## Claims

1. An AGV comb-type transfer robot, comprising:

a lifting frame, with comb teeth being mounted on the lifting frame;

a travelling frame, with a comb tooth lifting apparatus being mounted on the travelling frame, and a travelling drive mechanism and a central control system being mounted in the travelling frame;

wherein the comb tooth lifting apparatus comprises a lifting drive motor and a gear set in transmission connection with the lifting drive motor; the travelling drive mechanism comprises a travelling drive motor and a travelling wheel set mounted in the travelling frame, and the travelling drive motor comprises a drive motor and a steering motor to realize omnidirectional travelling;

wherein the central control system is composed of a main controller and a travelling module, a transfer module, a guidance and orientation module, a safety module, a power supply and charging management module, a communication module and a human-computer interaction apparatus which are electrically connected with the main controller; wherein: the guidance and orientation module is used for guiding and orientating the travelling path of the transfer robot; the safety module is used for preventing the transfer robot from being collided with surrounding objects during its travelling; the communication module is used for conducting wireless communication between the transfer robot and outside; and the human-computer interaction apparatus is used for setting the parameters of the transfer robot and displaying the operating state of the transfer robot;

wherein the travelling module comprises two drive motors, two steering motors, four servo drivers and four encoders; the transfer module comprises a comb tooth lifting motor and a vehicle position centering motor;

wherein the guidance and orientation module is used for obtaining segment table parameters, point information and operation code information sent by an upper system, thereby realizing generation of the speed, determination of a destination point and output of a transfer operation code command;

wherein the main controller is used for completing an accurate estimation and calculation of positions by adopting a main position calculator and an auxiliary position calculator, wherein the main position calculator is used for calculating the theoretic position of the AGV in real time based on the previous position information, encoder information and kinematic model of a vehicle body; the auxiliary position calculator is used for obtaining the real position based on information of a laser head/magnetic dot sensor of a navigation apparatus; the main controller is

further used for converting the speed information into electric signals and sending to a steering servo driver and a drive servo driver of the travelling module, and the servo drivers control the motor to complete travelling.

2. The AGV comb-type transfer robot of claim 1, wherein the transfer robot is further mounted with a power supply apparatus, a navigation apparatus and a safety detection apparatus, and the power supply apparatus comprises batteries and a charging mechanism electrically connected with the batteries which are mounted in the travelling frame.

3. The AGV comb-type transfer robot of claim 2, wherein the navigation apparatus comprises a laser navigation module mounted in the travelling frame, or a magnetic marker navigation module or an electromagnetic navigation module mounted on the periphery of the travelling frame, or an inertial navigation module mounted in the travelling frame.

4. The AGV comb-type transfer robot of claim 2, wherein the safety detection apparatus comprises a laser anti-collision module, a mechanical anti-collision module, an infrared anti-collision module or an ultrasonic anti-collision module which is mounted on the travelling frame for recognizing the objects surrounding the transfer robot.

5. The AGV comb-type transfer robot of any of claims 1-4, wherein the four corners of the travelling frame are further provided with passive travelling wheels.

6. A method for storing a vehicle by utilizing an AGV comb-type transfer robot of any of claims 1-5, comprising the following steps:

a transfer robot goes below a lifting platform, a main controller controls a lifting drive motor to lift a vehicle, when the vehicle reaches a limited height, a high-position limit switch sends signals to stop lifting;

the transfer robot leaves the lifting platform and transfers the vehicle to a corresponding comb tooth frame of a parking space;

after the transfer robot reaches corresponding comb tooth frame of the parking space, the lifting drive motor inverses, and the vehicle descends to the comb tooth frame of the parking space; and

the transfer robot leaves the comb tooth frame of the parking space.

7. A method for retrieving a vehicle by utilizing an AGV comb-type transfer robot of any of claims 1-5, comprising the following steps:

a dispatching system of an upper computer sends a vehicle retrieval command at corresponding parking space, the transfer robot travels to corresponding parking space from its position after receiving the vehicle retrieval vehicle;

the lifting drive motor drives the lifting frame to ascend, to separate the vehicle from the comb tooth frame of the parking space;

the transfer robot travels to transfer the vehicle out of the comb tooth frame of the parking space; and

the transfer robot travels to the lifting platform, the lifting drive motor drives the lifting frame to descend, the vehicle is parked on the comb tooth frame at the entrance and exit, and the transfer robot leaves.