CLAIMS

1. A goods retrieval and placement device for high-bay rack, applied to the high-bay rack comprising a plurality of stacked goods storage areas and being provided with at least two horizontally arranged traveling rails, wherein the goods retrieval and placement device comprises: a lifting assembly; a traveling assembly arranged on the traveling rail in a movable manner; and at least two floating assemblies arranged at intervals along the height direction of the lifting assembly, each floating assembly being connected to at least one traveling assembly;

wherein the floating assembly comprises a rigid support and an elastic assembly, the lifting assembly is arranged on the rigid support, the elastic assembly is arranged between the rigid support and the traveling assembly, and the elastic assembly is configured so that the distance between the rigid support and the traveling assembly can be adaptively changed within a first threshold in the vertical direction;

wherein the rigid support is provided with a positioning sensor, a detection end of the positioning sensor faces the traveling rail, and a positioning mark is provided on a side of the traveling rail facing the positioning sensor, and the positioning sensor is configured to detect the positioning mark to determine the position coordinates of the rigid support corresponding to the positioning sensor;

wherein the goods retrieval and placement device further comprises a first controller electrically connected to the positioning sensor and the traveling assembly;

wherein the first controller is configured to:

obtain the moments when all the positioning sensors detect the positioning marks (200);

determine the time difference between the positioning sensors of any two floating assemblies detecting the positioning mark, and the sequence of time when all the positioning sensors detect the positioning marks, based on the moments when all the positioning sensors detect the positioning marks; and

determine the traveling assembly that needs to be adjusted and the corresponding adjustment amount of traveling speed according to the sequence of time when all the positioning sensors detect the positioning marks, if there is any time difference that is greater than a second threshold.

2. The goods retrieval and placement device for high-bay rack according to claim 1, wherein the elastic assembly comprises an elastic member and a suspension rod, one end of the suspension rod is rotatably fixed on the rigid support, and the other end is connected to the traveling assembly, and the elastic member is arranged between the rigid support and the rod body of the suspension rod.

3. The goods retrieval and placement device for high-bay rack according to claim 2, wherein the elastic assembly further comprises an adjustment block disposed between the rigid support and the traveling assembly, and the adjustment block is configured to adjust the value of the first threshold.

4. The goods retrieval and placement device for high-bay rack according to claim 1, wherein a position limiting assembly is provided on the rigid support, and the position limiting assembly can slidably abut against or engage with the traveling rail, and is configured to limit the distance between the positioning sensor and the positioning mark in the horizontal direction;

wherein the position limiting assembly comprises a first position limiting body and a second position limiting body respectively abutting against two opposite sides of the traveling rail, and one of the two opposite sides is provided with the positioning mark; or

the position limiting assembly comprises a third position limiting body, and the traveling rail is provided with a groove for engaging the third position limiting body, and the groove is used to limit the distance between the positioning sensor and the positioning mark in the horizontal direction.

5. The goods retrieval and placement device for high-bay rack according to claim 1, wherein a lidar is provided on the lifting assembly for detecting point cloud data of the traveling rail with the lidar as a base point;

wherein the goods retrieval and placement device further comprises a second controller electrically connected to the lidar and the traveling assembly;

wherein the second controller is configured to:

obtain point cloud data of the traveling rail detected by the lidar;

generate a contour line of the traveling rail according to the point cloud data of the traveling rail;

determine the inclination angle of the contour line of the traveling rail according to the contour line of the traveling rail, based on the horizontal plane where the lidar is located; and

determine the traveling assemblies that need to be adjusted and the corresponding adjustment amount of traveling speed according to the inclination angle of the contour line of the traveling rail.

6. The goods retrieval and placement device for high-bay rack according to claim 1, wherein the traveling assembly comprises a traveling wheel and a first driving mechanism, the traveling wheel is disposed on the traveling rail and connected to an output shaft of the first driving mechanism, and the elastic assembly is connected to the first driving mechanism.

7. The goods retrieval and placement device for high-bay rack according to claim 1, wherein, if multiple traveling assemblies are connected to the same floating assembly, there is at least one traveling assembly that only includes a traveling wheel arranged on the traveling rail, and a rotating shaft of the traveling wheel is connected to the floating assembly.

8. The goods retrieval and placement device for high-bay rack according to claim 1, wherein, if the number of the floating assemblies is greater than or equal to three, the traveling assembly on at least one floating assembly only includes a traveling wheel arranged on the traveling rail, and a rotating shaft of the traveling wheel is connected to the floating assembly.

9. The goods retrieval and placement device for high-bay rack according to claim 1, wherein the lifting assembly comprises a lifting track, a second driving mechanism and a goods retrieval and placement platform;

wherein the lifting track is connected to the rigid support, the goods retrieval and placement platform is slidably arranged on the lifting track, and the second driving mechanism is connected to the goods retrieval and placement platform, and is configured to drive the goods retrieval and placement platform to move along the lifting track.

10. A high-bay rack, comprising a plurality of stacked goods storage areas, wherein at least two horizontally arranged traveling rails are provided on the high-bay rack, and the goods retrieval and placement device for high-bay rack according to claim 1 is provided on the traveling rail.