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

(11) **EP 4 159 977 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.04.2023 Bulletin 2023/14

(21) Application number: **21200342.0**

(22) Date of filing: **30.09.2021**

(51) International Patent Classification (IPC):
F01C 21/08 *(2006.01)* ***F04C 2/344*** *(2006.01)*
F04C 2/356 *(2006.01)* ***F04C 18/344*** *(2006.01)*
F04C 18/356 *(2006.01)* ***F04C 29/02*** *(2006.01)*
F04C 15/00 *(2006.01)* ***F04C 29/00*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
F04C 18/344; F01C 21/0818; F01C 21/0854; F04C 2/344; F04C 2/356; F04C 15/0042; F04C 18/356; F04C 29/0021; F04C 15/0088; F04C 29/02

(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
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **KNORR-BREMSE Systeme für Nutzfahrzeuge GmbH**
80809 München (DE)

(72) Inventors:
- **SCHALLER, Sebastian**
  86462 Langweid (DE)
- **HEBRARD, Gilles**
  14100 Lisieux (FR)
- **VASS, Zoltan Laszlo**
  6000 Kecskemet (HU)
- **KANTOR, Kornel**
  6000 Kecskemet (HU)
- **GEIS-ESSER, Daniel**
  81377 München (DE)
- **COMPERA, Yves**
  85748 Garching bei München (DE)

(74) Representative: **Prüfer & Partner mbB**
Patentanwälte · Rechtsanwälte
Sohnckestraße 12
81479 München (DE)

(54) COMPRESSOR

(57) A compressor (1) for supplying a working fluid is disclosed, wherein
the compressor (1) comprises:
- a low pressure side with an inlet port;
- a high pressure side with an outlet port;
- a rotor (2), configured to rotate around a rotation axis (7);
- a counter element (3), and
- at least one compressor chamber separation element (4), which
is provided in or on the rotor (2) and configured to be movable along a compressor chamber separation element moving direction (8) towards the counter element (3), wherein
the rotor (2), the counter element (3) and the at least one compressor chamber separation element (4) are configured to form at least one compressor chamber (5), which can be set in communicating connection with the low pressure side and the high pressure side according to the rotation of the rotor (2), wherein
the compressor (1) is configured to increase the volume of the at least one compressor chamber (5) when the at least one compressor chamber (5) is in communicating connection with the low pressure side and to reduce the volume of the at least one compressor chamber (5) when the at least one compressor chamber (5) is in communicating connection with the high pressure side when the rotor (2) rotates around the rotation axis (7), wherein
the compressor (1) further comprises a compressor chamber separation element adjusting device (9) configured to apply a compressor chamber separation element adjusting force to the at least one compressor chamber separation element (4) in parallel to the counter element moving direction (8).

Further, a vehicle and a method are disclosed.

EP 4 159 977 A1

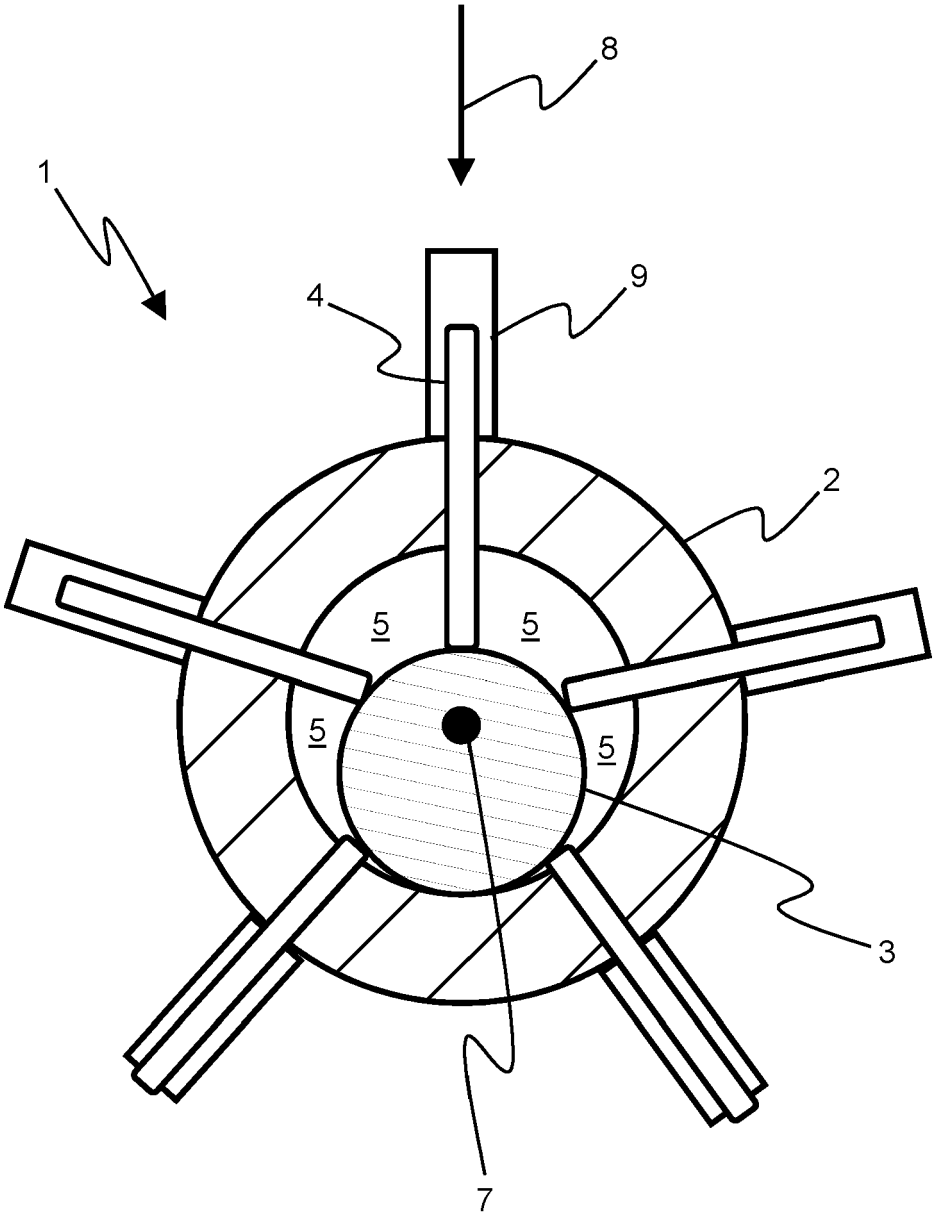

Fig. 1

Description

[0001] The present invention relates to a compressor, a vehicle comprising such a compressor and a method for controlling such a compressor.

[0002] In today's rotary vane compressors the rotor is mounted eccentrically inside the stator and incorporates vanes or blades which are distributed circumferentially on and partially in the rotor as it is shown in the US 2010 / 0 150 766 A1. Due to the centrifugal forces during the rotation of the rotor body, the blades are driven outwards, meaning towards the inner contour of the stator (counter element), creating thereby compression chambers, in which a working fluid, e.g. air, will be compressed. In order to compensate for the friction forces between the blades and the stator surface as well as to achieve tightening of the chambers, an oil layer will be used between the blades and the stator. The blades therefore act as compressor chamber separation elements, wherein the stator comprises a cavity, the rotor and the blades are disposed inside. Further, the stator acts as a connection element with a low pressure side with an inlet port and a high pressure side with an outlet port, wherein the compressor chambers can be brought into communicating connection with the low pressure side and the high pressure side according to the rotation of the rotor.

[0003] In general, the state of the art describes a rotary vane compressor (RV compressor) consisting of a rotor with radially expandable blades mounted inside a stator, whereby oil lubrication is used. The movement of the blades is driven by centrifugal forces.

[0004] Since the movement of the blades is driven by centrifugal forces, it is an issue of such compressors that the sealing effect of the compressor chamber and the friction between the compressor chamber separation elements and the counter element depend on the current operating state of the compressor.

[0005] Therefore, it is an object of the present invention to provide a compressor, wherein at least one of these issues is solved.

[0006] According to the invention, a compressor for supplying a working fluid is provided, wherein

the compressor comprises:

- a low pressure side with an inlet port;
- a high pressure side with an outlet port;
- a rotor, configured to rotate around a rotation axis;
- a counter element, and
- at least one compressor chamber separation element, which

is provided in or on the rotor and configured to be movable along a compressor chamber separation element moving direction towards the counter element, wherein
the rotor, the counter element and the at least one compressor chamber separation element are configured to form at least one compressor chamber, which can be set in communicating connection with the low pressure side and the high pressure side according to the rotation of the rotor, wherein
the compressor is configured to increase the volume of the at least one compressor chamber when the at least one compressor chamber is in communicating connection with the low pressure side and to reduce the volume of the at least one compressor chamber when the at least one compressor chamber is in communicating connection with the high pressure side when the rotor rotates around the rotation axis, wherein
the compressor further comprises a compressor chamber separation element adjusting device configured to apply a compressor chamber separation element adjusting force to the at least one compressor chamber separation element in parallel to the counter element moving direction.

[0007] Preferably, the compressor is configured to supply the working fluid from the inlet port to the outlet port.

[0008] In the following, the term "fluid" is used. If this term is not specified in any way, any fluid can be included by this term, particularly a gas, a liquid and/or the working fluid. In particular, air or a hydraulic liquid can be included by this term.

[0009] Preferably, the working fluid comprises or consists of a gas, in particular air, hydrogen or methane or other gases, or the working fluid comprises or consists of a hydraulic fluid, in particular a hydraulic oil. If the working fluid is incompressible, the compressor can act as a pump, in particular as a pump for a hydraulic fluid. If the working fluid is compressible, the compressor is configured to compress the working fluid and therefore configured to act as a compressor.

[0010] In particular, the compressor chamber separation element moving direction rotates according to the rotation of the rotor.

[0011] By applying the compressor chamber separation element adjusting force to the at least one compressor chamber separation element, the movement of the at least one compressor chamber separation element along the compressor chamber separation element moving direction and/or the contact between the at least one compressor chamber separation element and the counter element can be affected. In particular, a sliding contact between the at least one compressor chamber separation element and the counter element can be affected in such way that a contact force in the sliding contact between the at least one compressor chamber separation element and the counter element can be reduced or increased. By applying the compressor chamber separation element adjusting force accordingly to reduce said contact force, a friction force acting in the sliding contact between the at least one compressor chamber separa-

tion element and the counter element can be reduced. By applying the compressor chamber separation element adjusting force accordingly to increase said contact force, a sealing effect in this sliding contact can be increased, wherein blow-by of working fluid out of the at least one compressor chamber through the sliding contact can be reduced or avoided.

[0012] Preferably, the compressor chamber separation element adjusting force is applied to act against a centrifugal force acting on the at least one compressor chamber separation element due to the rotation of the rotor. Thereby, negative effects as the increasing of the friction in the sliding contact due to increased rotation of the rotor is reduced.

[0013] Preferably, the counter element comprises a cavity, wherein the rotor is provided inside the cavity. According to this embodiment, an inner surface of the counter element can form a part of the at least one compressor chamber. Due to the centrifugal force acting on the at least one compressor chamber separation element, the contact force between the at least one compressor chamber separation element and the inner surface of the counter element is increased when the rotational speed of the rotor is increased. The compressor chamber separation element adjusting force is configured to be able to act against the centrifugal force to reduce said contact force and therefore to reduce friction in the sliding contact between the at least one compressor chamber separation element and the inner surface of the counter element.

[0014] Alternatively, the rotor comprises a cavity, wherein the counter element is provided inside the cavity. According to this embodiment, an inner surface of the rotor can form a part of the at least one compressor chamber. Since the at least one compressor chamber separation element is provided in or on the rotor, the centrifugal force acting on the at least one compressor chamber separation element due to the rotation of the rotor is heading away from the counter element, causing to release the sliding contact between the at least one compressor chamber separation element and the counter element. Therefore, to keep the at least one compressor chamber separation element and the counter element in sliding contact, the compressor chamber separation element adjusting force is configured to be able to be applied to force the at least one compressor chamber separation element towards the counter element. Further, this embodiment has the advantage, that in comparison with an embodiment wherein the rotor is provided in a cavity of the counter element, the point or the line of the sliding contact between the at least one compressor chamber separation element and the counter element is located at a smaller distance from the axis of rotation of the rotor to the surface of the counter element. Therefore, the relative speed between the at least one compressor chamber separation element and the counter element is reduced due to the geometric and kinematic boundary conditions of this embodiment and therefore friction in the sliding contact is reduced as well.

[0015] Preferably, the at least one compressor chamber is formed by abutting of the at least one compressor chamber separation element at a surface of the counter element. The abutting contact can be configured as a sliding contact, as described above.

[0016] Preferably, the compressor chamber separation element adjusting device is configured to apply the compressor chamber separation element adjusting force to the at least one compressor chamber separation element as a fluidic force, in particular a pneumatic or hydraulic force. Preferably, the compressor chamber separation element adjusting device comprises means for applying the compressor chamber separation element adjusting force to the at least one compressor chamber separation element. In the following, such means are described. More than one of these means can be combined as well.

[0017] Preferably, the compressor chamber separation element adjusting device comprises a control chamber in communication connection with a face of the at least one compressor chamber separation element, wherein the compressor chamber separation element adjusting device is configured to apply a pressure in the control chamber to the face. Therefore said face of the at least one compressor chamber separation element acts as a piston face, wherein the pressure in the control chamber is applied to said face. Due to the application of the pressure on said face, the compressor chamber separation element adjusting force is applied to the at least one compressor chamber separation element. The pressure in the control chamber can act as a high-pressure source and push the at least one compressor chamber separation element and/or act as a low-pressure source and pull the at least one compressor chamber separation element. Whether the at least one compressor chamber separation element is pushed and/or pulled due to the pressure in the control chamber depends in particular on the operating state of the compressor and/or of the arrangement of the rotor, the counter element and the at least one compressor chamber separation element. Preferably, the fluid in the control chamber can be supplied from the high pressure side of the compressor itself. Preferably, the fluid flowing through the fluid channel comprises or consists of the working fluid.

[0018] Preferably, the compressor chamber separation element adjusting device is configured to apply the compressor chamber separation element adjusting force to the at least one compressor chamber separation element as a mechanical force, in particular a preloaded spring force, and/or as a magnetic force and/or as an electric force. These embodiments can be provided additionally or alternatively to the embodiment above relating to the applying of the compressor chamber separation element adjusting force as a fluidic force. Here, a spring can be provided acting on the at least one compressor chamber separation element. Alternatively or additionally, a magnetic force can be applied. In this case, the com-

pressor chamber separation element adjusting device can comprise an electric magnet and/or a permanent magnet and/or an electric motor, in particular a linear motor. Alternatively or additionally, an electric force can be applied. In this case, the compressor chamber separation element adjusting device can comprise electric field generating elements, wherein the at least one compressor chamber separation element is configured to react on the electric fields accordingly.

[0019] The preceding paragraphs show several possibilities to apply the compressor chamber separation element adjusting force to the at least one compressor chamber separation element. These embodiments can also be combined. Further, the compressor chamber separation element adjusting device is preferably configured to actively control the applying of the compressor chamber separation element adjusting force. In particular, the compressor chamber separation element adjusting device comprises means to control the pressure in the control chamber and/or to release the spring and/or to control an electric current and/or a magnetic flow for applying the electric and/or magnetic force.

[0020] Preferably, the compressor chamber separation element adjusting device is configured to apply the compressor chamber separation element adjusting force to the at least one compressor chamber separation element according to the compressor chamber separation element moving direction and/or against the compressor chamber separation element moving direction. In particular, this is realised according to one or more of the embodiments described above.

[0021] Preferably, the at least one compressor chamber separation element comprises a fluid channel and at least one compressor chamber separation element aperture on the surface of the at least one compressor chamber separation element, wherein the at least one compressor chamber separation element aperture is configured to form a fluid buffer from outflowing fluid between the at least one compressor chamber separation element and the counter element, preferably in the sliding contact between the at least one compressor chamber separation element and the counter element. The fluid buffer can act as a sealing element between the at least one compressor chamber separation element and the counter element, wherein a locally limited zone of high pressure is generated by the fluid buffer, wherein a blow-by from the at least one compressor chamber through the sliding contact is avoided. Additionally or alternatively, by forming the fluid buffer between the at least one compressor chamber separation element and the counter element both elements can be separated from each other, that means they are spaced from each other, wherein the friction in this contact, which is no longer a contact, in particular no longer a sliding contact, in this operating state of the compressor, is reduced, respectively completely avoided. The fluid flowing through the fluid channel is preferably supplied from the high pressure side of the compressor. Preferably, the fluid flowing through the fluid channel comprises or consists of the working fluid. Further preferably, the compressor chamber separation element aperture and the counter element are configured that the fluid flowing through the fluid channel is supported to at least one compressor chamber which is adjacent to the compressor chamber separation element aperture.

[0022] For driving the rotor, the compressor preferably comprises a motor, in particular an electric motor, wherein the rotor is driven directly or via a transmission by the motor.

[0023] Preferably, the counter element is configured as a stator. Alternatively, the counter element is configured to rotate around a counter element rotation axis in the same rotating direction as the rotor, wherein preferably, the counter element is configured to rotate with the same rotational speed as the rotor. By rotation of the counter element, the relative speed between the at least one compressor chamber separation element, which rotates with the rotational speed of the rotor, and the counter element can be reduced, wherein friction, in particular in the sliding contact, is reduced. Preferably, the compressor is configured to reduce the relative speed between the at least one compressor chamber separation element and the counter element to zero speed in at least one angular point around the rotation axis of the rotor. For rotating the counter element, the compressor preferably comprises a motor, in particular an electric motor, which is further preferably configured to drive the rotor as well.

[0024] Preferably, the compressor is configured as a rotary vane compressor, wherein the at least one compressor chamber separation element acts as at least one rotary vane or blade.

[0025] Preferably, the compressor is configured as a lubricant-free compressor, in particular as an oil-free compressor. Since the compressor is configured according to one or more of the embodiments described above, friction in the compressor is reduced. This can allow to provide a compressor, which has such a reduced friction so that no lubrication is needed.

[0026] Preferably, the compressor chamber separation element adjusting device is configured to actively control the compressor chamber separation element adjusting force according to a current operating state of the compressor. Since the contact between the counter element and the at least one compressor chamber separation element depends on the centrifugal force due to the rotation of the rotor, the compressor chamber separation element adjusting device preferably comprises measuring means, in particular comprising a rotation sensor, to measure the rotational speed of the rotor. According to the rotational speed of the rotor the amount of the compressor chamber separation element adjusting force can be determined, which in particular has to act against the centrifugal force acting on the at least one compressor chamber separation element. Additionally or alternatively, the pressure on the high and/or on the low

pressure side can be taken into account. Therefore, the compressor chamber separation element adjusting device preferably comprises pressure sensing means. The operating state of the compressor can therefore be described by the rotational speed of the rotor and/or of the counter element and/or by the pressure on the high pressure side and/or on the low pressure side. Additionally or alternatively, a current and/or a voltage of an electric motor are taken into account to calculate the rotation and the operating state of the compressor.

[0027] Further preferably, the compressor chamber separation element adjusting device comprises electric and/or electronic operating means. In particular, these means are configured to determine a target compressor chamber separation element adjusting force and to control the compressor chamber separation element adjusting force according to the operating state of the compressor.

[0028] Preferably, the electric and/or electronic operating means are configured to operate the compressor according to the method according to the invention, which is described later.

[0029] Preferably, the compressor is configured to supply working fluid to a fuel cell and/or to a fluid system, in particular to a fuel cell and/or to a fluid system of a vehicle as described in the following paragraph. In particular, the supplied working fluid can contain or consist of air or fuel, in particular hydrogen or methane.

[0030] According to a further aspect of the invention, a vehicle is provided, comprising a compressor as described above, wherein

the vehicle is configured as a commercial vehicle, a truck, a trailer, a combination of a towing vehicle connected with a trailer, a bus and/or as a utility vehicle, and/or wherein
the vehicle is configured as a conventional, hybrid or electric vehicle, and/or wherein
the vehicle comprises a fuel cell and/or a fluid system, in particular a brake system and/or a suspension system, wherein the compressor is preferably configured to supply working fluid to the fuel cell and/or to the fluid system; and/or wherein
the compressor is configured to supply fluid to a fluid system of a trailer, which can be connected to the vehicle.

[0031] According to a further aspect of the invention, a method for controlling a compressor as described above is provided, wherein the method comprises the steps:

- determining a current operating state of the compressor;
- adjusting the compressor chamber separation element adjusting force to the at least one compressor chamber separation element according to the current operating state of the compressor.

[0032] Preferably, the method is carried out by electric and/or electronic operating means of the compressor.

[0033] Further, it is clear for a person skilled in the art that aspects relating to the vehicle or to the method, which were described in the part of the description relating to the compressor itself, are meant to be optional features of the vehicle and/or of the method.

[0034] In the following, preferred embodiments of the invention are described by referring to the attached drawings.

Fig. 1 shows a first embodiment of the invention.

Fig. 2 shows a second embodiment of the invention.

Fig. 3 shows a sectional view of a compressor chamber separation element with a fluid channel inside.

Fig. 1 shows a first embodiment of the invention.

[0035] A compressor 1 is shown in a sectional view. The compressor 1 comprises a rotor 2 with a cavity inside, wherein the rotor 2 is configured to rotate around a rotation axis 7, which is perpendicular oriented to the drawing plane. In said cavity a counter element 3 is provided.

[0036] The rotor 2 comprises five compressor chamber separation elements 4 which are provided regularly spaced around the rotor 2. Each compressor chamber separation element 4 is configured to be moveable in parallel to a compressor chamber separation element moving direction 8, which is only shown for the upper compressor chamber separation element 4 to keep the drawing simple. The one end of each compressor chamber separation element 4 ending in the cavity of the rotor 2 abuts to the surface of the counter element 3. Therefore, the inner surface of the rotor 2, the surface of the counter element and two compressor chamber separation elements 4 form a compressor chamber 5.

[0037] Further, the compressor 1 comprises compressor chamber separation element adjusting devices 9, which are assigned to the compressor chamber separation elements 4. Said compressor chamber separation element adjusting devices 9 can apply a compressor chamber separation element adjusting force to the at least one compressor chamber separation element 4 in parallel to the compressor chamber separation element moving direction 8. For applying the compressor chamber separation element adjusting force, said compressor chamber separation element adjusting devices 9 can comprise a control chamber as described above, wherein fluid supplied to the control chamber can be working fluid from the high pressure side of the compressor 1. Additionally or alternatively, the compressor chamber separation element adjusting devices 9 can comprise mechanic, magnetic and/or electric means as described above.

[0038] By the compressor chamber separation element adjusting devices 9 the contact between the com-

pressor chamber separation elements 4 and the counter element 3 can be controlled. As the centrifugal force due to the rotation of the rotor 2 acts on the compressor chamber separation elements 4 against the compressor chamber separation element moving direction 8, the compressor chamber separation element adjusting devices 9 can act against this force and keep the ends of the compressor chamber separation elements 4 in the cavity of the rotor 2 in contact with the surface of the counter element 3 to seal the compressor chambers 5 against each other.

[0039] The compressor chamber separation element adjusting devices 9 can comprise electric and/or electronic means for controlling the application of the compressor chamber separation element adjusting force as described above and/or measuring means to determine the operating state of the compressor as described above.

[0040] **Fig. 2** shows a second embodiment of the invention. Here, the rotor 2 is provided in a cavity of the counter element 3, wherein the compressor chamber separation elements 4 are provided in the rotor 2 and movable in parallel to the compressor chamber separation element moving direction 8.

[0041] Here, five compressor chamber separation element adjusting devices 9 are provided in the rotor 2 and assigned to the compressor chamber separation elements 4, accordingly. The compressor chamber separation element adjusting devices 9 are configured to apply a compressor chamber separation element adjusting force to the compressor chamber separation elements 4 in parallel to the compressor chamber separation element moving direction 8.

[0042] Since the compressor chamber separation elements 4 are moved outwards to the inner surface of the counter element 3 due to the centrifugal force caused by the rotation of the rotor 2, friction in the contact between the counter element 3 and the compressor chamber separation elements 4 can be reduced by a compressor chamber separation element adjusting force applied by the respective compressor chamber separation element adjusting device 9 pulling the compressor chamber separation elements 4 away from the inner surface of the counter element 3. Further, when the rotational speed of the rotor 2 is low, wherein the centrifugal force acting in the compressor chamber separation elements 4 does not cause a sufficient sealing of the compressor chambers 5 in the contact between the compressor chamber separation elements 4 and the counter element 3, the compressor chamber separation element adjusting device 9 can apply a compressor chamber separation element adjusting force to the compressor chamber separation elements 4 to press them against the counter element 3 to increase the sealing.

[0043] The compressor chamber separation element adjusting device 9 can be configured as the compressor chamber separation element adjusting device 9 according to Fig. 1 to apply the compressor chamber separation element adjusting force to the compressor chamber separation elements 4.

[0044] The compressor chamber separation element adjusting devices 9 can comprise electric and/or electronic means for controlling the application of the compressor chamber separation element adjusting force as described above and/or measuring means to determine the operating state of the compressor as described above.

[0045] **Fig. 3** shows a sectional view of compressor chamber separation element with a fluid channel inside.

[0046] A sectional view of a compressor chamber separation element 4 is shown heading to the surface of a counter element 3. On the left and right side of the compressor chamber separation element 4, compressor chambers 5 are formed, for example in by a counter element 3, a rotor 2 and a further compressor chamber separation element 4 according to Fig. 1 or Fig. 2. The compressor chamber separation element 4 comprises a fluid channel 6 inside, which ends towards the surface of the counter element 3 in a compressor chamber separation element aperture 10, wherein fluid, in particular working fluid, can flow through the fluid channel 6 and be blown out through the compressor chamber separation element aperture 10 as indicated by the arrows in the drawing.

[0047] When the pressure of the fluid flowing out the compressor chamber separation element aperture 10 is high enough, a fluid buffer 11 is formed between the compressor chamber separation element 4 and the counter element 3, causing the compressor chamber separation element 4 to lift off from the counter element 3 or to be spaced from the counter element 3, wherein friction in this contact is reduced. The area of the fluid buffer 11 is marked-up by a dotted frame in the drawing. Further, the fluid buffer 11 can act as a sealing between the compressor chambers 5, when the pressure of the fluid buffer is high enough.

[0048] As it is shown by the arrows in the drawing indicating the fluid direction, the fluid flows in the adjacent compressor chambers 5 on the left and right of the compressor chamber separation element 4.

[0049] For example, the fluid flowing through the fluid channel can be taken from the high pressure side of the compressor.

[0050] The embodiments shown in Fig. 1 and 2 each show a counter element 3 that is fixed. It acts as a stator. To reduce the relative movement between the compressor chamber separation elements 4 and the counter element 3 further embodiments comprise counter elements 3 that are configured to rotate around a counter element rotation axis in the same rotation direction as the rotor 2. Thereby, the relative speed between the compressor chamber separation elements 4 and the counter element 3 is reduced and therefore, friction in this contact is further reduced.

[0051] Further, Fig. 1 and Fig. 2 show sectional views of compressors 1. Since in the drawings no inlet or outlet port is shown, it is clear for a person skilled in the art that

such ports can for example be arranged in the drawing plane, for example in the counter element 3 or in front of or behind the drawing plane. To keep the drawings simple, such ports are not shown here.

LIST OF REFERENCE SIGNS

[0052]

1	compressor
2	rotor
3	counter element
4	compressor chamber separation element
5	compressor chamber
6	fluid channel
7	rotation axis
8	compressor chamber separation element moving direction
9	compressor chamber separation element adjusting device
10	compressor chamber separation element aperture
11	fluid buffer

Claims

1. Compressor (1) for supplying a working fluid, wherein

the compressor (1) comprises:

- a low pressure side with an inlet port;
- a high pressure side with an outlet port;
- a rotor (2), configured to rotate around a rotation axis (7);
- a counter element (3), and
- at least one compressor chamber separation element (4), which

is provided in or on the rotor (2) and configured to be movable along a compressor chamber separation element moving direction (8) towards the counter element (3), wherein
the rotor (2), the counter element (3) and the at least one compressor chamber separation element (4) are configured to form at least one compressor chamber (5), which can be set in communicating connection with the low pressure side and the high pressure side according to the rotation of the rotor (2), wherein
the compressor (1) is configured to increase the volume of the at least one compressor chamber (5) when the at least one compressor chamber (5) is in communicating connection with the low pressure side and to reduce the volume of the at least one compressor chamber (5) when the at least one compressor chamber (5) is in communicating connection with the high pressure side when the rotor (2) rotates around the rotation axis (7), wherein
the compressor (1) further comprises a compressor chamber separation element adjusting device (9) configured to apply a compressor chamber separation element adjusting force to the at least one compressor chamber separation element (4) in parallel to the counter element moving direction (8).

2. Compressor (1) according to claim 1, wherein
the counter element (3) comprises a cavity the rotor (2) is provided inside.

3. Compressor (1) according to claim 1, wherein
the rotor (2) comprises a cavity the counter element (3) is provided inside.

4. Compressor (1) according to one of the preceding claims, wherein
the at least one compressor chamber (5) is formed by abutting of the at least one compressor chamber separation element (4) at a surface of the counter element (3).

5. Compressor (1) according to one of the preceding claims, wherein
the compressor chamber separation element adjusting device (9) is configured to apply the compressor chamber separation element adjusting force to the at least one compressor chamber separation element (4) as a fluidic force, in particular a pneumatic or hydraulic force.

6. Compressor (1) according to claim 5, wherein
the compressor chamber separation element adjusting device (9) comprises a control chamber in communication connection with a face of the at least one compressor chamber separation element (4) wherein, the compressor chamber separation element adjusting device (9) is configured to apply the pressure in the control chamber to the face

7. Compressor (1) according to one of the preceding claims, wherein
the compressor chamber separation element adjusting device (9) is configured to apply the compressor chamber separation element adjusting force to the at least one compressor chamber separation element (4) as a mechanical force, in particular a preloaded spring force, and/or as a magnetic force and/or as an electric force.

8. Compressor (1) according to one of the preceding claims, wherein
the compressor chamber separation element adjusting device (9) is configured to apply the compressor chamber separation element adjusting force to the

at least one compressor chamber separation element (4) according to the compressor chamber separation element moving direction (8) and/or against the compressor chamber separation element moving direction (8).

9. Compressor (1) according to one of the preceding claims, wherein
the at least one compressor chamber separation element (4) comprises a fluid channel (6) and at least one compressor chamber separation element aperture (10) on the surface of the at least one compressor chamber separation element (4), wherein the at least one compressor chamber separation element aperture (10) is configured to form a fluid buffer (11) from outflowing fluid between the at least one compressor chamber separation element (4) and the counter element (3).

10. Compressor (1) according to one of the preceding claims, wherein
the counter element (3) is configured as a stator or configured to rotate around a counter element rotation axis in the same rotating direction as the rotor (2), wherein preferably, the counter element (3) is configured to rotate with the same rotational speed as the rotor (2).

11. Compressor (1) according to one of the preceding claims, wherein
the compressor (1) is configured as a rotary vane compressor, wherein the at least one compressor chamber separation element (4) acts as at least one rotary vane.

12. Compressor (1) according to one of the preceding claims, wherein
the compressor (1) is configured as a lubricant-free compressor, in particular as an oil-free compressor.

13. Compressor (1) according to one of the preceding claims, wherein
the compressor chamber separation element adjusting device (9) is configured to actively control the compressor chamber separation element adjusting force according to a current operating state of the compressor (1).

14. Vehicle, comprising a compressor (1) according to one of the claims 1 to 13, wherein

the vehicle is configured as a commercial vehicle, a truck, a trailer, a combination of a towing vehicle connected with a trailer, a bus and/or as a utility vehicle, and/or wherein
the vehicle is configured as a conventional, hybrid or electric vehicle, and/or
wherein

the vehicle comprises a fuel cell and/or a fluid system, in particular a brake system and/or a suspension system, wherein the compressor (1) is preferably configured to supply working fluid to the fuel cell and/or to the fluid system; and/or wherein
the compressor (1) is configured to supply fluid to a fluid system of a trailer, which can be connected to the vehicle.

15. Method for controlling a compressor (1) according to one of the claims 1 to 13 comprising the steps:

- determining a current operating state of the compressor (1);
- applying the compressor chamber separation element adjusting force to the at least one compressor chamber separation element (4) according to the current operating state of the compressor (1).

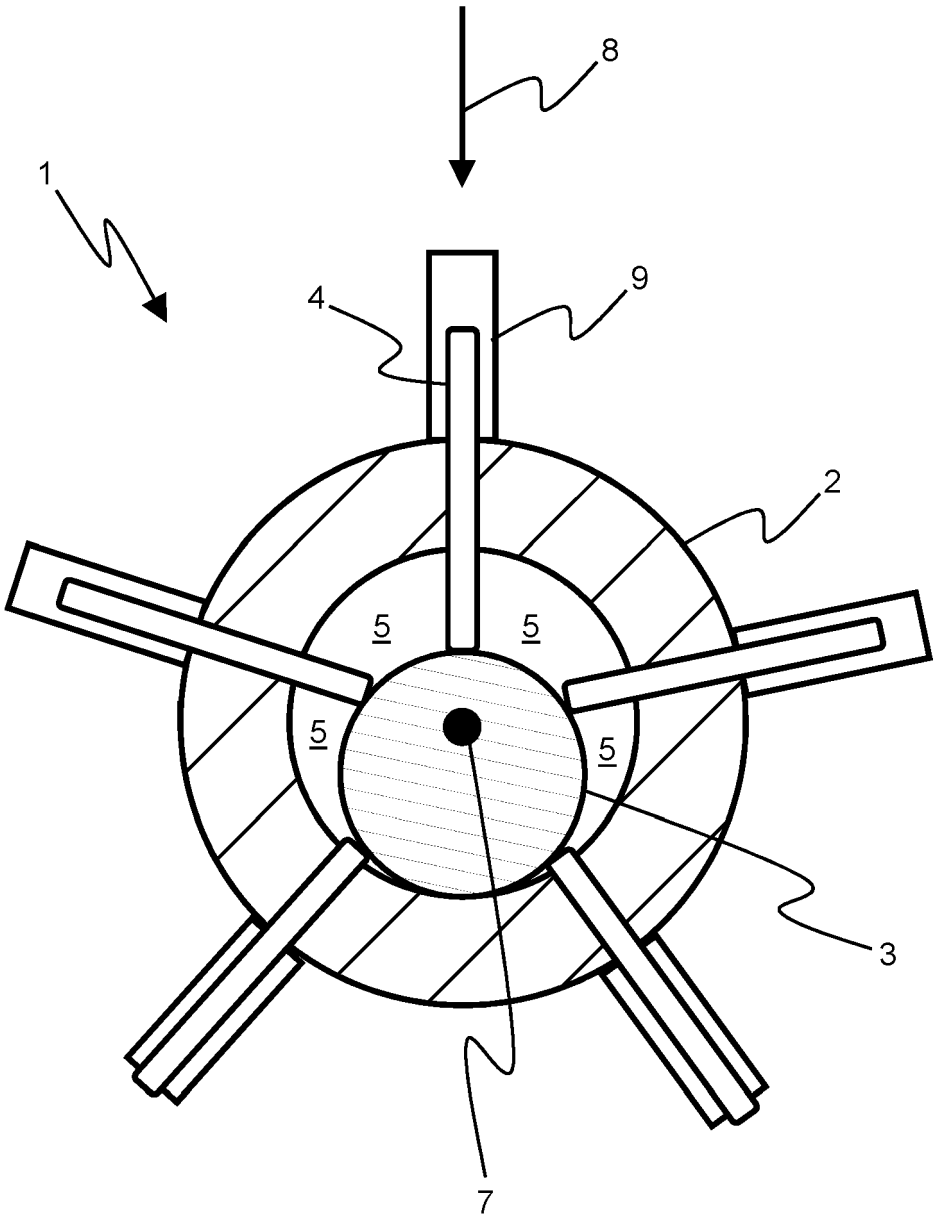

Fig. 1

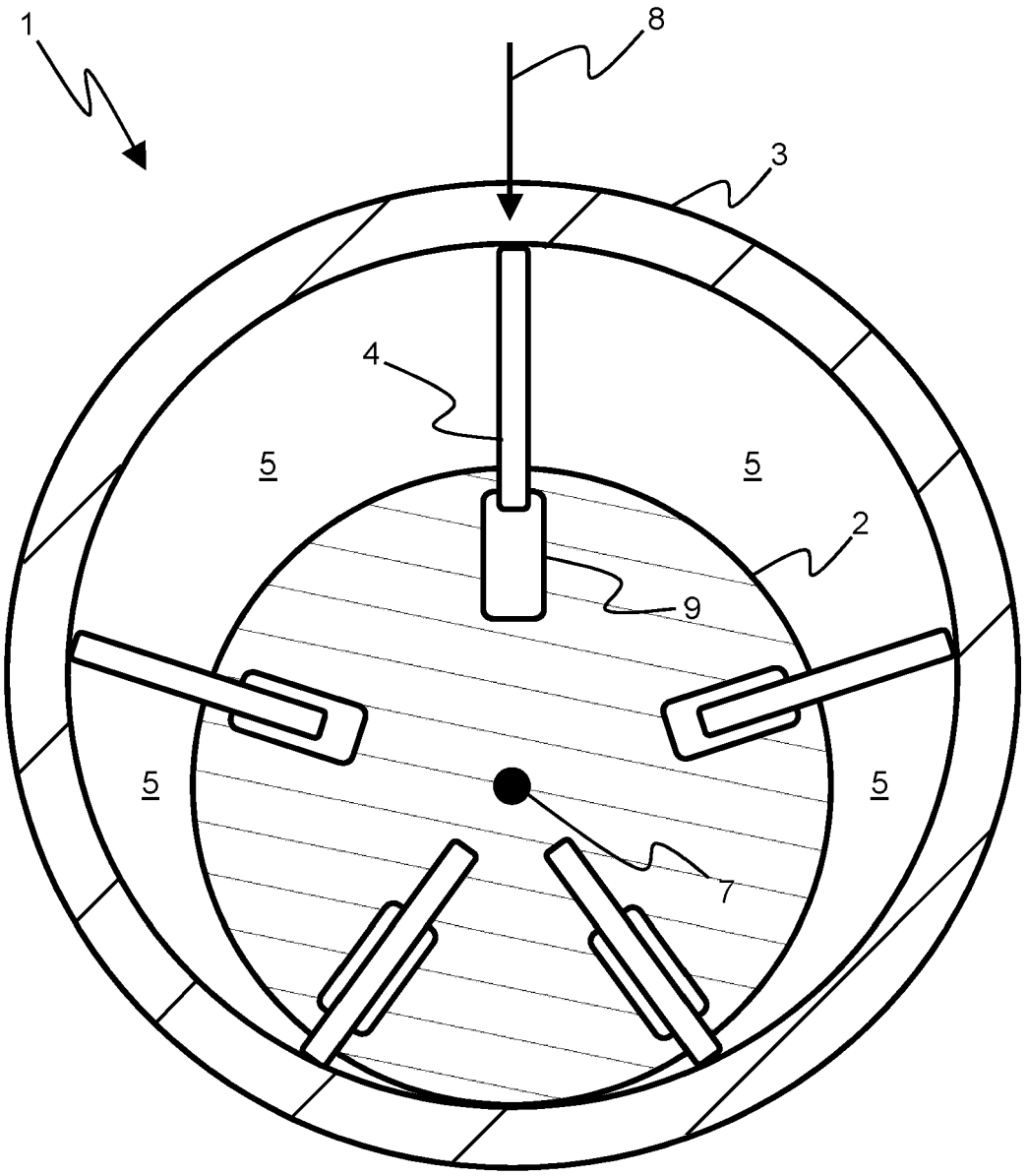

Fig. 2

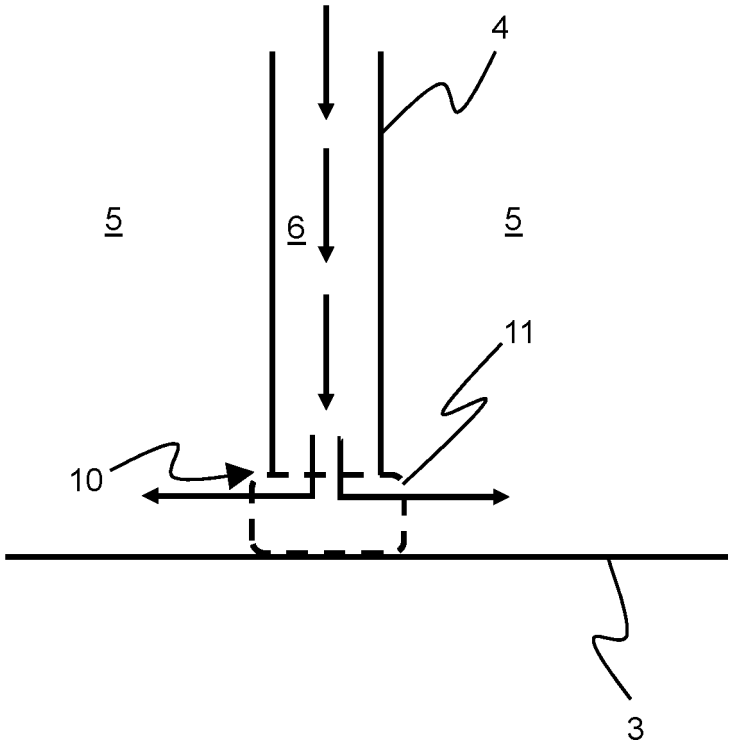

Fig. 3

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Application Number
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1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 March 2022	Sbresny, Heiko

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