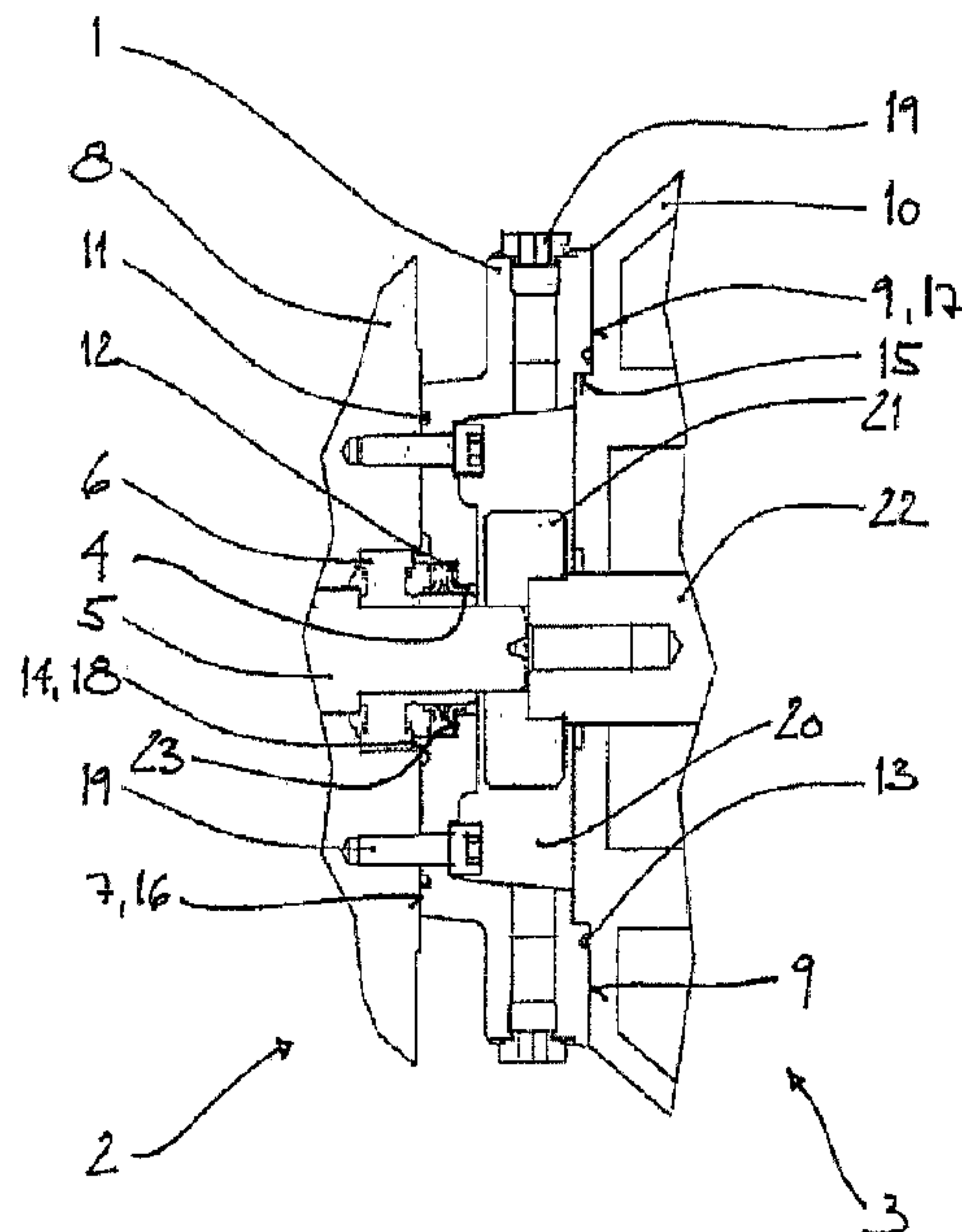




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(54) Titre : BRIDE DE COMPRESSEUR POUR COMPRESSEUR A VIS
(54) Title: COMPRESSOR FLANGE FOR SCREW-TYPE COMPRESSOR



(57) **Abrégé/Abstract:**

The invention relates to a compressor flange (1) for connecting a screw-type compressor (2) to a drive (3), wherein the compressor flange (1) has a central opening (4) for receiving a shaft (5) and/or a bearing (6) and a first annular bearing face (7) for bearing on a housing (8) of the compressor (2) and a second annular bearing face (9) for bearing on a housing (10) of the drive (3). According to the invention, the compressor flange (1) also comprises axially and/or radially effective seals (11, 12) for forming a seal with respect to the compressor housing (8) and/or the shaft (5), with the result that an open compressor housing (8) can be closed off and sealed by insertion of the compressor flange (1). In addition, the device relates to a screw-type compressor with such a compressor flange.

Abstract

The invention relates to a compressor flange (1) for connecting a screw-type compressor (2) to a drive (3), wherein the compressor flange (1) has a central opening (4) for receiving a shaft (5) and/or a bearing (6) and a first annular bearing face (7) for bearing on a housing (8) of the compressor (2) and a second annular bearing face (9) for bearing on a housing (10) of the drive (3). According to the invention, the compressor flange (1) also comprises axially and/or radially effective seals (11, 12) for forming a seal with respect to the compressor housing (8) and/or the shaft (5), with the result that an open compressor housing (8) can be closed off and sealed by insertion of the compressor flange (1). In addition, the device relates to a screw-type compressor with such a compressor flange.

Compressor flange for screw-type compressor

Field of the invention

- 5 The invention relates to a compressor flange for connecting a screw-type compressor to a drive. The invention relates, furthermore, to a screw-type compressor having such a compressor flange.
- 10 Currently available screw-type compressors have, for connection to a drive, connecting elements which are provided for centering purposes with a centering collar or with centering pins. The connecting elements regularly comprise a connecting flange which is connectable to an
- 15 end cover of the screw-type compressor. The end cover closes the compressor housing and seals it off outwardly. A plurality of components are therefore regularly required which have to be appropriately positioned and fastened for connecting the screw-type compressor to a
- 20 drive. The outlay in terms of manufacture and assembly is therefore very high.

Prior art

- 25 Laid-open publication DE 10 44 122 A discloses a cold compressor with a horizontally flanged-on electric motor which, in the closed version, comprises a flange component for connecting the compressor to the electric motor. The compressor housing has a hub-like extension
- 30 for receiving the driveshaft and for receiving a

centrically arranged extension of the flange component,
so that centering of the flange component takes place
while the latter is being inserted. Centering of the
compressor with respect to the electric motor is to take
5 place by means of a further annular step formed
concentrically to the centric extension. In this case,
floating ring shaft sealing is dispensed with, since some
leakage is tolerated or is desired. Moreover, a bore is
provided in the flange component in order to feed
10 lubricant from the electric motor to the interior of the
compressor housing.

The object of the present invention is to provide a
compressor flange for connecting a screw-type compressor
15 to a drive, which compressor flange requires low outlay
in terms of manufacture and assembly and combines a
plurality of functions in one component.

Disclosure of the invention
20

According to one embodiment, there is provided a
compressor flange for connecting a screw-type compressor
to a drive, the compressor flange having a central
orifice for the reception of a shaft and/or of a
25 bearing, and possessing a first ring-shaped bearing
surface for bearing against a housing of the compressor
and a second ring-shaped bearing surface for bearing
against a housing of the drive, wherein the compressor
flange comprises, axially and/or radially active seals
30 for sealing off with respect to the compressor housing

and/or to the shaft, so that an open compressor housing
can be closed and sealed off, using the compressor
flange, wherein, the compressor flange is of pot-shaped
design and, when bearing against the compressor housing
5 and against the housing of the drive, delimits a cavity
for receiving a clutch which connects the shaft of the
compressor to a shaft of the drive.

According to another embodiment, there is provided a
10 compressor flange for connecting a screw-type compressor
to a drive, the compressor flange comprising: a central
orifice for the reception of a shaft and/or bearing;
a first ring-shaped bearing surface that bears against a
house housing of the screw-type compressor; a second
15 ring-shaped bearing surface, parallel to the first ring-
shaped bearing surface, that bears against a housing of
the drive; and axially and/or radially active seals that
seal off with respect to the compressor housing of the
screw-type compressor and/or to the shaft, so that the
20 compressor housing, when open, is closed and sealed off,
using by the compressor flange, wherein axially active
seals are embedded in parallel first and second ring-
shaped bearing surfaces, and wherein the compressor
flange is pot-shaped and, when bearing against the
25 compressor housing at a bottom of the pot-shaped
compressor flange and against the housing of the drive,

delimits a cavity that receives a clutch which connects the shaft of the compressor to a shaft of the drive.

5 The seals form integral parts of the connecting flange, so that there is no need to use separate sealing means which have to be mounted separately from the flange component. The compressor flange therefore at the same time assumes the function of an end cover which is usually provided for closing and sealing off a screw-type
10 compressor. That is to say, the compressor flange assumes not only the connecting function, but also a closing and seal-off function. The number of components required can therefore be reduced, so that the outlay in terms of manufacture and assembly is consequently also reduced.

15 The axially and/or radially active seals may be inserted in grooves on the compressor flange or may be injected-molded on or integrally formed. Sealing off with respect to the shaft preferably takes place in the region of the
20 shaft bearing, so that the seal is not exposed to any dynamic load. The seal therefore has a long service life.

Preferably, furthermore, there is provision for the compressor flange to possess an axially active seal for
25 sealing off with respect to the housing of the drive. A leaktight connection of the screw-type compressor to the drive housing is thus also ensured.

Preferably, furthermore, an annular step is formed on at least one end face of the compressor flange for the purpose of centering the compressor flange with respect to the compressor housing, to the shaft, to the bearing
5 and/or to the housing of the drive. The compressor flange thus has at the same time a centering function and makes it unnecessary to have further connecting elements, for example in the form of centering pins. Preferably, an annular step for centering with respect to the compressor
10 housing and to the drive is formed on each of the two end faces of the compressor flange.

Advantageously, an axial extension for fixing the axial position of the bearing is formed on the end face

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facing the compressor housing. That is to say, after the connection of the compressor flange to the compressor housing, the axial extension is supported on a radially running surface of the bearing. Furthermore, 5 the axial extension may be designed in such a way that it replaces a centering annular step arranged on the compressor side. For this purpose, the axial extension can preferably be inserted into a recess formed on the compressor housing or on the bearing in such a way that 10 the axial extension is supported not only axially, but also radially. The axial extension on the compressor flange thus fulfils a holding and a centering function.

Alternatively, the flange may also have an annular step 15 in a form in which the latter receives the surface area of the shaft bearing and fixes the axial position of the latter. Centering of the flange on the bearing is thereby also achieved. The latter may be achieved in that the bearing end projects axially beyond the 20 compressor housing or in that the compressor housing has a corresponding recess.

The compressor flange can preferably be fastened to the compressor housing by means of screws. For this 25 purpose, bores for receiving the screws are provided in the region of the first ring-shaped bearing surface for the bearing of the compressor flange against the compressor housing.

30 According to a preferred exemplary embodiment, the compressor flange is of pot-shaped design and, when bearing against the compressor housing and against the housing of the drive, delimits a cavity for receiving a clutch which connects the shaft of the compressor to a 35 shaft of the drive. By the clutch being housed by the compressor flange, it becomes possible to dispense with a clutch bell housing and therefore to use a simple clutch. The number of components can thus be reduced

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even further. Moreover, the space requirement decreases on account of the smaller overall construction size. Finally, weight can also be saved.

- 5 Furthermore, a reduction in the number of components is accompanied by a reduced outlay in terms of assembly, since fewer components have to be aligned with one another and fastened to one another. Moreover, the locations which additionally have to be sealed off are
10 reduced. The adding-up of manufacturing and/or assembly tolerances is thereby also reliably avoided.

The seals provided on the compressor flange ensure, even when a clutch bell housing is dispensed with, that
15 the clutch received in the cavity of the pot-shaped compressor flange is sufficiently protected. This protection can be ensured even when, for example, the screw-type compressor is in partially immersed operational use. Moreover, the cavity may serve for
20 receiving a lubricating medium, since the seals of the compressor flange ensure that no lubricating medium escapes outward. Should a leakage of lubricant occur in the region of the shaft, the cavity of the pot-shaped compressor flange serves for capturing the lubricant
25 which has emerged.

Preferably, the end face forms, in the region of the bottom of the pot-shaped compressor flange, the first ring-shaped bearing surface for the bearing of the
30 compressor flange against the compressor housing. The cover function of the compressor flange can thus be implemented in a simple way. The central orifice for receiving the shaft is likewise provided in the region of the bottom of the pot-shaped compressor flange.
35 Preferably, furthermore, the end face radially delimiting the cavity and lying opposite the bottom of the pot-shaped compressor flange forms the second ring-

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shaped bearing surface for the bearing of the compressor flange against the drive housing.

For the maintenance and/or bleeding of the screw-type compressor, the compressor flange may, furthermore, possess orifices, in particular maintenance and/or bleeding orifices. These are preferably designed in such a way that the sealing function of the compressor flange is still ensured.

10

To achieve the object, furthermore, a screw-type compressor having a compressor flange according to the invention is proposed, the compressor flange serving at the same time as an end cover for closing and sealing off the compressor housing and as a connecting flange for connecting the compressor housing to the housing of the drive. In this case, the space enclosed by the compressor flange may be designed as an open or a closed compressor, depending on the requirements of the type of clutch used, on the type of shaft connection or on further requirements arising from the application.

A preferred embodiment of the invention is explained in more detail below by means of the single figure. This shows a compressor flange according to the invention bearing against a compressor housing and against a housing of a drive.

Detailed description of the drawing

30

The single figure shows a detail of a screw-type compressor 2 in the region of connection to a drive 3, the connection being effected via a compressor flange 1. The compressor flange 1 combines a plurality of functions in one component, since it not only makes a connection between the compressor 2 and drive 3, but also at the same time, via annular steps 14, 15 formed on its end faces 16, 17, makes it possible to center

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the compressor 2 with respect to the drive 3. The compressor flange 1 at the same time replaces an end cover for closing and sealing off the housing 8 of the compressor 2 in that an axially active seal 11 is
5 embedded in a first ring-shaped bearing surface 7 for the bearing of the compressor flange 1 against the compressor housing 8. Moreover, the compressor flange 1 seals off with respect to a shaft 5 of the compressor 2, said shaft being led through a central orifice 4 of
10 the compressor flange 1. For this purpose, a radially active seal 12 is embedded in the compressor flange 1 in the region of the central orifice 4. The radially active seal 12 bears sealingly against a bearing 6 which is provided for mounting the shaft 5 of the
15 compressor 2. Sealing off with respect to the shaft 5 of the compressor 2 therefore takes place indirectly via the bearing 6. The advantage of this is that the radially active seal 12 is not exposed to any dynamic load.

20 A further axially active seal 13 is provided in the end face 17 for sealing off the compressor flange 1 with respect to the housing 10 of the drive 3. Moreover, the end face 17 forms a second ring-shaped bearing surface
25 9 for the bearing of the compressor flange 1 against the housing 10 of the drive 3. To fix the compressor flange 1 to the compressor housing 8, screws 19 are provided which are led through bores in the end face 16 for the purpose of screwing the compressor flange 1 to
30 the compressor housing 8. The screws 19 ensure axial prestressing of the compressor flange 1 with respect to the compressor housing 8, the axially active seal 11 also being pressed onto the compressor housing 8.

35 In the embodiment illustrated, the annular step 14 in the region of the end face 16 is designed as an axial extension 18, by means of which the bearing 6 is held in position. The compressor flange 1 thus fulfils,

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furthermore, a holding function, the holding of the bearing 6 being ensured by connection by means of the screws 19. For this purpose, the axial extension 18 engages positively into a ring-shaped recess of the compressor housing 8. Therefore, at the same time, this also gives rise via the axial extension 18 to centering of the compressor flange with respect to the compressor housing 8 and/or to the shaft 5 of the compressor 2.

Alternatively or additionally to the axial extension 18, moreover, an axial receptacle 23 for fixing the axial position of the bearing 6 may be formed in the compressor flange in the region of the end face 16. Advantageously, for this purpose, the bearing 6 is designed in such a way that it projects in the axial direction, so that it can at least partially be inserted (not illustrated) into the axial recess 23.

Furthermore, the compressor flange 1 of the embodiment illustrated is of pot-shaped design, so that, between a bottom region, which is secured axially to the compressor housing 8, and a side wall region, a cavity 20 is formed, which in the present case serves for receiving a clutch 21 for connecting the shaft 5 of the compressor 2 to the shaft 22 of the drive 3. The compressor flange 1 thus also assumes a protective function which makes it unnecessary to arrange a clutch bell housing. The seals 11, 13 in this case ensure that the cavity 20 formed between the compressor 2 and the drive 3 is sealed off outwardly.

The compressor flange according to the invention, illustrated in the figure, can thus combine within itself the functions of an end cover, of a flange and of a protective hood, while at the same time it assumes a centering, holding and sealing function. All these functions are implemented by a single component, so that the number of components required can be markedly

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reduced and the outlay in terms of manufacture and assembly can be markedly diminished. At the same time, the construction size and the weight of a screw-type compressor are reduced, and therefore the latter
5 requires less construction space.

List of reference symbols

- | | |
|----|------------------------------------|
| 1 | Compressor flange |
| 2 | Compressor |
| 3 | Drive |
| 4 | Central orifice |
| 5 | Shaft of the compressor |
| 6 | Bearing |
| 7 | First ring-shaped bearing surface |
| 8 | Housing of the compressor |
| 9 | Second ring-shaped bearing surface |
| 10 | Housing of the drive |
| 11 | Axially active seal |
| 12 | Radially active seal |
| 13 | Axially active seal |
| 14 | Annular step |
| 15 | Annular step |
| 16 | End face |
| 17 | End face |
| 18 | Axial extension |
| 19 | Screws |
| 20 | Cavity |
| 21 | Clutch |
| 22 | Shaft of the drive |
| 23 | Receptacle |

Claims

1. A compressor flange for connecting a screw-type compressor to a drive, the compressor flange having a central orifice for the reception of a shaft and/or of a bearing, and possessing a first ring-shaped bearing surface for bearing against a housing of the compressor and a second ring-shaped bearing surface for bearing against a housing of the drive, wherein the compressor flange comprises, axially and/or radially active seals for sealing off with respect to the compressor housing and/or to the shaft, so that an open compressor housing can be closed and sealed off, using the compressor flange,

wherein, the compressor flange is of pot-shaped design and, when bearing against the compressor housing and against the housing of the drive, delimits a cavity for receiving a clutch which connects the shaft of the compressor to a shaft of the drive.

2. The compressor flange as claimed in claim 1, wherein the compressor flange possesses, an axially active seal for sealing off with respect to the housing of the drive.

3. The compressor flange as claimed in claim 1 or 2, wherein an annular step is formed on at least one end face of the compressor flange for the purpose of centering the compressor flange with respect to the compressor housing, to the shaft and/or to the housing of the drive.

4. The compressor flange as claimed in any one of claims 1 to 3, wherein an axial extension for fixing the axial position of the bearing is formed on an end face facing the compressor housing.

5. The compressor flange as claimed in claim 4, wherein an axial receptacle for fixing the axial position of the bearing is formed on the end face facing the compressor housing.

6. The compressor flange as claimed in any one of claims 1 to 5, wherein the compressor flange can be fastened to the compressor housing by means of screws.

7. The compressor flange as claimed in any one of claims 1 to 2, wherein an end face forms, in a region of a bottom of compressor flange, the first ring-shaped bearing surface, and an end face radially delimiting the cavity and lying opposite the bottom forms the second ring-shaped bearing surface.

8. The compressor flange as claimed in any one of claims 1 to 7, wherein the compressor flange possesses, orifices.

9. The compressor flange as claimed in claim 8, wherein the orifices comprise maintenance orifices.

10. The compressor flange as claimed in claim 8, wherein the orifices comprise bleeding orifices

11. A screw-type compressor having a compressor flange as claimed in any one of claims 1 to 10, the compressor flange serving at the same time as an end cover for closing and sealing off the compressor housing and as a connecting flange for connecting the compressor housing to the housing of the drive.

12. A compressor flange for connecting a screw-type compressor to a drive, the compressor flange comprising:

- a central orifice for the reception of a shaft and/or bearing;

- a first ring-shaped bearing surface that bears against a house housing of the screw-type compressor;

- a second ring-shaped bearing surface, parallel to the first ring-shaped bearing surface, that bears against a housing of the drive; and

- axially and/or radially active seals that seal off with respect to the compressor housing of the screw-type compressor and/or to the shaft, so that the compressor housing, when

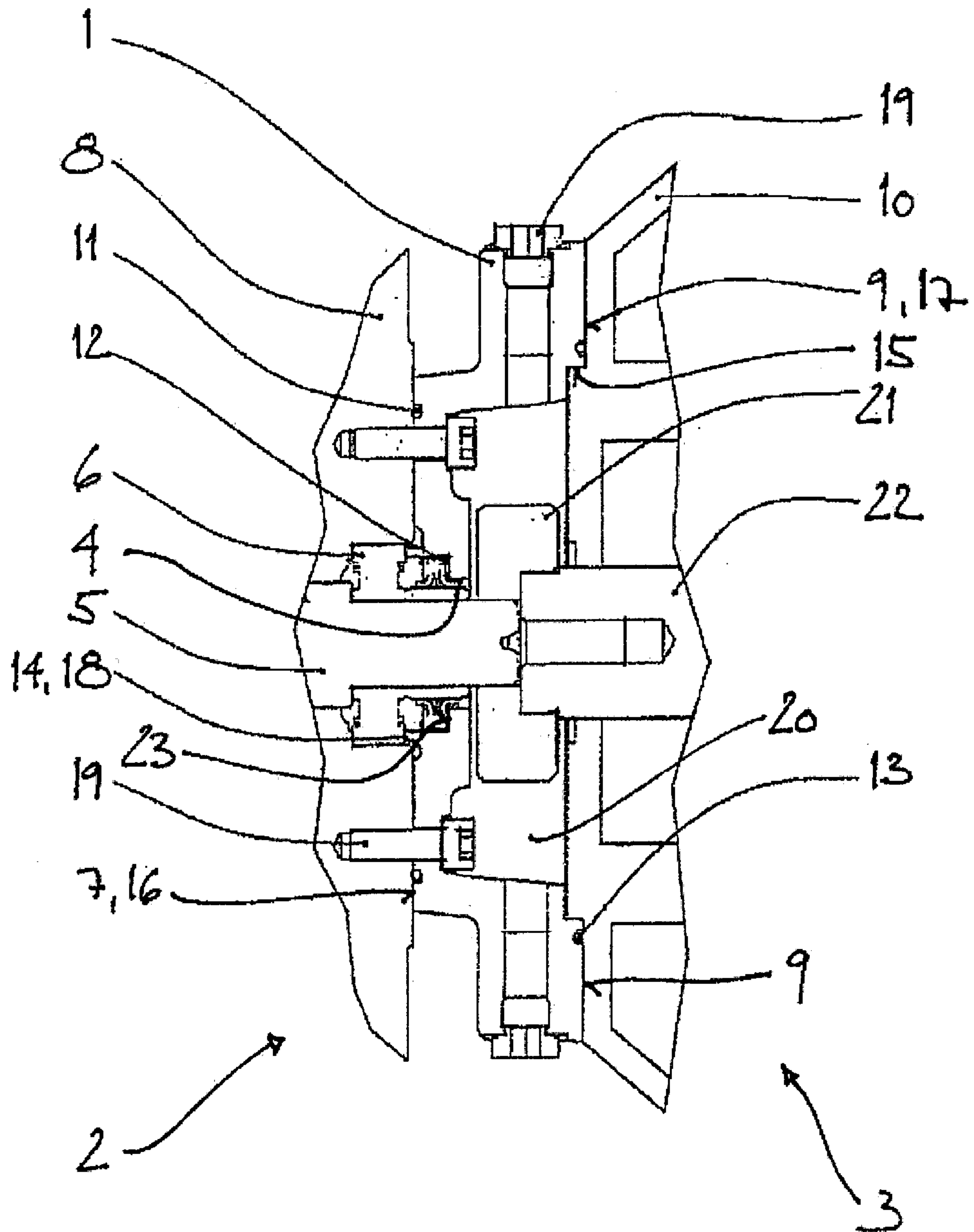
open, is closed and sealed off, using by the compressor flange,

wherein axially active seals are embedded in parallel first and second ring-shaped bearing surfaces, and

wherein the compressor flange is pot-shaped and, when bearing against the compressor housing at a bottom of the pot-shaped compressor flange and against the housing of the drive, delimits a cavity that receives a clutch which connects the shaft of the compressor to a shaft of the drive.

13. The compressor flange of claim 12, wherein an end face forms, in the region of the bottom of the pot-shaped compressor flange, the first ring-shaped bearing surface, and the end face radially delimiting the cavity and lying opposite the bottom forms the second ring-shaped bearing surface.

14. The compressor flange of claim 12, further comprising maintenance and/or bleeding orifices.



Figure

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