Patent documents

[0005]

Patent document 1: Japanese Patent Laid-Open Application No. 2002-004620

Patent document 2: Japanese Patent Laid-Open Application No. 2010-084491

Patent document 3: Japanese Patent Laid-Open Application No. 2013-160024

Patent document 4: Japanese Patent Laid-Open Application No. 2014-134079

Patent document 5: Japanese Patent Laid-Open Application No. 2015-040421

Patent document 6: Japanese Patent Laid-Open Application No. 2016-200001

SUMMARY OF THE INVENTION

Problem to be solved by the invention

[0006]

Some automated parking apparatuses, however, transfer only vehicles from the carrier to the storages instead of storing vehicles in the storages with the pallets. The charging contact fixed to the pallet cannot be used for such automated parking apparatuses.

[0007]

A purpose of the disclosure made in view of the above is to provide a vehicle charging apparatus and an automated parking apparatus that allow for charging a stored vehicle even if the automated parking apparatus transfers only vehicles from the carrier to the storages.

Means for solving the problem

[0008]

A vehicle charging apparatus of the disclosure is for an automated parking apparatus that is configured to carry a vehicle to a specified floor by means of a carrier operable to move up and down, to move the vehicle from the carrier to a specified storage provided on the specified floor, and to store the vehicle in the storage, the vehicle charging apparatus comprises: a charging part for being connected with a charging cable of the vehicle; a placement part provided on the carrier for connecting to the charging part; and a feeding part provided

on the storage for connecting to the charging part and supplying power to the charging cable, wherein the charging part is configured to connect with the placement part when the vehicle is carried by the carrier, the charging part is configured to connect to the feeding part with the movement of the vehicle from the carrier to the storage, and the charging part is configured to be disconnected from the placement part after the connection of the charging part to the feeding part.

[0009]

The charging part of this configuration connects with the placement part provided on the carrier when the vehicle is carried by the carrier. The charging part connects to the feeding part provided on the storage with the movement of the vehicle from the carrier to the storage, and the charging part is disconnected from the placement part after the connection of the charging part to the feeding part.

[0010]

This allows the charging part placed on the carrier to move to the storage with the storing of the vehicle in the storage, and then the vehicle is charged from the feeding part via the charging cable connected to the charging part. Therefore, even the automated parking apparatus that transfers only a vehicle from the carrier to the storage allows for charging the stored vehicle.

[0011]

In the vehicle charging apparatus of the disclosure, when the vehicle is checked in, the carrier loaded with the vehicle may elongate to the storage with the vehicle being loaded thereon after moving to the specified floor and may contract after moving downward relative to the storage and thereby moving the vehicle to the storage, and the charging part may connect to the feeding part with the elongation of the carrier and may be disconnected from the placement part with the carrier's downward movement relative to the storage.

[0012]

When the vehicle is checked in in this configuration, the charging part connects to the feeding part with the elongation operation of the carrier for moving the vehicle from the carrier to the storage, and the charging part is disconnected from the placement part with

This configuration allows the placement part to be provided at a place convenient for an occupant of the vehicle.

[0019]

In the vehicle charging apparatus of the disclosure, the storage may comprise: a pair of body parts extending in a direction parallel to both sides of the vehicle; and a plurality of wheel support members provided in a direction perpendicular to the body parts in order to support each wheel of the vehicle in a front-rear direction of the vehicle, and a loading part of the carrier for being loaded with the vehicle to move to the storage may be formed with gaps through which the wheel support members pass in a vertical direction.

[0020]

This configuration allows for charging the vehicle to be stored even in an automated parking apparatus of a so-called comb type.

[0021]

An automated parking apparatus that is configured to carry a vehicle to a specified floor by means of a carrier operable to move up and down, to move the vehicle from the carrier to a specified storage provided on the specified floor, and to store the vehicle in the storage, the automated parking apparatus comprising: a charging part for being connected with a charging cable of the vehicle; a placement part provided on the carrier for connecting to the charging part; and a feeding part provided on the storage for connecting to the charging part and supplying power to the charging cable, wherein the charging part is configured to connect with the placement part when the vehicle is carried by the carrier, the charging part is configured to connect to the feeding part with the movement of the vehicle from the carrier to the storage, and the charging part is configured to be disconnected from the placement part after the connection of the charging part to the feeding part.

Advantage of the invention

[0022]

The disclosure allows for charging a stored vehicle even in the automated parking apparatus that transfers only vehicles from the carrier to the storages.

CLAIMS

1. A vehicle charging apparatus for an automated parking apparatus that is configured to carry a vehicle to a specified floor by means of a carrier operable to move up and down, to move the vehicle from the carrier to a specified storage provided on the specified floor, and to store the vehicle in the storage, the vehicle charging apparatus comprising:

a charging part for being connected with a charging cable of the vehicle;

a placement part provided on the carrier for connecting to the charging part; and

a feeding part provided on the storage for connecting to the charging part and supplying power to the charging cable,

wherein the charging part is configured to connect with the placement part when the vehicle is carried by the carrier, the charging part is configured to connect to the feeding part with the movement of the vehicle from the carrier to the storage, and the charging part is configured to be disconnected from the placement part after the connection of the charging part to the feeding part.

2. The vehicle charging apparatus according to claim 1,

wherein when the vehicle is checked in,

the carrier loaded with the vehicle is configured to elongate to the storage with the vehicle being loaded thereon after moving to the specified floor and to contract after moving downward relative to the storage and thereby moving the vehicle to the storage, and

the charging part is configured to connect to the feeding part with the elongation of the carrier and to be disconnected from the placement part with the carrier's downward movement relative to the storage.

3. The vehicle charging apparatus according to claim 1 or 2,

wherein when the vehicle is checked out,

the carrier is configured to elongate to the storage after moving to the specified floor on which the vehicle to be checked out is stored and to contract after moving upward relative to the storage and thereby moving the vehicle from the storage, and

the charging part is configured to connect to the placement part with the

carrier's upward movement relative to the storage and to be disconnected from the feeding part with the contraction of the carrier.

4. The vehicle charging apparatus according to claim 2 or 3, wherein the charging part is configured to connect to the placement part on the charging part's underside, and to connect to the feeding part in a direction of the vehicle's movement from the carrier to the storage.

5. The vehicle charging apparatus according to any one of claims 1 to 4, wherein the placement part is provided below the vehicle loaded on the carrier and near a front wheel of the vehicle.

6. The vehicle charging apparatus according to any one of claims 1 to 5,
wherein the storage comprises:

a pair of body parts extending in a direction parallel to both sides of the vehicle; and

a plurality of wheel support members provided in a direction perpendicular to the body parts in order to support each wheel of the vehicle in a front-rear direction of the vehicle, and

wherein a loading part of the carrier for being loaded with the vehicle to move to the storage is formed with gaps through which the wheel support members pass in a vertical direction.

7. An automated parking apparatus that that is configured to carry a vehicle to a specified floor by means of a carrier operable to move up and down, to move the vehicle from the carrier to a specified storage provided on the specified floor, and to store the vehicle in the storage, the automated parking apparatus comprising:

a charging part for being connected with a charging cable of the vehicle;

a placement part provided on the carrier for connecting to the charging part; and

a feeding part provided on the storage for connecting to the charging part and supplying power to the charging cable,

wherein the charging part is configured to connect with the placement part when the vehicle is carried by the carrier, the charging part is configured to connect to the

feeding part with the movement of the vehicle from the carrier to the storage, and the charging part is configured to be disconnected from the placement part after the connection of the charging part to the feeding part.