{DESCRIPTION}

{Title of Invention}

MECHANICAL PARKING LOT PALLET AND MECHANICAL PARKING LOT

{Technical Field}

{0001}

The present invention relates to a mechanical parking lot pallet that carries a vehicle and to a mechanical parking lot.

{Background Art}

{0002}

In a mechanical parking lot, vehicles, such as cars and two-wheeled vehicles, are placed on pallets, and these vehicles are moved in the mechanical parking lot by transporting the pallets in the up-down and right-left directions. FIG. 31 is a schematic diagram showing an example of a mechanical parking lot 1. The mechanical parking lot 1 is a structure that has, on a ground floor portion thereof, a loading floor 11, where vehicles 10 are loaded and unloaded, and parking portions on a plurality of floors. Furthermore, the mechanical parking lot 1 includes a lift 24 that moves vehicles up and down, housing shelves 21 installed in the plurality of floors along an ascending/descending pathway 23, in which the lift 24 moves up and down, and pallets 2 that are grasped by the lift 24 and carry the vehicles 10 to be loaded and unloaded.

{0003}

It is desirable that vehicles equipped with a rechargeable battery, such as hybrid vehicles and electric vehicle, be able to be charged while parked. Hence, a technique is disclosed in which, in a mechanical parking lot, outlets are provided on pallets to enable rechargeable batteries to be charged while vehicles are parked. FIGS. 32 to 34 show an example of a pallet with an outlet.

{0004}

The pallet 2 is formed by bending a steel plate and is provided with a center-guide protrusion 4 formed in the middle thereof in the width direction, a pair of right and left wheel-guiding walls 5 provided upright at side edge portions on both sides, and two wheel-guiding channels 3 that guide wheels of a vehicle in the longitudinal direction of the pallet 2. Furthermore, a power supply portion 6 is provided at one end of one of the wheel-guiding walls 5. In the example shown in FIGS. 32 to 34, the power supply portion 6 is provided vertically upright so as to extend from the wheel-guiding wall 5 and has an outlet portion 7 and a casing 8. The power supply portion 6 supplies power of, for example, 200 V.

{Citation List}

{Patent Literature}

{0005}

{PTL 1} Japanese Unexamined Patent Application, Publication

No. 2011-144565

{Summary of Invention}

{Technical Problem}

{0006}

In the mechanical parking lot 1, the pallets 2 are moved with the vehicles 10 placed thereon. Hence, an effective space for storing one vehicle is specified. This effective space has a size of, for example, (W + 150) × (L + 200) × (H + 50), where W × L × H is the size of the largest vehicle that can be stored.

{0007}

When a hybrid vehicle or an electric vehicle is to be charged, a plug provided at one end of a charging cable is connected to an outlet portion 7 of the pallet 2, and a charging gun (charging terminal) provided at the other end of the charging cable is connected to a side surface or a front surface of the vehicle 10. Therefore, depending on the parking position of the vehicle 10 or the installation condition of the cable, the charging gun or the charging cable connected to the vehicle 10 might project outside the above-mentioned effective space.

{0008}

FIGS. 35 to 38 show cases where the charging gun and the charging cable might project outside the effective space. In FIGS. 35 to 37, reference numeral S denotes the boundary of

the effective space. In FIG. 35, both the charging gun 12 and the charging cable 13 project outside the effective space. In FIG. 36, the charging gun 12 connected to the vehicle is located within the effective space, but a portion of the charging cable 13 adjacent to the charging gun 12 projects outside the effective space. Furthermore, in FIG. 37, a portion of the charging cable 13 adjacent to the pallet 2 projects outside the effective space. Moreover, in FIG. 38, although the charging gun 12 and the charging cable 13 are located within the pallet 2, when the pallet 2 is rotated or moved in the up-down or forward-backward directions, the charging cable 13 might slide and project out from an end 3A of the wheel-guiding channel 3. In these situations, when the pallet 2 starts to be rotated or moved, the charging gun 12 or the charging cable 13 might interfere with another component, causing damage to the vehicle 10 or the inside of the mechanical parking lot 1.

{0009}

The pallet 2 is moved at high speed in the mechanical parking lot 1 to enable speedy loading and unloading. Therefore, the charging gun 12 and the charging cable 13 are required to be configured as simply as possible and to be reliably stored in the effective space.

{0010}

The present invention has been made in view of the above-

described circumstances, and an object thereof is to provide a mechanical parking lot pallet that is capable of charging a vehicle equipped with a rechargeable battery, and a mechanical parking lot with which it is possible to safely charge the rechargeable battery of the vehicle, regardless of the movement of the pallet.

{Solution to Problem}

{0011}

A mechanical parking lot pallet according to a first aspect of the present invention is a mechanical parking lot pallet carrying a vehicle equipped with a rechargeable battery and has a parking prohibited section or a parking section that is indicated on a surface thereof and is used when a charging terminal is connected to the vehicle to charge the rechargeable battery.

{0012}

With this configuration, a position where the vehicle, to which the charging terminal will be connected, must not be parked or a position where parking is allowed on the pallet is identified. Hence, by parking the vehicle according to the indication, it is possible to safely park the vehicle in the mechanical parking lot.

{0013}

In the first aspect of the present invention, the parking prohibited section or the parking section may be determined

according to the charging terminal and a cable, such that the vehicle to which the charging terminal is connected, the charging terminal, and the cable connected to the charging terminal are stored in a storage space for storing the vehicle.

{0014}

With this configuration, by parking the vehicle according to the parking prohibited section or the parking section, the vehicle to which the charging terminal is connected is stored within the storage space, together with the charging terminal and the cable.

{0015}

In the first aspect of the present invention, the mechanical parking lot pallet may further includes a fixing means that fixes the cable connected to the charging terminal to the pallet when the charging terminal is connected to the vehicle to charge the rechargeable battery.

{0016}

A mechanical parking lot pallet according to a second aspect of the present invention is a mechanical parking lot pallet carrying a vehicle equipped with a rechargeable battery and includes a fixing means that fixes a cable connected to a charging terminal to the pallet when the charging terminal is connected to the vehicle to charge the rechargeable battery.

{0017}

With this configuration, because the cable is fixed to the pallet with the fixing means, it is possible to prevent the cable from moving freely. As a result, it is possible to safely park the vehicle in the mechanical parking lot.

{0018}

In the second aspect of the present invention, the fixing means may be provided near an outlet provided at one end of the pallet and to be connected to the cable or may be provided at the other end of the pallet opposite from the outlet.

{0019}

With this configuration, the cable may be reliably fixed at one end of the pallet near the outlet or at the other end of the pallet opposite from the outlet.

{0020}

In the second aspect of the present invention, the fixing means can be attached to or removed from the pallet and may be attached to a wheel-guiding channel in the pallet.

{0021}

With this configuration, even when the cable placed on the wheel-guiding channel in the pallet slides due to the movement of the pallet, the fixing means prevents the cable from projecting outside the pallet.

{0022}

A mechanical parking lot according to a third aspect of the present invention includes a mechanical parking lot pallet

carrying a vehicle equipped with a rechargeable battery and having a parking prohibited section or a parking section that is indicated on a surface thereof and is used when a charging terminal is connected to the vehicle to charge the rechargeable battery. The mechanical parking lot stores and moves the pallet.

{0023}

A mechanical parking lot according to a fourth aspect of the present invention includes a mechanical parking lot pallet carrying a vehicle equipped with a rechargeable battery. The pallet includes a fixing means that fixes a cable connected to a charging terminal to the pallet when the charging terminal is connected to the vehicle to charge the rechargeable battery. The mechanical parking lot stores and moves the pallet.

{Advantageous Effects of Invention}

{0024}

With the present invention, it is possible to safely charge a rechargeable battery of a vehicle, regardless of the movement of a pallet capable of charging a vehicle equipped with a rechargeable battery.

{Brief Description of Drawings}

{0025}

{FIG. 1} FIG. 1 is a perspective view showing a pallet according to a first embodiment of the present invention.

{FIG. 2} FIG. 2 is a plan view showing the pallet according to the first embodiment of the present invention.

{FIG. 3} FIG. 3 is an end view of the pallet according to the first embodiment of the present invention.

{FIG. 4} FIG. 4 is a plan view showing a modification of the pallet according to the first embodiment of the present invention.

{FIG. 5} FIG. 5 is a plan view showing a modification of the pallet according to the first embodiment of the present invention.

{FIG. 6} FIG. 6 is a schematic diagram showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 7} FIG. 7 is a perspective view showing a fixing member according to a first example of a second embodiment of the present invention.

{FIG. 8} FIG. 8 is an exploded perspective view showing the fixing member according to the first example of the second embodiment of the present invention.

{FIG. 9} FIG. 9 is a schematic diagram showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 10} FIG. 10 is a side view showing the fixing member and the charging cable according to the first example of the second embodiment of the present invention.

{FIG. 11} FIG. 11 is a perspective view showing a fixing member according to a second example of the second embodiment of the present invention.

{FIG. 12} FIG. 12 is an exploded perspective view of the fixing member according to the second example of the second embodiment of the present invention.

{FIG. 13} FIG. 13 is a schematic diagram showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 14} FIG. 14 is a lateral sectional view showing the fixing member and a charging cable according to the second example of the second embodiment of the present invention.

{FIG. 15} FIG. 15 is a perspective view showing a modification of the fixing member according to the second example of the second embodiment of the present invention.

{FIG. 16} FIG. 16 is a perspective view showing a pallet and a fixing member according to a third example of the second embodiment of the present invention.

{FIG. 17} FIG. 17 is an exploded perspective view of the fixing member according to the third example of the second embodiment of the present invention.

{FIG. 18} FIG. 18 is a schematic diagram showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 19} FIG. 19 is a vertical sectional view showing the

fixing member and the charging cable according to the third example of the second embodiment of the present invention.

{FIG. 20} FIG. 20 is a perspective view showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 21} FIG. 21 is a perspective view showing a modification of a pallet and a fixing member according to a fourth example of the second embodiment of the present invention.

{FIG. 22} FIG. 22 is an exploded perspective view showing a modification of the fixing member according to the fourth example of the second embodiment of the present invention.

{FIG. 23} FIG. 23 is a schematic diagram showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 24} FIG. 24 is a vertical sectional view showing the fixing member and a charging cable according to the fourth example of the second embodiment of the present invention.

{FIG. 25} FIG. 25 is a perspective view showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 26} FIG. 26 is a perspective view showing a pallet and a fixing member according to a fifth example of the second embodiment of the present invention.

{FIG. 27} FIG. 27 is a perspective view showing a block

member according to the fifth example of the second embodiment of the present invention.

{FIG. 28} FIG. 28 is a perspective view showing the pallet and the fixing member according to the fifth example of the second embodiment of the present invention.

{FIG. 29} FIG. 29 is a perspective view showing the fixing member according to the fifth example of the second embodiment of the present invention.

{FIG. 30} FIG. 30 is a perspective view showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 31} FIG. 31 is a side view and a partial sectional view showing a mechanical parking lot.

{FIG. 32} FIG. 32 is a perspective view showing a related-art pallet.

{FIG. 33} FIG. 33 is a front view showing a power supply portion provided on a pallet, taken along line A-A in FIG. 32.

{FIG. 34} FIG. 34 is a side view showing a power supply portion provided on the pallet, taken along line B-B in FIG. 32.

{FIG. 35} FIG. 35 is a schematic diagram showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 36} FIG. 36 is a schematic diagram showing the relationship between a pallet and a vehicle placed on the

pallet, and a charging gun and a charging cable.

{FIG. 37} FIG. 37 is a schematic diagram showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 38} FIG. 38 is a top view showing the relationship between a pallet and a vehicle placed on the pallet, and a charging gun and a charging cable.

{FIG. 39} FIG. 39 is a perspective view showing an entrance portion of the mechanical parking lot.

{FIG. 40} FIG. 40 is a perspective view showing the entrance portion of the mechanical parking lot.

{FIG. 41} FIG. 41 is a perspective view showing a loading floor of the mechanical parking lot.

{FIG. 42} FIG. 42 is a block diagram showing a control unit according to the first embodiment of the present invention.

{Description of Embodiments}

{0026}

Embodiments of the present invention will be described below with reference to the drawings.

First Embodiment

A first embodiment of the present invention will be described below using FIGS. 1 to 6.

In a mechanical parking lot 1, a pallet 2 is rotated and moved in the forward-backward and up-down directions to store a vehicle 10 in a predetermined position.

{0027}

The pallet 2 is formed by bending a steel plate, and two wheel-guiding channels 3 that guide wheels of the vehicle 10 in the longitudinal direction of the pallet 2 are formed between a center-guide protrusion 4 formed in the middle of the pallet 2 in the width direction and a pair of right and left wheel-guiding walls 5 provided upright at side edge portions on both sides. A power supply portion 6 is provided at one end of one wheel-guiding wall 5B. The power supply portion 6 may be provided also on the other wheel-guiding wall 5A.

{0028}

As shown in FIGS. 33 and 34, the power supply portion 6 is provided vertically upright so as to extend from the wheel-guiding wall 5 and has an outlet portion 7 and a casing 8. The power supply portion 6 supplies power of, for example, 200 V.

{0029}

Parking prohibited sections 9A and 9B are indicated in the wheel-guiding channels 3 in the pallet 2. The parking prohibited sections 9A and 9B are indicated by, for example, paint. When a vehicle 10 having a connecting port to be connected to the charging gun 12 on the wheel-guiding wall 5A side thereof is placed on the pallet 2, the driver places the vehicle 10 such that the vehicle 10 does not overlie the

parking prohibited section 9A. On the other hand, when a vehicle 10 having the connecting port to be connected to the charging gun 12 on the wheel-guiding wall 5B side thereof is placed on the pallet 2, the driver places the vehicle 10 such that the vehicle 10 does not overlie the parking prohibited section 9B. By doing so, as shown in FIG. 6, the vehicle 10 is placed closer to one side of the pallet 2, and thus, the charging gun 12 and the charging cable 13 are reliably stored in the effective space. Reference numeral S in FIG. 6 shows the boundary of the effective space.

{0030}

As a result, even when the pallet 2 is rotated and moved, the charging gun 12 and the charging cable 13 connected to the vehicle 10 can be prevented from projecting outside the effective space. Thus, it is possible to prevent the charging gun 12 and the charging cable 13 from interfering with or contacting and, thus, damaging or breaking other components, other devices, or other vehicles 10 in the mechanical parking lot 1.

{0031}

Herein, the effective space has a size of, for example, $(W + 150) \times (L + 200) \times (H + 50)$, where $W \times L \times H$ is the size of the largest vehicle that can be stored. By determining the effective space, the pallet 2 can be safely rotated and moved within the mechanical parking lot 1.

{0032}

The area of the parking prohibited sections 9A and 9B is determined according to the sizes, positions, and shapes of the charging gun 12 and the charging cable 13, such that the vehicle 10 to which the charging gun 12 is connected, the charging gun 12, and the charging cable 13 are stored in the effective space in which the vehicle 10 is reliably stored. For example, the width of the parking prohibited sections 9A and 9B, from the ends of the pallet 2 toward the inner side of the pallet 2, is determined taking into consideration the length of the charging gun 12 to be connected to the vehicle 10 to be stored and the flexibility of the charging cable 13.

{0033}

Note that the parking prohibited sections 9A and 9B may be indicated by lighting LEDs. With this configuration, when a vehicle 10 having no rechargeable battery is to be loaded, the LEDs are not lit, thus preventing the driver from being confused. Furthermore, depending on the vehicle type, one of the parking prohibited section 9A and the parking prohibited section 9B is lit according to the position of the connecting port of the vehicle 10. With this configuration, it is possible to prevent the driver from being confused and, thus, parking the vehicle 10 closer to the other side, compared with a case where the parking prohibited sections 9A and 9B are painted on the pallet 2. The type of the vehicle placed on

the pallet 2 is determined according to, for example, the result captured by a camera 35 when the vehicle is loaded or on the basis of the input entered with a control panel 18 installed near a loading/unloading port 14, as shown in FIGS. 39 and 40. Reference numeral 16 in FIG. 39 denotes a loading/unloading door, and reference numeral 17 in FIGS. 39 and 40 denotes a loading control light. The control panel 18 has a display 25, an IC card reader 26, a speaker 27, an emergency stop button 28, etc.

{0034}

Furthermore, the parking prohibited sections 9A and 9B may be either in the same color and same pattern, as shown in FIGS. 1 and 2, or in different colors or patterns, as shown in FIG. 4, so that the parking prohibited section 9A and the parking prohibited section 9B can be distinguished from each other. In addition, by indicating, on an indication panel 37 as shown in FIG. 41, which of the parking prohibited sections 9A and 9B should the driver park the car close to when loading, according to the vehicle type, the driver is prevented from being confused. For example, when the parking prohibited sections 9A and 9B are painted in different colors, i.e., red and blue, respectively, and when the vehicle 10 is not to be placed on the parking prohibited section 9B, a sign reading "Don't park the car on the blue section" or "Park the car on the red section" is indicated on the indication panel

37 to enable the driver to park the vehicle 10 at an appropriate position. Herein, a case where one parking prohibited section, 9B (blue), indicates that a car cannot be parked on this section while the other parking prohibited section, 9A (red), serves as a parking section has been described. Note that reference numeral 35 in FIG. 41 shows the camera, reference numeral 36 shows a mirror, and reference numeral 38 indicates a caution board.

{0035}

Furthermore, the information indicated on the indication panel 37 is changed by using, for example, a control block shown in FIG. 42. That is, the result captured by the camera 35 and data, such as user ID and password, inputted with the control panel 18 are sent to a main control unit 45. The main control unit 45 refers to a user database 46 to determine the type of the vehicle 10 to be loaded, whether or not charging is needed, and the position of the connecting port to be connected to the charging gun 12. Then, according to the determination result, the main control unit 45 indicates a sign "Don't park the car on the blue section" on the indication panel 37, as described above. Note that the information indicated on the indication panel 37 may be "Park the car on the right side" or "Park the car on the left side", which are also useful to warn the driver not to allow the charging gun 12 or the charging cable 13 to project outside

the effective space, similarly to the above-mentioned ones.

{0036}

Furthermore, although a case where the parking prohibited sections 9A and 9B are indicated on the pallet 2 has been described with reference to FIGS. 1 to 4, a parking section 15 may be indicated on the pallet 2, as shown in FIG. 5. When it is intended to leave a space on the wheel-guiding wall 5A side of the pallet 2, the vehicle 10 is parked such that the side surface of the vehicle 10 adjacent to the wheel-guiding wall 5A is located within the parking section 15. In contrast, when it is intended to leave a space on the wheel-guiding wall 5B side of the pallet 2, the vehicle 10 is parked such that the side surface of the vehicle 10 adjacent to the wheel-guiding wall 5B is located within the parking section 15.

{0037}

Note that, regarding the parking position of the vehicle 10, by looking at a mirror 36 provided in front of the vehicle 10 when loading, as shown in FIG. 41, the driver can check the relationship between the vehicle 10 and the parking prohibited sections 9A and 9B or between the vehicle 10 and the parking section 15 and, thus, can park the vehicle 10 in accordance with the indication. Alternatively, it may be configured such that the position of the vehicle 10 can be checked on the display 25 from the result captured by the camera 35, or such that the main control unit 45 checks the position of the

vehicle 10 and the relationship between the vehicle 10 and the parking prohibited sections 9A and 9B or between the vehicle 10 and the parking section 15 according to the result captured by the camera 35 and determines if the vehicle 10 is appropriately placed on the pallet 2 and indicates, on the indication panel 37, whether or not the vehicle 10 is appropriately placed on the pallet 2. Furthermore, the position of the vehicle 10 and the relationship between the vehicle 10 and the parking prohibited sections 9A and 9B or between the vehicle 10 and the parking section 15 may be captured by the camera 35 and recorded. By doing so, a manager or the like of the mechanical parking lot 1 can check, from behind, if the pallet 2 is appropriately used when parking.

{0038}

Furthermore, although both the parking prohibited sections 9A and 9B are indicated on the pallet 2 in FIGS. 1 to 4, only one of them may be indicated on the pallet 2. Then, in association with the information about the vehicle type, the pallet 2 is rotated before loading the vehicle, such that the parking prohibited section matches the connection side of the vehicle 10 to be parked, the side to be connected to the charging gun 12. With this configuration, the driver can appropriately place the vehicle 10 only by parking the vehicle 10 in accordance with only one parking prohibited section,

which is indicated.

{0039}

Note that the parking prohibited sections 9A and 9B may indicate a section in which the charging cable 13 may be disposed. For example, as shown in FIG. 2, by not painting the parking prohibited sections 9A and 9B to the end 3A of the wheel-guiding channels 3, it is possible to warn the driver not to place charging cable 13 on the end 3A of the wheel-guiding channels 3. As a result, the charging cable 13 is placed close to the center, so, it is possible to prevent the charging cable 13 from sliding and projecting outside the pallet 2 as a result of rotation or movement of the pallet 2.

{0040}

Second Embodiment

Next, a second embodiment of the present invention will be described using FIGS. 6 to 30.

In the second embodiment, a fixing member (fixing means) that fixes the charging cable 13 to the pallet 2 is provided on the pallet 2.

{0041}

The fixing member shown in FIGS. 7 to 10 is attached to the casing 8 of the power supply portion 6. The fixing member includes a clip 31 having insertion holes 32 and used to grip a plate portion of the casing 8, and a belt member 33 that is provided with a Magic Tape (registered trademark), i.e.,

Velcro (registered trademark) tape, and is to be inserted through the insertion holes 32. The belt member 33 is disposed parallel to the longitudinal direction of the vehicle 10. Hence, it is possible to prevent the belt member 33 from projecting outside the effective space. Magic tape is a surface fastener including a support member with hooks and a support member with loops.

{0042}

By fixing the charging cable 13 with the belt member 33, it is possible to prevent an upstanding portion of the charging cable 13, which is a portion between the power supply portion 6 and the charging gun 12 connected to the vehicle 10, from projecting outside the effective space.

{0043}

Because the fixing member has the clip 31, the fixing member can be easily attached to and detached from the casing 8, and replacement of the clip 31 and the belt member 33 is easy. Furthermore, the belt member 33 may be provided with another means, such as, for example, a magnet, a hook, a press stud, instead of the Magic Tape, and the charging cable 13 may be fixed using such a means. As described above, the fixing member according to this embodiment is formed of a relatively reasonably priced parts, but it can reliably prevent the charging cable 13 from projecting.

{0044}

Although the fixing member shown in FIGS. 7 to 10 is attached to the top surface of the casing 8 of the power supply portion 6, the fixing member may be attached to the side surface of the casing 8, as shown in FIGS. 11 to 14.

The fixing member is formed of a clip 41 having insertion holes 42 and used to grip the plate portion of the casing 8, and the belt member 33 that is provided with a Magic Tape and is to be inserted through the insertion holes 42. The belt member 33 is disposed perpendicular to the longitudinal direction of the vehicle 10. With this configuration, although the belt member 33 could project outside the effective space, by disposing the belt member 33 such that a portion adjacent to an end 33b, which is located within the pallet 2, is longer than a portion adjacent to an end 33a, as shown in FIGS. 11 and 14, the belt member 33 is ensured to have a length sufficient to fix the charging cable 13 without projecting outside the pallet 2.

{0045}

Furthermore, in FIGS. 11 to 14, although the clip 41 has such a shape that the belt member 33 is located outside the casing 8 the fixing member may be formed such that the belt member 33 is located inside the casing 8, like a clip 43 shown in FIG. 15.

{0046}

The fixing members shown in FIGS. 16 to 20 are attached

to the wheel-guiding wall 5. The fixing members each include a cover portion 61 that grips the wheel-guiding wall 5 and is provided with insertion holes 62, the belt member 33 that is provided with a Magic Tape (Velcro tape) and is to be inserted through the insertion holes 62, and screws 64 that are fastened with screw holes 63 provided in the cover portion 61. The belt member 33 is disposed perpendicular to the longitudinal direction of the vehicle 10. By placing the cover portion 61 on the wheel-guiding wall 5 so as to pinch the side surfaces and the top and bottom surfaces of the wheel-guiding wall 5 and by fastening the screws 64 from above, the cover portion 61 is fixed to the wheel-guiding wall 5. Like this, the fixing member has a simple configuration, so, attachment and removal thereof are easy. As shown in FIG. 20, the fixing members are provided at two positions on the wheel-guiding wall 5. Note that the number of the fixing members is not limited to two, but may be appropriately increased.

{0047}

The charging cable 13 is usually five to ten meters long. For example, if the charging cable 13 is longer than the distance between the power supply portion 6 and the connecting port of the vehicle 10 to be connected to the charging gun 12, the charging cable 13 has to be routed on the pallet 2. By fixing the charging cable 13 with the belt member 33, as shown

in FIGS. 18 and 20, it is possible to prevent the charging cable 13, which extends from the power supply portion 6 and is disposed on the pallet 2, from projecting outside the effective space.

{0048}

Although the belt members 33 of the fixing members shown in FIGS. 16 to 20 are attached to the top surface of the wheel-guiding wall 5, the belt members 33 may be attached to a side surface of the wheel-guiding wall 5, as shown in FIGS. 21 to 25.

The fixing member includes a cover portion 71 having insertion holes 72 and used to grip the wheel-guiding wall 5, the belt member 33 that is provided with a Magic Tape (Velcro tape) and is to be inserted through the insertion holes 72, and screws 74 to be fastened with screw holes 73 provided in the cover portion 71. The belt member 33 is disposed parallel to the longitudinal direction of the vehicle 10. By placing the cover portion 71 on the wheel-guiding wall 5 so as to grip the side surfaces and top and bottom surfaces of the wheel-guiding wall 5 and by fastening the screws 74 from above, the cover portion 71 is fixed to the wheel-guiding wall 5. As shown in FIG. 25, the fixing members are provided at two positions on the wheel-guiding wall 5. Note that the number of the fixing members is not limited to two, but may be appropriately increased.

Furthermore, although the fixing members shown in FIGS. 6 to 25 are fixed by gripping or by using cap screws, the fixing members may be fixed by using a magnet, a tape, an adhesive, or the like.

{0049}

Fixing members shown in FIGS. 26 to 30 are attached to the wheel-guiding channel 3 in the pallet 2 when they are used to prevent the charging cable 13 from projecting and are stored in storage cases 82 on the wheel-guiding wall 5 when they are not used. The fixing members are each formed of a block member 81 having a magnet (not shown) for fixing the fixing member to the pallet 2 made of a steel plate, and a lever 83 that switches the magnet ON/OFF. Note that the block member 81 is provided with the belt member 33 having a Magic Tape (Velcro tape), as shown in FIG. 27.

{0050}

As shown in FIGS. 26 and 30, because the block members 81 are attached to the wheel-guiding channel 3 in the pallet 2 with the magnets, even when the charging cable 13 placed on the wheel-guiding channel 3 in the pallet 2 slides due to the movement, such as rotation and shifting, of the pallet 2, the block members 81 prevent the charging cable 13 from projecting outside the end 3A of the wheel-guiding channel 3 in the pallet 2. Furthermore, by fixing the charging cable 13 with the belt member 33 shown in FIG. 27, projecting of the

charging cable 13 can be more reliably prevented, as shown in FIG. 30.

{0051}

When the block members 81 are not used, such as when charging the vehicle 10 is unnecessary or when the vehicle 10 is to be moved on the pallet 2, the block members 81 are stored in the storage cases 82, as shown in FIGS. 28 and 29. At this time, it is desirable that the block members 81 be fixed by the magnets. Each storage case 82 has side walls surrounding the block member 81 from four sides and prevents the block member 81 from rotating, even when the pallet 2 is rotated or moved.

{0052}

Note that, in the mechanical parking lot, the fixing members according to the second embodiment and the indication on the pallet 2 according to the first embodiment may be used in combination.

{0053}

As has been described above, according to the first embodiment of the present invention, the position where the vehicle 10, to which the charging gun 12 will be connected, must not be parked or the position where parking is allowed on the pallet 2 is identified. Hence, the driver can safely park the vehicle 10 in the mechanical parking lot 1 by parking the vehicle 10 according to the indication. Furthermore,

according to the second embodiment of the present invention, because the charging cable 13 is fixed to the pallet 2 by the fixing members, it is possible to prevent the charging cable 13 from moving freely. As a result, when the pallet 2 capable of charging the vehicle 10 equipped with a rechargeable battery is to be used in the mechanical parking lot 1, it is possible to safely charge the rechargeable battery of the vehicle 10, regardless of the rotation or movement of the pallet 2.

{Reference Signs List}

{0054}

1 mechanical parking lot

2 pallet

3 wheel-guiding channel

4 center-guide protrusion

5 wheel-guiding wall

6 power supply portion

12 charging gun (charging terminal)

13 charging cable (cable)

31, 41, 43 clip

33 belt member

61, 71 cover portion

64, 74 screw

81 block member

82 storage case

{Claim 1}

A mechanical parking lot pallet carrying a vehicle equipped with a rechargeable battery, the pallet comprising a fixing means that fixes a cable connected to a charging terminal to the pallet when the charging terminal is connected to the vehicle to charge the rechargeable battery,

wherein the fixing means is capable of disposing the cable on the pallet such that the cable is folded back to the back-and-forth direction of the vehicle.

{Claim 2}

The mechanical parking lot pallet according to Claim 1, wherein the fixing means can be attached to or removed from the pallet and is provided near an outlet provided at one end of the pallet and to be connected to the cable or is provided at the other end of the pallet opposite from the outlet.

{Claim 3}

A mechanical parking lot pallet carrying a vehicle equipped with a rechargeable battery, the pallet comprising a fixing means that fixes a cable connected to a charging terminal to the pallet when the charging terminal is connected

to the vehicle to charge the rechargeable battery,

wherein the fixing means can be attached to or removed from the pallet and is attached to a wheel-guiding channel in the pallet.

{Claim 4}

The mechanical parking lot pallet according to any one of Claims 1 to 3,

wherein the pallet has a parking prohibited section or a parking section that is indicated on a surface thereof and is used when a charging terminal is connected to the vehicle to charge the rechargeable battery.

{Claim 5}

The mechanical parking lot pallet according to Claim 4,

wherein the parking prohibited section or the parking section is determined according to the charging terminal and a cable, such that the vehicle to which the charging terminal is connected, the charging terminal, and the cable connected to the charging terminal are stored in a storage space for storing the vehicle.

{Claim 6}

A mechanical parking lot comprising a mechanical parking lot pallet carrying a vehicle equipped with a rechargeable

battery, the pallet including a fixing means that fixes a cable connected to a charging terminal to the pallet when the charging terminal is connected to the vehicle to charge the rechargeable battery and that is capable of disposing the cable on the pallet such that the cable is folded back to the back-and-forth direction of the vehicle,

wherein the mechanical parking lot stores and moves the pallet.