

A HIGH-RISE WALL CLEANING ROBOT

FIELD OF THE INVENTION

The invention relates to the technical field of cleaning devices, in particular to a high-rise wall cleaning robot.

BACKGROUND OF THE INVENTION

When some high-rise walls need to be cleaned, the cleaning staff is generally suspended on the high-rise walls by crane equipment, and cleans them. Using such a method, there is a safety hazard that the cleaning staff will fall.

Therefore, there are deficiencies in the prior art that need improvement.

SUMMARY OF THE INVENTION

In view of the aforesaid drawbacks of the prior art, the present invention provides a high-rise wall cleaning robot.

So, the invention provides a high-rise wall cleaning robot, comprising a main control box, a left propeller, a right propeller, a cleaning device and a traction winch assembly; the bottom end of the traction winch assembly is connected with the main control box; the left propeller and the right propeller are respectively connected to the two sides of the main control box in the horizontal direction; the cleaning device is arranged on the side of the main control box which is close to the wall, and the cleaning device is electrically connected to the main control box; the traction winch assembly, the left propeller and the right propeller are respectively electrically connected to the main control box

Furthermore, the cleaning device includes a cleaning drum, a detergent water spray system and a telescopic device, the detergent water spray system is partially arranged above the cleaning drum and fixedly connected to the cleaning drum, and the detergent water spray system is partly fixed on the main control box, one end of the telescopic device is fixedly connected with the main control box, and the other end is fixedly connected with the cleaning drum.

Furthermore, the high-rise wall cleaning robot also comprises a landing rack, and the landing rack is fixed at one end of the main control box away from the traction winch assembly.

Furthermore, the traction winch assembly comprises a main winch wheelset and a support plate, the main winch wheelset is fixedly arranged on one side of the support plate, and a sling wheelset is arranged on the outer side of the main winch wheelset, and the sling wheelset consists of several small suspension wheels.

Furthermore, the number of small suspension wheels is 8.

Furthermore, a V-shaped groove is arranged on the main winch wheelset between the sling wheelset and the main winch wheelset, an elastic spring is arranged outside the sling wheelset, and one end of the elastic spring is connected to the support plate, the other end the elastic spring is connected with the sling wheelset.

Furthermore, there are two main winch wheelsets, and the diameter of each main winch wheelset is 110mm.

Furthermore, a top guide pulley is arranged on the top of the support plate, and the top guide pulley is composed of several small pulleys.

Furthermore, an adjustable nut is arranged at one end of the elastic spring, and the adjustable nut is arranged between the elastic spring and the sling wheelset.

Furthermore, outlet groove tracks are arranged on both sides of the main winch wheelset.

Furthermore, the sling wheelset is arranged around the outside of the main winch wheelset.

Compared with the prior art, the invention, the high-rise wall cleaning robot has the following advantages:

The product is hoisted on the outer of the high-rise wall, and the staff locates far away from the building and can clean the wall by remoter with automation. At the same time, the staff do not have to hang outside of the high-rise wall, and there is no cleaning staff. It is not possible falling while the staff do the cleaning work and is safer to reduce the loss of the enterprise and also convenient, and safe for cleaning operations.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a three-dimensional structural schematic diagram of a high-rise wall cleaning robot of the present invention.

Fig. 2 is a schematic diagram of the three-dimensional structure of the high-rise wall cleaning robot of the present invention.

Fig. 3 is a schematic perspective view of the three-dimensional structure of the main winch

wheelset of the present invention.

Fig. 4 is an enlarged view at A in Fig. 2.

Explanation of reference labels:

1. the high-rise wall cleaning robot; 2. the traction winch assembly; 3. the main winch wheelset; 4. the support plate; 5. the sling wheelset; 6. the V-shaped groove; 7. the elastic spring; 8. splitter; 9. the top guide pulley; 10. the adjustable nut; 11. the main control box; 13. outlet groove tracks; 14. the landing rack; 15. the left propeller; 16. the right propeller; 17. the cleaning device; 18. the cleaning drum; 19. the detergent water spray system; 20. the telescopic device.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to clarify the object, technical solution and advantages of the present invention, the present invention will be further described in detail below in the accompanying drawings and implementation examples. It should be used to describe the specific embodiments and explain the present invention, but not to limit the present invention.

Please refer to Fig. 1-4, the present invention provides a high-rise wall cleaning machine, which has the function of automatic detection and avoiding wall obstacles, comprising the traction winch assembly 2. The traction winch assembly 2 comprises the main winch wheelset 3 and the support plate 4, the main winch wheelset 3 is fixedly arranged on one side of the support plate, 4 and the sling wheelset 5 is arranged on the outer side of the main winch wheelset 3, and the sling wheelset 5 consists of several small suspension wheels. Especially, the number of small suspension wheels is eight in the present invention and it can be nine to twelve according to the actual situation. The V-shaped groove 6 is arranged on the main winch wheelset 3 between the sling wheelset 5 and the main winch wheelset 3, the elastic spring 7 is arranged outside the sling wheelset 5, and one end of the elastic spring 7 is connected to the support plate 4, the other end of the elastic spring 7 is connected with the sling wheelset 5.

The invention, preferably, there are two main winch wheelsets, and the diameter of each main winch wheelset is 110mm. So that it can balance bending fatigue and rotation rates of slings. The sling wheelset 5 is arranged outer of the main winch wheelset 3 to adjust the tightness of the pressure; the main winch wheelset 3 is provided with a splitter 8, which can balance the bending fatigue and rotation rate of the sling.

The invention, preferably, the top guide pulley 9 is arranged on the top of the support plate 4, and the top guide pulley 9 is composed of several small pulleys, which are used to increase the convenience of rotation of the sling and reduce the probability of the lead wire being cut.

In the invention, the adjustable nut 10 is arranged at one end of the elastic spring 7, and the adjustable nut 10 is arranged between the elastic spring 7 and the sling wheelset 5. It is used to adjust the distance between the elastic spring 7 and the main winch wheelset 3. When the elastic spring 7 is tightened, the whole sling wheelset 5 is tightened into the V-shaped groove 6 of the main winch wheelset 3.

The invention, preferably, the bottom of the support plate 4 is connected with the main control box 11 electrically, and the main winch wheelset 3 is electrically connected with the main control box 11. The high-rise wall cleaning robot 1 also comprises the left propeller 15 and the right propeller 16, they are respectively connected to the two sides of the main control box in the horizontal direction and electrically connect to the main control box 11. The left propeller 15 and the right propeller 16 are used to provide a certain pressure by generating wind to blow against the wall to maintain the relative stability of the high-rise wall cleaning robot 1 and to improve the cleaning ability, which is beneficial to the smooth progress of the cleaning work, and is also used when the product encounters obstacles by blowing a stronger wind to increase the distance from the wall to facilitate smooth passage.

The outlet groove tracks 13 is provided on one side of the main winch wheelset 3, which is convenient for constraining the movement path of the sling and avoiding knotting caused by the random movement of the sling. The splitter 8 is welded by a metal sheet fixed on one side of the support plate 4.

Preferably, the high-rise wall cleaning robot 1 of the invention also comprises the cleaning device 17. The cleaning device 17 is used to wipe and clean the wall by sliding it on the wall. The cleaning device 17 is connected to the end of the main control box 11 close to the wall and is electrically connected to it.

Furthermore, the cleaning device 17 includes the cleaning drum 18, the detergent water spray system 19 and the telescopic device 20, the detergent water spray system 19 is partially arranged above the cleaning drum 18 and fixedly connected with the cleaning drum 18, and the detergent water spray system 19 is partly fixed on the main control box 11, one end of the

telescopic device 20 is fixedly connected with the main control box 11, and the other end is fixedly connected with the cleaning drum 18. The cleaning drum 18 is used to wipe the wall, and can increase or decrease the wiping strength and adjust the wiping distance under the drive of the telescopic device 20; the detergent water spray system 19 is used to spray the cleaner to the wall so as to facilitate the cleaning of the wiping. The telescopic device 20 is used to adjust the distance between the cleaning drum 18, the detergent water spray system 19 and the wall so as to wipe better, and also makes the cleaning drum 18 adaptable to the uneven wall surface and sticks to the wall surface all the time.

Specifically, the main control box 11 can adjust the horizontal posture of the high-rise wall cleaning robot 1 by changing the speed difference of the right propeller 16 and the left propeller 15 to let the cleaning roller 18 always parallel to the wall to improve the cleaning effect.

Furthermore, the landing rack 14 is arranged on the end of the main control box 11 away from the traction winch assembly 2, which can land on the ground beside the main control box 11 for convenient landing, and reduces the risk of scratching and crashing the main control box 11 due to direct hit the ground.

When in use, the main winch wheelset 3 combines the advantages of the two existing large-scale crane traction winches, and then the overall design is minimized to reduce the weight. The multiple sling wheelsets 5 and the V-shaped groove 6 ensure that the main winch wheelset 3 and the sling have sufficient friction, so that the main winch wheelset 3 rotates accurately by the program control and these will not cause slippage errors. At the same time, the elastic spring 7 can adjust the tightness of multiple sling wheelsets 5, thereby adjusting the smoothness of the sling, specifically when the elastic spring 7 is tightened in a direction away from the sling wheelset 5, the whole sling is tightened in the arc direction. By setting the splitter 8, using the characteristics of the splitter 8 during production, since the production method of the splitter 8 is made of stainless steel, the stainless steel round tube is produced by a sheet metal sheet using the welding method, so that the original seven parts are combined into one. Using one multi-functional piece can achieve the three functions of splitting, guiding, and outputting the line. The price is cheaper than the original split device, and at the same time, it can ensure short production time, so as to ensure that it can be carried out on-site for fast installation.

Specifically, the high-rise wall cleaning robot 1 realizes the control of the right propeller 16,

the left propeller 15, the cleaning device 17 and the traction winch assembly 2 by using the control of the main control box 11 by the staff manipulating the remote control device.

Compared with the prior art, the invention, the high-rise wall cleaning robot has the following advantages:

The product is hoisted on the outer of the high-rise wall, and the staff locates far away from the building and can clean the wall by remoter with automation. At the same time, the staff do not have to hang outside of the high-rise wall, and there is no cleaning staff. It is not possible falling while the staff do the cleaning work and is safer to reduce the loss of the enterprise and also convenient, and safe for cleaning operations.

The above descriptions are only preferred embodiments of the present invention, and are not intended to limit the patent scope of the present invention. Any modifications made within the concept of the present invention, equivalent replacements and improvements, etc. should be included in the scope of patent protection of the present invention. Inside.

CLAIM

1. A high-rise wall cleaning robot, comprising a main control box, a left propeller, a right propeller, a cleaning device and a traction winch assembly; the bottom end of the traction winch assembly is connected with the main control box; the left propeller and the right propeller are respectively connected to the two sides of the main control box in the horizontal direction; the cleaning device is arranged on the side of the main control box which is close to the wall, and the cleaning device is electrically connected to the main control box; the traction winch assembly, the left propeller and the right propeller are respectively electrically connected to the main control box.
2. The high-rise wall cleaning robot of claim 1, wherein the cleaning device includes a cleaning drum, a detergent water spray system and a telescopic device, the detergent water spray system is partially arranged above the cleaning drum and fixedly connected with the cleaning drum, and the detergent water spray system is partly fixed on the main control box, one end of the telescopic device is fixedly connected with the main control box, and the other end is fixedly connected with the cleaning drum.
3. The high-rise wall cleaning robot of claim 1, wherein the high-rise wall cleaning robot also comprises a landing rack, and the landing rack is fixed at one end of the main control box away from the traction winch assembly.
4. The high-rise wall cleaning robot of claim 1, wherein the traction winch assembly comprises a main winch wheelset and a support plate, the main winch wheelset is fixedly arranged on one side of the support plate, and a sling wheelset is arranged on the outer side of the main winch wheelset, and the sling wheelset consists of several small suspension wheels.
5. The high-rise wall cleaning robot of claim 4, wherein the number of small suspension wheels is 8.
6. The high-rise wall cleaning robot of claim 4, wherein a V-shaped groove is arranged on the main winch wheelset between the sling wheelset and the main winch wheelset, an elastic spring is arranged outside the sling wheelset, and one end of the elastic spring is connected to the support plate, the other end the elastic spring is connected with the sling wheelset.
7. The high-rise wall cleaning robot of claim 4, wherein there are two main winch wheelsets, and the diameter of each main winch wheelset is 110mm.

8. The high-rise wall cleaning robot of claim 4, wherein a top guide pulley is arranged on the top of the support plate, and the top guide pulley is composed of several small pulleys.
9. The high-rise wall cleaning robot of claim 6, wherein an adjustable nut is arranged at one end of the elastic spring, and the adjustable nut is arranged between the elastic spring and the sling wheelset.
10. The high-rise wall cleaning robot of claim 6, wherein outlet groove tracks are arranged on both sides of the main winch wheelset.