Claims

[Claim 1]

A vehicular suspension device comprising:

a pair of primary support parts that respectively and elastically support running wheels having elasticity disposed on both sides in a vehicle width direction on a frame; and

a secondary support part that is disposed between the frame and a car body and integrally and elastically supports the pair of primary support parts and the car body via the frame.

[Claim 2]

The vehicular suspension device according to Claim 1,

wherein, if the spring stiffness of the running wheels is defined as k1, the spring stiffness of the primary support parts is defined as k2, and the spring stiffness of the secondary support part is defined as k3, $k1 > k2 > k3$ is satisfied.

[Claim 3]

The vehicular suspension device according to Claim 1 or 2,

wherein the spring stiffness of the primary support parts is set to 1/2 or more or 2/3 or less of the spring stiffness of the running wheels.

[Claim 4]

The vehicular suspension device according to any one of Claims 1 to 3,

wherein the primary support parts includes

a primary suspension mechanism that couples the running wheels and the frame so as to be displaceable in an upward-downward direction, and an elastic member that is arranged between the primary suspension mechanism and the frame.

[Claim 5]

The vehicular suspension device according to any one of Claims 1 to 4,

wherein the secondary support part includes

an air spring that is arranged between the car body and the frame, and

an air supply and exhaust mechanism that performs air supply to and exhausting from the air spring and adjusts the height of the air spring in the upward-downward direction, and

wherein the air supply and exhaust mechanism performs air supply to and exhausting from the air spring on the basis of the total displacement of the primary support parts and the secondary support part in the upward-downward direction with respect to the car body.

[Claim 6]

A steering bogie comprising:

the running wheels;

a steering guide device that is guided by a guide rail extending along a track; and

the vehicular suspension device according to any one of Claims 1 to 5 that is disposed between the running wheels and the car body.

[Claim 7]

A vehicle comprising:

the car body; and

the steering bogie according to Claim 6 that is provided in a lower part of the car body.

Claims

1. A vehicular suspension device comprising:

a pair of primary support parts that respectively and elastically support running wheels having elasticity disposed on both sides in a vehicle width direction on a frame; and

a secondary support part that is disposed between the frame and a car body and integrally and elastically supports the pair of primary support parts and the car body via the frame, wherein,

if the spring stiffness of the running wheels is defined as k1, the spring stiffness of the primary support parts is defined as k2, and the spring stiffness of the secondary support part is defined as k3, k1 > k2 > k3 is satisfied.

2. The vehicular suspension device according to Claim 1, wherein the spring stiffness of the primary support parts is set to 1/2 or more or 2/3 or less of the spring stiffness of the running wheels.

3. A vehicular suspension device comprising:

a pair of primary support parts that respectively and elastically support running wheels having elasticity disposed on both sides in a vehicle width direction on a frame; and

a secondary support part that is disposed between the frame and a car body and integrally and elastically supports the pair of primary support parts and the car body via the frame, wherein,

the spring stiffness of the primary support parts is set to 1/2 or more or 2/3 or less of the spring stiffness of the running wheels.

4. The vehicular suspension device according to any one of Claims 1 to 3, wherein the primary support parts includes

a primary suspension mechanism that couples the running wheels and the frame so as to be displaceable in an upward-downward direction, and

an elastic member that is arranged between the primary suspension mechanism and the frame.

5. The vehicular suspension device according to any one of Claims 1 to 4,

wherein the secondary support part includes

an air spring that is arranged between the car body and the frame, and

an air supply and exhaust mechanism that performs air supply to and exhausting from the air spring and adjusts the height of the air spring in the upward-downward direction, and wherein the air supply and exhaust mechanism performs air supply to and exhausting from the air spring on the basis of the total displacement of the primary support parts and the secondary support part in the upward-downward direction with respect to the car body.

6. The vehicular suspension device according to Claim 1 or 3, wherein the vehicular suspension device is an independent type of suspension in which the running wheels disposed on both sides in the vehicle width direction are elastically supported by the primary support parts, respectively.

7. The vehicular suspension device according to Claim 6, wherein the independent type is a double wishbone type.

8. The vehicular suspension device according to Claim 6, wherein the independent type is a swing axle type.

9. A steering bogie comprising:

the running wheels;

a steering guide device that is guided by a guide rail extending along a track; and

the vehicular suspension device according to any one of Claims 1 to 8 that is disposed between the running wheels and the car body.

10. A vehicle comprising:

the car body; and

the steering bogie according to Claim 9 that is provided in a lower part of the car body.