (21) mit einem zweiten Durchgangsloch (23) versehen ist.

6. Halterung (10) nach Anspruch 4, **dadurch gekennzeichnet, dass** es im Inneren des Schalenelements (19) einen rohrförmigen Abschnitt (24) gibt, der einstückig damit ist, wobei der rohrförmige Abschnitt (24) den seitlichen Rand der Aufnahme (11) für das Lager (12) darstellt.

7. Halterung (10) nach Anspruch 6, **dadurch gekennzeichnet, dass** der Innendurchmesser des rohrförmigen Abschnitts (24) größer ist als der Durchmesser des zweiten Durchgangslochs (23).

8. Halterung (10) nach Anspruch 6, **dadurch gekennzeichnet, dass** der rohrförmige Abschnitt (24), das Schalenelement (19), der scheibenförmige Abschnitt (15) und der ringförmige Abschnitt (16) koaxial sind und ihre Achse mit der Erstreckungsachse (X) der Halterung (10) zusammenfällt.

9. Halterung (10) nach Anspruch 4, **dadurch gekennzeichnet, dass** das Flanschelement (26) und das Schalenelement (19) durch ein oder mehrere Brückenelemente (27) verbunden und zusammengefügt sind.

10. Halterung (10) nach Anspruch 9, **dadurch gekennzeichnet, dass** das eine oder die mehreren Brückenelemente (27) ein im Wesentlichen dreieckiges Profil aufweisen und radial in Bezug auf die Erstreckungsachse (X) der Halterung (10) angeordnet sind.

11. Elektrische Pumpe (50), umfassend:

- einen Nassbereich (51), wobei ein oder mehrere Laufräder (54), die auf eine drehende Welle (18) aufgesteckt sind, angeordnet sind,
- ein Motorgehäuse (52)
- einen Motor, der innerhalb des Motorgehäuses (52) angeordnet ist, der Motor umfassend einen Rotor (55) für die Bewegung der drehenden Welle (18), der darauf gesteckt ist, und einen Stator (56), der den Rotor (55) umgibt, wobei die durch Welle (18) durch zwei an den Enden des Rotors (55) angeordnete Lager in axialer Ausrichtung gehalten wird:
- ein erstes Lager (57),
- ein zweites Lager (12), das innerhalb des Motorgehäuses (52) in der Nähe des Nassbereichs (51) angeordnet ist, **dadurch gekennzeichnet, dass** sie an der Schnittstelle zwischen dem Nassbereich (51) und dem Motorgehäuse (52) eine Halterung (10) zum Halten des zweiten Lagers (12) nach einem oder mehreren der vorherigen Ansprüche umfasst.

Revendications

1. Support (10) pour un palier (12) pour une pompe électrique (50), ayant une partie profilée qui forme dans un seul corps; et comprenant:

- un logement (11) pour ledit palier (12),
- un logement (13) pour un élément d'étanchéité (14) ledit réceptacle (13) pour ledit élément d'étanchéité (14) étant agencé à l'intérieur d'un élément de bride (26) qui comprend:
- une partie en forme de disque (15) munie d'un premier trou traversant (25)
- une partie annulaire (16), qui est coaxiale à ladite partie en forme de disque (15) et entoure ledit premier trou traversant (25);

le support (10) étant pourvu d'un élément (17) pour recouvrir ladite partie annulaire (16), qui forme ledit réceptacle (13) pour ledit élément d'étanchéité (14), dans lequel ledit élément de recouvrement (17):

- est réalisé en matériau métallique, de préférence en acier inoxydable;
- est co-moulé avec ledit élément de bride (26),
- est complémentaire de ladite portion annulaire (16),
- a une forme qui reproduit la forme de ladite partie annulaire (16).

2. Support (10) selon la revendication 1, **caractérisé en ce qu'**il est réalisé en matériau métallique.

3. Support (10) selon la revendication 1, **caractérisé en ce que** ledit réceptacle (11) pour ledit palier (12) et ledit réceptacle (13) pour ledit élément d'étanchéité (14) sont agencés à deux extrémités opposées dudit support (10) le long son axe d'extension (X), en considérant ledit axe d'extension (X) comme:

- un axe central, qui se trouve sur le plan de symétrie dudit support (10),
- perpendiculairement aux plans d'agencement dudit logement (11) pour ledit palier (12) et dudit logement (13) pour ledit élément d'étanchéité (14).

4. Support (10) selon la revendication 3, **caractérisé en ce que**, considérant ledit axe d'extension (X), il comprend un élément de plateau (19) qui présente un profil circulaire, à l'opposé de l'extrémité munie dudit réceptacle (13) pour ledit élément d'étanchéité (14).

5. Support (10) selon la revendication 4, **caractérisé en ce que** ledit élément de plateau (19) comprend une base (21) et une paroi latérale (22), ladite base (21) étant pourvue d'un deuxième trou traversant (23).

6. Support (10) selon la revendication 4, **caractérisé en ce qu'** à l'intérieur dudit élément de plateau (19) se trouve une partie tubulaire (24) qui est monolithique avec lui, ladite partie tubulaire (24) constituant le bord latéral dudit réceptacle (11) pour ledit palier (12).

7. Support (10) selon la revendication 6, **caractérisé en ce que** le diamètre intérieur de ladite partie tubulaire (24) est supérieur au diamètre dudit deuxième trou traversant (23).

8. Support (10) selon la revendication 6, **caractérisé en ce que** ladite partie tubulaire (24), ledit élément de plateau (19), ladite partie en forme de disque (15) et ladite partie annulaire (16) sont coaxiaux et leur axe coïncide avec ledit axe d'extension (X) dudit support (10).

9. Support (10) selon la revendication 4, **caractérisé en ce que** ledit élément de rebord (26) et ledit élément de plateau (19) sont reliés et reliés par un ou plusieurs éléments de pont (27).

10. Support (10) selon la revendication 9, **caractérisé en ce que** lesdits un ou plusieurs éléments de pont (27) ont un profil sensiblement triangulaire et sont disposés radialement par rapport audit axe d'extension (X) dudit support (10).

11. Pompe électrique (50), comprenant:

- une région humide (51), une ou plusieurs hélices (54) calées sur un arbre rotatif (18) étant agencées dans ladite région humide,
- un carter moteur (52),
- un moteur agencé à l'intérieur dudit carter de moteur (52), ledit moteur comprenant un rotor (55) pour le mouvement dudit arbre rotatif (18), qui est calé dessus, et un stator (56) qui entoure ledit rotor (55),

ledit arbre rotatif (18) étant maintenu en alignement axial au moyen de deux paliers agencés aux extrémités dudit rotor (55):

- un premier palier (57),
- un deuxième palier (12), agencé à l'intérieur dudit carter de moteur (52), à proximité de ladite région humide (51), **caractérisé en ce qu'**il comprend, à l'interface entre ladite région humide (51) et ledit carter de moteur (52), un support (10) pour le support dudit deuxième palier (12) selon une ou plusieurs des revendications précédentes.

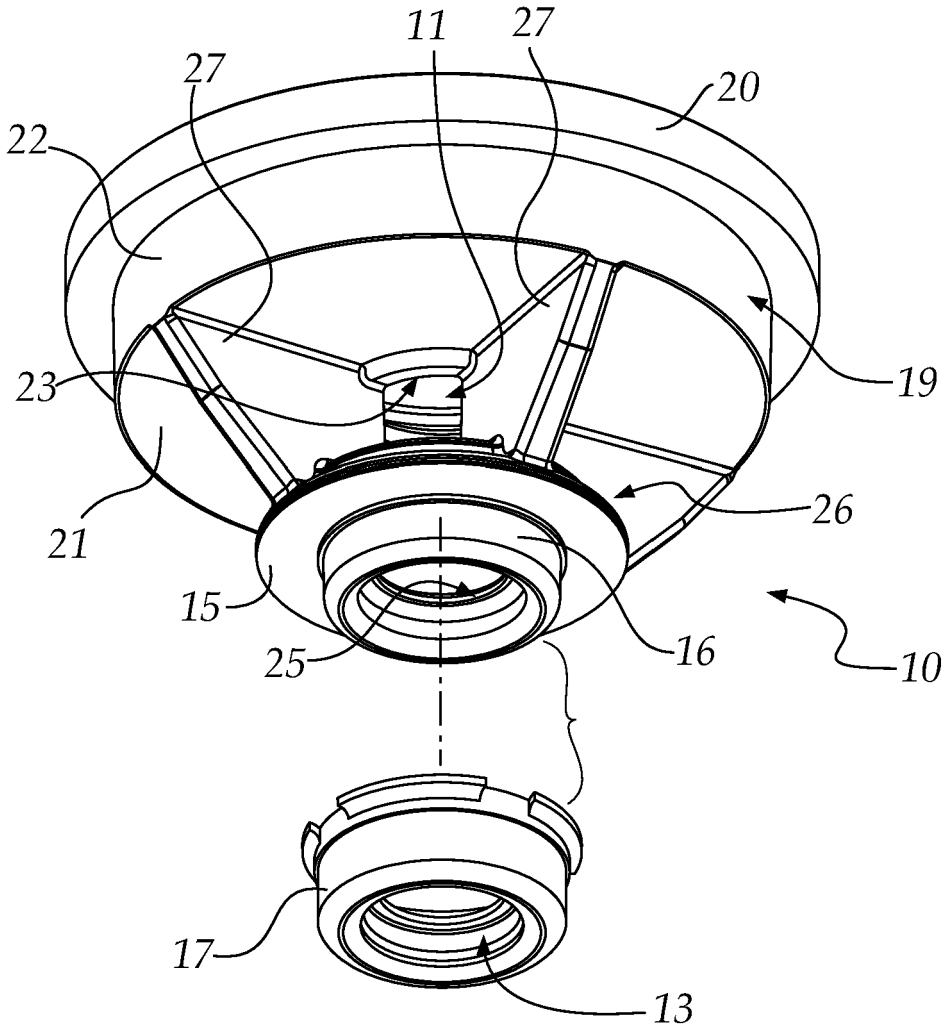

Fig.1

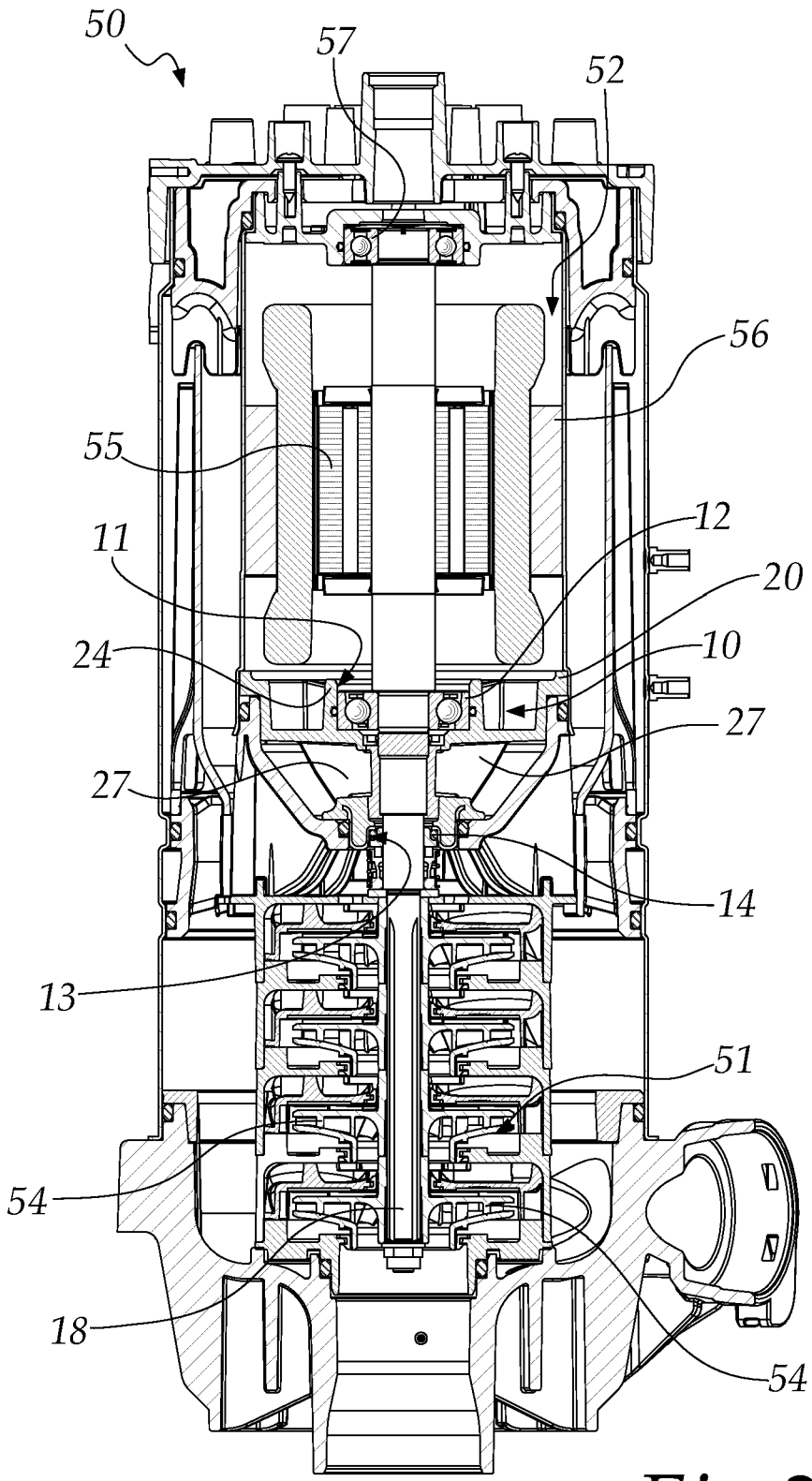

Fig.2

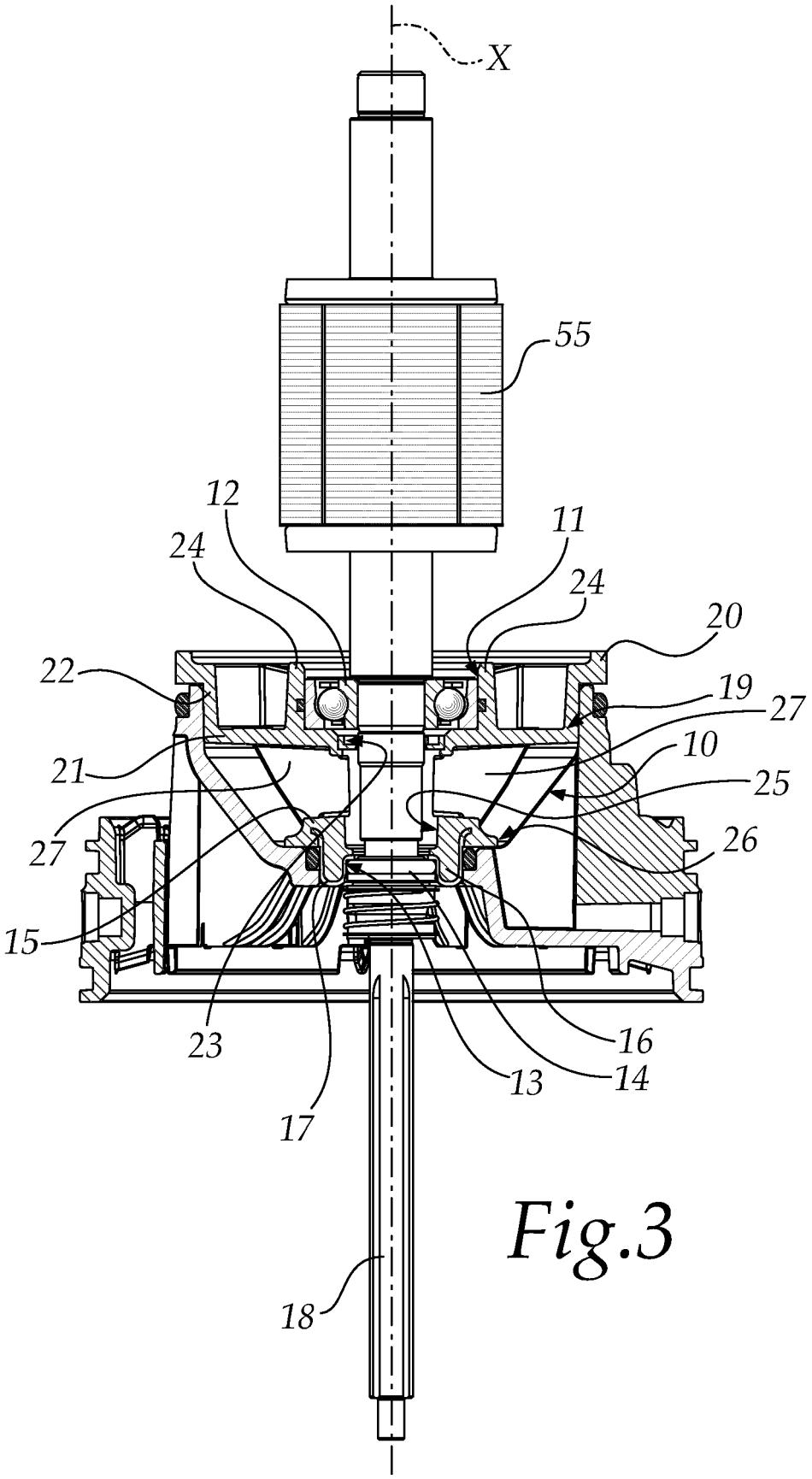

Fig.3

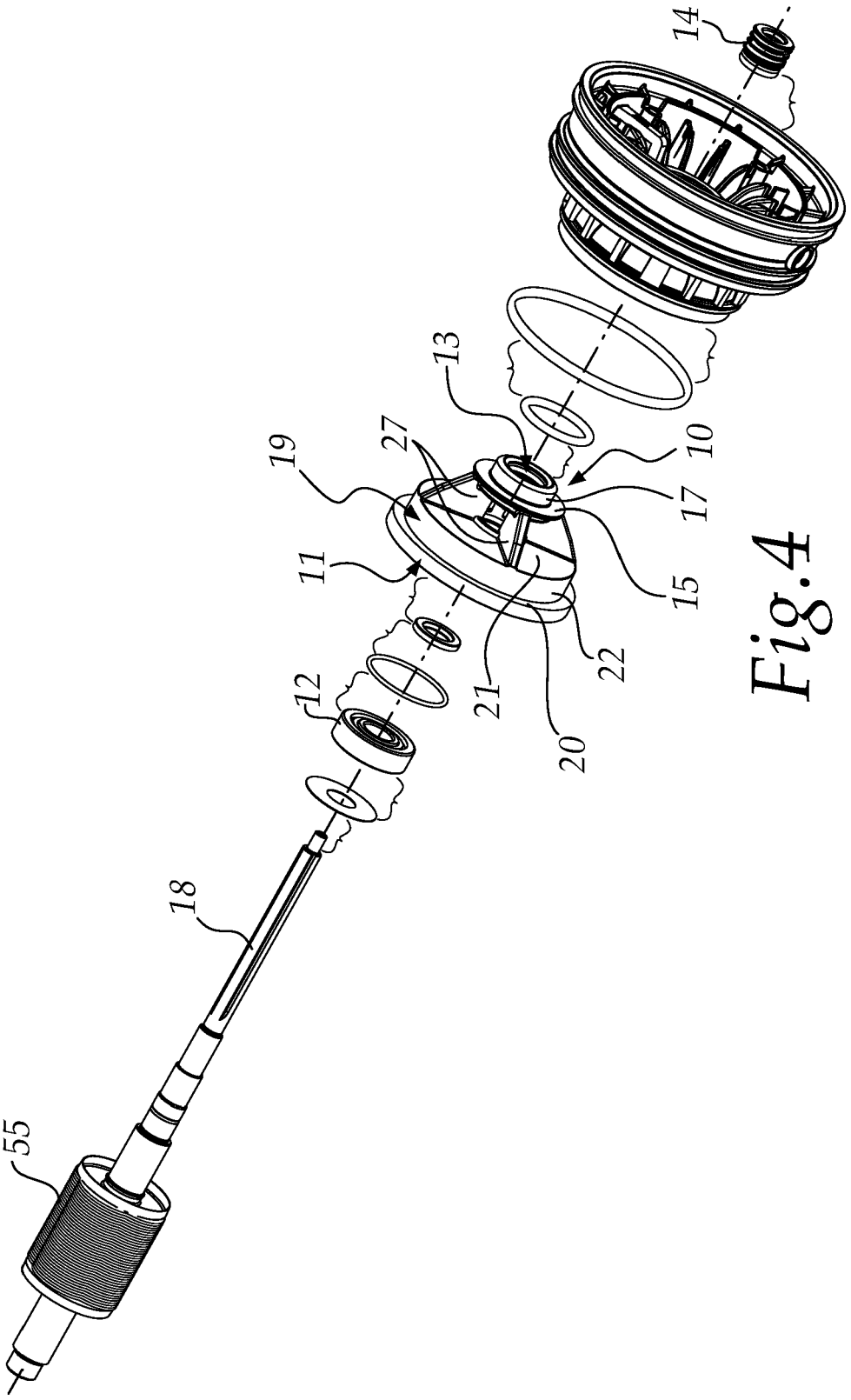

Fig.4

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 3290712 A1 **[0005]**