CLAIMS

1. A movement control method of a cleaning robot, wherein the movement control method is applied to the cleaning robot, the cleaning robot is provided with a sensor system capable of acquiring three-dimensional information of an obstacle, and the movement control method comprises:

during travel of the cleaning robot, when the obstacle moves within a detection range of the sensor system, when a distance between the obstacle and the cleaning robot along a central axis of the cleaning robot is less than a first preset detection threshold, when a maximum value among included angles between connection lines constituted by a first reference point of the cleaning robot and second reference points of the obstacle and a current traveling direction of the cleaning robot is greater than a third preset detection threshold, and when a minimum value among the included angles between the connection lines constituted by the first reference point of the cleaning robot and the second reference points of the obstacle and the current traveling direction of the cleaning robot is less than the third preset detection threshold, performing an action away from the obstacle to enable the sensor system to acquire three-dimensional information of the obstacle,

wherein the central axis of the cleaning robot is parallel to the current traveling direction of the cleaning robot, the first reference point is one point closer to the obstacle along the current traveling direction in intersection points of a body boundary of the cleaning robot and the central axis of the cleaning robot, the second reference points are intersection points of an outer peripheral boundary of the obstacle and a reference line of the obstacle, and the reference line is perpendicular to the central axis.

2. The movement control method according to claim 1, wherein the movement control method further comprises:

when the distance between the obstacle and the cleaning robot along the central axis of the cleaning robot is less than the first preset detection threshold, and when the minimum value among the included angles between the connection lines constituted by the first reference point of the cleaning robot and the second reference points of the obstacle and the current traveling direction of the cleaning robot is greater than or equal

to the third preset detection threshold, not performing the action away from the obstacle and continuing to travel along a current traveling path.

3. The movement control method according to claim 1, wherein the sensor system comprises one or more of a monocular vision sensor, a binocular vision sensor, a line laser sensor, a surface laser sensor, a laser direct structuring (LDS) sensor, a direct time of flight (Dtof) sensor, and an indirect time of flight (Itof) sensor; and

the first preset detection threshold is a minimum value among effective detection distances of sensors in the sensor system.

4. The movement control method according to claim 3, wherein the cleaning robot performs the action away from the obstacle until it moves to a first position, and a distance between the first position and the obstacle is less than a maximum value among the effective detection distances of the sensors in the sensor system.

5. The movement control method according to claim 1, wherein after performing the action away from the obstacle, the movement control method further comprises:

performing a steering action to adjust a detection direction of the sensor system so that the sensor system acquires the three-dimensional information of the obstacle.

6. The movement control method according to claim 1, wherein after performing the action away from the obstacle, the movement control method further comprises:

executing a waiting action;

during a waiting period, re-detecting an obstacle area through the sensor system; and

when the obstacle does not exist in the obstacle area, performing a return cleaning action.

7. The movement control method according to claim 6, wherein after re-detecting the obstacle area through the sensor system, the movement control method further comprises:

when the obstacle exists in the obstacle area, re-planning a cleaning path and performing a detour action.

8. The movement control method according to claim 6, wherein after re-detecting the obstacle area through the sensor system, the movement control method further comprises:

when the obstacle exists in the obstacle area and the obstacle is a human, broadcasting relevant prompt information by voice.

9. A movement control method of a cleaning robot, wherein the movement control method is applied to the cleaning robot, the cleaning robot is provided with a sensor system capable of acquiring three-dimensional information of an obstacle, and the movement control method comprises:

during travel of the cleaning robot, when the obstacle moves within a detection range of the sensor system, when a distance between the obstacle and the cleaning robot along a central axis of the cleaning robot is less than a first preset detection threshold, when a maximum value among vertical distances between the obstacle and the central axis of the cleaning robot is greater than a second preset detection threshold, and when a minimum value among the vertical distances between the obstacle and the central axis of the cleaning robot is less than the second preset detection threshold, performing an action away from the obstacle to enable the sensor system to acquire three-dimensional information of the obstacle,

wherein the central axis of the cleaning robot is parallel to the current traveling direction of the cleaning robot,

wherein the vertical distance between the obstacle and the central axis of the cleaning robot is a length of a perpendicular line from a point on an outer peripheral boundary of the obstacle to the central axis.

10. The movement control method according to claim 9, wherein the movement control method further comprises:

when the distance between the obstacle and the cleaning robot along the central axis of the cleaning robot is less than the first preset detection threshold, and when the minimum value among the vertical distances between the obstacle and the central axis of the cleaning robot is greater than or equal to the second preset detection threshold,

not performing the action away from the obstacle and continuing to travel along a current traveling path.

11. The movement control method according to claim 9, wherein the second preset detection threshold is greater than or equal to 0.45 times a maximum length of a body of the cleaning robot in a direction perpendicular to the central axis of the cleaning robot, and less than or equal to 0.55 times the maximum length of the body of the cleaning robot in the direction perpendicular to the central axis of the cleaning robot.

12. The movement control method according to claim 9, wherein the sensor system comprises a binocular vision sensor.

13. The movement control method according to claim 9, wherein the sensor system comprises one or more of a monocular vision sensor, a binocular vision sensor, a line laser sensor, a surface laser sensor, a LDS sensor, a Dtof sensor, and an Itof sensor; and

the first preset detection threshold is a minimum value among effective detection distances of sensors in the sensor system.

14. The movement control method according to claim 9, wherein the cleaning robot performs the action away from the obstacle until it moves to a first position, and a distance between the first position and the obstacle is less than a maximum value among the effective detection distances of the sensors in the sensor system.

15. The movement control method according to claim 9, wherein after performing the action away from the obstacle, the movement control method further comprises:

performing a steering action to adjust a detection direction of the sensor system so that the sensor system acquires the three-dimensional information of the obstacle.

16. The movement control method according to claim 9, wherein after performing the action away from the obstacle, the movement control method further comprises:

executing a waiting action;

during a waiting period, re-detecting an obstacle area through the sensor system; and

when the obstacle does not exist in the obstacle area, performing a return cleaning action.

17. The movement control method according to claim 16, wherein after re-detecting the obstacle area through the sensor system, the movement control method further comprises:

when the obstacle exists in the obstacle area, re-planning a cleaning path and performing a detour action.

18. The movement control method according to claim 16, wherein after re-detecting the obstacle area through the sensor system, the movement control method further comprises:

when the obstacle exists in the obstacle area and the obstacle is a human, broadcasting relevant prompt information by voice.

19. A movement control method of a cleaning robot, wherein the movement control method is applied to the cleaning robot, the cleaning robot is provided with a sensor system capable of acquiring three-dimensional information of an obstacle, and the movement control method comprises:

during travel of the cleaning robot, when the obstacle moves within a detection range of the sensor system, when a distance between the obstacle and the cleaning robot along a central axis of the cleaning robot is greater than or equal to a first preset detection threshold, when a maximum value among vertical distances between the obstacle and the central axis of the cleaning robot is greater than a second preset detection threshold, and when a minimum value among the vertical distances between the obstacle and the central axis of the cleaning robot is less than the second preset detection threshold, performing a steering action,

wherein the central axis of the cleaning robot is parallel to the current traveling direction of the cleaning robot,

wherein the vertical distance between the obstacle and the central axis of the cleaning robot is a length of a perpendicular line from a point on an outer peripheral boundary of the obstacle to the central axis.

20. The movement control method according to claim 19, wherein the second preset detection threshold is greater than or equal to 0.45 times a maximum length of a body of the cleaning robot in a direction perpendicular to the central axis of the cleaning robot, and less than or equal to 0.55 times the maximum length of the body of the cleaning robot in the direction perpendicular to the central axis of the cleaning robot.

21. A movement control method of a cleaning robot, wherein the movement control method is applied to the cleaning robot, the cleaning robot is provided with a sensor system capable of acquiring three-dimensional information of an obstacle, and the movement control method comprises:

during travel of the cleaning robot, when the obstacle moves within a detection range of the sensor system, when a distance between the obstacle and the cleaning robot along a central axis of the cleaning robot is greater than or equal to a first preset detection threshold, when a maximum value among included angles between connection lines constituted by a first reference point of the cleaning robot and second reference points of the obstacle and a current traveling direction of the cleaning robot is greater than a third preset detection threshold, and when a minimum value among the included angles between the connection lines constituted by the first reference point of the cleaning robot and the second reference points of the obstacle and the current traveling direction of the cleaning robot is less than the third preset detection threshold, performing a steering action,

wherein the central axis of the cleaning robot is parallel to the current traveling direction of the cleaning robot, the first reference point is one point closer to the obstacle along the current traveling direction in intersection points of a body boundary of the cleaning robot and the central axis of the cleaning robot, the second reference points are intersection points of an outer peripheral boundary of the obstacle and a reference line of the obstacle, and the reference line is perpendicular to the central axis.

22. A cleaning robot, wherein the cleaning robot comprises a body, a sensor system provided on the body and capable of acquiring three-dimensional information of an obstacle, a processor, and a memory for storing instructions executable by the processor;

during travel of the cleaning robot, when the processor executes the instructions, steps of the movement control method according to any one of claim 1 to claim 21 are

implemented to enable the sensor system to acquire the three-dimensional information of the obstacle.

23. A computer readable storage medium, wherein the computer readable storage medium comprises a stored program, and the program is executed to perform the movement control method according to any one of claim 1 to claim 21.