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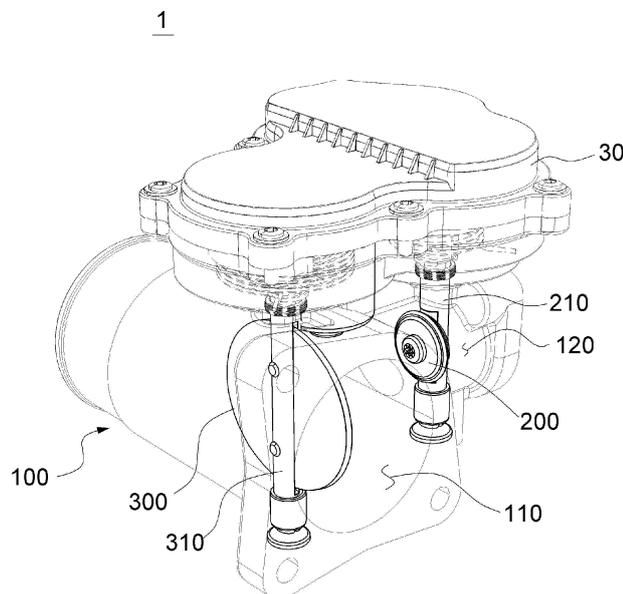
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(54) **COMBINED EGR VALVE AND FRESH AIR VALVE FOR A VEHICLE**

(57) A vehicle valve includes a housing in which an exhaust gas recirculation (EGR) flow passage and a fresh air flow passage are formed, a driving motor, a gear train connected to the driving motor, a first output gear and a second output gear that are included in the gear train, a moving member installed on the second output gear and rotating together with the second output gear, a first shaft in which an EGR valve is installed and the

first shaft fixed to the first output gear, a second shaft on which a fresh air valve is installed, and a rotating member that is connected to the second shaft and that rotates together with the moving member and a fresh air valve output gear and simultaneously rotates the second shaft when selectively coming into contact with the moving member of the second shaft to contact the moving member and then pushing the moving member.

[Fig. 4]



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Description**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of Korean Patent Application No. 10-2020-0021872, filed on February 21, 2020, which is hereby incorporated by reference as if fully set forth herein.

BACKGROUND OF THE INVENTION**Field of the Invention**

[0002] The present disclosure relates to a valve for a vehicle, and more particularly to a valve for a vehicle having a compact size and for precisely controlling the timing of an operation of a fresh air valve depending on the state of an opening state of an exhaust gas recirculation (EGR) valve.

Discussion of the Related Art

[0003] In general, a method that has been the most popular thus far to prevent generation of nitrogen oxide (NO_x) from exhaust gas discharged from an engine installed in a vehicle has used an exhaust gas recirculation (EGR) valve for partially adding cooled exhaust gas to a mixer and inhaling the gas into a cylinder.

[0004] As disclosed in Korean Patent Publication No. 10-1338272, an EGR valve includes a fresh air flow passage into which outside fresh air is introduced, and an EGR flow passage in which exhaust gas discharged from an engine returns and is guided to be reintroduced to the engine.

[0005] Here, a fresh air control valve is provided in the fresh air flow passage, and an EGR control valve is provided in the EGR flow passage.

[0006] The EGR control valve and the fresh air control valve are operatively associated with each other by a power transfer device such as a gear and an actuator connected thereto rather than being separately moved.

[0007] According to the above conventional art, when the EGR valve is completely closed, the fresh air control valve is positioned in parallel to a flow direction of fresh air, and thus interference in introduction of fresh air is minimized and fresh air is capable of being introduced into the engine while being maintained in a maximum inflow rate.

[0008] When the EGR valve is open by a predetermined degree to re-introduce exhaust gas into the engine, while the fresh air control valve is simultaneously moved, a predetermined portion of a cross section of the fresh air flow passage is blocked, and accordingly, the EGR valve reduces the amount of fresh air introduced per hour.

[0009] When the EGR valve is completely open, the fresh air control valve is closed by a maximum degree, and thus the EGR valve further reduces the amount of

fresh air introduced into the engine.

[0010] However, the conventional art has a problem in that a large space is occupied by the EGR valve due to a large size thereof to degrade a degree of freedom of space.

[Cited Reference]

[Patent Document]

[0011]

Korean Patent No. 10-1338272 (published on December 9, 2013)

Korean Patent No. 10-1987054 (published on June 10, 2019)

Korean Patent Laid-Open Publication No. 10-2017-0060452 (Laid-Open on June 1, 2017)

20 SUMMARY OF THE INVENTION

[0012] An object of the present disclosure is to provide a valve for a vehicle having a compact size and for precisely controlling the timing of an operation of a fresh air valve depending on the state of an opening state of an exhaust gas recirculation (EGR) valve.

[0013] According to an aspect of the present disclosure, a valve for a vehicle includes a housing in which an exhaust gas recirculation (EGR) flow passage and a fresh air flow passage are formed, a driving motor, a gear train connected to the driving motor, a first output gear and a second output gear that are included in the gear train, a moving member installed on the second output gear and rotating together with the second output gear, a first shaft on which an EGR valve is installed and the first shaft fixed to the first output gear, a second shaft in which a fresh air valve is installed therein, and a rotating member that is connected to the second shaft and that rotates together with the moving member and a fresh air valve output gear and simultaneously rotates the second shaft when the rotating member selectively comes into contact with the moving member of the second shaft to contact the moving member and then pushes the moving member.

[0014] First rotation of the second output gear and first rotation of the rotating member may be performed with a time difference.

[0015] The gear train may include a motor gear connected to a motor axis, an intermediate gear engaged with the motor gear, the first output gear engaged with the intermediate gear, and the second output gear engaged with the first output gear.

[0016] When the EGR valve is completely closed and the fresh air valve is completely open, if a motor is driven, the first output gear may rotate to begin to open the EGR valve, and the second output gear engaged with the first output gear may also rotate, but in contrast, the rotating member and the second shaft may not rotate before the

moving member comes into contact with the rotating member to maintain the fresh air valve to be completely open.

[0017] The motor may be further driven when the EGR valve is partially open and the fresh air valve is completely open, and when the moving member comes into contact with the rotating member and then further rotates, the rotating member and the second shaft may rotate and the fresh air valve may begin to perform a closing operation.

[0018] The moving member may include a base portion fixed to the second output gear, and a flange protruding from the base portion and provided to contact the rotating member.

[0019] The base portion may be shaped like a ring, and the flange may be configured in plural and the flanges are provided at opposite sides.

[0020] The rotating member may be shaped like a plate and may include a fixing hole which the second shaft fixedly penetrates, and a contact portion that is provided on an external circumference and protrudes to allow the moving member to reach and come into contact with the contact portion.

[0021] The valve for the vehicle may further include a stopper provided on the housing, provided adjacent to the rotating member, provided to come contact with the contact portion, and configured to prevent the rotating member from rotating by a predetermined degree or greater.

[0022] The first output gear may be fixed to the first shaft and may allow the first shaft and the EGR valve fixed thereto to rotate as the first output gear rotates, and the second output gear may be rotatably installed on the first shaft and the first shaft may not be affected by rotation of the second gear before the moving member installed on the second output gear comes into contact with the rotating member.

[0023] When the fresh air flow passage is completely open and the EGR flow passage is completely closed, the moving member and the rotating member may not contact each other, when the fresh air flow passage is completely open and the EGR flow passage is partially open, the moving member and the rotating member may be provided to contact each other, and when the moving member pushes the rotating member, an opening degree of the fresh air valve with respect to the fresh air flow passage may be reduced, and an opening degree of the EGR valve with respect to the EGR flow passage may be increased.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The accompanying drawings, which are included to provide a further understanding of the present disclosure and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the present disclosure and together with the description serve to explain the principle of the present disclosure. In the draw-

ings:

FIG. 1 is a perspective view according to the present disclosure;

FIG. 2 is an exploded perspective view according to the present disclosure;

FIG. 3 is an exploded perspective view showing the state in which a second output gear and a moving member are spaced apart from a rotating member while the second output gear and the moving member are coupled according to the present disclosure;

FIG. 4 is a projection according to the present disclosure;

FIG. 5 is an internal perspective view according to the present disclosure;

FIG. 6 shows the state in which a fresh air valve is completely open and an exhaust gas recirculation (EGR) valve is completely closed according to the present disclosure;

FIG. 7 shows the state in which a fresh air valve is completely open and an EGR valve is partially open according to the present disclosure; and

FIG. 8 shows the state in which a fresh air valve is partially open and an EGR valve is completely open according to the present disclosure.

DETAILED DESCRIPTION OF THE INVENTION

[0025] As the present disclosure allows for various changes and numerous embodiments, particular embodiments will be illustrated in the drawings and described in detail in the written description.

[0026] However, this is not intended to limit the present disclosure to particular modes of practice, and it is to be appreciated that all changes, equivalents, and substitutes that do not depart from the spirit and technical scope of the present disclosure are encompassed in the present disclosure.

[0027] The terms such as "first" and "second" are used herein merely to describe a variety of constituent elements, but the constituent elements are not limited by the terms.

[0028] The terms are used only for the purpose of distinguishing one constituent element from another constituent element.

[0029] For example, a first element may be termed a second element and a second element may be termed a first element without departing from the teachings of the present disclosure.

[0030] As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0031] It will be understood that when an element, such as a layer, a region, or a substrate, is referred to as being "on", "connected to" or "coupled to" another element, it may be directly on, connected or coupled to the other element or intervening elements may be present.

[0032] In contrast, when an element is referred to as

being "directly on," "directly connected to" or "directly coupled to" another element or layer, there are no intervening elements or layers present.

[0033] The terms used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the present disclosure.

[0034] The singular forms "a," "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise.

[0035] It will be further understood that the terms "comprises" or "comprising" when used in this specification, specify the presence of stated features, integers, steps, operations, elements, or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, or groups thereof.

[0036] Hereinafter, the present disclosure will be described in detail by explaining exemplary embodiments of the present disclosure with reference to the attached drawings. The same reference numerals in the drawings denote like elements, and a repeated explanation thereof will not be given.

[0037] As shown in FIG. 1, a valve for a vehicle may be a 3-way valve and may include a fresh air flow passage 110 formed at one side of a housing 100 configuring a body and an exhaust gas recirculation (EGR) flow passage 120 formed at the other side. Here, the EGR flow passage 120 may be disposed in a perpendicular direction to a direction in which the fresh air flow passage 110 is disposed or may be disposed oblique thereto.

[0038] An EGR valve 200 for opening and closing the EGR flow passage 120 may be provided in the EGR flow passage 120, and a fresh air valve 300 for opening and closing the fresh air flow passage 110 may be provided in the fresh air flow passage 110. Although described below, the fresh air valve 300 and the EGR valve 200 may be operatively connected to each other.

[0039] A diameter of the fresh air flow passage 110 may be larger than that of the EGR flow passage 120 because the amount of introduced fresh air needs to be larger than the amount of EGR gas.

[0040] As shown in FIG. 2, a motor 10, a gear train connected to the motor 10, and two shafts 210 and 310 that are operatively connected to the gear trains may be provided in the housing 100.

[0041] The two shafts may include an EGR valve shaft (hereinafter referred to as a first shaft) 210 and a fresh air valve shaft (hereinafter referred to as a second shaft) 310.

[0042] A motor insertion portion 101 may be installed inside the housing 100, and the motor 10 may be fixedly inserted to the motor insertion portion 101.

[0043] The gear train may include a pinion gear 11 installed at a motor axis, an intermediate gear 12 engaged with the pinion gear 11 and provided in the form of a multiple-layer gear, an EGR valve output gear (hereinafter referred to as a first output gear) 13 engaged with a small-diameter portion of the intermediate gear 12, and

a fresh air valve output gear (hereinafter referred to as a second output gear) 14 engaged with the first output gear 13.

[0044] Here, the first and second output gears 13 and 14 may each be configured as a partial tooth gear on which a tooth form is formed on a partial edge.

[0045] A first output gear installation portion 15 on which the first output gear 13 is rotatably installed may be formed on the housing 100, and a first elastic restoration member 21 formed like a coil spring may be provided between the first output gear 13 and the first output gear installation portion 15.

[0046] A second output gear installation portion 16 on which the second output gear 14 is rotatably installed may be formed on the housing 100, a second elastic restoration member 22 and a third elastic restoration member 23 may be installed between the second output gear installation portion 16 and the second output gear 14, and the third elastic restoration member 23 may be installed to be surrounded by the second elastic restoration member 22.

[0047] Here, the second elastic restoration member 22 may restore the second output gear 14 to the original position, and the third elastic restoration member 23 may restore a rotating member 400 that will be described below to the original position, and accordingly, force for restoring the second shaft 310 and the fresh air valve 300 to a complete opening position may be applied.

[0048] A moving member 500 may be provided at one side of (or below) the second output gear 14, and the rotating member 400 that is rotatably installed on the second output gear installation portion 16 and is fixed to the second shaft 310 using welding or other fixing devices may be provided below the moving member 500.

[0049] The moving member 500 may be formed of a metallic material, may be fixed to the second output gear 14 using an inserting method, and may rotate together with the second output gear 14.

[0050] The rotating member 400 may be a component that separately rotates from the second output gear 14 and the moving member 500, may be formed of a metallic material, and may be fixed to the second shaft 310 to rotate together with the second shaft 310. The moving member 500 and the rotating member 400 may selectively come into contact with each other to rotate together, or when the moving member 500 and the rotating member 400 are spaced apart from each other, only the moving member 500 may rotate, and the rotating member 400 may be kept stopped.

[0051] A base portion 510 shaped like a circular ring may be provided in the moving member 500 and may be inserted between a plurality of partitions 14a and 14b provided below the second output gear 14. To this end, a through hole 530 may be installed in a central portion of the base portion 510.

[0052] Thus, a thin rib of the base portion 510 may be positioned between the partitions 14a and 14b.

[0053] The moving member 500 may further include a

flange 520 that protrudes on the base portion 510. The flange 520 may be formed like '┌' and may include a horizontal extension 521 and a downward extension 522 that extends downward from the horizontal extension 521.

[0054] The flange 520 may be configured in two and the two moving members 500 may be positioned at opposite sides, but the positions and the number thereof are not limited thereto.

[0055] The flange 520 of the moving member 500 may come in contact with the rotating member 400 and may be caught thereby. To this end, the rotating member 400 may be configured in an approximately circular plate and may include a contact portion 410 that extends therearound.

[0056] The contact portion 410 may be provided with a lateral cross section shaped like '┌'. An extension piece 420 may be provided between the contact portion 410 and the contact portion 410, and a plurality of slit portions 430 formed in a narrow shape may be provided between the extension piece 420 and the contact portion 410, in which case a one-end portion 23a of the third elastic restoration member 23 may be caught by any one slit portion 430.

[0057] The other-end portion 23b of the third elastic restoration member 23 may be installed to be caught by the housing 100.

[0058] Here, the flange 520 and the contact portion 410 may selectively come into contact with each other or may be spaced apart from each other depending on rotation of the second output gear 14 and the moving member 500.

[0059] The EGR valve 200 may be coupled to the first shaft 210 by a predetermined coupling member, and the first shaft 210 may be coupled to the first output gear 13 through the EGR flow passage 120. Thus, whenever the first output gear 13 rotates, an opening degree of the EGR flow passage 120 may be adjusted or the EGR flow passage 120 may be open or closed while the first shaft 210 and the EGR valve 200 coupled thereto rotate.

[0060] A magnet 220 indicating a rotation state of the first shaft 210 may be provided at an end portion of the first shaft 210, and a hall sensor (not shown) may be provided at an opposite side. The hall sensor may be provided on a housing cover 30.

[0061] A butterfly type of the fresh air valve 300 may be coupled to the second shaft 310 through a predetermined coupling member, and the second shaft 310 may be fixed to the rotating member 400 through the fresh air flow passage 110. As the rotating member 400 rotates, an opening degree of the fresh air flow passage 110 may be adjusted or the fresh air flow passage 110 may be open or closed while the second shaft 310 and the fresh air valve 300 coupled thereto rotate.

[0062] A reference numeral 600 that is not described may be a bearing 600, and the bearing 600 may be installed at an end of the second shaft 310 while being

inserted into the center of rotation of the second output gear 14, and thus the second output gear 14 may be rotatably supported by the second shaft 310. Here, the bearing 600 may be configured as a needle bearing or different bearing structures.

[0063] As shown in FIG. 3, a protrusion rib 17 protruding from the housing 100 may be formed around the second output gear installation portion 16 provided on the housing 100, and a narrow slot 17a may be formed in the protrusion rib 17.

[0064] The rotating member 400 may be rotatably installed on the protrusion rib 17, and the third elastic restoration member 23 may be installed below the rotating member 400. A one-end portion 23b of the third elastic restoration member 23 may be inserted into the slot 17a provided in the protrusion rib 17, and the other-end portion 23a of the third elastic restoration member 23 may be caught by one side of the rotating member 400.

[0065] As described above, the second shaft 310 may be fixed to the center of the rotating member 400, and an end portion of the second shaft 310 may protrude. A bearing (not shown) may be installed on the protruding portion of the second shaft 310, and the bearing may be installed on the second output gear 14, and thus the second output gear 14 may be rotatably supported by the second shaft 310.

[0066] The moving member 500 may be fixed to a lower surface of the second output gear 14, and the second output gear 14, the moving member 500, and the rotating member 400 may be arranged to configure respective layers in the order stated in upward and downward directions.

[0067] An external circumference of the flange 520 of the moving member 500 may be smaller than that of the contact portion 410 of the rotating member 400 and may be larger than that of another portion (e.g., the extension piece 420) on which the contact portion is not formed.

[0068] Accordingly, when the second output gear 14 and the moving member 500 rotate, the flange 520 may get past the portion of an outer circumference of the rotating member 400, on which the contact portion 410 is not formed, and may be caught by the contact portion 410.

[0069] A part of the protrusion rib 17 may protrude upward to form a stopper 19. The stopper 19 may be disposed on a route on which the contact portion 410 moves and may come into contact with the contact portion 410 in order to prevent the rotating member 400 from excessively rotating when the rotating member 400 rotates.

[0070] As shown in FIG. 4, in a valve 1 for a vehicle, the EGR valve 200 may completely close the EGR flow passage 120 in an ordinary state in which a motor is not driven, and the fresh air valve 300 may completely open the fresh air flow passage 110.

[0071] In this case, EGR gas may be prevented from being introduced into an engine.

[0072] In the state in which the EGR valve 200 may completely close the EGR flow passage 120 and the fresh

air valve 300 completely opens the fresh air flow passage 110, the fresh air valve 300 may be disposed parallel to a direction in which the fresh air flow passage 110 is disposed and the EGR valve 200 may be disposed to cross the EGR flow passage 120 in a perpendicular direction to a direction in which the EGR flow passage 120 is disposed, as shown in FIG. 5.

[0073] In this case, the motor gear 11 and the large-diameter portion of the intermediate gear 12 may be engaged with each other, the small-diameter portion of the intermediate gear 12 and the first output gear 13 may be engaged with each other, the first output gear 13 and the second output gear 14 may be engaged with each other.

[0074] In this state, a one-end portion of the first output gear 13 and the other-end portion of the second output gear 14 may be engaged with each other. The flange 520 of the moving member 500 fixed to the second output gear 14 may be spaced apart from the contact portion 410 of the rotating member 400 fixed to the second shaft 310.

[0075] Hereinafter, an operation according to the present disclosure will be described.

[0076] As shown in FIG. 6, in the state in which power is not applied to the motor 10, the one-end portion of the first output gear 13 and the other-end portion of the second output gear 14 may be engaged with each other, the EGR valve 200 may block and completely close the EGR flow passage 120, and the fresh air valve 300 may completely open the fresh air flow passage 110.

[0077] In this case, EGR gas may be prevented from being introduced into the fresh air flow passage 110.

[0078] In this state, the flange 520 of the moving member 500 may be spaced apart from the contact portion 410 of the rotating member 400.

[0079] In this case, when power is applied to the motor 10 in order to re-introduce EGR gas to the engine, the motor gear 11 and the intermediate gear 12 may rotate, and accordingly, the first output gear 13 may rotate, and the second output gear 14 engaged with the first output gear 13 may also rotate, as shown in FIG. 7.

[0080] In this state, a region between a one-end portion and a central portion of the first output gear 13 and a central region of the second output gear 14 may be engaged with each other.

[0081] Since the first shaft 210 may be fixed to the first output gear 13, the first shaft 210 may also rotate by an angle at which the first output gear 13 rotates and the EGR valve 200 fixed to the first shaft 210 may also rotate, and accordingly, the EGR flow passage 120 may also be partially open.

[0082] Accordingly, EGR gas may begin to be introduced into the fresh air flow passage 110.

[0083] However, the second output gear 14 may be rotatably disposed rather than being fixed to the second shaft 310, and accordingly, even if the second output gear 14 rotates, the second shaft 310 may not rotate.

[0084] However, the moving member 500 may be fixed to the second output gear 14, and thus the second moving

member 500 may rotate by an angle at which the second output gear 14 rotates, and the flange 520 of the moving member 500 may come into contact with the contact portion 410 of the rotating member 400.

[0085] In this case, the fresh air valve 300 may also be maintained to completely open the fresh air flow passage 110.

[0086] Accordingly, a relative ratio of a flow amount of fresh air to a flow amount of EGR gas is great, and thus a ratio of EGR gas of gas flowed to the engine may be relatively small.

[0087] In this state, when the state in which power applied to the motor is maintained, the first output gear 13 and the second output gear 14 engaged therewith may further rotate. In this state, a central region of the first output gear 13 and a one-end portion of the second output gear 14 may be engaged with each other.

[0088] When the first output gear 13 further rotates (counterclockwise direction), the EGR valve 200 may completely open the EGR flow passage 120. That is, the EGR valve 200 may be disposed parallel to a longitudinal direction of the EGR flow passage 120.

[0089] When the second output gear 14 further rotates, the flange 520 of the moving member 500 may rotate the rotating member 400 in a clockwise direction by pushing the contact portion 410 of the rotating member 400, as shown in FIG. 8.

[0090] In this case, an opening degree of the fresh air valve 300 with respect to the fresh air flow passage 110 may be reduced, and an opening degree of the EGR valve 200 with respect to the EGR flow passage 120 may be increased.

[0091] Since the rotating member 400 is fixedly coupled to the second shaft 310 and the fresh air valve 300 is disposed in the second shaft 310, the second shaft 310 and the fresh air valve 300 may rotate by a degree by which the rotating member 400 rotates, and accordingly, the fresh air flow passage 110 may be partially closed and an opening degree of the fresh air valve 300 may be reduced.

[0092] However, such rotation is not infinitely possible and is performed until the contact portion 410 comes into contact with the stopper 19 provided in the housing 100.

[0093] When the contact portion 410 comes into contact with the stopper 19, rotation of the rotating member 400, the moving member 500, and the second output gear 14 may not proceed any longer, and accordingly, rotation of the first output gear 13 may also stop.

[0094] The timing at which rotation of the first output gear 13 stops may correspond to the state in which the EGR valve 200 opens the EGR flow passage 120 by a maximum degree, that is, the state in which the EGR valve 200 is positioned parallel to the EGR flow passage 120, and in this case, a flow amount of EGR gas introduced into the fresh air flow passage 110 may be highest, and a ratio of EGR gas to gas introduced into the engine may be increased compared with the state of FIG. 7.

[0095] According to the present disclosure, an opening

degree of a fresh air valve and an EGR valve may be adjusted through selective contact between a moving member and a rotating member and an operation in which the moving member pushes the rotating member, and thus the timing at which the opening degree is adjusted may be precisely adjusted.

[0096] When the moving member and the rotating member are formed of a metallic material, wear resistance may also be improved.

[0097] Because a first output gear rotates an EGR valve and simultaneously transfers rotating power to a second output gear, the first output gear may be capable of performing a multi-function, and accordingly, the number of gears for power transfer only may be reduced, thereby advantageously improving a utilization degree of space and achieving a compact size.

[0098] While the disclosure has been particularly shown and described with reference to exemplary embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the disclosure as defined by the appended claims.

[0099] Therefore, the scope of the disclosure is defined by the appended claims.

Claims

1. A valve for a vehicle comprising:
 - a housing in which an exhaust gas recirculation (EGR) flow passage and a fresh air flow passage are formed;
 - a driving motor;
 - a gear train connected to the driving motor;
 - a first output gear and a second output gear that are included in the gear train;
 - a moving member installed on the second output gear and rotating together with the second output gear;
 - a first shaft on which an EGR valve is installed and the first shaft fixed to the first output gear;
 - a second shaft on which a fresh air valve is installed; and
 - a rotating member that is connected to the second shaft and that rotates together with the moving member and a fresh air valve output gear and simultaneously rotates the second shaft when the rotating member selectively comes into contact with the moving member of the second shaft to contact the moving member and then pushes the moving member.
2. The valve for the vehicle of claim 1, wherein first rotation of the second output gear and first rotation of the rotating member are performed with a time difference.
3. The valve for the vehicle of claim 1, wherein the gear train comprises:
 - a motor gear connected to a motor axis;
 - an intermediate gear engaged with the motor gear;
 - the first output gear engaged with the intermediate gear; and
 - the second output gear engaged with the first output gear.
4. The valve for the vehicle of claim 1, wherein, when the EGR valve is completely closed and the fresh air valve is completely open, if a motor is driven, the first output gear rotates to begin to open the EGR valve, and the second output gear engaged with the first output gear also rotates, but in contrast, the rotating member and the second shaft do not rotate before the moving member comes into contact with the rotating member to maintain the fresh air valve to be completely open.
5. The valve for the vehicle of claim 4, wherein the motor is further driven when the EGR valve is partially open and the fresh air valve is completely open, and when the moving member comes into contact with the rotating member and then further rotates, the rotating member and the second shaft rotate and the fresh air valve begins to perform a closing operation.
6. The valve for the vehicle of claim 1, wherein the moving member comprises:
 - a base portion fixed to the second output gear; and
 - a flange protruding from the base portion and provided to contact the rotating member.
7. The valve for the vehicle of claim 6, wherein the base portion is shaped like a ring; and wherein the flange is configured in plural and the flanges are provided at opposite sides.
8. The valve for the vehicle of claim 1, wherein the rotating member is shaped like a plate, and comprises a fixing hole which the second shaft fixedly penetrates and a contact portion that is provided on an external circumference and protrudes to allow the moving member to reach and come into contact with the contact portion.
9. The valve for the vehicle of claim 8, further comprising:
 - a stopper provided on the housing, provided adjacent to the rotating member, provided to come contact with the contact portion, and configured to prevent the rotating member from rotating by a predetermined degree or greater.

10. The valve for the vehicle of claim 1, wherein the first output gear is fixed to the first shaft and allows the first shaft and the EGR valve fixed thereto to rotate as the first output gear rotates; and wherein the second output gear is rotatably installed on the first shaft and the first shaft is not affected by rotation of the second gear before the moving member installed on the second output gear comes into contact with the rotating member.

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11. The valve for the vehicle of claim 1, wherein, when the fresh air flow passage is completely open and the EGR flow passage is completely closed, the moving member and the rotating member do not contact each other; wherein, when the fresh air flow passage is completely open and the EGR flow passage is partially open, the moving member and the rotating member are provided to contact each other; and wherein, when the moving member pushes the rotating member, an opening degree of the fresh air valve with respect to the fresh air flow passage is reduced, and an opening degree of the EGR valve with respect to the EGR flow passage is increased.

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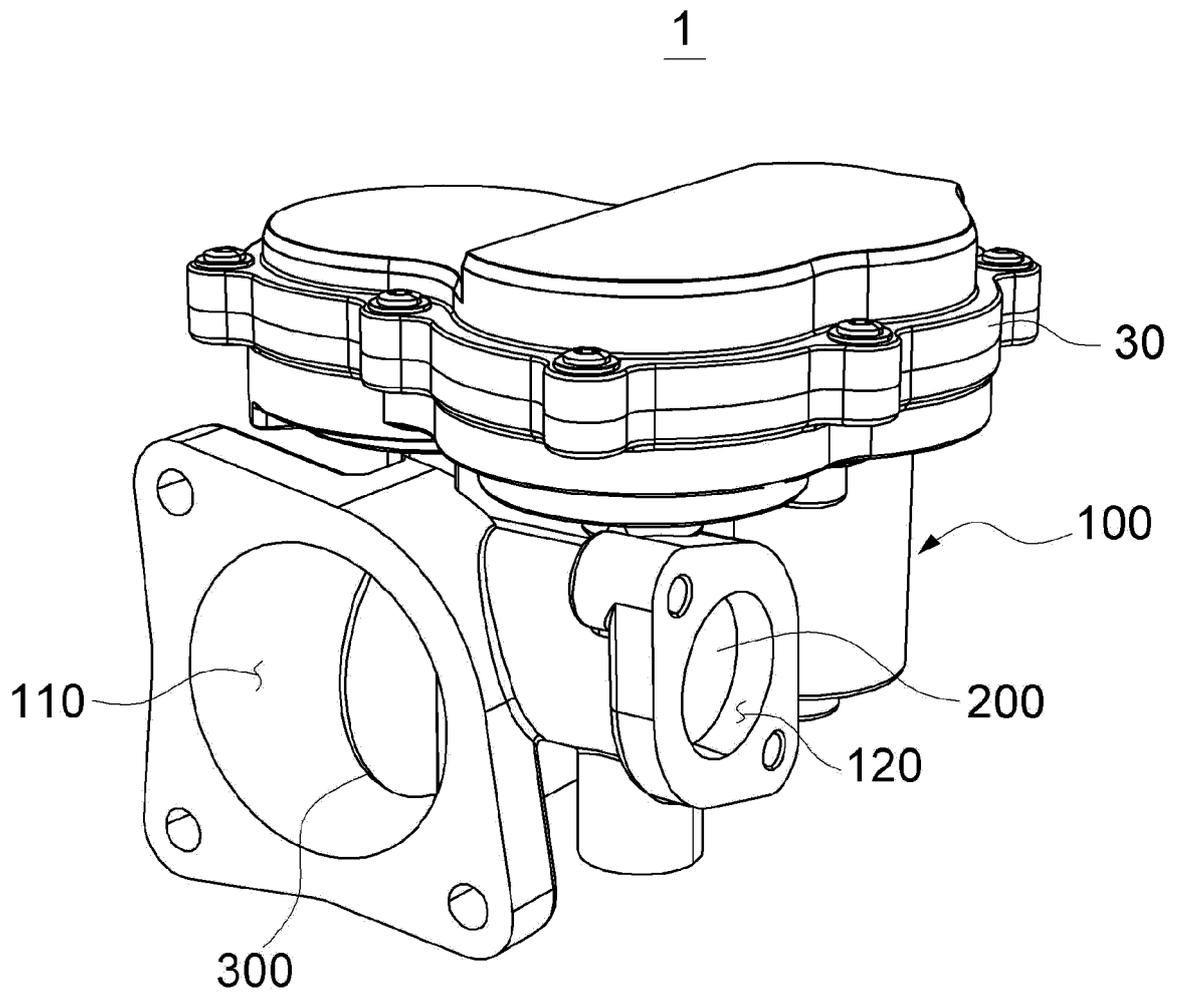
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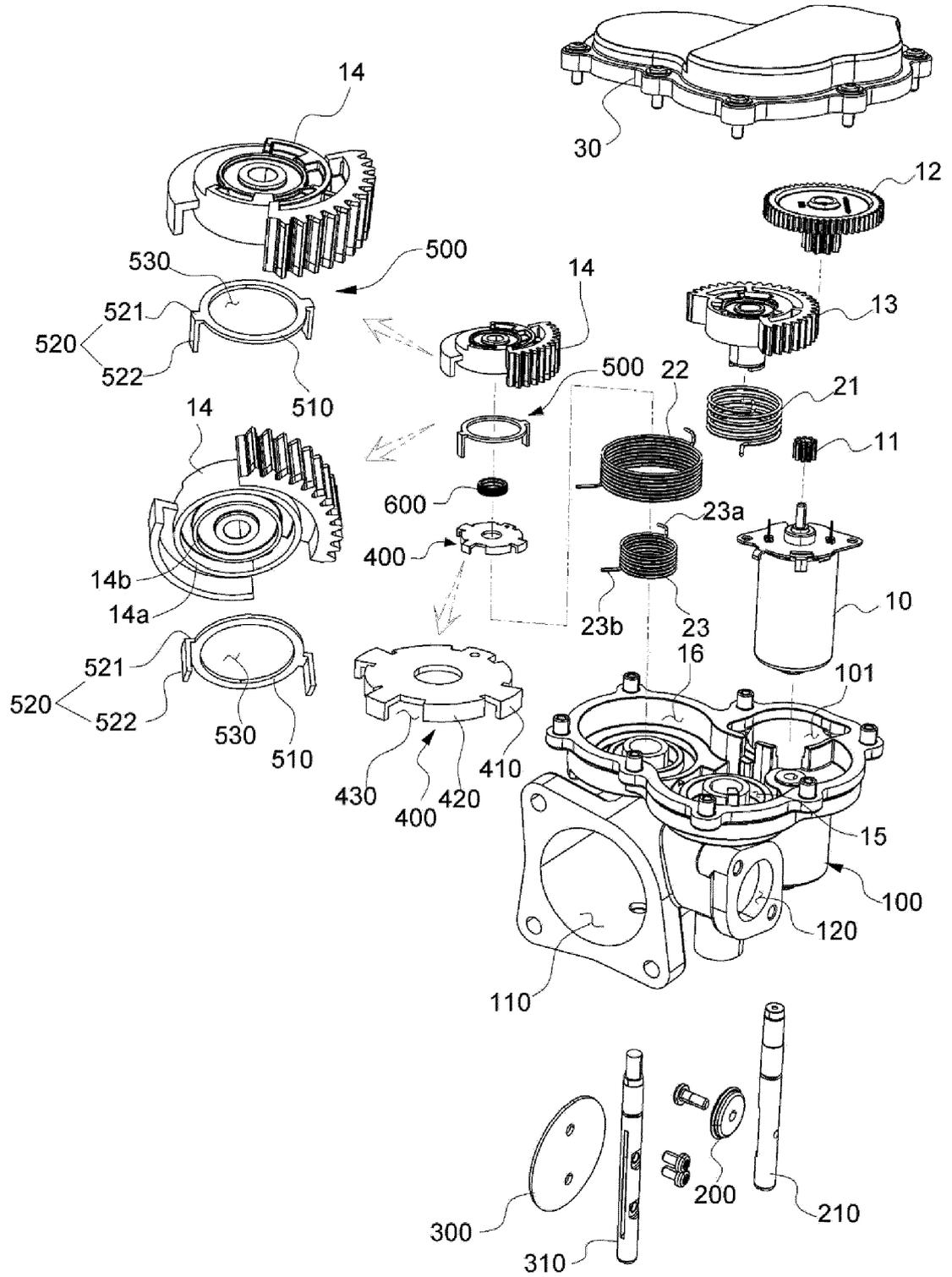
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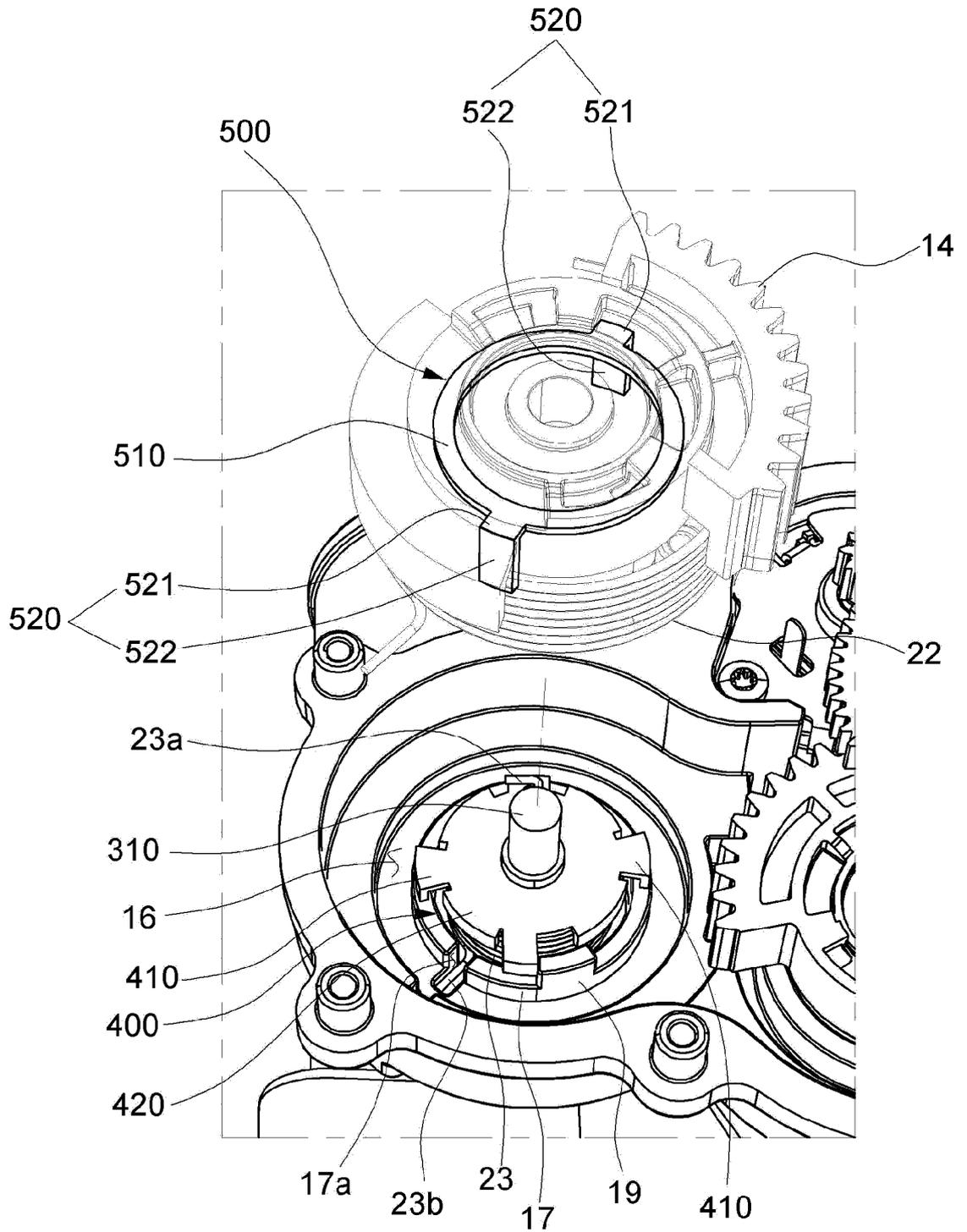
【Fig. 1】



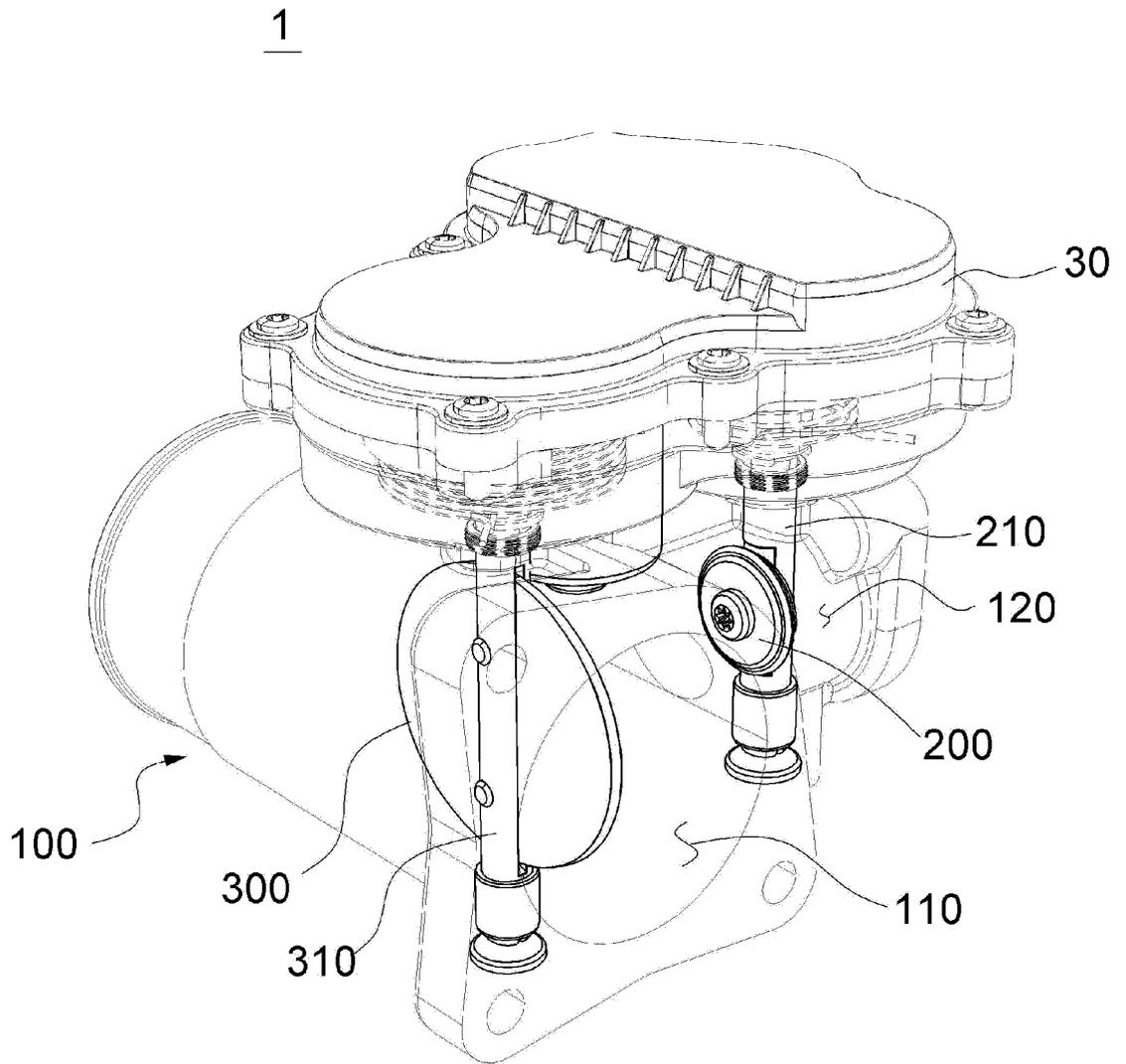
【Fig. 2】



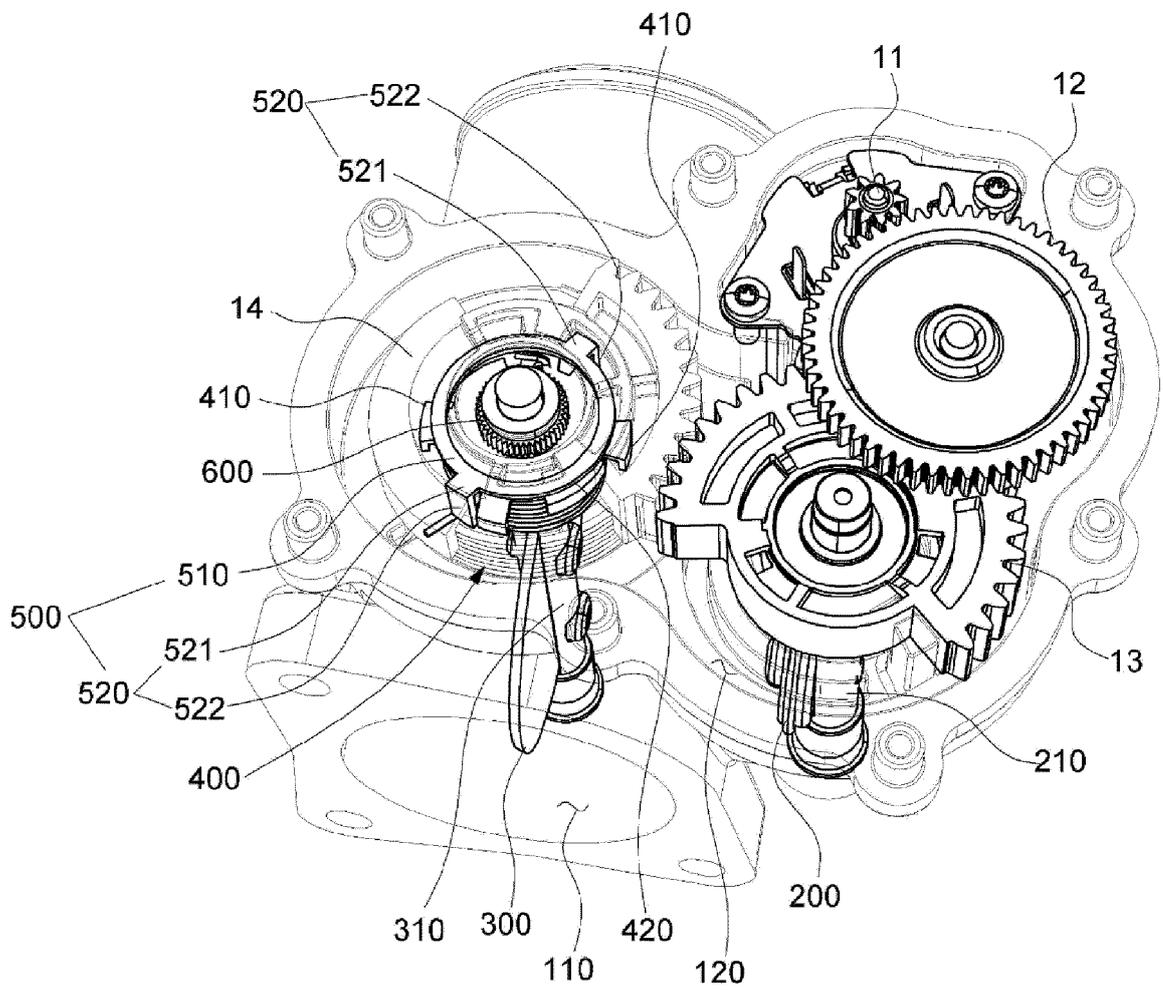
【Fig. 3】



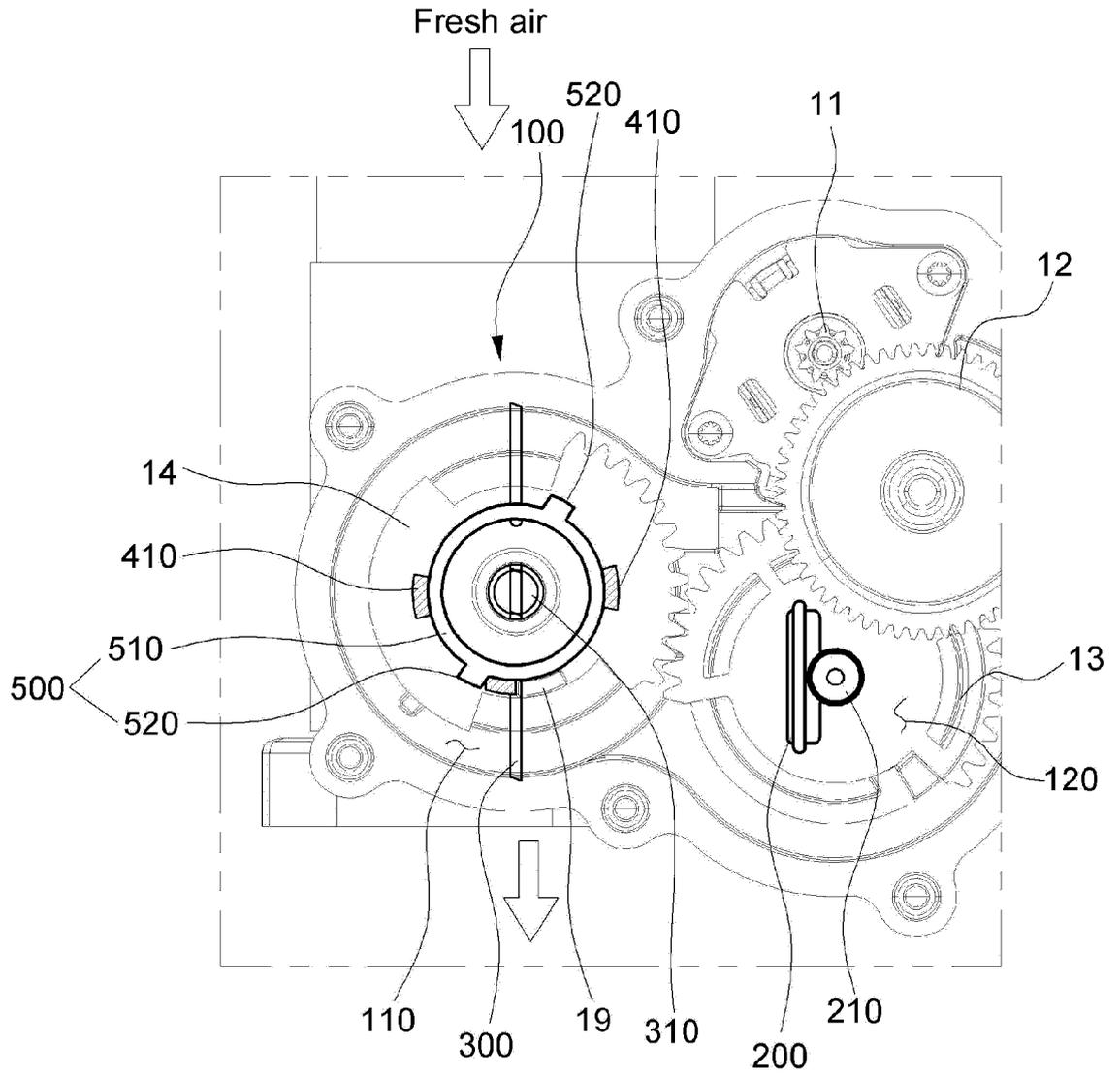
【Fig. 4】



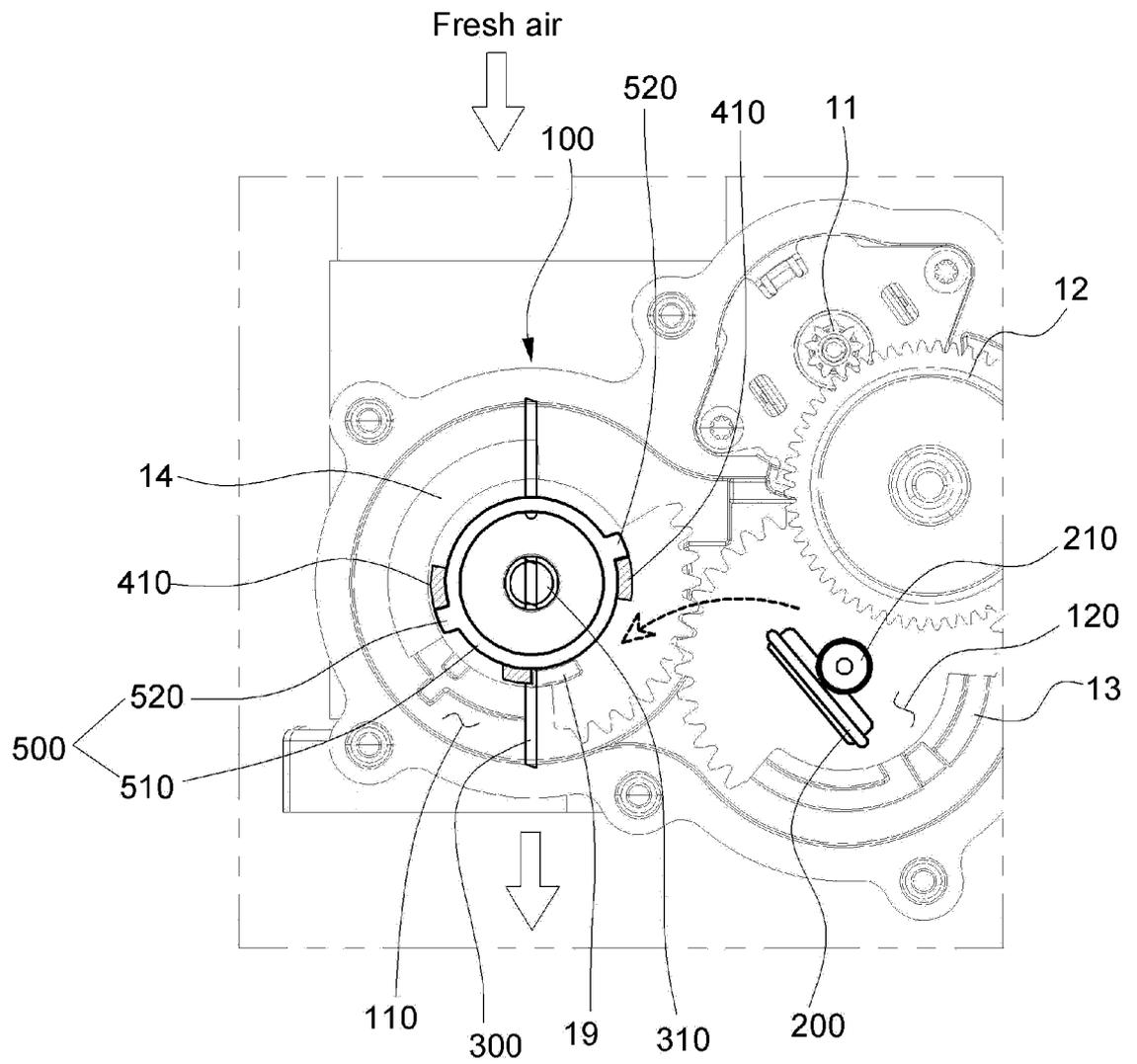
【Fig. 5】



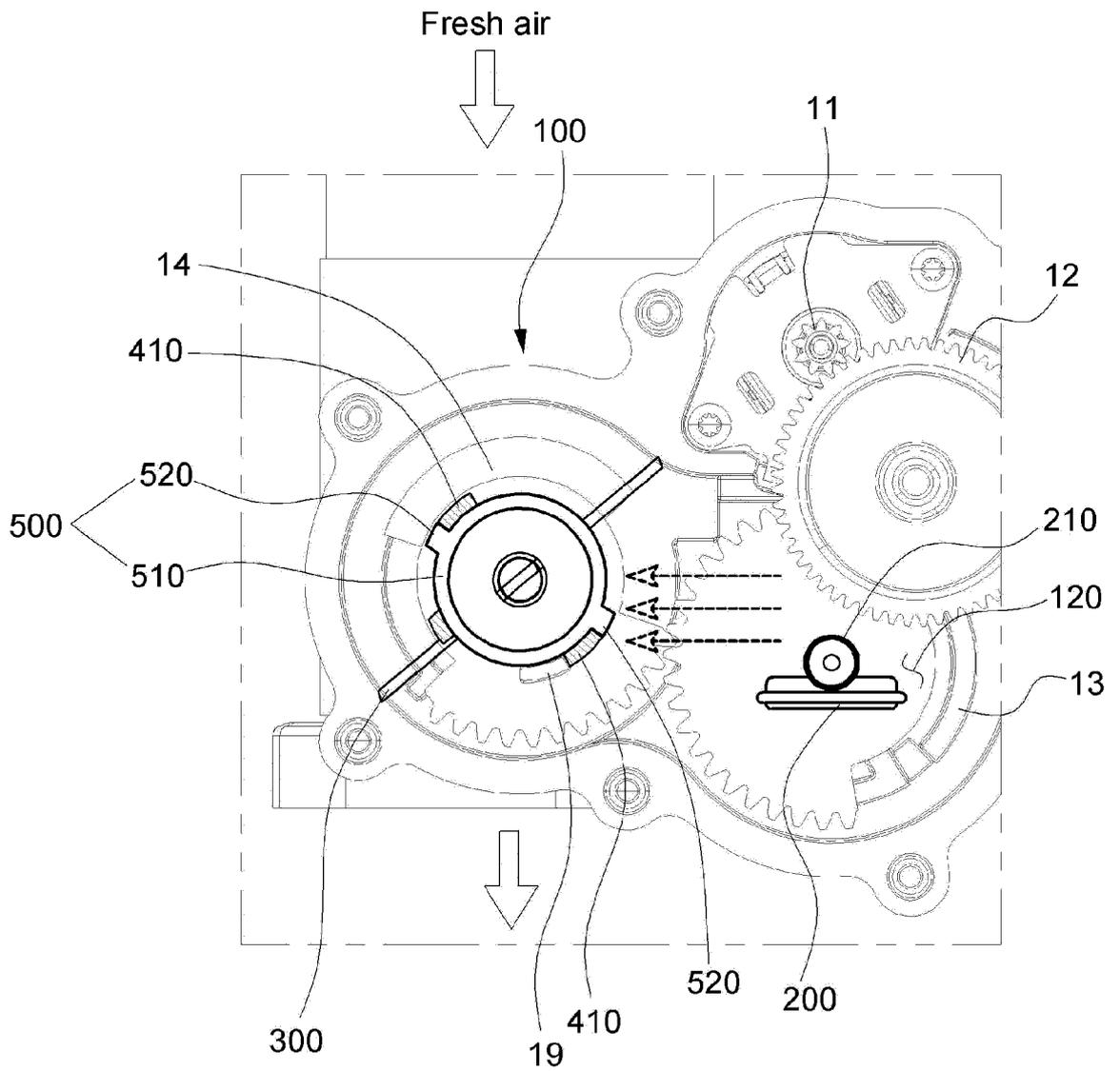
【Fig. 6】



【Fig. 7】



【Fig. 8】





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