Claims

1. A battery swapping station, characterized in that the battery swapping station comprising:

a first battery charging compartment and a second battery charging compartment, both the first battery charging compartment and the second charging compartment being used to store battery of a vehicle and charge the battery of the vehicle;

a first battery swapping platform, the first battery swapping platform being arranged between the first battery charging compartment and the second battery charging compartment, and the first battery swapping platform being used to swap the battery of the vehicle;

a first shuttle and a second shuttle, the first shuttle travels between the first battery charging compartment and the first battery swapping platform, the second shuttle travels between the second battery charging compartment and the first battery swapping platform, and the first shuttle and the second shuttle are both used for executing the operations of battery unmounting and battery mounting for a vehicle on the first battery swapping platform;

a control unit, the control unit being electrically connected to the first shuttle and to the second shuttle, used for controlling the first shuttle and the second shuttle to perform the following operations: when operating a same vehicle on the first battery swapping platform, if the first shuttle is executing either operation of battery unmounting or battery mounting, the second shuttle is executing the other operation of battery unmounting or battery mounting.

2. The battery swapping station according to claim 1, characterized in that the battery swapping station further comprises a second battery swapping platform and a third shuttle; the second battery swapping platform is arranged at the opposite side of the first battery charging compartment relative to the first battery swapping platform; the third shuttle travels between the first battery charging compartment and the second battery swapping platform and is connected to the control unit, and the third shuttle is used to execute operations of battery unmounting and battery mounting for a vehicle on the second battery swapping platform.

3. The battery swapping station according to claim 2, characterized in that a first stacker and a second stacker are arranged respectively in the first battery charging compartment and the second battery charging compartment, wherein both of the first stacker and the second stacker are electrically connected to the control unit;

a first front compartment and a first rear compartment which are mutually communicated are formed in the first battery charging compartment, the first stacker travels between the first front compartment and the first rear compartment, the first shuttle swaps batteries with the first stacker in the first front compartment, the first rear compartment is used to store a first battery rack, and the first stacker is used to pick and place batteries on the first battery rack;

a second front compartment and a second rear compartment which are mutually connected

are formed in the second battery charging compartment, the second stacker travels back and forth between the second front compartment and the second rear compartment, the second shuttle swaps batteries with the second stacker in the second front compartment, the second rear compartment is used to store a second battery rack, and the second stacker is used to pick and place batteries on the second battery rack.

4. The battery swapping station according to any of claims 1 to 3, characterized in that the first battery swapping platform is respectively connected to an uphill ramp and to a downhill ramp at upstream and downstream of a travelling direction of the vehicle.

5. The battery swapping station according to any of claims 1 to 4, characterized in that the battery swapping station further comprises a first monitoring compartment;

in the direction of a vehicle travelling to the first battery swapping platform, the first monitoring compartment is arranged at the upstream of the first battery charging compartment; and the control unit is arranged in the first monitoring compartment.

6. The battery swapping station according to any of claims 1 to 5, characterized in that the battery swapping station further comprises a first monitoring compartment and a second monitoring compartment;

the control unit comprises a first monitoring device and a second monitoring device, the first monitoring device and the second monitoring device are respectively arranged in the first monitoring compartment and the second monitoring compartment;

the first monitoring device is used for controlling the first shuttle to alternately execute the operations of battery unmounting and battery mounting for the vehicle which on the first battery swapping platform;

the second monitoring device is used for controlling the second shuttle to alternately execute the operations of battery unmounting and battery mounting for the vehicle which on the first battery swapping platform.

7. The battery swapping station according to any of claims 1 to 6, characterized in that the first shuttle comprises a chassis, a lifting frame and a jacking mechanism;

the jacking mechanism is connected to the chassis and the lifting frame and used to lift the lifting frame relative to the chassis; the jacking mechanism comprises a connecting rod, a first end of the connecting rod connected to the lifting frame in a rotary way and a second end of the connecting rod connected to the chassis in a rotary way;

the lifting frame is used for unmounting and mounting the battery of the vehicle.

8. The battery swapping station according to claim 7, characterized in that the connecting rod is a cam.

9. A control method of a battery swapping station according to any one of claims 1 to 8, the control method includes the following steps:

S1: when a vehicle does not travel into the first battery swapping platform, the control unit controls the first shuttle to pick up a fully-charged battery from the first battery charging compartment and stand by in the first battery charging compartment;

S2: after the vehicle travels into the first battery swapping platform, the control unit controls the second shuttle to travel to the first battery swapping platform and unmount the battery of the vehicle;

S3: the control unit controls the first shuttle to mount the fully-charged battery on the vehicle which is on the first battery swapping platform.

10. The control method according to claim 9, characterized in that in the step S2, after the second shuttle unmounts the battery of the vehicle, the control unit controls the second shuttle to transfer the battery of the vehicle to the second battery charging compartment for charging and pick up a fully-charged battery in the second battery charging compartment and stand by in the second battery charging compartment;

in the step S3, after the first shuttle mounts the fully-charged battery on the vehicle which is on the first battery swapping platform, the control unit controls the first shuttle to return to the first battery charging compartment to stand by;

the control method further comprises following steps:

S4: after a next vehicle travels to the first battery swapping platform, the control unit controls the first shuttle to travel to the first battery swapping platform and unmount the battery of the vehicle, after the first shuttle unmounts the battery of the vehicle, the control unit controls the first shuttle to transfer the battery of the vehicle to the first battery charging compartment for charging and pick up the fully-charged battery in the first battery charging compartment and stand by in the first battery charging compartment;

S5: the control unit controls the second shuttle to mount the fully-charged battery on the vehicle which is on the first battery swapping platform; after the second shuttle mounts the fully-charged battery on the vehicle, the control unit controls the second shuttle to return the second battery charging compartment to stand by;

S6: return to step S2.