Citation List

Patent Literature

[0004]

Patent Literature 1: JP 1997-117016A

Summary of Invention

Technical Problem

[0005]

However, the vehicle structures for the conventional electric automobiles have problems in that the rotation radius when the vehicle body is turned is large, and that the turnability showing easy variation in the direction of the vehicle body is low. For this reason, a wide space is required to turn the vehicle body. For example, when one's own automobile is parked between two automobiles that have been parked, a space for quickly turning the vehicle body is required, and a high skill level is required from a driver.

[0006]

The present invention is made in view of the above-mentioned issue, and aims to provide a novel and improved vehicle structure for an electric automobile capable of enhancing turnability.

Solution to Problem

[0007]

According to an aspect, there is provided a vehicle structure for an electric automobile that is driven by traveling wheels, in each of which a drive device driven by receiving supply of electric energy is mounted, the vehicle structure comprising: a first traveling wheel unit and a second traveling wheel unit which are provided in the front and rear of a vehicle body and which each include an arrangement of two traveling wheels; and a drive control unit that individually drives the four traveling wheels depending on an amount of operation input by a driver, wherein the first traveling wheel unit is constructed to be integrally rotatable about a first center of

rotation near the midpoint of a support unit, which rotatably supports the two traveling wheels forming the first traveling wheel unit at opposite ends of the first traveling wheel unit, in a plane substantially perpendicular to a direction of a height of the vehicle body, while maintaining a state in which disc surfaces of the two traveling wheels are perpendicular to a straight line that passes through rotation centers of the corresponding traveling wheels and the midpoint of the support unit, and wherein the drive control unit differentially drives the traveling wheels forming the first traveling wheel unit depending on an amount of steering among the operation amount, and rotates the first traveling wheel unit about the first rotation center.

~~According to the first aspect of the present invention in order to achieve the above-mentioned object, there is provided a vehicle structure for an electric automobile that is driven by traveling wheels, in each of which a drive device driven by receiving supply of electric energy is mounted. The vehicle structure for the electric automobile of the present invention includes: a first traveling wheel unit and a second traveling wheel unit which are provided in the front and rear of a vehicle body and which each include an arrangement of two traveling wheels; and a drive control unit that individually drives the four traveling wheels depending on an amount of operation input by a driver. The first traveling wheel unit is constructed~~

~~to be integrally rotatable about a first center of rotation near the midpoint of a support unit, which rotatably supports the two traveling wheels forming the first traveling wheel unit at opposite ends of the first traveling wheel unit, in a plane substantially perpendicular to a direction of a height of the vehicle body. The drive control unit differentially drives the traveling wheels forming the first traveling wheel unit depending on an amount of steering among the operation amount, and rotates the first traveling wheel unit about the first rotation center.~~

[0008]

According to embodiments of the present invention, the first traveling wheel unit integrally rotates depending on the operation amount input by the driver, thereby changing the advance direction of a vehicle. Thus, it is possible to easily change the direction of the vehicle body, and provide high turnability.

[0009]

Here, an interval between the traveling wheels forming the first traveling wheel unit may be smaller than that between the traveling wheels forming the second traveling wheel unit. Thus, it is possible to reduce the rotation radius of the first traveling wheel unit and to enhance the turnability of the entire vehicle.

[0010]

Further, the drive control unit may differentially drive the four traveling wheels depending on the operation amount input by the driver, and cause the vehicle body to be turned about a predetermined position within an area where the second traveling wheel unit of the vehicle body is provided. For example, when the first traveling wheel unit rotates about the first rotation center at an angle of 90° with respect to a direction of the first traveling wheel unit when the automobile travels to the front of the vehicle body, the drive control unit may differentially drive the four traveling wheels depending on the operation amount input by the driver, and cause the vehicle body to be turned about a middle position between the two traveling wheels forming the second traveling wheel unit.

[0011]

Moreover, a radius of rotation required to turn the vehicle body may be smaller than an overall length of the vehicle body. Accordingly, the electric

automobile having the vehicle construction according to embodiments of the present invention makes it possible to turn the vehicle body in a narrow space.

[0012]

Further, the first traveling wheel unit may be a front wheel unit, whereas the second traveling wheel unit may be a rear wheel unit. Alternatively, the first traveling wheel unit may be a rear wheel unit, whereas the second traveling wheel unit may be a front wheel unit.

Advantageous Effects of Invention

[0013]

According to embodiments of the present invention as described above, it is possible to provide a vehicle structure for an electric automobile capable of enhancing turnability.

Brief Description of Drawings

[0014]

[Fig. 1] Fig. 1 is an explanatory view showing a vehicle structure for an electric automobile according to a first embodiment of the present invention.

[Fig. 2] Fig. 2 is functional block diagram explaining processing based on an electronic control device.

[Fig. 3] Fig. 3 is an explanatory view showing turnability of the electric automobile according to the same embodiment.

[Fig. 4] Fig. 4 is an explanatory view showing turnability of a conventional electric automobile.

[Fig. 5] Fig. 5 is an explanatory view showing turnability of the electric automobile according to the same embodiment.

[Fig. 6] Fig. 6 is an explanatory view showing vehicle movement when the electric automobile according to the same embodiment is parked.

[Fig. 7] Fig. 7 is an explanatory view showing a vehicle structure for an electric automobile according to a second embodiment of the present invention.

[Fig. 8] Fig. 8 is an explanatory view showing turnability of the electric automobile

CLAIMS

Claim 1 ~~(Amended)~~

A vehicle structure for an electric automobile that is driven by traveling wheels, in each of which a drive device driven by receiving supply of electric energy is mounted, the vehicle structure comprising:

a first traveling wheel unit and a second traveling wheel unit which are provided in the front and rear of a vehicle body and which each include an arrangement of two traveling wheels; and

a drive control unit that individually drives the four traveling wheels depending on an amount of operation input by a driver,

wherein the first traveling wheel unit is constructed to be integrally rotatable about a first center of rotation near the midpoint of a support unit, which rotatably supports the two traveling wheels forming the first traveling wheel unit at opposite ends of the first traveling wheel unit, in a plane substantially perpendicular to a direction of a height of the vehicle body, while maintaining a state in which disc surfaces of the two traveling wheels are perpendicular to a straight line that passes through rotation centers of the corresponding traveling wheels and the midpoint of the support unit, and

wherein the drive control unit differentially drives the traveling wheels forming the first traveling wheel unit depending on an amount of steering among the operation amount, and rotates the first traveling wheel unit about the first rotation center.

Claim 2

The vehicle structure according to claim 1, wherein an interval between the traveling wheels forming the first traveling wheel unit is smaller than that between the traveling wheels forming the second traveling wheel unit.

Claim 3

The vehicle structure according to claim 1, wherein the drive control unit differentially drives the four traveling wheels depending on the operation amount

input by the driver, and causes the vehicle body to be turned about a predetermined position within an area where the second traveling wheel unit of the vehicle body is provided.

Claim 4

The vehicle structure according to claim 3, wherein, when the first traveling wheel unit rotates about the first rotation center at an angle of 90° with respect to a direction of the first traveling wheel unit when traveling in front of the vehicle body, the drive control unit differentially drives the four traveling wheels depending on the operation amount input by the driver, and causes the vehicle body to be turned about a middle position between the two traveling wheels forming the second traveling wheel unit.

Claim 5

The vehicle structure according to claim 1, wherein a radius of rotation required to turn the vehicle body is smaller than an overall length of the vehicle body.

Claim 6

The vehicle structure according to claim 1, wherein the first traveling wheel unit is a front wheel unit, and the second traveling wheel unit is a rear wheel unit.

Claim 7

The vehicle structure according to claim 1, wherein the first traveling wheel unit is a rear wheel unit, and the second traveling wheel unit is a front wheel unit.