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(54) ADJUSTMENT MECHANISM FOR AN INLET FLOW SECTION OF A COMPRESSOR WHEEL OF A TURBOCHARGER

VERSTELLMECHANISMUS FÜR EINEN EINLASSSTRÖMUNGSABSCHNITT EINES VERDICHTERRADES EINES TURBOLADERS

MÉCANISME DE RÉGLAGE D’UNE SECTION D’ÉCOULEMENT D’ENTRÉE D’UNE ROUE DE COMPRESSEUR D’UN TURBOCOMPRESSEUR

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Description

Background of the invention

Field of the Invention

[0001] The invention relates to an adjustment mechanism for an inlet flow section of a compressor wheel of a turbocharger for defining a variable inlet.

Description of the Background Art

[0002] German Patent Application DE 10 2004 003 206 A1 relates to a compressor which is mounted in the intake tract of an internal combustion engine. A compressor wheel of the compressor is rotatably received in an axial compressor inlet channel. The compressor wheel compresses to an increased boost pressure the combustion air which is supplied to the axial compressor inlet channel from a combustion air channel through at least one axial air opening mounted upstream of the compressor wheel. The cross-section of the combustion air channel or the flow in the combustion air channel can be adjusted. At least one radial air opening is disposed in the opening area of said compressor inlet channel and has an adjustable cross-section of flow, thereby supplying combustion air and driving the compressor wheel. The cross-sections of flow of the axial air opening and the radial air opening can be adjusted by means of adjustable locking elements that can be actuated by means of at least one actuator. The compressor is additionally provided with a regulating device which, if the actuator is not operating or disabled, automatically brings the locking elements in a position in which the axial air opening and/or the radial air opening has a defined cross-section of flow.

[0003] German Patent Application DE 102 24 051 A1 relates to a mechanism for adjusting the setting of an exhaust turbo charger unit of a motor vehicle. The exhaust turbo charger has a setting motor in order to obtain at least a variable turbine geometry. The setting motor with a transmission moves the setting unit between two end positions. The transmission has levers linked together by swivel joints. The assembly has at least one spring to move the setting unit into a given position when the setting motor power supply is cut.

[0004] US patent application US 2016/0123333 discloses a centrifugal compressor for a turbocharger which includes an inlet-adjustment mechanism in an air inlet for the compressor. The inlet-adjustment mechanism is operable to move between an open position and a closed position in the air inlet. The inlet-adjustment mechanism includes an axially elongated ring. In the open position, the radially outer surface of the ring is spaced from a tapering inner surface of the air inlet so that air can flow in an annular passage between the tapering surface and the ring. In the closed position, the ring abuts the tapering surface to close off the annular passage, whereby the effective inlet diameter is then defined by the inner diameter of the ring at its trailing edge. Movement of the inlet-adjustment mechanism from the open position to the closed position is effective to shift the compressor's surge line to lower flow rates.

[0005] US patent application US 2016/0146099 discloses a centrifugal compressor for a turbocharger which includes an inlet-adjustment mechanism in an air inlet for the compressor, operable to move between an open position and a closed position in the air inlet. The inlet-adjustment mechanism includes a variable-geometry conical mechanism comprising a plurality of vanes that, in the closed position, collectively form a frusto-conical inlet member having a trailing edge inner diameter that is smaller than an inner diameter of the shroud surface of the compressor housing at the inducer portion of the compressor wheel such that an effective diameter of the air inlet at the inducer portion is determined by the trailing edge inner diameter of the variable-geometry conical mechanism. The vanes in the open position are pivoted radially outwardly so as to increase the trailing edge inner diameter of the inlet member and thereby increase the effective diameter of the air inlet at the inducer portion.

[0006] US patent application US 2016/0177956 discloses a centrifugal compressor for a turbocharger which includes an inlet-adjustment mechanism in an air inlet for the compressor, operable to move between an open position and a closed position in the air inlet. The inlet-adjustment mechanism includes a variable-geometry orifice actuated by a rotatable actuator ring. In the closed position, the orifice's inner diameter is smaller than that of a shroud surface of the compressor housing and therefore dictates the effective inlet diameter for the compressor. In the open position, the orifice no longer forms an inner diameter smaller than the shroud surface, so that the effective inlet diameter is determined by the shroud surface.

[0007] US patent US 3,787,022 relates to an iris check valve having vane plates. Each vane plate is connected to a housing of the check valve by a respective spring.

[0008] International publication WO 2018/200611 A1 relates to an adjusting mechanism for a compressor of a charging device. The adjusting mechanism has a trimming device with a plurality of vanes coupled to adjusting elements. The vanes may be biased radially outward, for example by a spring. US patent application US2017298953A1 discloses another inlet-adjustment mechanism representing the technical background of the invention.

Summary of the invention

[0009] It is therefore an object of the present invention to provide an adjustment mechanism for an air inlet flow section of a compressor wheel of a turbocharger which has a reliable failsafe function for the vanes of the adjustment mechanism.

[0010] The above object is achieved by an adjustment mechanism for an air inlet flow section of a compressor wheel of a turbocharger which comprises the features of claim 1.

[0011] In an exemplary embodiment of the present invention, an adjustment mechanism for an air inlet flow section of a compressor wheel of a turbocharger is configured to define a variable inlet diameter for an axial air flow to the compressor wheel. The adjustment mechanism has a unison ring, which is arranged in the axial air flow prior to the compressor wheel. The adjustment mechanism further comprises a plurality of movable vanes. The vanes are mounted pivotable and are mechanically linked to the unison ring.

[0012] The adjustment mechanism also comprises an actuator for providing a first pivoting motion to the unison ring. The first pivoting motion takes place around a central axis of the adjustment mechanism and thereby provides a second pivoting motion to the plurality of vanes. At least one elastic biasing means is arranged such that it provides, upon the first pivoting motion to the unison ring, a restoring force to the unison ring and/or the plurality of vanes.

[0013] At least one of the at least one elastic biasing means is arranged between the unison ring and each of the plurality of vanes. This at least one elastic biasing means can be a second spring element. Upon rotation or the first pivoting motion of the unison ring, the elastic biasing means, which is applied between the unison ring and each of the vanes, provides the restoring force for the vanes. The restoring force for the vanes is sufficiently large in order to move the unison ring as well into the initial position. Consequently, the vanes are moved back into the initial position.

[0014] The advantage of the adjustment mechanism according to the invention is that the restoring force for the vanes is available even at a failure of the actuator which positions the vanes during a proper operation. In case of a fault, for example caused by a malfunctioning actuator for the vanes, the restoring force enables that a damage of the turbo charger is avoided.

[0015] According to a further embodiment of the invention, at least one of the at least one elastic biasing means is attached to the unison ring and a housing of the turbocharger, and at least one of the at least one elastic biasing means is arranged between the unison ring and each of the plurality of vanes. The at least one elastic biasing means which connects the unison ring and the housing of the turbocharger can be a first spring element. The elastic biasing means connecting each vane to the unison ring may be a second spring element. Together, the first spring element and the second spring element provide sufficient restoring force to move the plurality of vanes and the unison ring back into the initial position.

[0016] The initial position is defined by the not powered actuator, which means that the vanes are in a position that the inlet diameter of the air inlet flow section is at a maximal size. As a consequence, the air is not guided by the vanes to the compressor wheel.

[0017] In all embodiments of the invention, each vane is mounted pivotably about a corresponding pivot point and each vane is mechanically linked to an inner circumference of the unison ring. In an exemplary embodiment, the mechanical link of each vane and the unison ring is provided by a corresponding nose of each vane. Each nose reaches in a corresponding recess formed at the inner circumference of the unison ring.

[0018] The present invention further provides a turbocharger having an adjustment mechanism according to any embodiment according to the invention as described herein.

[0019] Additionally, the present invention provides a vehicle with an internal combustion engine having a turbocharger, which is equipped with an adjustment mechanism according to any embodiment according to the invention as described herein.

[0020] Further features, objects and advantages of the present invention will now be explained in greater detail in the following description which should not be regarded as limiting the invention and which refers to the accompanying figures. Same reference numbers refer to same elements throughout the various figures and are not explained repeatedly.

Brief description of the drawings

[0021]

FIG. 1 shows a top view of an embodiment of the turbocharger according to the invention, looking at the compressor wheel.

FIG. 2 is a cross-sectional view of the turbocharger taken along the cutting line B-B in FIG. 1.

FIG. 3 shows a schematic top view of an example of an adjustment mechanism not part of the invention.

FIG. 4 shows a schematic top view of a first embodiment of an adjustment mechanism according to the invention.

FIG. 5 shows a schematic top view of a second embodiment of an adjustment mechanism according to the invention.

FIG. 6 shows a perspective view of a housing part of the turbocharger according to an embodiment of the invention, wherein the adjustment mechanism is positioned in the axial direction prior to the compressor wheel (not shown here) of the turbocharger.

FIG. 7 is a schematic side view of a motor vehicle using an embodiment of the turbo charger according to the invention.

Detailed description

[0022] Same reference numerals refer to same elements or elements of similar function throughout the various figures. Furthermore, only reference numerals necessary for the description of the respective figure are shown in the figures. The shown embodiments represent only examples of how the invention can be carried out. This should not be regarded as a limitation of the invention.

[0023] **FIG. 1** is a top view of an embodiment of the turbocharger 1 according to the invention, looking at a compressor wheel 5 of the turbocharger 1. In the embodiment shown, the compressor wheel 5 is positioned in an air inlet flow section 9 of the turbocharger 1. A volute 6, which is defined by a housing 15, surrounds the compressor wheel 5 and receives the compressed air from the compressor wheel 5. The compressor wheel 5 rotates about a central axis A. An actuator 12 is used to adjust the flow of air to the compressor wheel 5 by varying an inlet diameter D (see Fig. 2) of the air inlet flow section 9. With the actuator 12, the position of vanes 20 of an adjustment mechanism 10 is changed, which regulates, by varying the inlet diameter D, an inflow cross-section of air to the compressor wheel 5 of the turbocharger 1.

[0024] **FIG. 2** is a cross-sectional view of the turbocharger 1 taken along the cutting line B-B in FIG. 1. A turbine wheel 3 and the compressor wheel 5 are both mounted on a rotatable shaft 7 inside the housing 15. A volute 4, formed by the housing 15, surrounds the turbine wheel 3 in order to guide the exhaust gas to the turbine wheel 3. The exhaust gas causes a rotation of the turbine wheel 3 and via the common shaft 7 a rotation of the compressor wheel 5. An inlet 13 provides a fluid connection of the volute 4 with the turbine wheel 3. A support 25 carries movable vanes 27 in order to regulate the flow of exhaust gas from the volute 4 to the turbine wheel 3. The exhaust gas exits the turbocharger 1 via an axial exhaust flow 8A through an exhaust outlet 8.

[0025] An air inlet 9, formed by the housing 15 of the turbocharger 1, allows fresh air to reach the compressor wheel 5 via an axial air flow 9A. Prior to arriving at the compressor wheel 5, the axial air flow 9A (fresh air) has to pass an adjustment mechanism 10, which is positioned in the axial air flow 9A prior to the compressor wheel 5. The adjustment mechanism 10 has a plurality of vanes 20, which are pivotably mounted to a unison ring 11. With the movement of the vanes 20 an inlet diameter D of the air inlet 9 is adjusted. From the compressor wheel 5 the compressed air enters the volute 6, which surrounds the compressor wheel 5.

[0026] An example of an adjustment mechanism 10 not part of the invention is shown in a schematic top view in **FIG. 3.** The adjustment mechanism 10 for an air inlet flow section of the compressor wheel 5 of a turbocharger 1 (see FIG. 1 or 2) comprises the unison ring 11 and a plurality of vanes 20, which are mounted pivotable and are mechanically linked to the unison ring 11. An actuator 12 is used in order to impress a first rotating or pivoting motion P11 on the unison ring 11. The first rotating or pivoting motion P11 of the unison ring 11 causes the plurality of vanes 20 each to carry out a second pivoting motion P20 around a corresponding pivot point 21. The vanes 20, shown in dashed lines, represent the position of the vanes 20 after the first pivoting motion P11 of the unison ring 11 has been performed. The second pivoting motion P20 of the vanes 20 regulates the inlet diameter D of the axial air flow 9A of air to the compressor wheel 3 (see FIG. 2). The compressor wheel 5 rotates around the central axis A and compresses the air.

[0027] In the example as shown in FIG. 3, each vane 20 has a nose 22 which reaches in and or engages with a corresponding recess 14 of the unison ring 11 to effect the second pivoting motion P20 of the vanes 20. The recesses 14 are formed at an inner circumference 17 of the unison ring 11. Due to the at least one nose 22, the first pivoting motion P11 of the unison ring 11 causes the pivoting motion P20 of the vanes 20.

[0028] According to the example shown in FIG. 3, at least one elastic biasing means 30 is attached to the unison ring 11 and the housing 15 of the turbocharger 1. Upon operation of the actuator 12, the biasing means 30 causes a restoring force F12. The restoring force F12 causes the unison ring 11 to pivot in the opposite direction of the first pivoting motion P11, which, in the event of failure of the actuator 12, returns the vanes 20 back into the initial position (solid lines). Preferably, the at least one elastic biasing means 30 is a first spring element 31.

[0029] **FIG. 4** shows a schematic top view of a first embodiment of the adjustment mechanism 10 according to the present invention. The difference to the example as shown in FIG. 3 is that at least one elastic biasing means 30 is arranged between the unison ring 11 and each of the plurality of vanes 20. There is no elastic biasing means 30 arranged between the unison ring 11 and the housing 15 (not shown here) of the turbocharger 1. As mentioned in the description of FIG. 3, the actuator 12 impresses a first rotating or pivoting motion P11 on the unison ring 11. The first rotating or pivoting motion P11 of the unison ring 11 causes the plurality of vanes 20 to carry out the second pivoting motion P20 around the pivot point 21. The respective nose 22 of each vane 20, which reaches in and/or engages with a corresponding recess 14 of the unison ring 11, causes the second pivoting motion P20 of the vanes 20. Due to the second pivoting motion P20 of the vanes 20, the at least one elastic biasing means 30 between the unison ring 11 and each vane 20 is biased and causes a restoring force F12. The sum of the restoring forces F12 is sufficiently large that the unison ring 11 can be moved back into the initial position, if, for example, the actuator 12 fails during operation. Preferably, the at least one elastic biasing means, between the unison ring 11 and each vane 20 of the adjustment mechanism 10, is a second spring element 32.

[0030] **FIG. 5** shows a schematic top view of a second embodiment of the adjustment mechanism 10 according to the invention. Here, the at least one elastic biasing means 30 is attached to the unison ring 11 and the housing 15 of the turbocharger 1, and at least one elastic biasing means 30 is arranged between the unison ring 11 and each of the plurality of vanes 20. The at least one elastic biasing means 30 between the unison ring 11 and the housing 15 and the at least one elastic biasing means 30 between each vane 10 and the unison ring 11 provide a common restoring force F12. The common restoring force F12 is sufficiently large that the unison ring 11 can be moved back into the initial position, if, for example, the actuator 12 fails during operation. Preferably, the at least one elastic biasing means, between the unison ring 11 and each vane 20 of the adjustment mechanism 10, is a second spring element 32, and the at least one elastic biasing means 30 between the unison ring 11 and the housing or the turbocharger 1 is a first spring element 31.

[0031] The description of FIGS. 3 to 5 show three vanes 20 which are part of the example of an adjustment mechanism and embodiments of the adjustment mechanism 10 according to the invention, respectively. However, the number of vanes 20 is used for descriptive purposes only and should not be construed as a limitation of the invention. It is obvious to a skilled person that any number of more than two vanes can be used to practice the invention.

[0032] **FIG. 6** shows a perspective view of a housing 15 part of the turbocharger 1 according to an embodiment of the invention, wherein the adjustment mechanism 10 is arranged prior to the compressor wheel 5 (not shown here) in the air inlet flow section 9 of the turbocharger 1. The actuator 12 is mounted to the housing 15 of the turbocharger 1. A link 23 connects the actuator 12 to the unison ring 11. A recess 16 is formed in the housing 15 in order to provide space for the movement of the connection of the link 23 and the unison ring 11. The adjustment mechanism 10 is surrounded by the housing 15 and, upon action of the actuator 12, carries out the first pivoting motion P11 (for example see FIG. 3). Each vane 20 is pivotably mounted about a corresponding pivot point 21 to the housing 15 of the turbocharger 1. As mentioned in the description of FIGS. 3 to 5, a nose 22 of each vane 20 cooperates with a respective recess 14 of the unison ring 11. A volute 6 surrounds the compressor wheel 5 (not shown here) to receive the compressed air. The form of the vanes 20 is designed such that they are in line with the aerodynamic requirements within the air inlet flow section 9 of the turbocharger 1 to effectively guide and concentrate the axial air flow 9a to the compressor wheel 5.

[0033] **FIG. 7** is a schematic side view of a motor vehicle 100 using an embodiment of the turbocharger 1 according to the invention. The motor vehicle 100 has an internal combustion engine 102 which is equipped with any embodiment of the turbocharger 1 according to the invention. The turbocharger 1 according to the invention provides a fail-safe function, which still allows a safe driving in case of a malfunction of the turbocharger 1. The vanes 20 in the exhaust part of the turbocharger 1 are moved to an initial position at the occurrence of the malfunction.

[0034] In the above description, numerous specific details are given to provide a thorough understanding of embodiments of the invention. However, the above description of illustrated embodiments of the invention is not intended to be exhaustive or to limit the invention to the precise forms disclosed. One skilled in the relevant art will recognize that the invention can be practiced without one or more of the specific details, or with other methods, components, etc. In other instances, well-known structures or operations are not shown or described in detail to avoid obscuring aspects of the invention. While specific embodiments of, and examples for, the invention are described herein for illustrative purposes, various equivalent modifications are possible within the scope of the invention, as those skilled in the relevant art will recognize.

[0035] These modifications can be made to the invention in light of the above detailed description. The terms used in the following claims should not be construed to limit the invention to the specific embodiments disclosed in the specification and the claims. Rather, the scope of the invention is to be determined by the following claims, which are to be construed in accordance with established doctrines of claim interpretation.

List of reference numerals

[0036]

1	turbocharger
3	turbine wheel
4	volute
5	compressor wheel
6	volute
7	rotatable shaft
8	exhaust outlet
8A	axial exhaust flow
9	air inlet flow section
9A	axial air flow
10	adjustment mechanism
11	unison ring
12	actuator
13	inlet
14	recess
15	housing
16	recess
17	inner circumference
19	outer circumference
20	vane
21	pivot point
22	nose
23	link
25	support
27	vane
30	elastic biasing means
31	first spring element
32	second spring element
100	motor vehicle
102	internal combustion engine
A	central axis
B-B	cutting line

D variable inlet diameter
F12 restoring force
P11 first pivoting motion
P20 second pivoting motion

Claims

1. An adjustment mechanism (10) for an inlet flow section (9) of a compressor wheel (5) of a turbocharger (1) for defining a variable inlet diameter (D) for an axial air flow (9A) to the compressor wheel (5), the adjustment mechanism (10) comprising:

   a unison ring (11), arranged in an air inlet flow section (9) prior to the compressor wheel (5) in direction of the axial air flow (9A);
   a plurality of vanes (20) being pivotably mounted and mechanically linked to the unison ring (11);
   an actuator (12) for providing a first pivoting motion (P11) to the unison ring (11) about a central axis (A) and thereby providing a second pivoting motion (P20) to the plurality of vanes (20) which set the variable inlet diameter (D);
   at least one elastic biasing means (30) being arranged such that it provides, upon the first pivoting motion (P11) to the unison ring (11), a restoring force (F12) to the unison ring (11) and/or the plurality of vanes (20),
   at least one of the at least one elastic biasing means (30) being arranged between the unison ring (11) and each of the plurality of vanes (20).

2. The adjustment mechanism (10) as claimed in claim 1, wherein the at least one elastic biasing means (30) arranged between the unison ring (11) and each of the plurality of vanes (20) is a second spring element (32).

3. The adjustment mechanism (10) as claimed in claim 1, wherein at least one of the at least one elastic biasing means (30) is attached to the unison ring (11) and the housing (15) of the turbocharger (1).

4. The adjustment mechanism (10) as claimed in claim 3, wherein the at least one elastic biasing means (30) attached to the unison ring (11) and the housing (15) is at least one first spring element (31).

5. The adjustment mechanism (10) as claimed in any of the preceding claims, wherein each vane (20) is mounted pivotably about a pivot point (21) and mechanically linked to an inner circumference (17) of the unison ring (11).

6. The adjustment mechanism (10) as claimed in claim 5, wherein the mechanical link is provided by a nose (22) of each vane (20), wherein each nose (22) reaches in a corresponding recess (14) formed at the inner circumference (17) of the unison ring (11).

7. A turbocharger (1) having the adjustment mechanism (10) as claimed by any of the preceding claims.

8. A vehicle (100) with an internal combustion engine (102) having a turbocharger (1) with the adjustment mechanism (10) as claimed by any of the claims 1 to 6.

Patentansprüche

1. Verstellmechanismus (10) für einen Einlassströmungsabschnitt (9) eines Verdichterrades (5) eines Turboladers (1) zum Definieren eines variablen Einlassdurchmessers (D) für eine axiale Luftströmung (9A) zu dem Verdichterrad (5), wobei der Verstellmechanismus (10) umfasst:

   einen Verstellring (11), der in einem Lufteinlassströmungsabschnitt (9) vor dem Verdichterrad (5) in Richtung der axialen Luftströmung (9A) angeordnet ist;
   eine Vielzahl von Leitschaufeln (20) die schwenkbar montiert und mit dem Verstellring (11) mechanisch verbunden sind;
   einen Aktuator (12) zum Bereitstellen einer ersten Schwenkbewegung (P11) für den Verstellring (11) um eine zentrale Achse (A) und dadurch Bereitstellen einer zweiten Schwenkbewegung (P20) für die Vielzahl von Leitschaufeln (20), die den variablen Einlassdurchmesser (D) einstellen;
   mindestens ein elastisches Vorspannmittel (30), das so angeordnet ist, dass es bei der ersten Schwenkbewegung (P11) des Verstellrings (11) eine Rückstellkraft (F12) auf den Verstellring (11) und/oder die Vielzahl von Leitschaufeln (20) ausübt,
   wobei mindestens eines des mindestens einen elastischen Vorspannmittels (30) zwischen dem Verstellring (11) und jeder der Vielzahl von Leitschaufeln (20) angeordnet ist.

2. Verstellmechanismus (10) nach Anspruch 1, wobei das mindestens eine elastische Vorspannmittel (30), das zwischen dem Verstellring (11) und jeder der Vielzahl von Leitschaufeln (20) angeordnet ist, ein zweites Federelement (32) ist.

3. Verstellmechanismus (10) nach Anspruch 1, wobei mindestens eines des mindestens einen elastischen Vorspannmittels (30) an dem Verstellring (11) und einem Gehäuse (15) des Turboladers (1) befestigt ist.

4. Verstellmechanismus (10) nach Anspruch 3, wobei das mindestens eine elastische Vorspannmittel (30), das an dem Verstellring (11) und dem Gehäuse (15) befestigt ist, mindestens ein erstes Federelement (31) ist.

5. Verstellmechanismus (10) nach einem der vorhergehenden Ansprüche, wobei jede Leitschaufel (20) um einen Drehpunkt (21) schwenkbar montiert und mit einem Innenumfang (17) des Verstellrings (11) mechanisch verbunden ist.

6. Verstellmechanismus (10) nach Anspruch 5, wobei die mechanische Verbindung durch eine Nase (22) jeder Leitschaufel (20) hergestellt wird, wobei jede Nase (22) in eine entsprechende Aussparung (14) greift, die am Innenumfang (17) des Verstellrings (11) ausgebildet ist.

7. Turbolader (1) mit dem Verstellmechanismus (10) nach einem der vorhergehenden Ansprüche.

8. Fahrzeug (100) mit einem Verbrennungsmotor (102), der einen Turbolader (1) mit dem Verstellmechanismus (10) nach einem der Ansprüche 1 bis 6 aufweist.

Revendications

1. Mécanisme de réglage (10) pour une section d'écoulement d'entrée (9) d'une roue de compresseur (5) d'un turbocompresseur (1) pour définir un diamètre d'entrée variable (D) pour un écoulement d'air axial (9A) vers la roue de compresseur (5), le mécanisme de réglage (10) comprenant :

un anneau de conjugaison (11), disposé dans une section d'écoulement d'entrée d'air (9) avant la roue de compresseur (5) dans la direction de l'écoulement d'air axial (9A) ;
une pluralité d'aubes (20) montées de manière pivotante et reliées mécaniquement à l'anneau de conjugaison (11) ;
un actionneur (12) pour fournir un premier mouvement de pivotement (P11) à l'anneau de conjugaison (11) autour d'un axe central (A) et fournissant ainsi un second mouvement de pivotement (P20) à la pluralité d'aubes (20) qui définissent le diamètre d'entrée variable (D) ;
au moins un moyen de sollicitation élastique (30) disposé de façon à conférer, lors du premier mouvement de pivotement (P11) à l'anneau de conjugaison (11), une force de restauration (F12) à l'anneau de conjugaison (11) et/ou à la pluralité d'aubes (20),
au moins un des au moins un moyen de sollicitation élastique (30) étant disposé entre l'anneau de conjugaison (11) et chacune de la pluralité d'aubes (20).

2. Mécanisme de réglage (10) selon la revendication 1, dans lequel l'au moins un moyen de sollicitation élastique (30) disposé entre l'anneau de conjugaison (11) et chacune de la pluralité d'aubes (20) est un second élément de ressort (32).

3. Mécanisme de réglage (10) selon la revendication 1, dans lequel au moins un des au moins un moyen de sollicitation élastique (30) est fixé à l'anneau de conjugaison (11) et au carter (15) du turbocompresseur (1).

4. Mécanisme de réglage (10) selon la revendication 3, dans lequel l'au moins un moyen de sollicitation élastique (30) fixé à l'anneau de conjugaison (11) et au carter (15) est au moins un premier élément de ressort (31).

5. Mécanisme de réglage (10) selon l'une quelconque des revendications précédentes, dans lequel chaque aube (20) est montée pivotante autour d'un point de pivotement (21) et reliée mécaniquement à une circonférence intérieure (17) de l'anneau de conjugaison (11).

6. Mécanisme de réglage (10) selon la revendication 5, dans lequel la liaison mécanique est assurée par un nez (22) de chaque aube (20), chaque nez (22) s'engageant dans un évidement (14) correspondant formé au niveau de la circonférence intérieure (17) de l'anneau de conjugaison (11).

7. Turbocompresseur (1) comportant le mécanisme de réglage (10) tel que revendiqué par l'une quelconque des revendications précédentes.

8. Véhicule (100) avec un moteur à combustion interne (102) comportant un turbocompresseur (1) avec un mécanisme de réglage (10) tel que revendiqué par l'une quelconque des revendications 1 à 6.

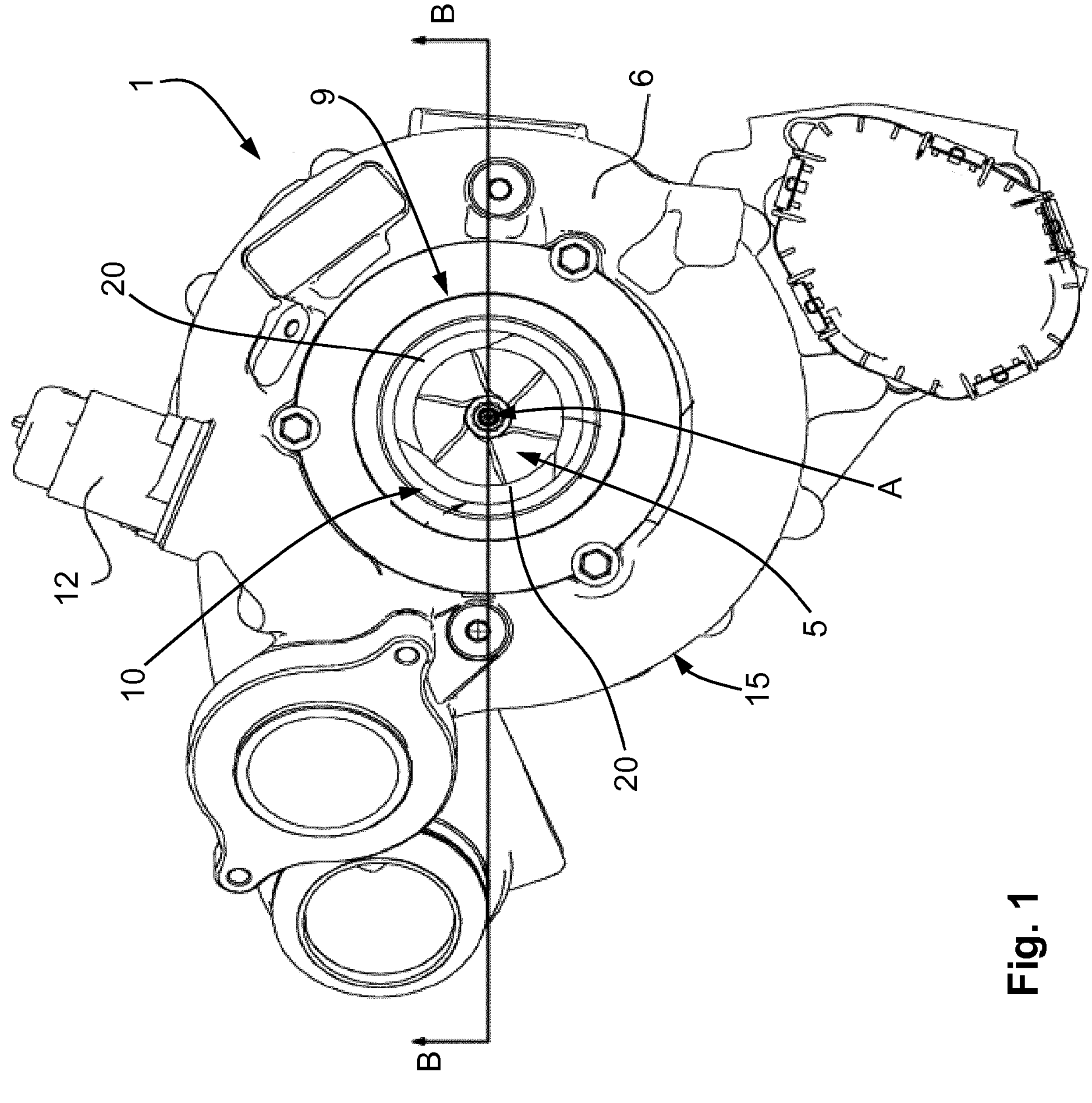

Fig. 1

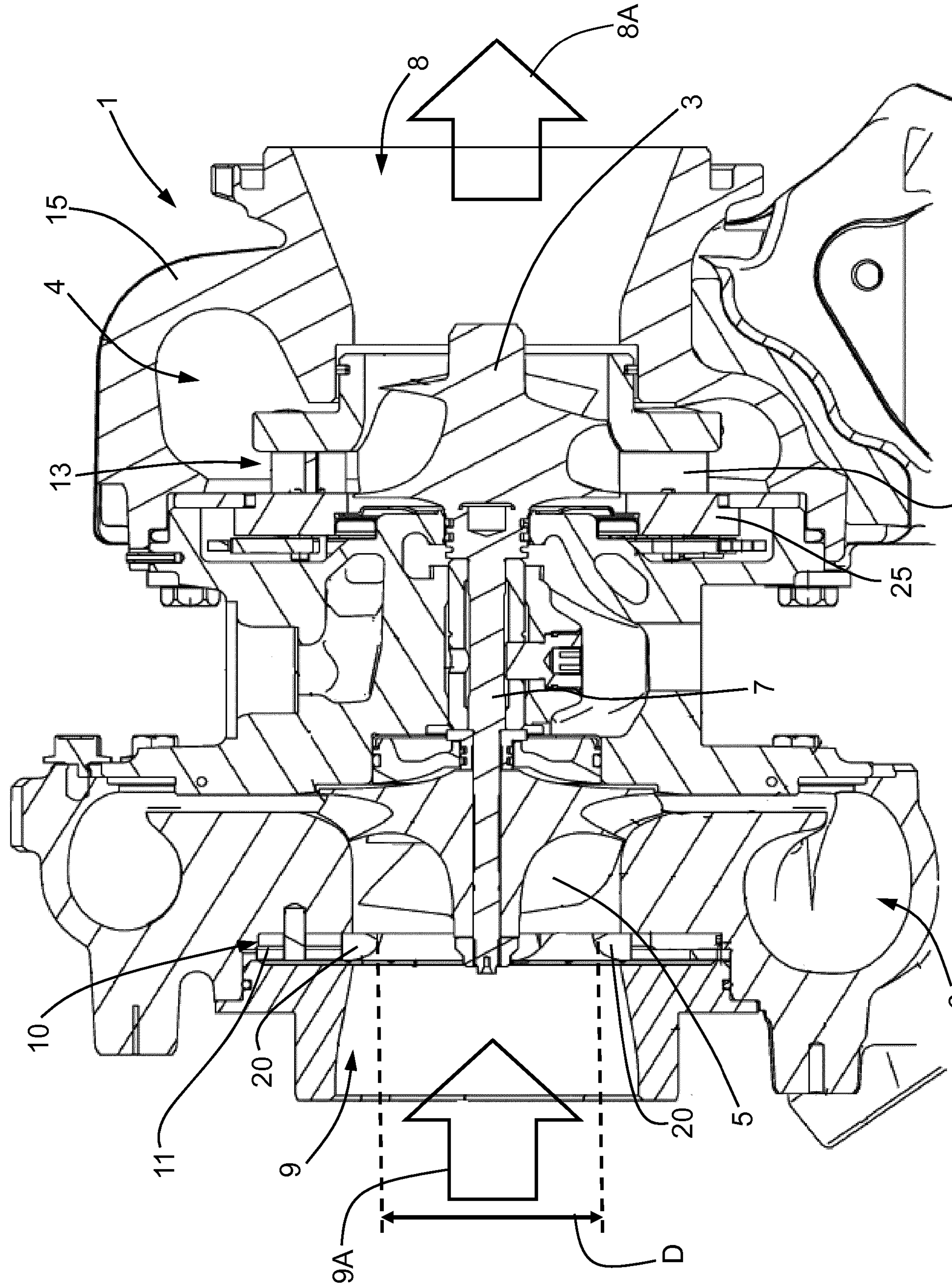

Fig. 2

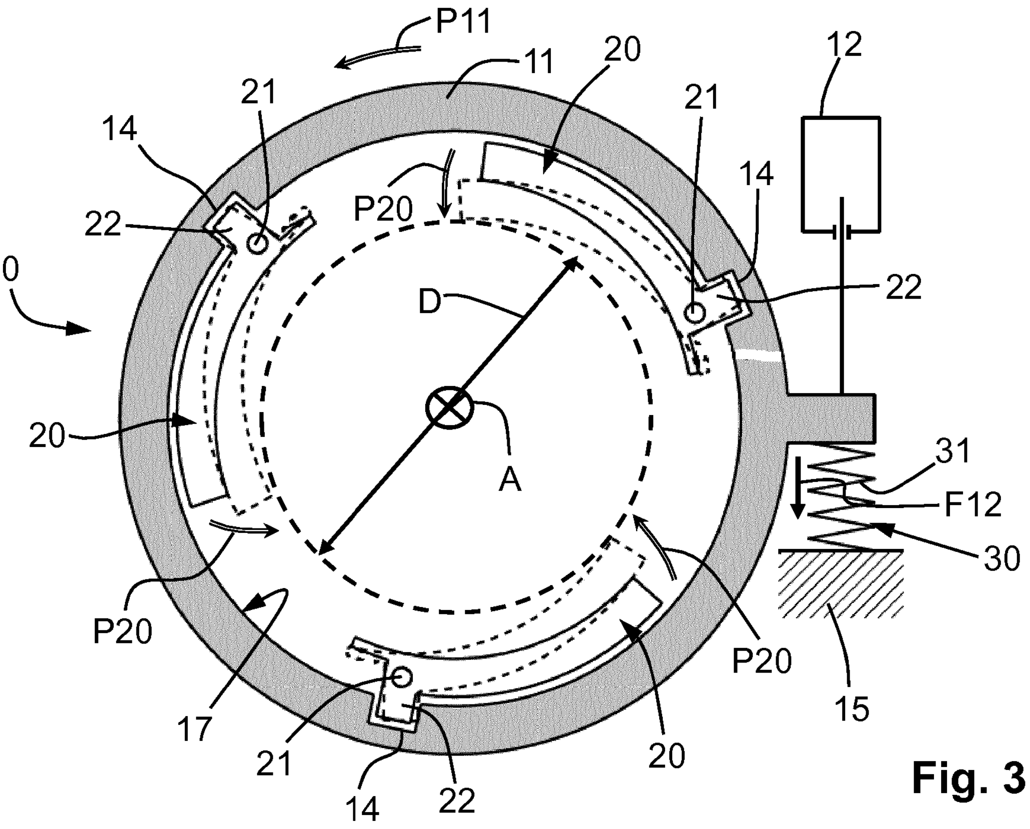
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Fig. 3

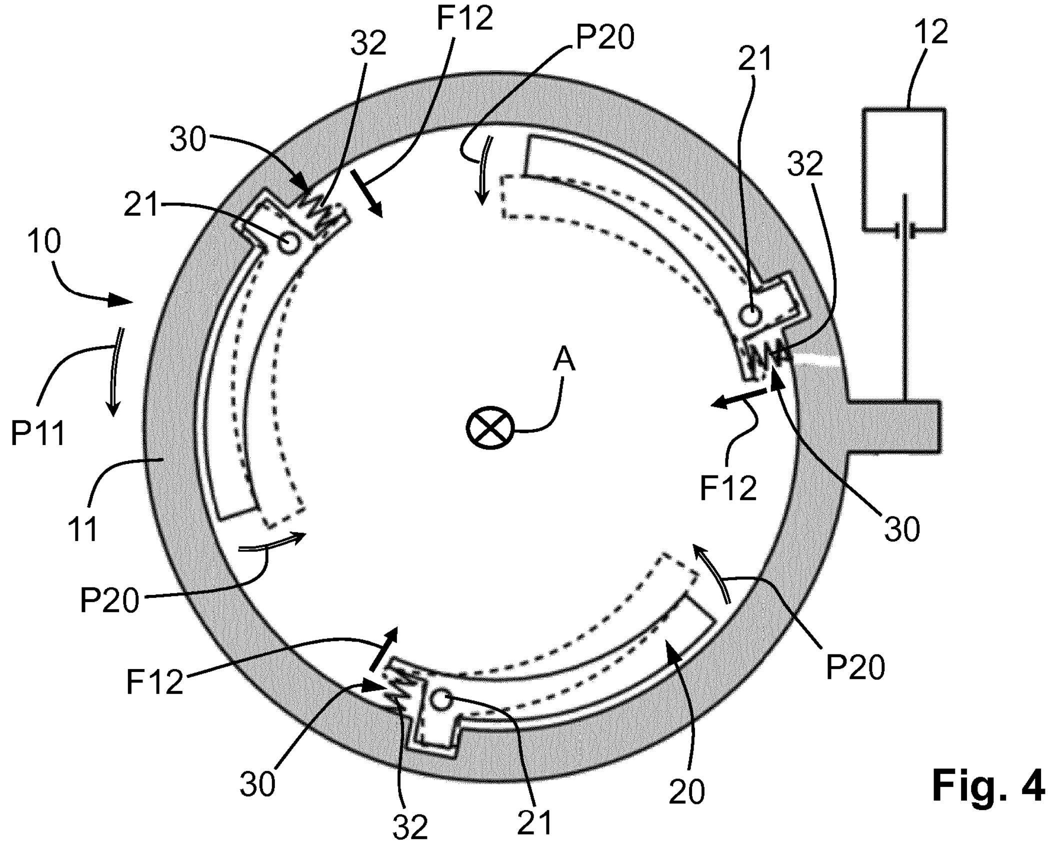
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Fig. 4

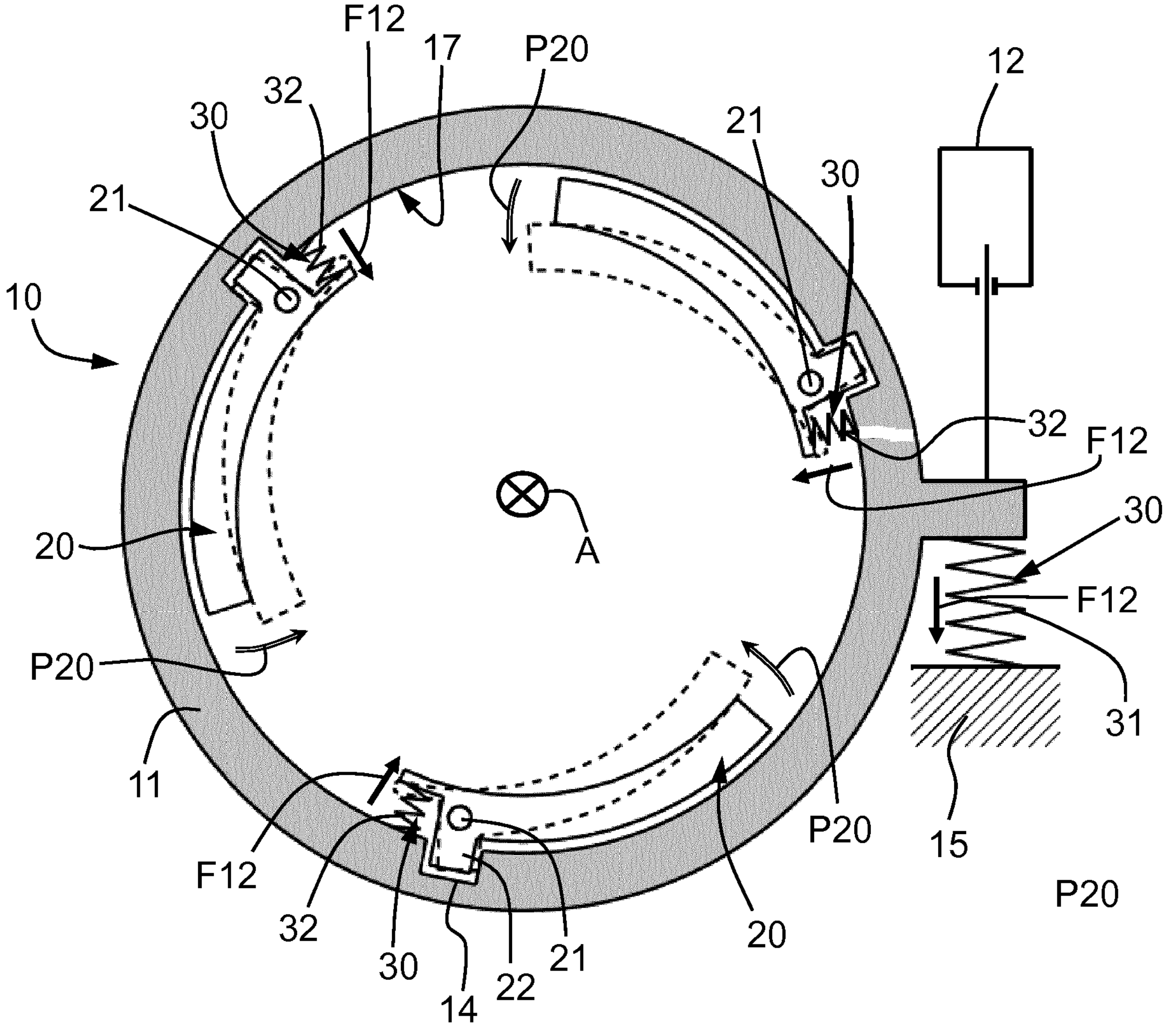
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Fig. 5

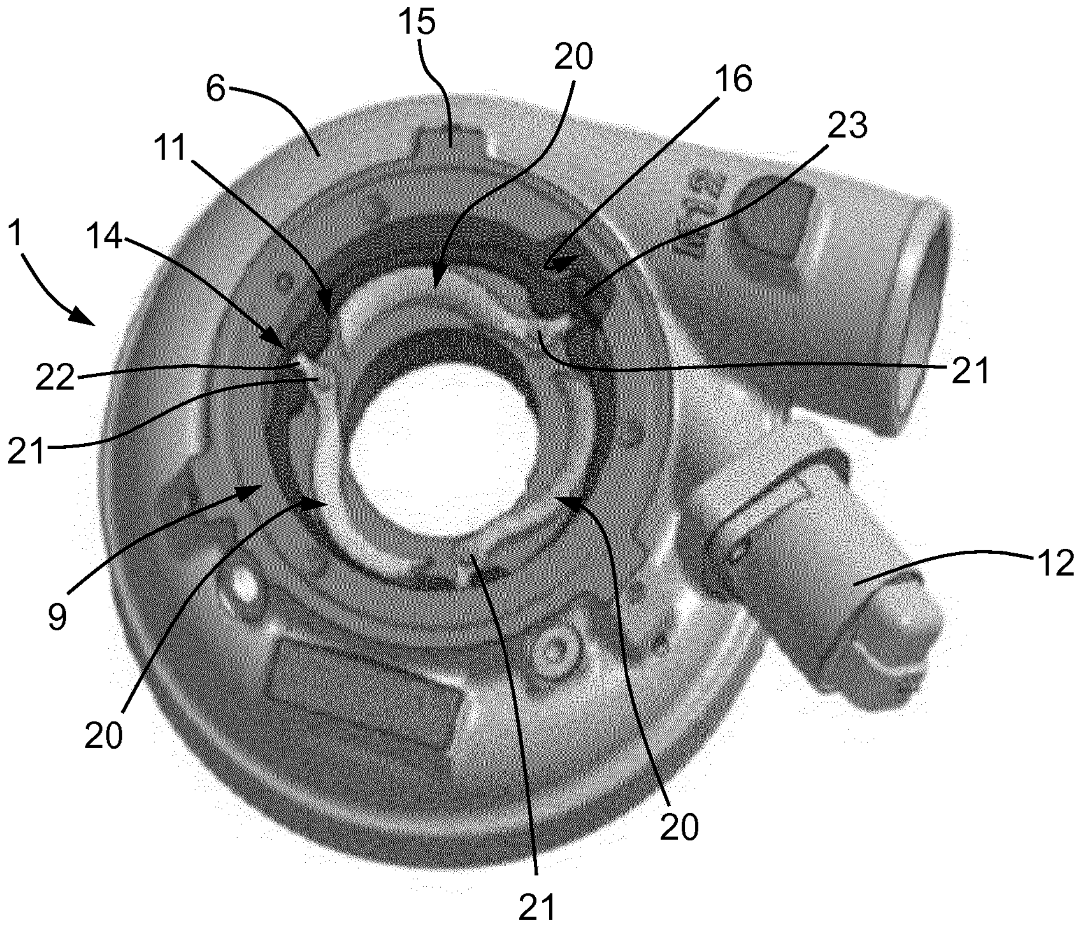

Fig. 6

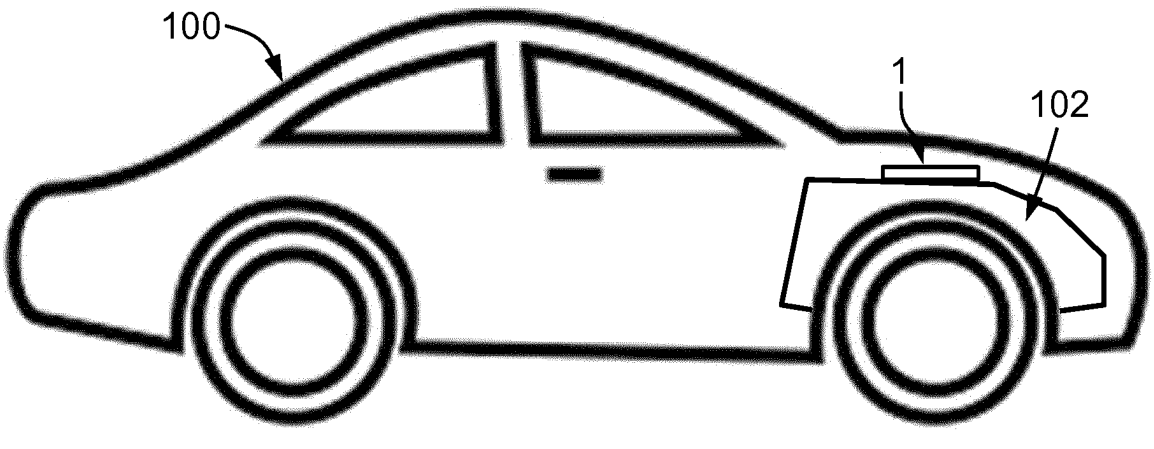

Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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