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(54) STRADDLED VEHICLE

GRÄTSCHSITZFAHRZEUG

VÉHICULE À ENFOURCHER

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Description

[0001] The present invention relates to a straddled vehicle .

[0002] A straddled vehicle known to date includes an oxygen sensor for detecting an oxygen concentration of an exhaust gas. The oxygen sensor includes a sensor element including a material such as zirconia. To detect the oxygen concentration accurately, the temperature of the sensor element needs to be maintained at a predetermined activation temperature.

[0003] JP 2009-226988 A describes a motorcycle in which an oxygen sensor is attached to a portion of an exhaust pipe located rearward of a fan cover. The fan cover accommodates a fan, and the fan cover has openings through which air is introduced.

[0004] EP 3 165 730 A1 discloses another motorcycle comprising an oxygen detector in the exhaust pipe downstream of a main catalyst and a fan with a fan cover.

[0005] In a configuration in which an oxygen sensor is disposed near a combustion chamber of an engine, a sensor element can be quickly warmed by a high-temperature exhaust gas from the combustion chamber. In addition, the sensor element can be easily maintained at a predetermined temperature. However, as described in JP 2009-226988 A, in some cases, the oxygen sensor needs to be disposed away from the combustion chamber in consideration of arrangement of the oxygen sensor. In such cases, the influence of heat from the combustion chamber decreases so that it takes time to warm the sensor element of the oxygen sensor. In addition, it is difficult to maintain the temperature of the sensor element stably. In view of this, it is conceivable that the motorcycle disclosed in JP 2009-226988 A employs an oxygen sensor incorporating a heater for heating the sensor element.

[0006] While a motorcycle is traveling, air flows from the front toward the rear in the motorcycle. This air will be hereinafter referred to as "flowing air." A fan cover has openings through which air is introduced. The fan cover is disposed at such a position that the flowing air passes around the fan cover in order to facilitate introduction of air during traveling of the motorcycle. Thus, in a configuration where the oxygen sensor is disposed near the fan cover, the oxygen sensor is readily cooled by the flowing air. Thus, even if the oxygen sensor incorporates a heater, a detection accuracy of the oxygen sensor might decrease.

[0007] It is therefore an object of the present invention to provide a straddled vehicle including an oxygen sensor disposed rearward of a fan cover and capable of suppressing cooling of the oxygen sensor by flowing air to thereby maintain accuracy of the oxygen sensor sufficiently high.

[0008] To achieve the object, an inventor of the present application tried to form a sensor cover for hindering blowing of flowing air to the oxygen sensor integrally with the fan cover. Specifically, the sensor cover is formed integrally with a rear portion of the fan cover so that the sensor cover overlaps at least a portion of the oxygen sensor in a vehicle side view. In addition, a portion of the sensor cover overlapping the oxygen sensor is formed to project outward in a vehicle width direction toward the rear. This configuration was expected to prevent direct blowing of flowing air to the oxygen sensor and to smoothly guide the flowing air rearward.

[0009] The idea described above prevents flowing air from directly blowing the oxygen sensor. However, a negative pressure is generated behind the sensor cover to cause flowing air that has flowed along the surface of the sensor cover to flow into the inside of the sensor cover and flow around the oxygen sensor.

[0010] In these circumstances, the inventor further studied as follows. First, the inventor tried to increase the size of the sensor cover such that the sensor cover extends rearward. However, when the size of the sensor cover is increased, a force exerted on the sensor cover from flowing air increases. Thus, this idea is not favorable in terms of obtaining rigidity of the sensor cover and the fan cover integrated with the sensor cover.

[0011] Then, the inventor focused on a silencer cover disposed outward of the silencer in the vehicle width direction. Consequently, the inventor has reached the idea that effective arrangement of both the sensor cover and the silencer cover can hinder a flow of flowing air that has flowed along the surface of the sensor cover into the inside of the sensor cover without an increase in size of the sensor cover, and the oxygen cover is not readily cooled by flowing air. The present invention is based on the findings described above.

According to the present invention said object is solved by a straddled vehicle having the features of independent claim 1. Preferred embodiments are laid down in the dependent claims.

[0012] A straddled vehicle disclosed here includes: an internal combustion engine; an exhaust pipe connected to the internal combustion engine; a silencer disposed rearward of the exhaust pipe and connected to the exhaust pipe; a fan disposed outward of the internal combustion engine in a vehicle width direction; a fan cover disposed outward of the fan in the vehicle width direction and having an opening; a silencer cover disposed outward of the silencer in the vehicle width direction; an oxygen sensor including a sensor element disposed inside the exhaust pipe and a heater that heats the sensor element, and a cylindrical case located outside the exhaust pipe, the oxygen sensor being attached to the exhaust pipe; and a sensor cover integrally formed with the fan cover, located outward of the oxygen sensor in the vehicle width direction, overlapping at least a portion of the cylindrical case of the oxygen sensor in a vehicle side view, and extending outward in the vehicle width direction and rearward in a vehicle fore-and-aft direction. The silencer cover has a front portion located outward of the oxygen sensor in the vehicle width direction and extending outward in the vehicle width direction and rearward

in the vehicle fore-and-aft direction. In a vehicle plan view, a distance between a rear end of the sensor cover and a front end of the front portion of the silencer cover in the vehicle fore-and-aft direction is smaller than a distance between a rear end of the fan cover and a front end of the silencer.

[0013] In the straddled vehicle, the sensor cover can prevent flowing air from directly blowing the oxygen sensor, and at the same time, the sensor cover and the front portion of the silencer cover can suppress a flow of flowing air to the surroundings of the oxygen sensor induced by a negative pressure. Accordingly, it is possible to suppress cooling of the oxygen sensor by flowing air to thereby keep accuracy of the oxygen sensor sufficiently high.

[0014] In a preferred aspect, in the vehicle plan view, an inner end in the vehicle width direction of the front portion of the silencer cover is located inward of an outer end in the vehicle width direction of the sensor cover in the vehicle width direction.

[0015] In a preferred aspect, in the vehicle plan view, a front end of the front portion of the silencer cover is located inward of the outer end in the vehicle width direction of the sensor cover in the vehicle width direction.

[0016] In these aspects, it is possible to further suppress a flow of flowing air to the surroundings of the oxygen sensor by a negative pressure.

[0017] In a preferred aspect, in a vehicle fore-and-aft direction, the front end of the front portion of the silencer cover is located at a position identical to a rear end of the sensor cover or forward of the rear end of the sensor cover.

[0018] In the aspect, it is possible to further suppress a flow of flowing air to the surroundings of the oxygen sensor by a negative pressure.

[0019] In a preferred aspect, the oxygen sensor is disposed rearward of the internal combustion engine.

[0020] In a preferred aspect, the straddled vehicle includes a rear wheel that is driven by the internal combustion engine, and at least a portion of the oxygen sensor overlaps the rear wheel in a vehicle side view.

[0021] In a preferred aspect, the straddled vehicle includes a catalyst that purifies an exhaust gas flowing in the exhaust pipe, and the oxygen sensor is disposed downstream of the catalyst in a flow direction of the exhaust gas.

[0022] In these aspects, since the oxygen sensor is located away from the internal combustion engine, the advantages described above become significant.

[0023] In a preferred aspect, the sensor cover is disposed rearward of the opening of the fan cover.

[0024] In the aspect, a portion of flowing air can be supplied to the fan through the opening of the fan cover, and another portion of the flowing air can be smoothly guided rearward with blowing of the flowing air to the oxygen sensor being prevented by the sensor cover.

[0025] In a preferred aspect, the oxygen sensor includes a cylindrical case located outside the exhaust pipe, and in a vehicle side view, a minimum gap between the sensor cover and the front portion of the silencer cover in a vehicle fore-and-aft direction is smaller than an axial dimension of the case of the oxygen sensor.

[0026] In the aspect, since a minimum gap between the sensor cover and the front portion of the silencer cover in the vehicle fore-and-aft direction is small, it is possible to further suppress a flow of flowing air to the surroundings of the oxygen sensor by a negative pressure.

[0027] In a preferred aspect, in a vehicle side view, the sensor cover has a recess that is recessed forward, and the front portion of the silencer cover has a projection projecting forward toward the recess.

[0028] In the aspect, the sensor cover and the front portion of the silencer cover are formed in shapes that match each other in the vehicle side view. Thus, it is possible to effectively suppress a flow of flowing air that has flowed along the surface of the sensor cover into the inside of the sensor cover so that cooling of the oxygen sensor by the flowing air can be effectively suppressed.

[0029] In a preferred aspect, the oxygen sensor includes a wire connection portion. The straddled vehicle includes a wire connected to the wire connection portion.

[0030] In a preferred aspect, the sensor cover overlaps the wire connection portion of the oxygen sensor in a vehicle side view.

[0031] In the aspect, the sensor cover can protect the wire connection portion of the oxygen sensor.

[0032] In a preferred aspect, the straddled vehicle includes a wire cover integrally formed with the fan cover, located outward of at least a portion of the wire in the vehicle width direction, and overlapping at least a portion of the wire in a vehicle side view.

[0033] In the aspect, the wire cover can protect at least a portion of the wire.

[0034] In a preferred aspect, the oxygen sensor includes a sensor element located inside the exhaust pipe, and the wire connection portion is disposed above the sensor element in a vehicle vertical direction and inward of the sensor element in the vehicle width direction.

[0035] In the aspect, since the wire connection portion is disposed above the sensor element, maintenance of the oxygen sensor can be easily performed. In addition, since the wire connection portion is disposed inward of the sensor element in the vehicle width direction, extension of the wire connection portion outward in the vehicle width direction can be avoided.

[0036] In a preferred aspect, the wire includes a wire portion disposed above the fan and inward of the fan cover in the vehicle width direction and extending forward.

[0037] In the aspect, the wire can be easily routed.

[0038] In a preferred aspect, the straddled vehicle includes a radiator disposed between the fan cover and the fan.

[0039] In the present invention, in a straddled vehicle including an oxygen sensor disposed rearward of a fan cover, cooling of the oxygen sensor by flowing air is suppressed so that accuracy of the oxygen sensor can be

kept sufficiently high.

BRIEF DESCRIPTION OF THE DRAWINGS

[0040]

FIG. 1 is a right side view of a scooter according to a preferred embodiment.
FIG. 2 is a right side view of the scooter when a front cover, a side cover and the like are detached.
FIG. 3 is a bottom view of the scooter.
FIG. 4 is a partial plan view of the scooter.
FIG. 5 is a partial front view of the scooter.
FIG. 6 is a perspective view of a cover.
FIG. 7 is a partial right side view of the scooter.
FIG. 8A is a partial front view of the scooter.
FIG. 8B is a partially cut-out view illustrating the front cover and corresponding to FIG. 8A.
FIG. 9 is a cross-sectional view of a second oxygen sensor and a second exhaust pipe and illustrates a cross section including a central line of the second oxygen sensor and perpendicular to a central line of the second exhaust pipe.
FIG. 10 is a partial plan view of the scooter and is used for describing flowing air flowing along a sensor cover and a silencer cover.
FIG. 11 is a view corresponding to FIG. 10 in a case where no sensor cover is assumed to be provided.
FIG. 12 is a view corresponding to FIG. 10 in a case where a distance between a rear end of the sensor cover and a front end of a front portion of the silencer cover in a vehicle fore-and-aft direction is large.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0041] A preferred embodiment of the present invention will be described hereinafter with reference to the drawings. As illustrated in FIGS. 1 and 2, a straddled vehicle according to this preferred embodiment is a scooter 1 including an oxygen sensor 50 for detecting an oxygen concentration of an exhaust gas.

[0042] The scooter 1 includes a seat 2 on which a rider is seated. Unless otherwise specified, the terms front, rear, left, right, up, and down as used in the description below, refer to front, rear, left, right, up, and down, respectively, as seen from an imaginary rider sitting on the seat 2 in a case where the scooter 1 on which the rider is not seated and a load is not mounted and which is not filled with fuel is stationary in an upright position on a horizontal surface. The reference characters F, Re, L, R, U, and D in the drawings represent front, rear, left, right, up, and down, respectively.

[0043] FIG. 2 is a side view of the scooter 1 when a front cover 28 and a side cover 29 described later. As illustrated in FIGS. 1 and 2, the scooter 1 includes a vehicle body frame 3, a front wheel 35, a rear wheel 36, a foot board 4, a pivot shaft 6 provided on the vehicle body frame 3. The foot board 4 is supported by the vehicle body frame 3, and at least a portion of the foot board 4 is disposed rearward of the front wheel 35. The scooter 1 also includes a front cover 28 at least partially located below a head pipe 3A of the vehicle body frame 3, the side cover 29 disposed outward of the vehicle body frame 3 in a vehicle width direction, and an under cover 5 disposed below the front cover 28 and the side cover 29. At least a portion of the under cover 5 is disposed below the foot board 4 and behind the front wheel 35. The engine unit 10 is swingably supported by the pivot shaft 6, and at least a portion of the engine unit 10 is disposed below the foot board 4.

[0044] As illustrated in FIG. 2, the engine unit 10 includes an internal combustion engine 11A. The internal combustion engine 11A includes a crankcase 11, a cylinder body 12 connected to the crankcase 11, and a cylinder head 13 connected to the cylinder body 12. Although not shown, a crank shaft of the internal combustion engine 11A is disposed inside the crankcase 11. The cylinder body 12 is disposed ahead of the crankcase 11, and the cylinder head 13 is disposed ahead of the cylinder body 12. The cylinder head 13 includes an exhaust port 14 from which an exhaust gas is exhausted.

[0045] The engine unit 10 includes a transmission case 7 (see FIG. 3) disposed at the left of the rear wheel 36, and an unillustrated belt continuously variable transmission (hereinafter referred to as a CVT) disposed inside the transmission case 7. The CVT is coupled to the crank shaft of the internal combustion engine 11A and the rear wheel 36, and transfers a torque of the crank shaft to the rear wheel 36 so that a transmission gear ratio is changeable. The rear wheel 36 is driven by the internal combustion engine 11A. As illustrated in FIG. 4, a rear arm 8 coupling the crankcase 11 and the rear wheel 36 to each other is disposed at the right of the rear wheel 36. The rear wheel 36 is supported by the engine unit 10 and the rear arm 8, and swings together with the engine unit 10 and the rear arm 8. A rear cushion unit 9 is disposed between the vehicle body frame 3 and the rear arm 8 (see FIG. 2) . When the engine unit 10 swings upward, the rear cushion unit 9 contracts, whereas when the engine unit 10 swings downward, the rear cushion unit 9 extends.

[0046] In this preferred embodiment, the internal combustion engine 11A of the engine unit 10 is of a water-cooled type. As illustrated in FIGS. 4 and 5, a fan 16 is disposed at the right of the crankcase 11, and a radiator 15 is disposed at the right of the fan 16.

[0047] As illustrated in FIG. 1, a cover 60 is disposed at the right of the radiator 15. FIG. 6 is a perspective view of the cover 60. The cover 60 includes a fan cover 61, a lower extension cover 62 extending rearward from a lower portion of the fan cover 61, and an upper extension cover 63 extending rearward from an upper portion of the fan cover 61, which will be described later in detail. The cover 60 is a single part, and the fan cover 61, the lower extension cover 62, and the upper extension cover

63 are integrally formed.

[0048] The fan cover 61 is a cover which is located in a region overlapping the fan 16 in a vehicle side view. In other words, the fan cover 61 is a cover which is located just beside the fan 16. FIG. 6 illustrates a contour of the fan 16 by a broken line. In this preferred embodiment, a portion of the cover 60 on the contour and a portion of the cover 60 inside the contour in the vehicle side view correspond to the fan cover 61. The fan cover 61 has a plurality of openings 17a and 17b. In this example, the fan cover 61 has five vertically arranged front openings 17a and three vertically arranged rear openings 17b. These openings 17a and 17b are merely an example, and the openings of the fan cover 61 are not limited to any of a specific number, a specific shape, and a specific position.

[0049] When an impeller (not shown) of the fan 16 rotates, air is supplied to the radiator 15 through the openings 17a and 17b of the fan cover 61. The fan 16, the radiator 15, and the cover 60, which are supported by the crankcase 11, swing integrally with the engine unit 10. The internal combustion engine 11A of the engine unit 10 is not necessarily of a water-cooled type. The internal combustion engine 11A may be of an air-cooled type, and the radiator 15 may not be provided.

[0050] The lower extension cover 62 includes an upper edge portion 62a and a lower edge portion 62b each extending rearward, and a rear edge portion 62c extending from the rear end of the upper edge portion 62a to the rear end of the lower edge portion 62b. The rear edge portion 62c includes an upper portion 62c1 extending forward and downward from the rear end of the upper edge portion 62a and a lower portion 62c2 extending forward and upward from the rear end of the lower edge portion 62b. The rear edge portion 62c is recessed forward.

[0051] The upper extension cover 63 includes an upper edge portion 63a extending rearward and downward and a lower edge portion 63b extending rearward and upward. The upper extension cover 63 protrudes rearward. This shape of the upper extension cover 63 is merely an example, and the upper extension cover 63 is not limited to a specific shape. The upper extension cover 63 is not necessarily provided, and may be omitted.

[0052] As illustrated in FIG. 1, the scooter 1 includes an exhaust pipe 24 and a silencer 25. The exhaust pipe 24 includes a first exhaust pipe 21, a catalyst case 23 accommodating the catalyst 20, and a second exhaust pipe 22. A silencer cover 26 is disposed at a side of the silencer 25. The first exhaust pipe 21, the catalyst case 23, the second exhaust pipe 22, the silencer 25, and the silencer cover 26 are configured to swing integrally with the engine unit 10.

[0053] As illustrated in FIG. 3, an upstream end portion 21a of the first exhaust pipe 21 is connected to the exhaust port 14 of the cylinder head 13. The first exhaust pipe 21 and the catalyst case 23 are connected to each other by a first pipe fitting 31. The catalyst case 23 and the second exhaust pipe 22 are connected to each other by a second pipe fitting 32. The second exhaust pipe 22 and the silencer 25 are connected to each other by a third pipe fitting 33.

[0054] The first exhaust pipe 21 is a metal pipe. The first exhaust pipe 21 is disposed below the engine unit 10. As illustrated in FIG. 3, in a vehicle bottom view, the first exhaust pipe 21 overlaps the engine unit 10.

[0055] The second exhaust pipe 22 is also a metal pipe. The second exhaust pipe 22 extends rearward and outward in the vehicle width direction in the vehicle bottom view. As illustrated in FIG. 1, in a vehicle side view, the second exhaust pipe 22 extends rearward and upward.

[0056] The catalyst case 23 is made of a metal cylinder. The catalyst case 23 is not limited to a specific shape. The catalyst 20 is disposed inside the catalyst case 23. The catalyst 20 is disposed inside the exhaust pipe 24 and purifies an exhaust gas flowing in the exhaust pipe 24. The catalyst case 23 is disposed forward of the rear wheel 36, and the catalyst 20 is disposed forward of the rear wheel 36. The catalyst case 23 has an inside diameter larger than an inside diameter of each of the first exhaust pipe 21 and the second exhaust pipe 22. The catalyst case 23 has an outside diameter larger than an outside diameter of each of the first exhaust pipe 21 and the second exhaust pipe 22. As illustrated in FIG. 3, in the vehicle bottom view, the catalyst case 23 extends rearward and outward in the vehicle width direction. As illustrated in FIG. 1, in the vehicle side view, the catalyst case 23 extends rearward. The catalyst case 23 is not limited to a specific posture in placing.

[0057] As illustrated in FIG. 7, a first oxygen sensor 40 is attached to the first exhaust pipe 21. The first oxygen sensor 40 is disposed upstream of the catalyst 20 and detects an oxygen concentration of an exhaust gas before purification by the catalyst 20. Based on the oxygen concentration of the exhaust gas detected by the first oxygen sensor 40, an air-fuel ratio of an exhaust gas emitted from the internal combustion engine 11A can be detected. Thus, based on a detection result of the first oxygen sensor 40, the internal combustion engine 11A can be controlled to obtain a predetermined combustion state.

[0058] As illustrated in FIG. 3, the first oxygen sensor 40 is attached to a portion of the first exhaust pipe 21 closer to the catalyst 20 than an intermediate position (position indicated by a broken line in FIG. 3) 21m of the first exhaust pipe 21. The intermediate position of the first exhaust pipe 21 is an intermediate position between the upstream end portion 21a and the downstream end portion 21b in a direction along the central line of the first exhaust pipe 21. The first oxygen sensor 40 is disposed rearward of the cylinder body 12 of the engine unit 10. The first oxygen sensor 40 is disposed rearward of the pivot shaft 6 swingably supporting the engine unit 10.

[0059] As illustrated in FIG. 7, the first exhaust pipe 21 includes an attachment portion 43 for attaching the first oxygen sensor 40. The attachment portion 43 is cylindri-

cal, and is welded to the first exhaust pipe 21.

[0060] As illustrated in FIG. 1, in the vehicle side view, the first oxygen sensor 40 is not covered with the side cover 29 and is exposed. The first oxygen sensor 40 is disposed to be visually recognized when the scooter 1 is seen from the right. As illustrated in FIG. 3, in the vehicle bottom view, the first oxygen sensor 40 overlaps the crankcase 11 but does not overlap the under cover 5. In the vehicle bottom view, at least a portion of the first oxygen sensor 40 is disposed at the right of a left end 35L of the front wheel 35 and at the left of a right end 35R of the front wheel 35. The first oxygen sensor 40 is disposed near the center of the vehicle.

[0061] As illustrated in FIG. 7, a second oxygen sensor 50 is attached to the second exhaust pipe 22. The second oxygen sensor 50 is disposed downstream of the catalyst 20 and detects the oxygen concentration of an exhaust gas purified by the catalyst 20. If the catalyst 20 has deteriorated, the exhaust gas is not appropriately purified. Thus, based on a detection result of the second oxygen sensor 50, it can be detected whether the catalyst 20 has deteriorated or not. Deterioration of the catalyst 20 may be detected by comparing the detection result of the first oxygen sensor 40 and the detection result of the second oxygen sensor 50.

[0062] As illustrated in FIG. 7, the second exhaust pipe 22 includes an attachment portion 54 for attaching the second oxygen sensor 50. The attachment portion 54 is cylindrical, and is welded to the second exhaust pipe 22.

[0063] As illustrated in FIG. 2, the second oxygen sensor 50 is disposed rearward of the internal combustion engine 11A of the engine unit 10. As illustrated in FIG. 7, at least a portion of the second oxygen sensor 50 overlaps the rear wheel 36 in a vehicle side view.

[0064] As illustrated in FIG. 9, the second oxygen sensor 50 includes a sensor element 51 located inside the second exhaust pipe 22, a cylindrical case 52 located outside the second exhaust pipe 22, and a heater 53 for heating the sensor element 51. The sensor element 51 includes a material such as zirconia. The heater 53 is incorporated in the second oxygen sensor 50.

[0065] As illustrated in FIG. 9, in a cross section including a central line 50C of the second oxygen sensor 50 and perpendicular to the central line 22C of the second exhaust pipe 22, at least a portion of the case 52 is located inward of the central line 22C of the second exhaust pipe 22 in the vehicle width direction and above the central line 22C. The posture of the second oxygen sensor 50 in placing described here is an example, and the posture of the second oxygen sensor 50 in placing is not limited to a specific posture. The expression of inward in the vehicle width direction refers to the direction toward a vehicle central line CL, and the expression of outward in the vehicle width direction refers to the direction away from the vehicle central line CL (see FIG. 3).

[0066] As illustrated in FIG. 1, a first wire 45 is connected to the first oxygen sensor 40. A portion of the first wire 45 is exposed in the vehicle side view. The portion of the first wire 45 is visually recognized when seen from the right. Accordingly, the first wire 45 can be easily handled from the right in maintenance or the like of the first oxygen sensor 40, and thus, maintenance of the first oxygen sensor 40 can be easily performed. The first wire 45 extends upward from the first oxygen sensor 40 and then extends forward. The first wire 45 does not pass under the engine unit 10. The first wire 45 is connected to an unillustrated electronic control unit (ECU).

[0067] As illustrated in FIG. 9, the second oxygen sensor 50 includes a wire connection portion 55, and a second wire 46 is connected to the wire connection portion 55. The wire connection portion 55 is disposed above the sensor element 51 in a vehicle vertical direction, and inward of the sensor element 51 in the vehicle width direction. As illustrated in FIG. 7, the second wire 46 extends upward from the second oxygen sensor 50 and then extends forward. The second wire 46 passes above the fan 16. A portion 46a of the second wire 46 is disposed above the fan 16. The second wire 46 does not pass under the engine unit 10. The second wire 46 is connected to the ECU.

[0068] As illustrated in FIGS. 8A and 8B, the first oxygen sensor 40 and the second oxygen sensor 50 overlap the under cover 5 in a vehicle front view. The first oxygen sensor 40 and the second oxygen sensor 50 are disposed not to be visually recognized when the scooter 1 is seen from the front.

[0069] As illustrated in FIG. 7, a portion of the lower extension cover 62 overlaps at least a portion of the second oxygen sensor 50 in a vehicle side view. In this preferred embodiment, the portion of the lower extension cover 62 constitutes a sensor cover 65. The sensor cover 65 is disposed rearward of the openings 17a and 17b of the fan cover 61. As illustrated in FIG. 4, the sensor cover 65 is located outward of the second oxygen sensor 50 in the vehicle width direction. The lower extension cover 62 extends outward in the vehicle width direction and rearward in the vehicle fore-and-aft direction. The sensor cover 65 also extends outward in the vehicle width direction and rearward in the vehicle fore-and-aft direction.

[0070] The silencer cover 26 is disposed outward of the silencer 25 in the vehicle width direction. A front portion 26a of the silencer cover 26 is located outward of the second oxygen sensor 50 in the vehicle width direction. The front portion 26a of the silencer cover 26 extends outward in the vehicle width direction and rearward in the vehicle fore-and-aft direction, and in this preferred embodiment, is curved.

[0071] In this preferred embodiment, as illustrated in FIG. 4, a rear end 62d of the lower extension cover 62 and a front end 26aa of the front portion 26a of the silencer cover 26 are at the same position in the vehicle fore-and-aft direction in a vehicle plan view. In the vehicle plan view, suppose a straight line passing through the rear end 62d of the lower extension cover 62 and extending in the vehicle width direction is L1, and a straight line passing through the front end 26aa of the front portion

26a of the silencer cover 26 and extending in the vehicle width direction is L2, the line L1 and the line L2 coincide with each other. Suppose a distance between the rear end 62d of the lower extension cover 62 and the front end 26aa of the front portion 26a of the silencer cover 26 in the vehicle fore-and-aft direction is ΔA, ΔA = 0 is established in this preferred embodiment. In FIG. 7, character 61a denotes a rear end of the fan cover 61. In FIG. 4, character L3 denotes a straight line passing through the rear end 61a of the fan cover 61 and extending in the vehicle width direction in the vehicle plan view. Character L4 denotes a straight line passing through a front end 25a of the silencer 25 and extending in the vehicle width direction in the vehicle plan view. In the vehicle plan view, a distance between the rear end 61a of the fan cover 61 and the front end 25a of the silencer 25 in the vehicle fore-and-aft direction is defined as ΔB. Then, ΔA < ΔB is established.

[0072] In FIG. 4, character L5 denotes a straight line passing through an inner end 26ae in the vehicle width direction of the front portion 26a of the silencer cover 26 and extending in the vehicle fore-and-aft direction in the vehicle plan view. Character L6 denotes a straight line passing through an outer end 62e in the vehicle width direction of the lower extension cover 62 and extending in the vehicle fore-and-aft direction in the vehicle plan view. In this example, the line L5 is located inward of the line L6 in the vehicle width direction. That is, in the vehicle plan view, the inner end 26ae in the vehicle width direction of the front portion 26a of the silencer cover 26 is located inward of the outer end 62e in the vehicle width direction of the lower extension cover 62 in the vehicle width direction.

[0073] In this preferred embodiment, as described above, the front end 26aa of the front portion 26a of the silencer cover 26 is at a position identical to the rear end 62d of the lower extension cover 62 in the vehicle fore-and-aft direction, but this positional relationship is not specifically limited. In the vehicle fore-and-aft direction, the front end 26aa of the front portion 26a of the silencer cover 26 may be located forward of the rear end 62d of the lower extension cover 62, and ΔA > 0 may be established. Even in the case of ΔA > 0, the relationship of ΔA < ΔB is preferable.

[0074] As illustrated in FIG. 7, the sensor cover 65 and the front portion 26a of the silencer cover 26 are formed in shapes that match each other in the vehicle side view. In this example, in the vehicle side view, the sensor cover 65 has a recess 65a that is recessed forward, and the front portion 26a of the silencer cover 26 has a projection 26ab projecting forward toward the recess 65a.

[0075] In the vehicle side view, a gap is provided between the sensor cover 65 and the front portion 26a of the silencer cover 26 in the vehicle fore-and-aft direction, but the gap is relatively small. The gap varies depending on the vertical position, and a minimum gap G1 is smaller than an axial dimension F1 (see FIG. 9) of the case 52 of the second oxygen sensor 50. However, this is only an example, and the minimum gap G1 is not specifically limited.

[0076] The sensor cover 65 overlaps the wire connection portion 55 of the second oxygen sensor 50 in a vehicle side view. A portion of the second wire 46 overlaps the sensor cover 65 in the vehicle side view. Another portion of the second wire 46 is located inward of the upper extension cover 63 of the cover 60 in the vehicle width direction, and overlaps the upper extension cover 63 in the vehicle side view. A portion of the upper extension cover 63 constitutes the wire cover 66. The portion 46a of the second wire 46 is located above the fan 16 and inward of the fan cover 61 in the vehicle width direction, and extends forward.

[0077] The configuration of the scooter 1 has been described above. Next, the influence of flowing air on the second oxygen sensor 50 will be described.

[0078] When the scooter 1 travels, air (i.e., flowing air) W flows from the front toward the rear, as illustrated in FIG. 10. The fan cover 61 is disposed at a position at which the flowing air W hits the fan cover 61 such that air can be easily introduced into the openings 17a and 17b (see FIG. 6). In this preferred embodiment, the second oxygen sensor 50 is disposed near the fan cover 61. Here, suppose no sensor cover 65 is provided as illustrated in FIG. 11, flowing air W1 that has flowed along the fan cover 61 flows toward the second oxygen sensor 50 to cool the second oxygen sensor 50. In this case, although the second oxygen sensor 50 incorporates the heater 53 (see FIG. 9), the temperature of the sensor element 51 decreases so that a detection accuracy might decrease.

[0079] On the other hand, in this preferred embodiment, the sensor cover 65 integrally formed with the fan cover 61 is disposed outward of the second oxygen sensor 50 in the vehicle width direction. This prevents flowing air W1 from directly blowing the second oxygen sensor 50. On the other hand, as illustrated in FIG. 12, in a case where a distance ΔA between a rear end 65d of the sensor cover 65 and the front end 26aa of the front portion 26a of the silencer cover 26 in the vehicle fore-and-aft direction is large, a negative pressure is generated behind the sensor cover 65, and accordingly, flowing air W2 that has flowed along the surface of the sensor cover 65 flows into the inside of the sensor cover 65 to flow around the second oxygen sensor 50.

[0080] On the other hand, in this preferred embodiment, the distance ΔA between the rear end 65d of the sensor cover 65 and the front end 26aa of the front portion 26a of the silencer cover 26 in the vehicle fore-and-aft direction is small and zero (see FIG. 4) . In addition, the sensor cover 65 and the front portion 26a of the silencer cover 26 both extend outward in the vehicle width direction and rearward in the vehicle fore-and-aft direction. Thus, as illustrated in FIG. 10, flowing air W3 that has flowed along the surface of the sensor cover 65 tends to flow rearward along the surface of the front portion 26a of the silencer cover 26. In the manner described above,

in this preferred embodiment, the sensor cover 65 and the silencer cover 26 cooperate to thereby suppress a flow of flowing air toward the second oxygen sensor 50.

[0081] As described above, in the scooter 1 according to this preferred embodiment, a flow of flowing air toward the second oxygen sensor 50 is suppressed so that cooling of the second oxygen sensor 50 by flowing air is suppressed. Accordingly, temperature of the sensor element 51 is suppressed to decrease so that accuracy of the second oxygen sensor 50 can be kept sufficiently high.

[0082] The sensor cover 65 and the front portion 26a of the silencer cover 26 are not limited to a specific positional relationship. In this embodiment, as illustrated in FIG. 4, the inner end 26ae in the vehicle width direction of the front portion 26a of the silencer cover 26 is located inward of the outer end 62e in the vehicle width direction of the sensor cover 65 in the vehicle width direction in the vehicle plan view. In this preferred embodiment, in the vehicle plan view, the front end 26aa of the front portion 26a of the silencer cover 26 is located inward of the outer end 62e in the vehicle width direction of the sensor cover 65 in the vehicle width direction. In this preferred embodiment, since the sensor cover 65 and the front portion 26a of the silencer cover 26 have the positional relationship described above, it is possible to further suppress a flow of flowing air toward the surroundings of the second oxygen sensor 50 by a negative pressure.

[0083] In this preferred embodiment, in the vehicle fore-and-aft direction, the front end 26aa of the front portion 26a of the silencer cover 26 is located at a position identical to the rear end 62d of the sensor cover 65. That is, $\Delta A = 0$ is established. Accordingly, it is possible to further suppress a flow of flowing air to the surroundings of the second oxygen sensor 50 by a negative pressure.

[0084] If the second oxygen sensor 50 is disposed near the exhaust port 14 of the internal combustion engine 11A of the engine unit 10, the second oxygen sensor 50 is heated by a high-temperature exhaust gas immediately after being emitted from the exhaust port 14. In this case, the temperature of the sensor element 51 of the second oxygen sensor 50 does not readily decrease. On the other hand, in this preferred embodiment, as illustrated in FIG. 2, the second oxygen sensor 50 is disposed rearward of the internal combustion engine 11A of the engine unit 10. In addition, the second oxygen sensor 50 is disposed rearward such that at least a portion of the second oxygen sensor 50 overlaps the rear wheel 36 in the vehicle side view. The second oxygen sensor 50 is disposed downstream of the catalyst 20 in a flow direction of an exhaust gas. In this preferred embodiment, the second oxygen sensor 50 is disposed away from the exhaust port 14, and is located near the fan cover 61. Thus, the advantage of keeping a sufficiently high accuracy of the second oxygen sensor 50 by suppressing a temperature decrease in the sensor element 51 become more significant.

[0085] In this preferred embodiment, as illustrated in FIG. 7, the sensor cover 65 is disposed rearward of the openings 17a and 17b of the fan cover 61. Accordingly, a portion of flowing air can be supplied to the fan 16 through the openings 17a and 17b, and the sensor cover 65 can smoothly guide another portion of the flowing air rearward while preventing the flowing air from blowing the second oxygen sensor 50.

[0086] In this preferred embodiment, in the vehicle side view, the minimum gap G1 between the sensor cover 65 and the front portion 26a of the silencer cover 26 in the vehicle fore-and-aft direction is smaller than the axial dimension F1 (see FIG. 9) of the case 52 of the second oxygen sensor 50. Since the minimum gap G1 between the sensor cover 65 and the front portion 26a of the silencer cover 26 in the vehicle fore-and-aft direction is small as described above, it is possible to further reduce a flow of flowing air to the surroundings of the second oxygen sensor 50 by a negative pressure.

[0087] In this preferred embodiment, in the vehicle side view, the sensor cover 65 has the recess 65a that is recessed forward, and the front portion 26a of the silencer cover 26 has the projection 26ab that projects forward toward the recess 65a. The sensor cover 65 and the front portion 26a of the silencer cover 26 are formed in shapes that match each other in the vehicle side view. Accordingly, it is possible to effectively suppress a flow of flowing air that has flowed along the surface of the sensor cover 65, and cooling of the second oxygen sensor 50 by flowing air can be effectively suppressed.

[0088] In this preferred embodiment, the sensor cover 65 overlaps the wire connection portion 55 of the second oxygen sensor 50 in the vehicle side view. Thus, the sensor cover 65 protects the wire connection portion 55 of the second oxygen sensor 50.

[0089] In this preferred embodiment, the cover 60 includes the wire cover 66 that is located outward of at least a portion of the second wire 46 in the vehicle width direction and overlaps at least a portion of the second wire 46 in the vehicle side view. Accordingly, the wire cover 66 protects at least a portion of the second wire 46.

[0090] In this preferred embodiment, as illustrated in FIG. 9, the wire connection portion 55 of the second oxygen sensor 50 is disposed above the sensor element 51 in the vehicle vertical direction and inward of the sensor element 51 in the vehicle width direction. Since the wire connection portion 55 is located above the sensor element 51 as described above, maintenance of the second oxygen sensor 50 can be easily performed. In addition, since the wire connection portion 55 is located inward of the sensor element 51 in the vehicle width direction, extension of the wire connection portion 55 outward in the vehicle width direction is avoided.

[0091] In this preferred embodiment, as illustrated in FIG. 7, the second wire 46 has a portion 46a disposed above the fan 16 and inward of the fan cover 61 in the vehicle width direction and extending forward. Accordingly, the second wire 46 is easily routed.

[0092] Although one preferred embodiment of the present invention has been described above, the present

invention is, of course, not limited to this preferred embodiment.

[0093] In the preferred embodiment, the transmission case 7 of the engine unit 10 is disposed at the left of the vehicle central line CL, and the second oxygen sensor 50, the cover 60, and the silencer cover 26 are located at the right of the vehicle central line CL. Alternatively, the transmission case 7 may be disposed at the right of the vehicle central line CL with the second oxygen sensor 50, the cover 60, and the silencer cover 26 being disposed at the left of the vehicle central line CL.

[0094] In the preferred embodiment, at least a portion of the second oxygen sensor 50 overlaps the rear wheel 36 in the vehicle side view. Alternatively, the entire second oxygen sensor 50 may not overlap the rear wheel 36 in the vehicle side view.

[0095] In the preferred embodiment, the second oxygen sensor 50 is disposed downstream of the catalyst 20. However, the location of the second oxygen sensor 50 is not limited to a specific location. The second oxygen sensor 50 may be disposed upstream of the catalyst 20.

[0096] In the preferred embodiment, the sensor cover 65 is disposed rearward of the openings 17a and 17b of the fan cover 61. A portion of the sensor cover 65 or whole sensor cover 65 may not be disposed rearward of the openings 17a and 17b of the fan cover 61.

[0097] In the preferred embodiment, the sensor cover 65 has the recess 65a, the front portion 26a of the silencer cover 26 has the projection 26ab, and the sensor cover 65 and the front portion 26a of the silencer cover 26 have shapes that match each other in the vehicle side view. Alternatively, the sensor cover 65 and the front portion 26a of the silencer cover 26 may have shapes that do not match each other in the vehicle side view.

[0098] In the preferred embodiment, the sensor cover 65 overlaps the wire connection portion 55 of the second oxygen sensor 50 in the vehicle side view, but is not limited to a specific positional relationship. The sensor cover 65 may not overlap a portion of the second oxygen sensor 50 in the vehicle side view or whole second oxygen sensor 50 in the vehicle side view.

[0099] In the preferred embodiment, the cover 60 includes the wire cover 66 that overlaps at least a portion of the second wire 46 in the vehicle side view. Alternatively, the cover 60 may not include such a wire cover 66.

[0100] The posture of the second oxygen sensor 50 in placing is not specifically limited. The wire connection portion 55 may be disposed below the sensor element 51 in the vehicle vertical direction. The wire connection portion 55 may be disposed outward of the sensor element 51 in the vehicle width direction.

[0101] In the preferred embodiment, the internal combustion engine 11A of the engine unit 10 is of a water-cooled type, and the scooter 1 includes the radiator 15. Alternatively, the internal combustion engine 11A may be of an air-cooled type. The scooter 1 may not include the radiator 15. The fan 16 may be configured to supply air to the internal combustion engine 11A.

[0102] A straddled vehicle as used herein refers to a vehicle on which a rider sits astride. The straddled vehicle is not limited to the scooter 1. The straddled vehicle may be a motorcycle of another type. The straddled vehicle may be a vehicle other than a motorcycle, such as a motor tricycle or an all terrain vehicle (ATV) .

DESCRIPTION OF REFERENCE CHARACTERS

[0103] 1 scooter (straddled vehicle), 10 engine unit, 15 radiator, 16 fan, 17a opening, 17b opening, 20 catalyst, 24 exhaust pipe, 25 silencer, 26 silencer cover, 26a front portion of silencer cover, 35 front wheel, 36 rear wheel, 46 second wire (wire), 46a wire portion, 50 second oxygen sensor (oxygen sensor), 51 sensor element, 52 case, 53 heater, 55 wire connection portion, 60 cover, 61 fan cover, 65 sensor cover, 66 wire cover

Claims

1. A straddled vehicle (1) comprising:

an internal combustion engine (11A);
an exhaust pipe (24) connected to the internal combustion engine (11A);
a silencer (25) disposed rearward of the exhaust pipe (24) and connected to the exhaust pipe (24);
a fan (16) disposed outward of the internal combustion engine (11A) in a vehicle width direction;
a fan cover (61) disposed outward of the fan (16) in the vehicle width direction and having an opening (17a, 17b);
a silencer cover (26) disposed outward of the silencer (25) in the vehicle width direction;
an oxygen sensor (50) including a sensor element (51) disposed inside the exhaust pipe (24), a heater (53) that heats the sensor element (51), and a cylindrical case (52) located outside the exhaust pipe (24), the oxygen sensor (50) being attached to the exhaust pipe (24); and
a sensor cover (65) integrally formed with the fan cover (61), located outward of the oxygen sensor (50) in the vehicle width direction, overlapping at least a portion of the cylindrical case (52) of the oxygen sensor (50) in a vehicle side view, and extending outward in the vehicle width direction and rearward in a vehicle fore-and-aft direction, wherein
the silencer cover (26) has a front portion (26a) located outward of the oxygen sensor (50) in the vehicle width direction and extending outward in the vehicle width direction and rearward in the vehicle fore-and-aft direction, and
in a vehicle plan view, a distance (ΔA) between a rear end (62d) of the sensor cover (65) and a front end (26aa) of the front portion (26a) of the

silencer cover (26) in the vehicle fore-and-aft direction is smaller than a distance (ΔB) between a rear end (61a) of the fan cover (61) and a front end (25a) of the silencer (25).

2. The straddled vehicle (1) according to claim 1, wherein in the vehicle plan view, an inner end (26ae) in the vehicle width direction of the front portion (26a) of the silencer cover (26) is located inward of an outer end (62e) in the vehicle width direction of the sensor cover (65) in the vehicle width direction.

3. The straddled vehicle (1) according to claim 1 or 2, wherein in the vehicle plan view, a front end (26aa) of the front portion (26a) of the silencer cover (26) is located inward of the outer end (62e) in the vehicle width direction of the sensor cover (65) in the vehicle width direction.

4. The straddled vehicle (1) according claim 3, wherein in a vehicle fore-and-aft direction, the front end (26aa) of the front portion (26a) of the silencer cover (26) is located at a position identical to a rear end (62d) of the sensor cover (65) or forward of the rear end (62d) of the sensor cover (65).

5. The straddled vehicle (1) according to any one of claims 1 to 4, wherein the oxygen sensor (50) is located rearward of the internal combustion engine (11A).

6. The straddled vehicle (1) according to any one of claims 1 to 5, comprising a rear wheel (36) that is driven by the internal combustion engine (11A), wherein
at least a portion of the oxygen sensor (50) overlaps the rear wheel (36) in a vehicle side view.

7. The straddled vehicle (1) according to any one of claims 1 to 6, comprising a catalyst (20) that purifies an exhaust gas flowing in the exhaust pipe (24), wherein
the oxygen sensor (50) is disposed downstream of the catalyst (20) in a flow direction of the exhaust gas.

8. The straddled vehicle (1) according to any one of claims 1 to 7, wherein the sensor cover (65) is disposed rearward of the opening (17a, 17b) of the fan cover (61).

9. The straddled vehicle (1) according to any one of claims 1 to 8, wherein
in a vehicle side view, a minimum gap (G1) between the sensor cover (65) and the front portion (26a) of the silencer cover (26) in a vehicle fore-and-aft direction is smaller than an axial dimension (F1) of the case (52) of the oxygen sensor (50).

10. The straddled vehicle (1) according to any one of claims 1 to 9, wherein in a vehicle side view, the sensor cover (65) has a recess (65a) that is recessed forward, and the front portion (26a) of the silencer cover (26) has a projection (26ab) projecting forward toward the recess (65a).

11. The straddled vehicle (1) according to any one of claims 1 to 10, wherein
the oxygen sensor (50) includes a wire connection portion (55), and
the straddled vehicle (1) includes a wire (46) connected to the wire connection portion (55).

12. The straddled vehicle (1) according to claim 11, wherein the sensor cover (65) overlaps the wire connection portion (55) of the oxygen sensor (50) in a vehicle side view.

13. The straddled vehicle (1) according to claim 11 or 12, comprising a wire cover (66) integrally formed with the fan cover (61), located outward of at least a portion of the wire (46) in the vehicle width direction, and overlapping at least a portion of the wire (46) in a vehicle side view.

14. The straddled vehicle (1) according to any one of claims 11 to 13, wherein
the oxygen sensor (50) includes a sensor element (51) located inside the exhaust pipe (24), and
the wire connection portion (55) is disposed above the sensor element (51) in a vehicle vertical direction and inward of the sensor element (51) in the vehicle width direction.

15. The straddled vehicle (1) according to any one of claims 11 to 14, wherein the wire (46) includes a wire portion (46a) disposed above the fan (16) and inward of the fan cover (61) in the vehicle width direction and extending forward.

16. The straddled vehicle (1) according to any one of claims 1 to 15, comprising a radiator (15) disposed between the fan cover (61) and the fan (16).

Patentansprüche

1. Spreizsitz-Fahrzeug (1), das umfasst:

einen Verbrennungsmotor (11A);
ein Auspuffrohr (24), das mit dem Verbrennungsmotor (11A) verbunden ist;
einen Schalldämpfer (25), der hinter dem Auspuffrohr (24) angeordnet und mit dem Auspuffrohr (24) verbunden ist;
einen Lüfter (16), der in einer Fahrzeug-Breitenrichtung außerhalb des Verbrennungsmotors

(11A) angeordnet ist;
eine Lüfter-Verkleidung (61), die in der Fahrzeug-Breitenrichtung außerhalb des Lüfters (16) angeordnet ist und eine Öffnung (17a, 17b) aufweist;
eine Schalldämpfer-Verkleidung (26), die in der Fahrzeug-Breitenrichtung außerhalb des Schalldämpfers (25) angeordnet ist;
einen Sauerstoffsensor (50), der ein Sensorelement (51), das im Inneren des Auspuffrohrs (24) angeordnet ist, eine Heizeinrichtung (53), die das Sensorelement (51) erhitzt, und ein zylindrisches Gehäuse (52) enthält, das außerhalb des Auspuffrohrs (24) angeordnet ist, wobei der Sauerstoffsensor (50) an dem Auspuffrohr (24) angebracht ist; und
eine Sensor-Verkleidung (65), die integral mit der Lüfter-Verkleidung (61) ausgebildet ist, in der Fahrzeug-Breitenrichtung außerhalb des Sauerstoffsensors (50) angeordnet ist, in einer Fahrzeug-Seitenansicht wenigstens einen Abschnitt des zylindrischen Gehäuses (52) des Sauerstoffsensors (50) überlappt und sich in der Fahrzeug-Breitenrichtung nach außen und in einer Fahrzeug-Längsrichtung nach hinten erstreckt, wobei
die Schalldämpfer-Verkleidung (26) einen vorderen Abschnitt (26a) aufweist, der in der Fahrzeug-Breitenrichtung außerhalb des Sauerstoffsensors (50) angeordnet ist und sich in der Fahrzeug-Breitenrichtung nach außen und in der Fahrzeug-Längsrichtung nach hinten erstreckt, und
ein Abstand (ΔA) zwischen einem hinteren Ende (62d) der Sensor-Verkleidung (65) und einem vorderen Ende (26aa) des vorderen Abschnitts (26a) der Schalldämpfer-Verkleidung (26) in der Fahrzeug-Längsrichtung, in einer Fahrzeug-Draufsicht, kleiner ist als ein Abstand (ΔB) zwischen einem hinteren Ende (61a) der Lüfter-Verkleidung (61) und einem vorderen Ende (25a) des Schalldämpfers (25).

2. Spreizsitz-Fahrzeug (1) nach Anspruch 1, wobei ein inneres Ende (26ae) des vorderen Abschnitts (26a) der Schalldämpfer-Verkleidung (26) in der Fahrzeug-Breitenrichtung, in der Fahrzeug-Draufsicht, in der Fahrzeug-Breitenrichtung innerhalb eines äußeren Endes (62e) der Sensor-Verkleidung (65) in der Fahrzeug-Breitenrichtung angeordnet ist.

3. Spreizsitz-Fahrzeug (1) nach Anspruch 1 oder 2, wobei ein vorderes Ende (26aa) des vorderen Abschnitts (26a) der Schalldämpfer-Verkleidung (26) in der Fahrzeug-Breitenrichtung, in der Fahrzeug-Draufsicht, innerhalb des äußeren Endes (62e) der Sensor-Verkleidung (65) in der Fahrzeug-Breitenrichtung angeordnet ist.

4. Spreizsitz-Fahrzeug (1) nach Anspruch 3, wobei das vordere Ende (26aa) des vorderen Abschnitts (26a) der Schalldämpfer-Verkleidung (26) in einer Fahrzeug-Längsrichtung an einer Position angeordnet ist, die identisch mit einem hinteren Ende (62d) der Sensor-Verkleidung (65) ist oder vor dem hinteren Ende (62d) der Sensor-Verkleidung (65) liegt.

5. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 1 bis 4, wobei der Sauerstoffsensor (50) hinter dem Verbrennungsmotor (11A) angeordnet ist.

6. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 1 bis 5, das ein Hinterrad (36) umfasst, das durch den Verbrennungsmotor (11A) angetrieben wird, wobei
wenigstens ein Abschnitt des Sauerstoffsensors (50) das Hinterrad (36) in einer Fahrzeug-Seitenansicht überlappt.

7. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 1 bis 6, das einen Katalysator (20) umfasst, der ein in dem Auspuffrohr (24) strömendes Abgas reinigt, wobei
der Sauerstoffsensor (50) in einer Strömungsrichtung des Abgases stromab von dem Katalysator (20) angeordnet ist.

8. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 1 bis 7, wobei die Sensor-Verkleidung (65) hinter der Öffnung (17a, 17b) der Lüfter-Verkleidung (61) angeordnet ist.

9. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 1 bis 8, wobei
ein minimaler Zwischenraum (G1) zwischen der Sensor-Verkleidung (65) und dem vorderen Abschnitt (26a) der Schalldämpfer-Verkleidung (26) in einer Fahrzeug-Längsrichtung, in einer Fahrzeug-Seitenansicht, kleiner ist als eine axiale Abmessung (F1) des Gehäuses (52) des Sauerstoffsensors (50).

10. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 1 bis 9, wobei, in einer Fahrzeug-seitenansicht, die Sensor-Verkleidung (65) eine Aussparung (65a) aufweist, die nach vorne ausgespart ist, und der vordere Abschnitt (26a) der Schalldämpfer-Verkleidung (26) einen Vorsprung (26ab) aufweist, der auf die Aussparung (65a) zu nach vorn vorsteht.

11. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 1 bis 10, wobei
der Sauerstoffsensor (50) einen Kabel-Verbindungsabschnitt (55) enthält und
das Spreizsitz-Fahrzeug (1) ein Kabel (46) enthält, das mit dem Kabel-Verbindungsabschnitt (55) verbunden ist.

12. Spreizsitz-Fahrzeug (1) nach Anspruch 11, wobei die Sensor-Verkleidung (65) den Kabel-Verbindungsabschnitt (55) des Sauerstoffsensors (50) in einer Fahrzeug-Seitenansicht überlappt.

13. Spreizsitz-Fahrzeug (1) nach Anspruch 11 oder 12, das eine Kabel-Verkleidung (66) umfasst, die integral mit der Lüfter-Verkleidung (61) ausgebildet ist, in der Fahrzeug-Breitenrichtung außerhalb wenigstens eines Abschnitts des Kabels (46) angeordnet ist und in einer Fahrzeug-Seitenansicht wenigstens einen Abschnitt des Kabels (46) überlappt.

14. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 11 bis 13, wobei
der Sauerstoffsensor (50) ein Sensorelement (51) enthält, das im Inneren des Auspuffrohrs (24) angeordnet ist, und
der Kabel-Verbindungsabschnitt (55) in einer vertikalen Richtung des Fahrzeugs oberhalb des Sensorelementes (51) und in der Fahrzeug-Breitenrichtung innerhalb des Sensorelementes (51) angeordnet ist.

15. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 11 bis 14, wobei das Kabel (46) einen Kabelabschnitt (46a) einschließt, der oberhalb des Lüfters (16) und in der Fahrzeug-Breitenrichtung im Inneren der Lüfter-Verkleidung (61) angeordnet ist und sich nach vorn erstreckt.

16. Spreizsitz-Fahrzeug (1) nach einem der Ansprüche 1 bis 15, das einen Kühler (15) umfasst, der zwischen der Lüfter-Verkleidung (61) und dem Lüfter (16) angeordnet ist.

Revendications

1. Véhicule à enfourcher (1) comprenant :

un moteur à combustion interne (11A) ;
un tuyau d'échappement (24) connecté au moteur à combustion interne (11A) ;
un silencieux (25) disposé à l'arrière du tuyau d'échappement (24) et connecté au tuyau d'échappement (24) ;
un ventilateur (16) disposé à l'extérieur du moteur à combustion interne (11A) en direction de la largeur du véhicule ;
un carénage de ventilateur (61) disposé à l'extérieur du ventilateur (16) en direction de la largeur du véhicule et comportant une ouverture (17a, 17b) ;
un carénage de silencieux (26) disposé à l'extérieur du silencieux (25) en direction de la largeur du véhicule ;
un capteur d'oxygène (50) comportant un élément capteur (51) disposé à l'intérieur du tuyau d'échappement (24), un dispositif de chauffage (53) qui chauffe l'élément capteur (51), et un boîtier cylindrique (52) situé à l'extérieur du tuyau d'échappement (24), le capteur d'oxygène (50) étant attaché au tuyau d'échappement (24) ; et
un carénage de capteur (65) formé de manière intégrée avec le carénage de ventilateur (61), situé à l'extérieur du capteur d'oxygène (50) en direction de la largeur du véhicule, chevauchant au moins une portion du boîtier cylindrique (52) du capteur d'oxygène (50) en vue latérale du véhicule, et s'étendant vers l'extérieur en direction de la largeur du véhicule et vers l'arrière en direction avant-arrière du véhicule, dans lequel le carénage de silencieux (26) comporte une portion avant (26a) située à l'extérieur du capteur d'oxygène (50) en direction de la largeur du véhicule et s'étendant vers l'extérieur en direction de la largeur du véhicule et vers l'arrière en direction avant-arrière du véhicule, et
dans une vue en plan du véhicule, la distance (ΔA) entre une extrémité arrière (62d) du carénage de capteur (65) et une extrémité avant (26aa) de la portion avant (26a) du carénage de silencieux (26) en direction avant-arrière du véhicule est inférieure à la distance (ΔB) entre une extrémité arrière (61a) du carénage de ventilateur (61) et une extrémité avant (25a) du silencieux (25).

2. Véhicule à enfourcher (1) selon la revendication 1, dans lequel, en vue en plan du véhicule, une extrémité interne (26ae) en direction de la largeur du véhicule de la portion avant (26a) du carénage de silencieux (26) est située à l'intérieur d'une extrémité externe (62e) en direction de la largeur du véhicule du carénage de capteur (65) en direction de la largeur du véhicule.

3. Véhicule à enfourcher (1) selon la revendication 1 ou 2, dans lequel, en vue en plan du véhicule, une extrémité avant (26aa) de la portion avant (26a) du carénage de silencieux (26) est située à l'intérieur de l'extrémité externe (62e) en direction de la largeur du véhicule du carénage de capteur (65) en direction de la largeur du véhicule.

4. Véhicule à enfourcher (1) selon la revendication 3, dans lequel, en direction avant-arrière du véhicule, l'extrémité avant (26aa) de la portion avant (26a) du carénage de silencieux (26) est située à une position identique à celle d'une extrémité arrière (62d) du carénage de capteur (65) ou à l'avant de l'extrémité arrière (62d) du carénage de capteur (65).

5. Véhicule à enfourcher (1) selon l'une quelconque des revendications 1 à 4, dans lequel le capteur

d'oxygène (50) est situé à l'arrière du moteur à combustion interne (11A).

6. Véhicule à enfourcher (1) selon l'une quelconque des revendications 1 à 5, comprenant une roue arrière (36) qui est entraînée par le moteur à combustion interne (11A), dans lequel au moins une portion du capteur d'oxygène (50) chevauche la roue arrière (36) en vue latérale du véhicule.

7. Véhicule à enfourcher (1) selon l'une quelconque des revendications 1 à 6, comprenant un catalyseur (20) qui purifie le gaz d'échappement qui entre dans le tuyau d'échappement (24), dans lequel le capteur d'oxygène (50) est disposé en aval du catalyseur (20) en direction d'écoulement du gaz d'échappement.

8. Véhicule à enfourcher (1) selon l'une quelconque des revendications 1 à 7, dans lequel le carénage de capteur (65) est disposé à l'arrière de l'ouverture (17a, 17b) du carénage de ventilateur (61).

9. Véhicule à enfourcher (1) selon l'une quelconque des revendications 1 à 8, dans lequel, en vue latérale du véhicule, un intervalle minimum (G1) entre le carénage de capteur (65) et la portion avant (26a) du carénage de silencieux (26) en direction avant-arrière du véhicule est inférieur à une dimension axiale (F1) du boîtier (52) du capteur d'oxygène (50).

10. Véhicule à enfourcher (1) selon l'une quelconque des revendications 1 à 9, dans lequel, en vue latérale du véhicule, le carénage de capteur (65) comporte un renfoncement (65a) qui est renfoncé vers l'avant, et la portion avant (26a) du carénage de silencieux (26) comporte une projection (26ab) qui se projette vers l'avant vers le renfoncement (65a).

11. Véhicule à enfourcher (1) selon l'une quelconque des revendications 1 à 10, dans lequel
le capteur d'oxygène (50) comprend une portion de connexion par câble (55), et
le véhicule à enfourcher (1) comprend un câble (46) connecté à la portion de connexion de câble (55).

12. Véhicule à enfourcher (1) selon la revendication 11, dans lequel le carénage de capteur (65) chevauche la portion de connexion de câble (55) du capteur d'oxygène (50) en vue latérale du véhicule.

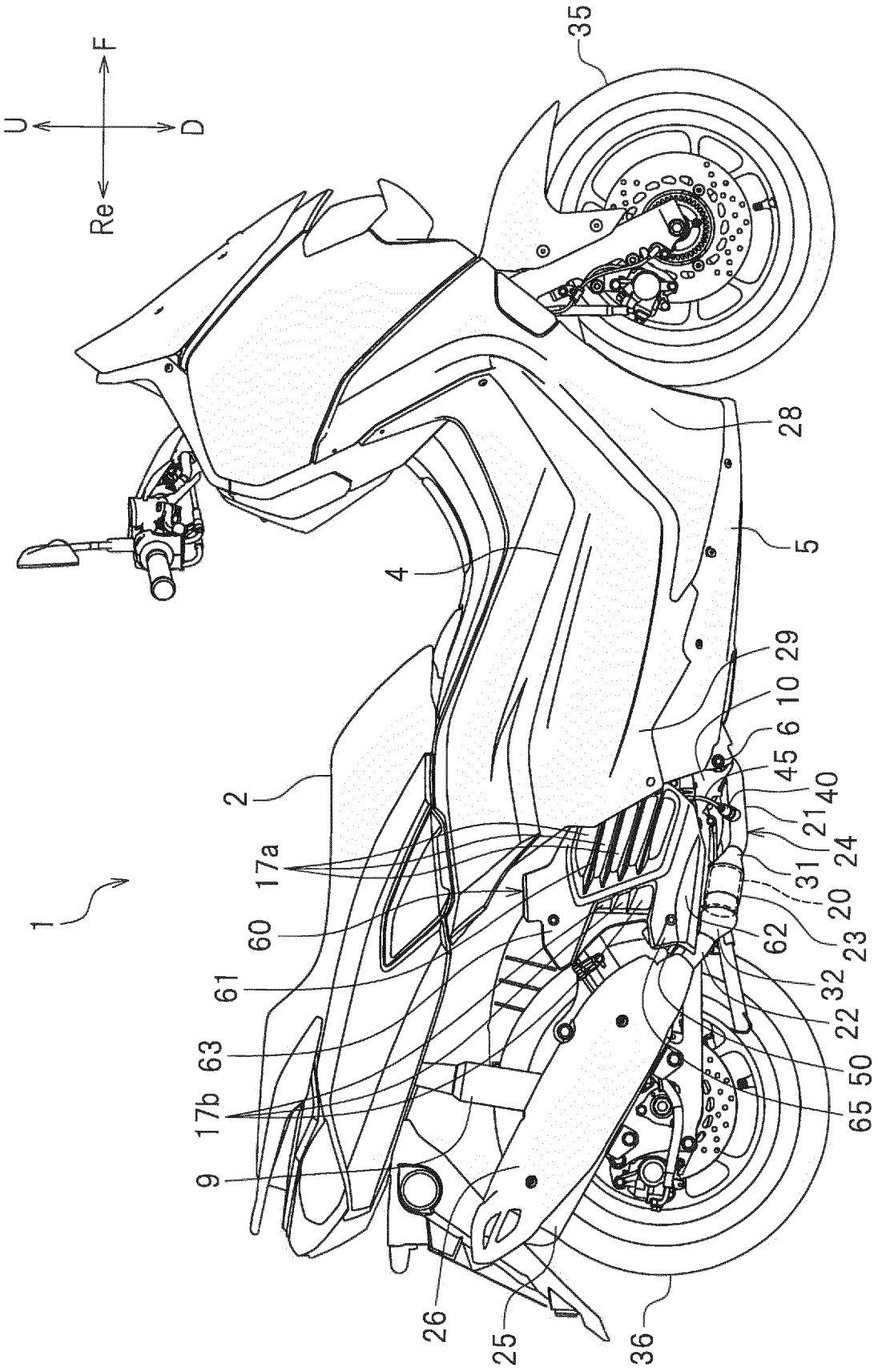
13. Véhicule à enfourcher (1) selon la revendication 11 ou 12, comprenant un carénage de câble (66) formé de manière intégrée avec le carénage de ventilateur (61), situé à l'extérieur d'au moins une portion du câble (46) en direction de la largeur du véhicule, et chevauchant au moins une portion du câble (46) en vue latérale du véhicule.

14. Véhicule à enfourcher (1) selon l'une quelconque des revendications 11 à 13, dans lequel
le capteur d'oxygène (50) comprend un élément capteur (51) situé à l'intérieur du tuyau d'échappement (24), et
la portion de connexion de câble (55) est disposée au-dessus de l'élément capteur (51) en direction verticale du véhicule et à l'intérieur de l'élément capteur (51) en direction de la largeur du véhicule.

15. Véhicule à enfourcher (1) selon l'une quelconque des revendications 11 à 14, dans lequel le câble (46) comprend une portion de câble (46a) disposée au-dessus du ventilateur (16) et à l'intérieur du carénage de ventilateur (61) en direction de la largeur du véhicule et s'étendant vers l'avant.

16. Véhicule à enfourcher (1) selon l'une quelconque des revendications 1 à 15, comprenant un radiateur (15) disposé entre le carénage de ventilateur (61) et le ventilateur (16) .

FIG.1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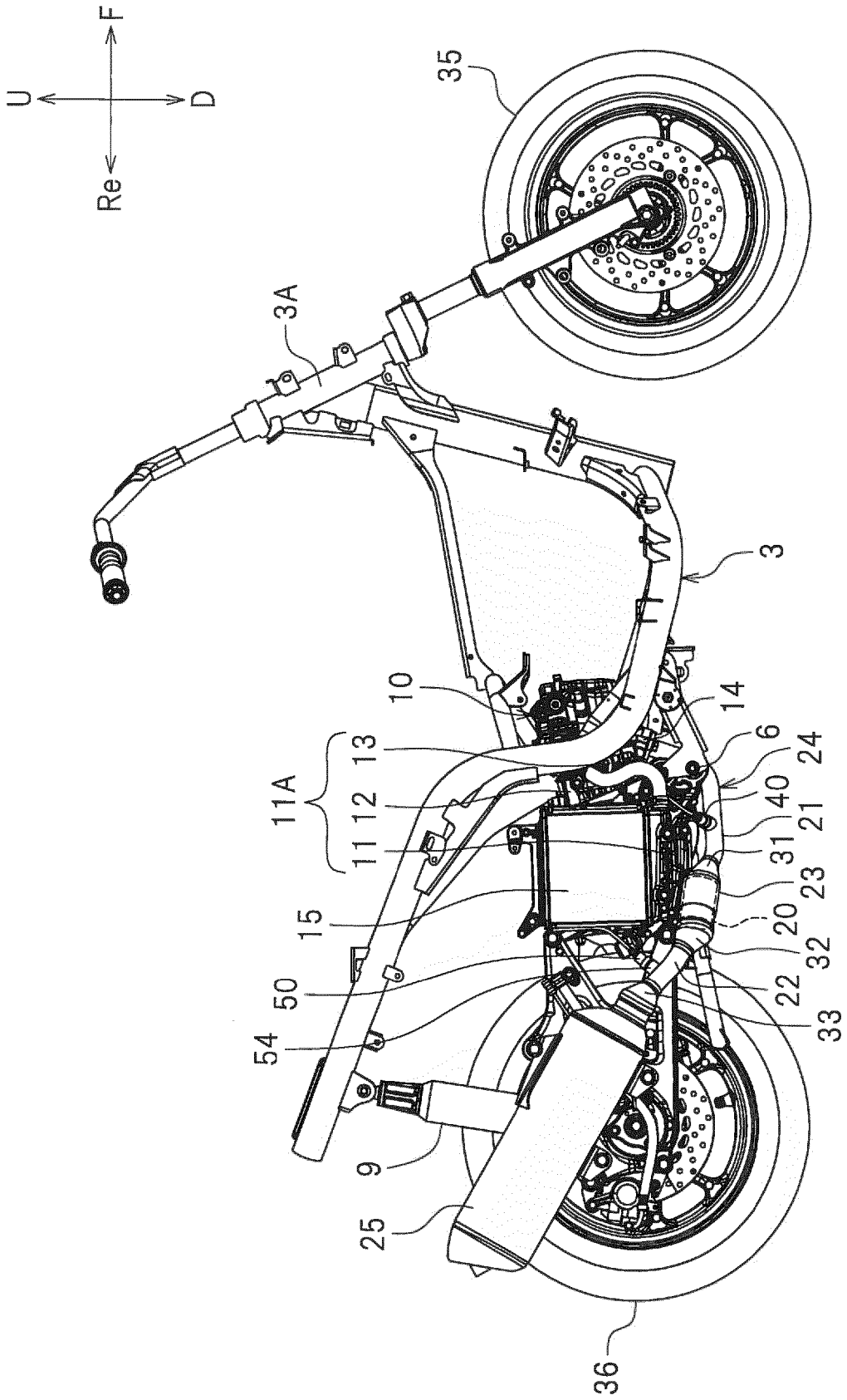
U
D
Re
35
28
5
4
29
10
6
45
40
21
24
31
20
23
62
32
22
50
65
36
25
26
9
17b
63
61
60
17a
2
1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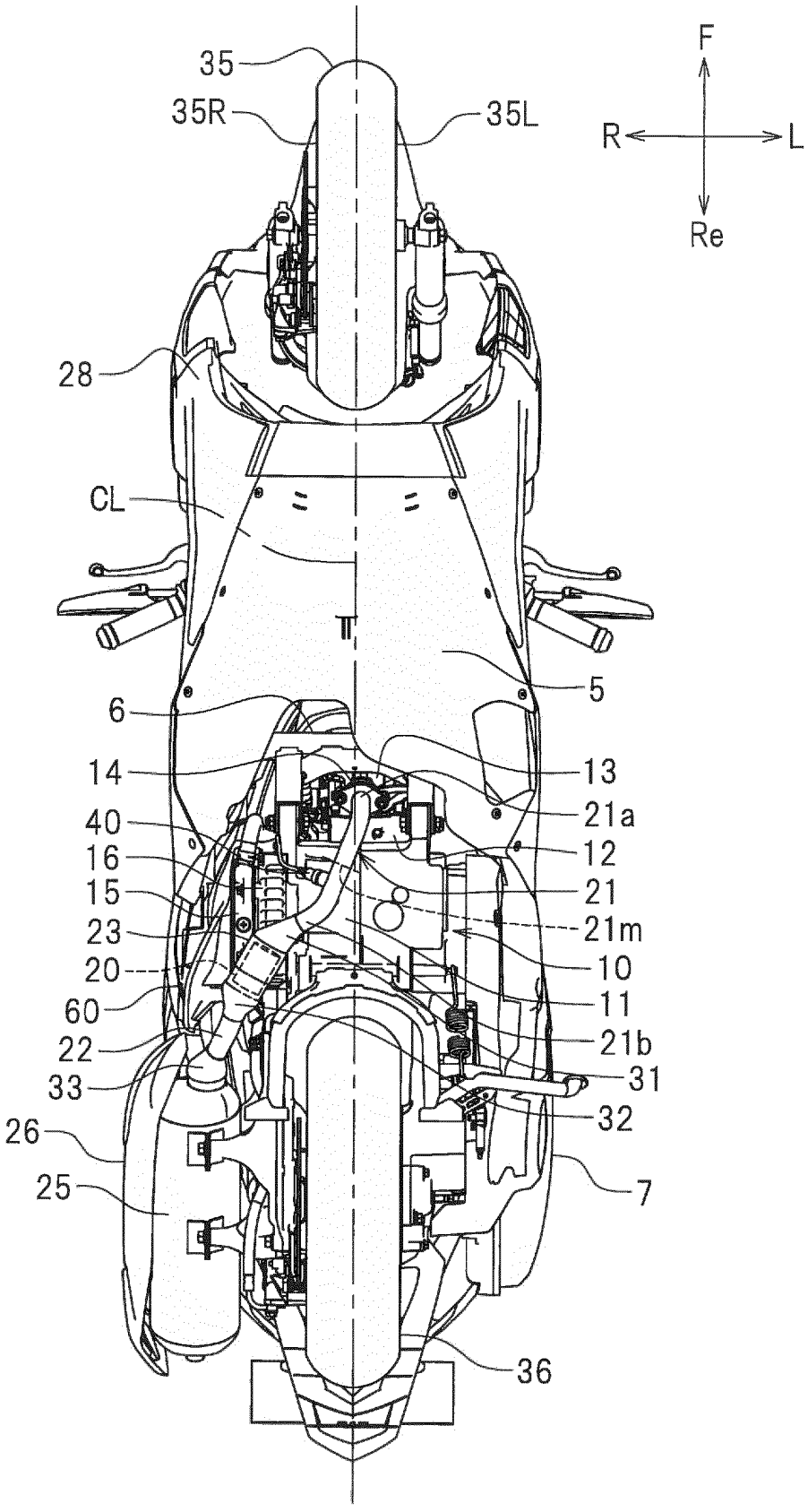
U
D
Re
35
3A
3
10
14
6
24
13
11A
12
40
21
11
31
23
15
20
32
50
22
54
33
9
25
36

FIG.2

FIG.3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35R
35L
F
R
L
Re
28
CL
6
5
14
13
40
21a
16
12
15
21
23
21m
20
10
60
11
22
21b
33
31
32
26
25
7
36

FIG.4

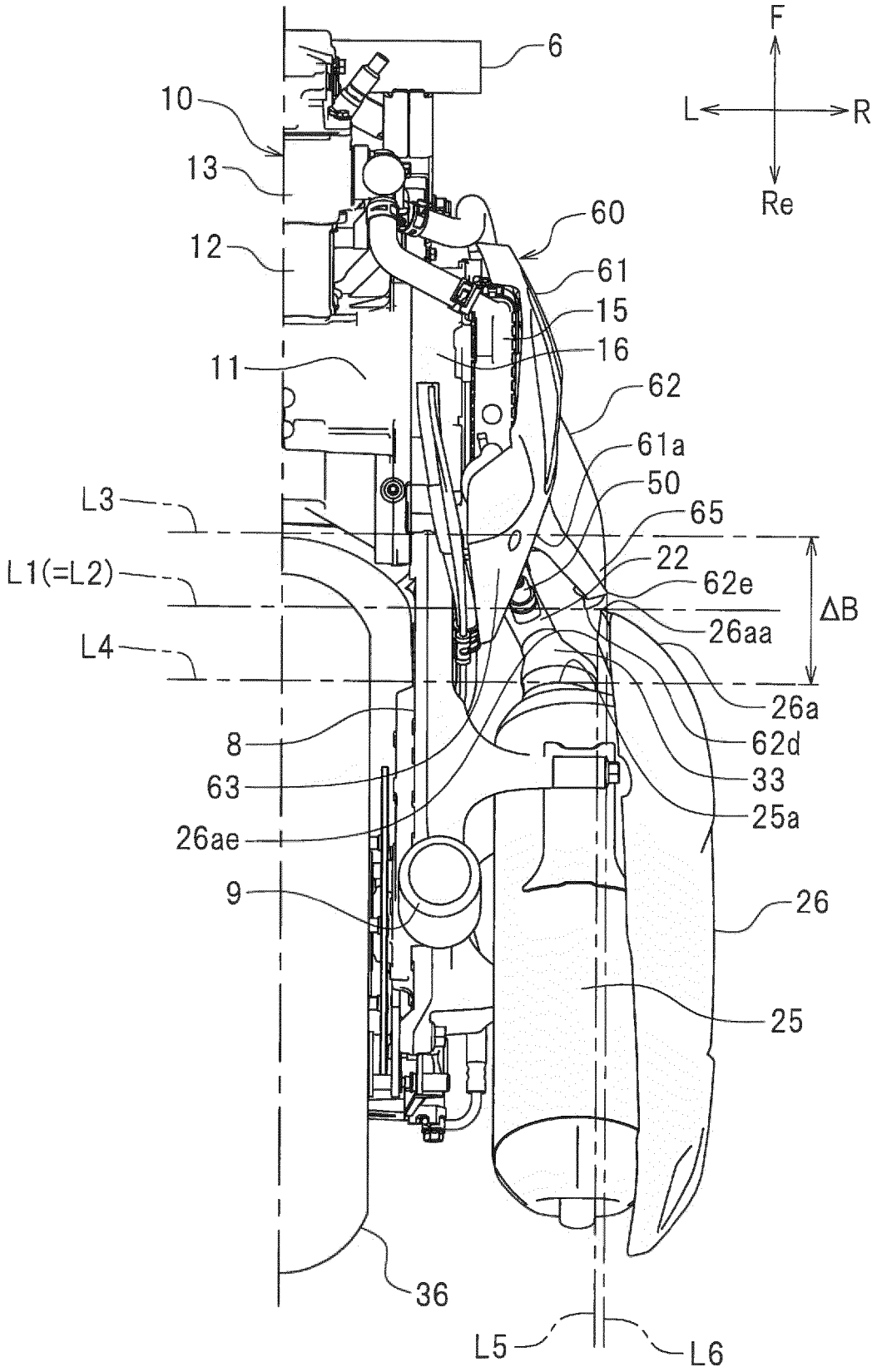

F
L
R
Re
6
10
13
12
60
61
15
16
11
62
61a
50
65
22
62e
26aa
26a
62d
33
25a
26
25
L3
L1(=L2)
L4
ΔB
8
63
26ae
9
36
L5
L6

FIG.5

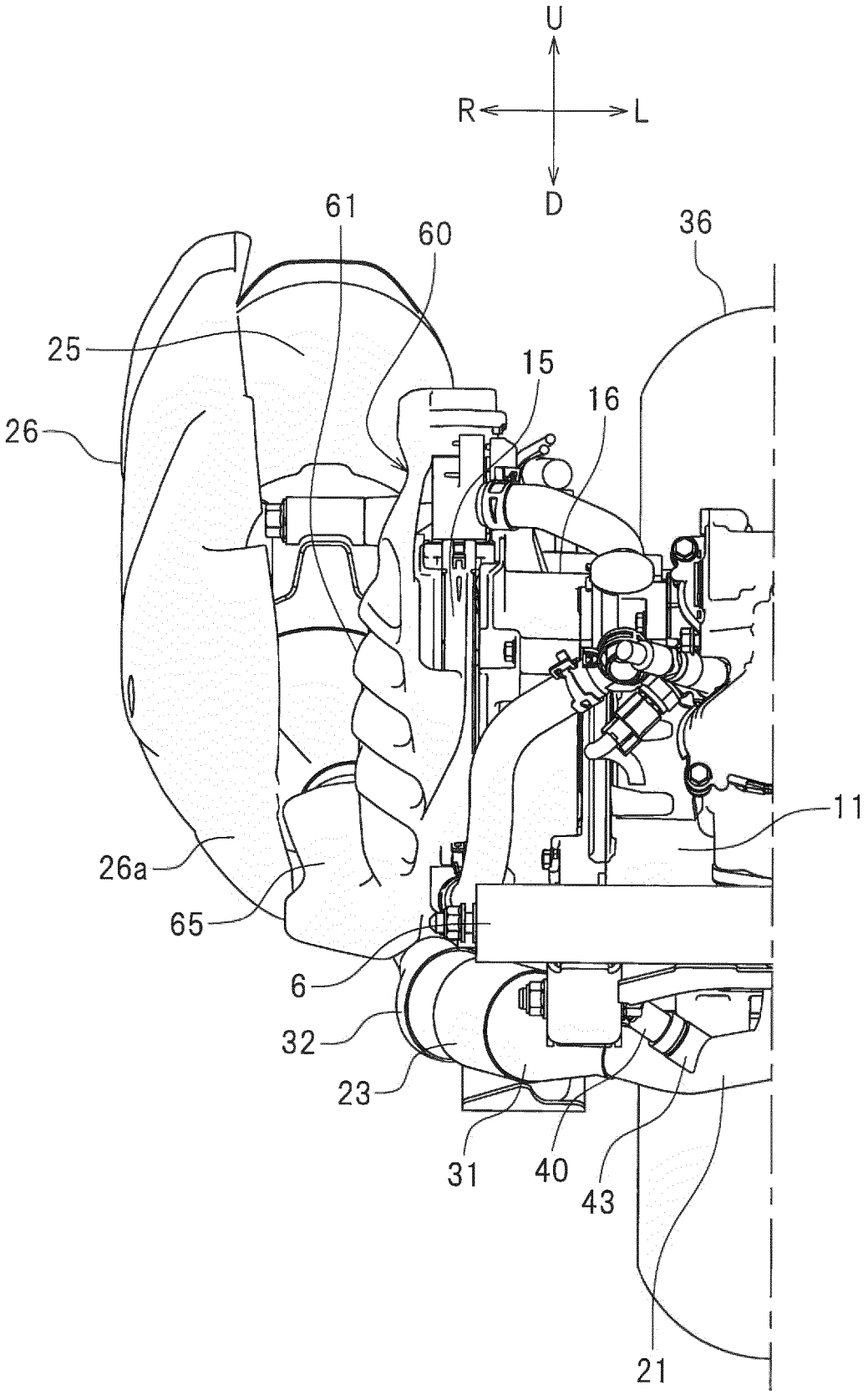


FIG.6

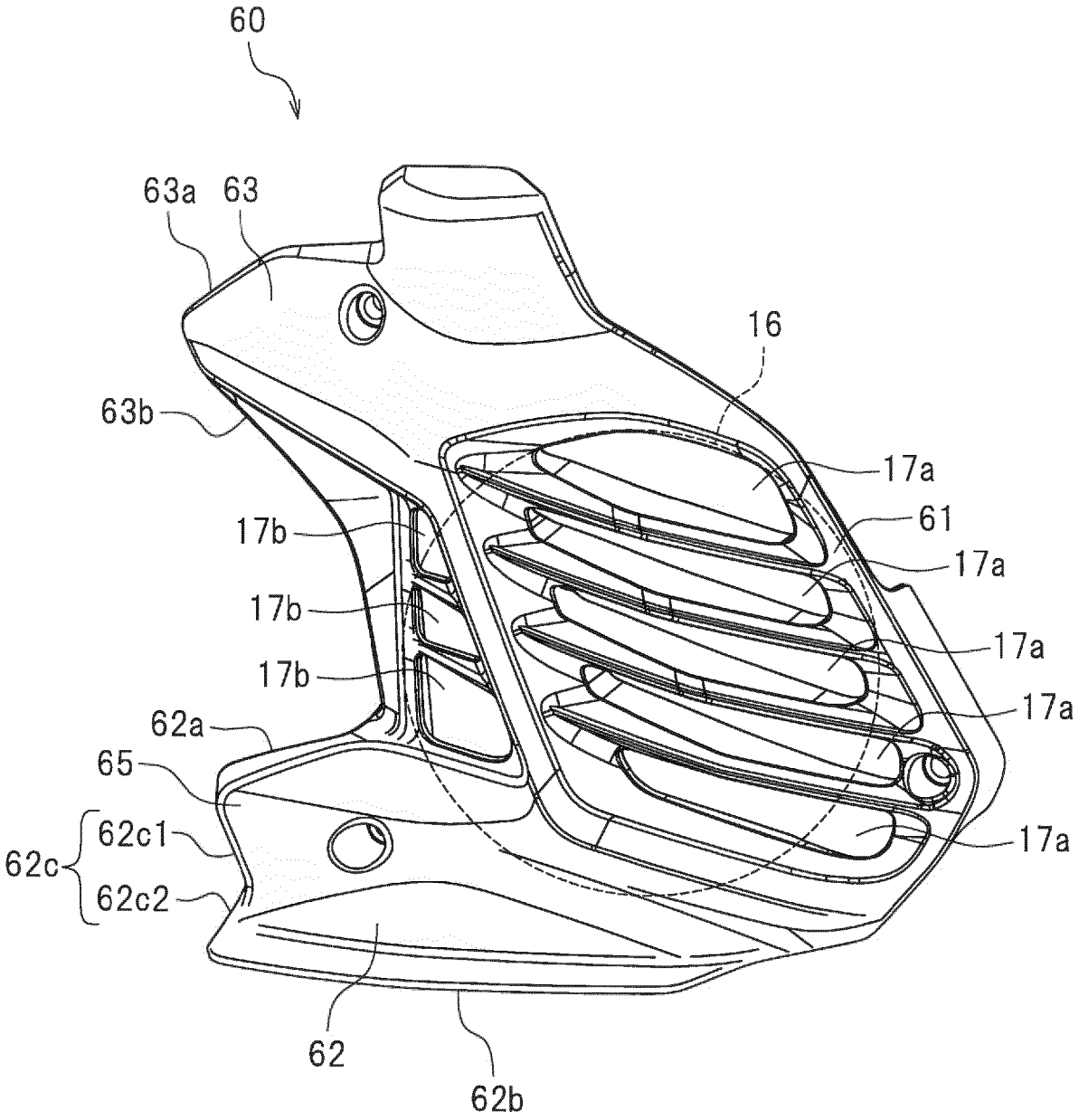

60
63a
63
16
63b
17a
17b
61
17a
17b
17a
17b
17a
62a
65
17a
62c
62c1
62c2
62
62b

FIG.7

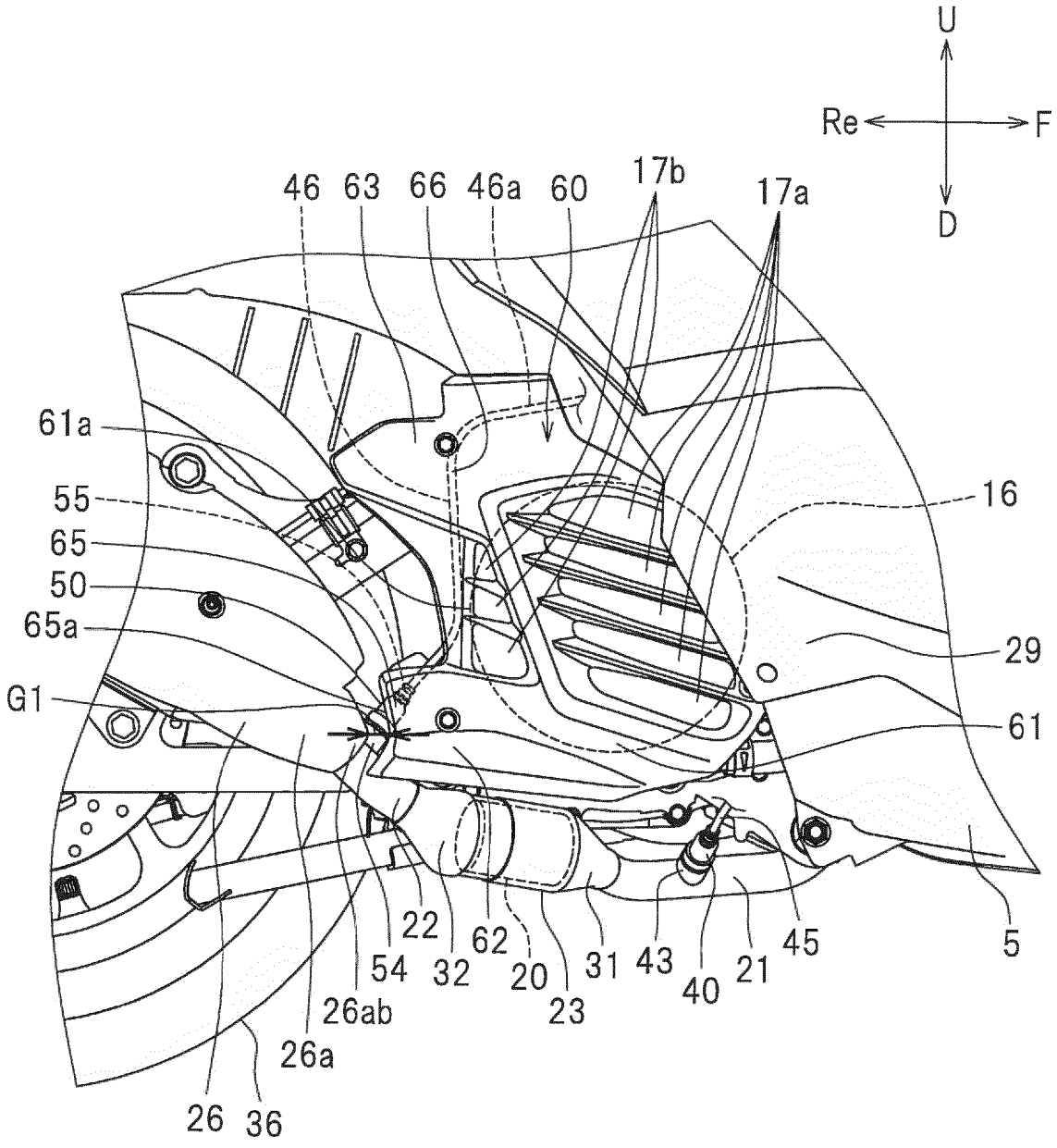

U
Re
F
D
46
63
66
46a
60
17b
17a
61a
55
65
50
65a
G1
16
29
61
5
45
21
40
43
31
23
20
62
32
22
54
26ab
26a
26
36

FIG.8A

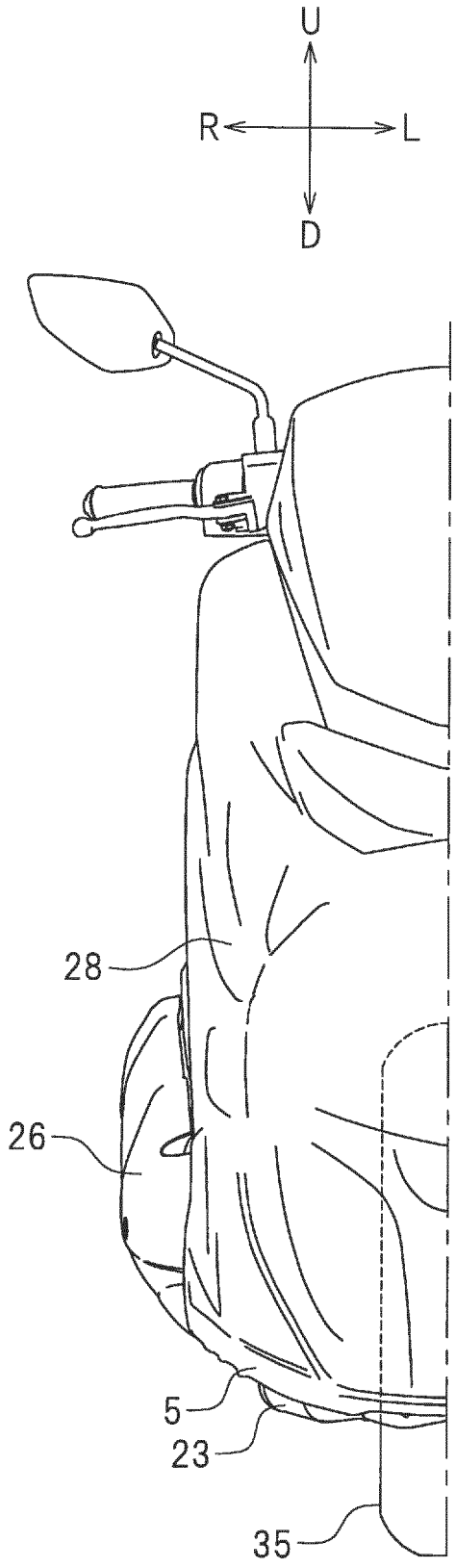


FIG.8B

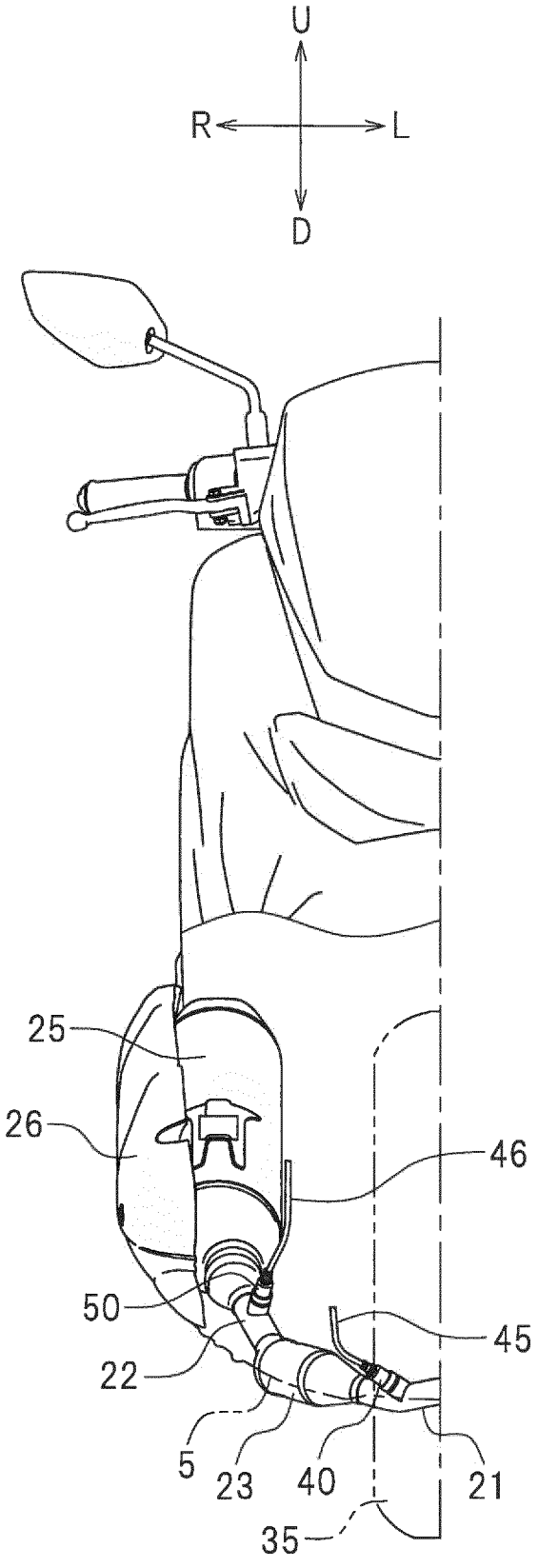


FIG.9

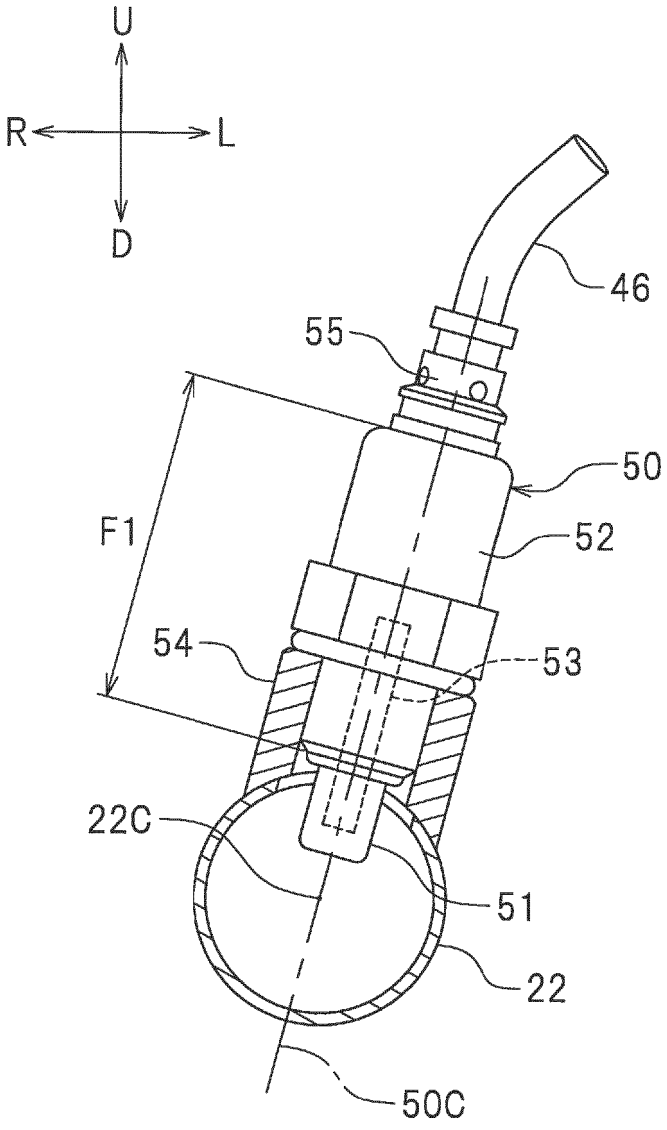


FIG.10

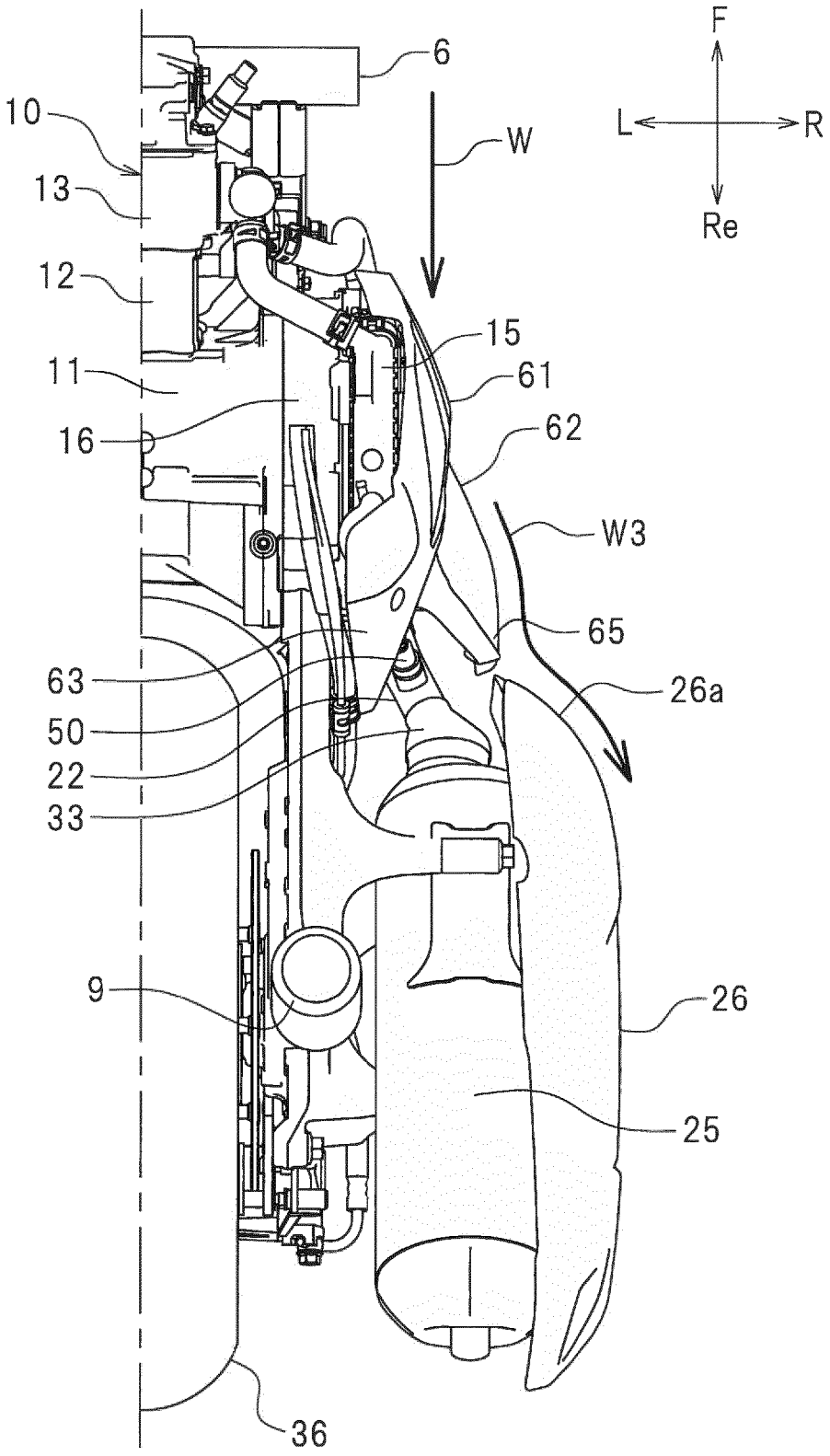


FIG.11

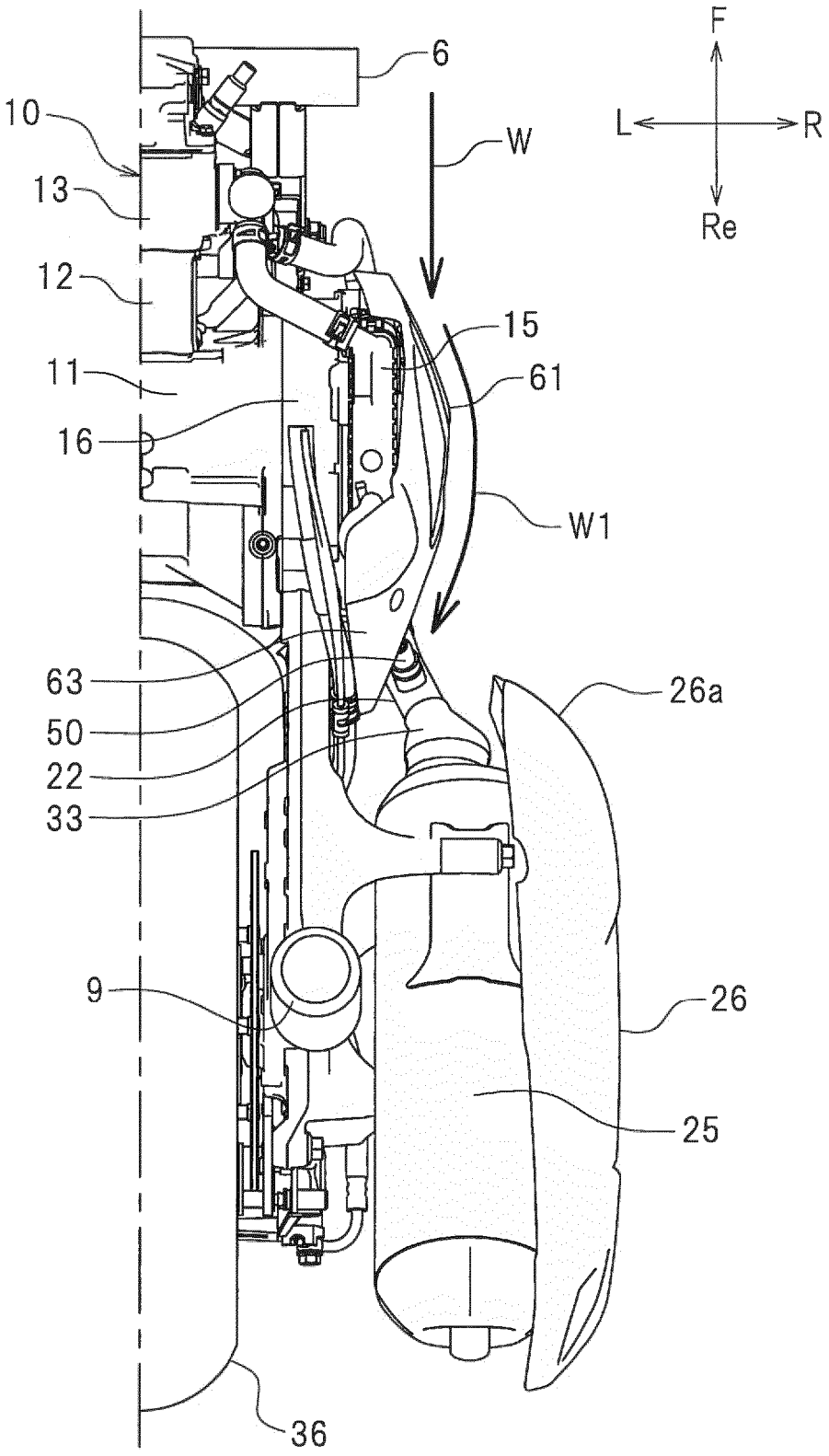
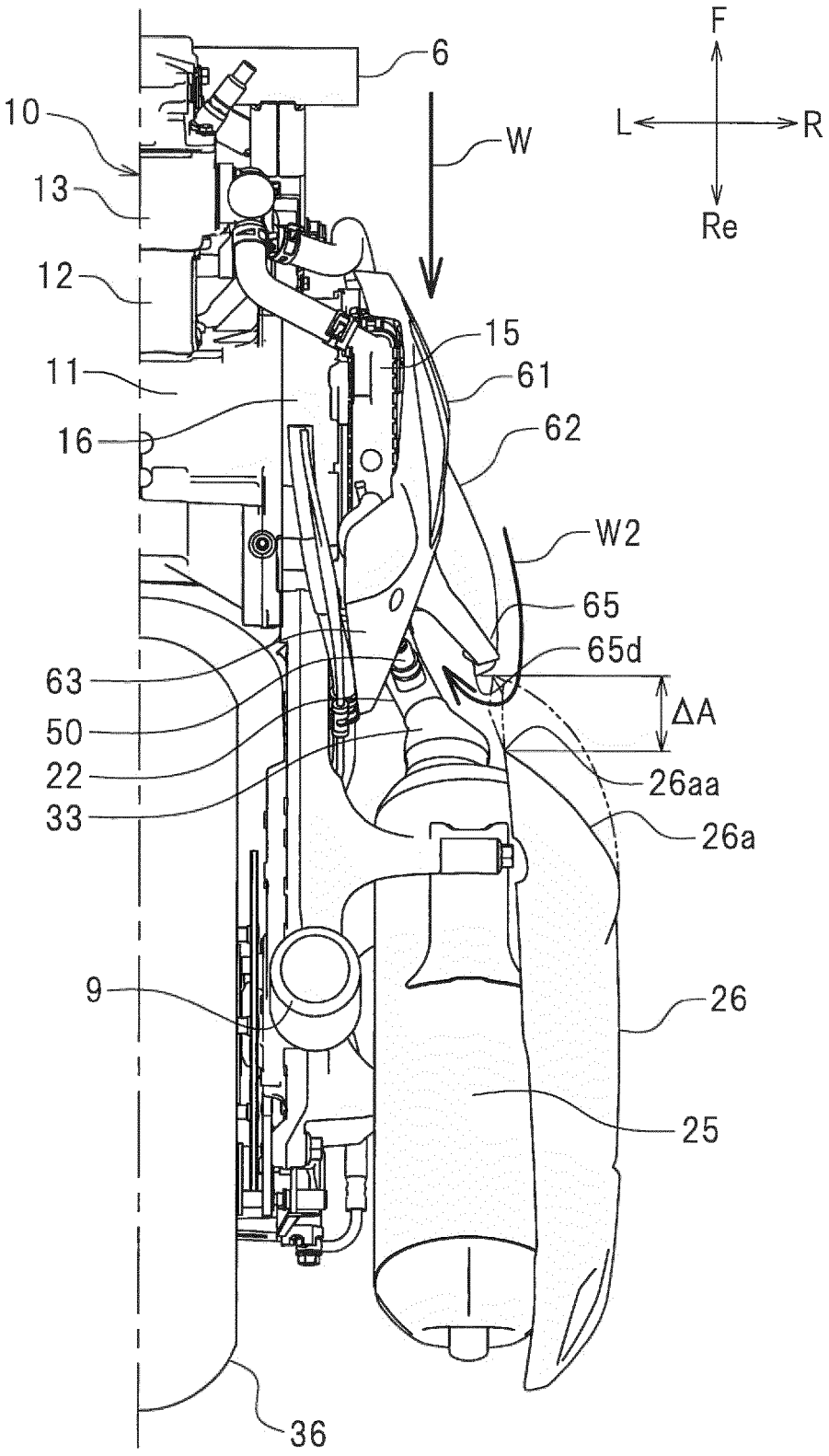


FIG.12


F
L
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16
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W2
65
65d
63
ΔA
50
22
26aa
33
26a
9
26
25
36

REFERENCES CITED IN THE DESCRIPTION

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- EP 3165730 A1 **[0004]**