CLAIMS

1. An active obstacle crossing control method for a cleaning robot, wherein the cleaning robot comprises an active obstacle crossing mechanism and an obstacle crossing driving device for driving a motion of the active obstacle crossing mechanism, wherein the method comprises steps of:

in case where an obstacle is on a cleaning path of the cleaning robot, identifying a height of the obstacle and a material type of a contact surface before the cleaning robot crosses the obstacle;

in case where the height of the obstacle matches a predefined obstacle crossing height range corresponding to the material type, activating an active obstacle crossing function of the cleaning robot.

2.The method according to claim 1, wherein the material type is obtained through real-time detection by the cleaning robot during operation.

3. The method according to claim 1, wherein the material type is obtained by the cleaning robot activating a contact surface material detection function and detecting the corresponding contact surface when about to cross the obstacle in case where the obstacle is on the cleaning path.

4. The method according to claim 1, wherein the material type comprises one or more of carpet, wood, ceramic tiles, marble, rubber roll, or epoxy resin.

5. The method according to claim 1, wherein the material type reflects a friction force between a wheel of the cleaning robot and a ground material.

6. The method according to claim 1, wherein the material type reflects a sinkage of a wheel of the cleaning robot on a corresponding ground.

7. The method according to claim 1, wherein:

the predefined obstacle crossing height range corresponding to the material type comprises a pre-stored mapping relationship.

8. The method according to claim 7, wherein:

the predefined obstacle crossing height range comprises a minimum height and a maximum height,

in case where the height of the obstacle is higher than the minimum height but lower than the maximum height, activating the active obstacle crossing function.

9. The method according to claim 1, wherein:

the active obstacle crossing function is not activated in case where the height of the obstacle does not match the predefined obstacle crossing height range corresponding to the material type.

10. A control system for a cleaning robot, wherein the cleaning robot comprises an active obstacle crossing mechanism and an obstacle crossing driving

device for driving a motion of the active obstacle crossing mechanism, wherein the control system comprises:

an identification module, wherein the identification module is configured to identify a height of an obstacle and a material type of a contact surface before the cleaning robot crosses the obstacle in case where the obstacle is on a cleaning path of the cleaning robot;

a control module, wherein the control module is configured to activate an active obstacle crossing function of the cleaning robot in case where the height of the obstacle matches a predefined obstacle crossing height range corresponding to the material type.

11. A control method for a cleaning robot, wherein the cleaning robot comprises an active obstacle crossing mechanism and an obstacle crossing driving device for driving a motion of the active obstacle crossing mechanism, the cleaning robot is provided with a binocular camera, and the control method comprises:

in case where an obstacle is on a cleaning path of the cleaning robot, adjusting a relative position of the binocular camera and the obstacle to identify an obstacle information and a material type of a contact surface before the cleaning robot crosses the obstacle, wherein the obstacle information at least comprises a height information of the obstacle;

in case where the obstacle information matches a predefined obstacle crossing height range corresponding to the material type, activating an active obstacle crossing function of the cleaning robot.

12. The method according to claim 11, wherein adjusting the relative position of the binocular camera and the obstacle comprises driving the cleaning robot so that the binocular camera faces the obstacle and a minimum distance between the binocular camera and the obstacle is greater than a predefined identification distance.

13. The method according to claim 11, wherein the obstacle information further comprises one or more of a width of the obstacle, an obstacle crossing slope, or a type of the obstacle.

14. A control system for a cleaning robot, wherein the cleaning robot comprises an active obstacle crossing mechanism and an obstacle crossing driving device that drives a motion of the active obstacle crossing mechanism, the cleaning robot is equipped with a binocular camera, and the control system comprises:

an adjustment module, wherein the adjustment module is configured to adjust a relative position of the binocular camera and an obstacle to identify an obstacle information and a material type of a contact surface before the cleaning robot crosses the obstacle in case where the obstacle is on a cleaning path of the cleaning robot;

a control module, wherein the control module is configured to activate an active obstacle crossing function of the cleaning robot in case where a height

of the obstacle matches a predefined obstacle crossing height range corresponding to the material type.

15. A computer-readable storage medium, wherein

a program is stored in the computer-readable storage medium, when the program is executed by a processor, the processor is configured to implement the control method according to any one of claim 1 to claim 9 or the control method according to any one of claim 11 to claim 13.

16. A cleaning robot, comprising an active obstacle crossing mechanism, an obstacle crossing driving device that drives a motion of the active obstacle crossing mechanism, a memory, and a processor, wherein a program is stored in the memory, the processor is configured to execute the control method according to any one of claim 1 to claim 9 or the control method according to any one of claim 11 to claim 13 through the program.

17. The cleaning robot according to claim 16, wherein the active obstacle crossing mechanism is a connecting rod mechanism, a cam mechanism, or a piston lifting mechanism.

18. The cleaning robot according to claim 17, wherein the obstacle crossing driving device is a motor system used for the motion of the active obstacle crossing mechanism.

19. The cleaning robot according to claim 16, wherein the active obstacle crossing mechanism and driving wheels are sequentially set before and after in a movement direction of the cleaning robot, a minimum distance between a contact point of the active obstacle crossing mechanism to a ground during an active obstacle crossing and a contact point of the driving wheels to the ground ranges from 3 cm to 5 cm.