

(12) INNOVATION PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 2020102475 A4**

(54) Title
INTELLIGENT INSPECTION ROBOT

(51) International Patent Classification(s)
B25J 15/12 (2006.01) **B25J 11/00** (2006.01)

(21) Application No: **2020102475** (22) Date of Filing: **2020.09.29**

(45) Publication Date: **2020.11.12**

(45) Publication Journal Date: **2020.11.12**

(45) Granted Journal Date: **2020.11.12**

(71) Applicant(s)
Sunny Technology Enterprise Limited

(72) Inventor(s)
PENG, Jian Sheng

(74) Agent / Attorney
Remarkable IP, PO Box 207, Queenstown, Otago, 9348, NZ

ABSTRACT

An intelligent inspection robot is provided. The inspection robot comprises a body. A support leg is mounted under the body. A support foot is mounted at the bottom of the support leg. One end of the support foot is provided with a connecting frame. One end of the connecting frame is provided with an electric wheel. One end of the supporting leg is equipped with a wireless signal receiver. A hydraulic rod is mounted on an inner side of the wireless signal receiver. Power supplies are separately mounted on both sides of the other end of the body. A support tube is mounted at the top of the power supply. An electromagnetic head is mounted at the top of the support tube. A magnetic levitation base plate is mounted above the electromagnetic head. A fixing seat is mounted at the top of the magnetic levitation base plate.

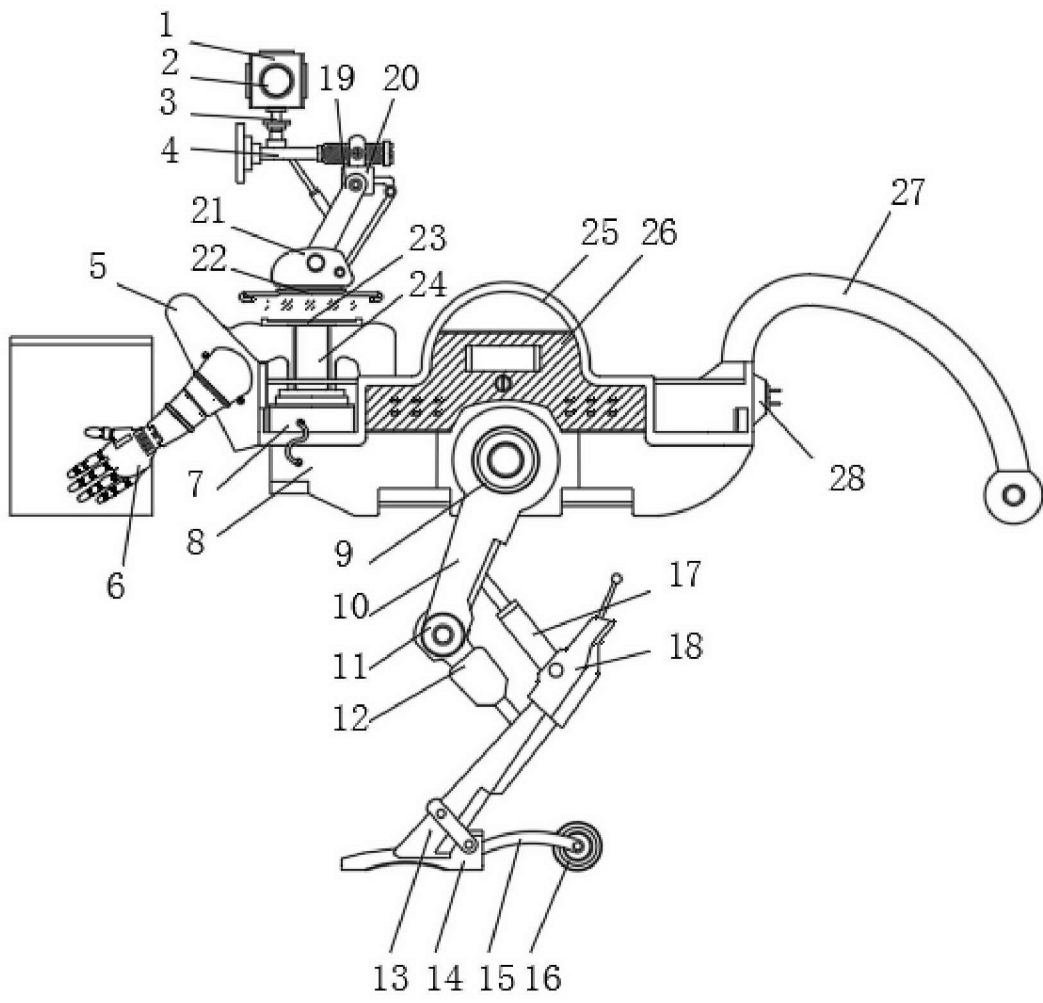


Fig. 1

INTELLIGENT INSPECTION ROBOT

TECHICAL FIELD

[0001] The present disclosure relates to the technical field of inspection robot, in particularly to a intelligent inspection robot.

BACKGROUND

[0002] The inspection robot is used to inspect the operation of the machine in the factory and the working conditions of the staff. The intelligent robot is called an intelligent robot because it has a fairly developed "brain", and a processor of the intelligent robot is the "brain". This robot has a direct connection with the person who operates it. The most important thing is that this robot can perform preset actions. Because of this, we say that such robot is a real robot, even though they may be different in appearance. A robot is a machine device that automatically conducts work. It can accept human commands, run pre-arranged programs, or act according to principles and programs formulated with artificial intelligence technology. Its task is to assist or replace human works, especially manufacturing, construction, or dangerous works.

[0003] The current inspection robot has many shortcomings, for example, weak sense of technology, lack of image, insufficient detection, poor general performance, and poor protection performance.

SUMMARY OF THIS INVENTION

[0004] One of the objects of the present disclosure is to provide an intelligent inspection robot to address the shortcomings as described in the background.

[0005] For this end, an intelligent inspection robot is provided. The inspection robot comprises a body. A support leg is mounted under the body. A support foot is mounted at the bottom of the support leg. One end of the support foot is provided with a connecting frame. One end of the connecting frame is provided with an electric wheel. One end of the supporting leg is equipped

with a wireless signal receiver. A hydraulic rod is mounted on an inner side of the wireless signal receiver. Power supplies are separately mounted on both sides of the other end of the body. A support tube is mounted at the top of the power supply. An electromagnetic head is mounted at the top of the support tube. A magnetic levitation base plate is mounted above the electromagnetic head. A fixing seat is mounted at the top of the magnetic levitation base plate. A connecting frame is mounted on the inner side of the fixing seat. A hinge block is mounted on one end of the connecting frame. A fixing rod is mounted above the fixing seat. A rotating shaft is mounted on the top of the fixing rod. A monitor is mounted at the top of the rotating shaft. A picture capturing port is provided on the monitor. Baffles are provided on both sides of one end of the body. Bionic hands are provided on sides of the baffles.

[0006] In some embodiments, the monitor is arranged in an octahedral structure, and eight faces of the monitor are provided with the picture capturing ports.

[0007] In some embodiments, the electromagnetic head and the magnetic levitation base plate are mounted directly opposite to each other, and the magnetic levitation base plate and the electromagnetic head are mutually repelled by magnetic fields.

[0008] In some embodiments, there are two electromagnetic heads, and the two electromagnetic heads are respectively located on both sides of one end of the body.

[0009] In some embodiments, two bionic hands are provided, and the two bionic hands are respectively mounted on sides of the baffle.

[0010] In some embodiments, there are two connection frames. The hinge block is located between the two connection frames. A clamp is mounted at one end of the hinge block, and the hinge block is fixedly connected to the fixing rod through the clamp.

[0011] In some embodiments, the hinge block is rotatably connected with the connecting frame.

[0012] In some embodiments, a protective cover is mounted on the top of the body, and a charging plug is mounted on one end of the body.

[0013] In some embodiments, a control panel is mounted on the front of the body, and a wireless signal transceiver rod is mounted at the top of the body.

[0014] In some embodiments, a mechanical leg is mounted at the middle of both sides of the body through a fixing ear. One end of the mechanical leg is provided with a connecting frame

through an hinge joint. The mechanical leg and the fixing ear are arranged in an integral structure, and the connection port of the mechanical leg is shaped to be U-shaped structure.

[0015] Compared with the prior art, the present disclosure has the following advantages.

[0016] 1. The body of the present disclosure is a mechanical dragon-like structure, which presents more sense of technology. The fixing seat and the electromagnetic head are arranged oppositely and connected through magnetic suspension. This brings stronger technology sense.

[0017] 2. The sides of the baffle of the present invention are equipped with bionic hands, through which the inspection obstacles can be manually removed. This increases the versatility of the robot. The monitor is mounted above the body and has eight capturing ports for full direction inspection. The wireless signal transceiver rod is mounted at the tail of the body, which is convenient for remote control through the wireless signal transceiver rod.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Fig. 1 is a schematic diagram of the intelligent inspection robot according to one embodiment of the present disclosure.

[0019] Fig. 2 is a side elevational view of the body of the inspection robot according to one embodiment of the present disclosure.

[0020] Fig. 3 is a side elevational view of the fixing seat of the inspection robot according to one embodiment of the present disclosure.

[0021] Fig. 4 is a schematic diagram of the monitor of the inspection robot according to one embodiment of the present disclosure.

[0022] In the drawings: 1. Monitor; 2. Picture capturing port; 3. Rotating shaft; 4. Fixing rod; 5. Baffle; 6. Bionic hand; 7. Power supply; 8. Body; 9. Fixing ear; 10. Mechanical leg; 11. Hinge joint; 12. Connecting frame; 13. Support leg; 14. Support foot; 15. Connecting frame; 16. Electric wheel; 17. Hydraulic rod; 18. Wireless signal receiver; 19. Connecting frame; 20. Hinge block; 21. Fixing seat; 22. Magnetic levitation base plate; 23. Electromagnetic head; 24. Support tube; 25. Protective cover; 26. Control panel; 27. Wireless signal transceiver rod; 28. Charging plug; 29. Clamp.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0023] The technical solutions in the embodiments of the present disclosure will be clearly and completely described below in conjunction with the accompanying drawings. Obviously, the described embodiments are only a part of the embodiments of the present disclosure, rather than all the embodiments.

[0024] Please referred to Figs. 1-4, the present disclosure provides one embodiment as follows. An inspection robot comprises a body 8. A support leg 13 is mounted under the body 8. The support leg 13 is used to support the mechanical leg 10. A support foot 14 is mounted at the bottom of the support leg 13. The support foot 14 allows the movement of the support leg 13. One end of the support foot 14 is provided with a connecting frame 15. One end of the connecting frame 15 is provided with an electric wheel 16. The electric wheel 16 allows the movement of the support foot 14. One end of the supporting leg 13 is equipped with a wireless signal receiver 18. The wireless signal receiver 18 is capable of receiving control signal from the control panel 26. A hydraulic rod 17 is mounted on an inner side of the wireless signal receiver 18. The hydraulic rod 17 is used for controlling the bend amplitude of the mechanical leg 10 and the support leg 13. Power supplies 7 are separately mounted on both sides of the other end of the body 8. The power supply 7 is used for supplying power to the electromagnetic head 23. A support tube 24 is mounted at the top of the power supply 7. The electromagnetic head 23 is mounted at the top of the support tube 24. The electromagnetic head 23 is used to act with the magnetic levitation base plate 22 for magnetic levitation. The magnetic levitation base plate 22 is mounted above the electromagnetic head 23. A fixing seat 21 is mounted at the top of the magnetic levitation base plate 22. A connecting frame 19 is mounted on the inner side of the fixing seat 21. A hinge block 20 is mounted on one end of the connecting frame 19. A fixing rod 4 is mounted above the fixing seat 21. A rotating shaft 3 is mounted on the top of the fixing rod 4. A monitor 1 is mounted at the top of the rotating shaft 3. The monitor 3 is use for inspecting the picture along the path. A picture capturing port 2 is provided on the monitor 1. Baffles 5 are

provided on both sides of one end of the body 8. Bionic hands 6 are provided on sides of the baffles 5. The bionic hands are capable of carrying goods.

[0025] In some embodiments, the monitor 1 is arranged in an octahedral structure, and each of the eight faces of the monitor 1 is provided with a picture capturing port 2.

[0026] In some embodiments, the electromagnetic head 23 and the magnetic levitation base plate 22 are mounted oppositely to each other, and the magnetic levitation base plate 22 and the electromagnetic head 23 are mutually repelled by magnetic fields.

[0027] In some embodiments, there are two electromagnetic heads 23, and the two electromagnetic heads 23 are respectively located on both sides of one end of the body 8. The electronic head 23 are capable of generating magnetic field.

[0028] In some embodiments, two bionic hands 6 are provided, and the two bionic hands 6 are respectively mounted on sides of the baffle 4. The bionic hands 6 are capable of carrying goods.

[0029] In some embodiments, there are two connection frames 19. The hinge block 20 is located between the two connection frames 19. A clamp 29 is mounted at one end of the hinge block 29, and the hinge block 20 is fixedly connected to the fixing rod 4 through the clamp 29.

[0030] In some embodiments, the hinge block 20 is rotatably connected with the connecting frame 19. The use of the clamp 29 facilitates the installation of the fixing rod 4.

[0031] In some embodiments, a protective cover 25 is mounted on the top of the body 8. The protective cover 25 may provide protection for the body 8. A charging plug 28 is mounted on one end of the body 8. The charging plug 28 facilitates charging for the body 8.

[0032] In some embodiments, a control panel 26 is mounted on the front of the body 8, and a wireless signal transceiver rod 27 is mounted at the top of the body 8. The wireless signal transceiver rod 27 is capable of communicating with the remote control central.

[0033] In some embodiments, a mechanical leg 10 is mounted at the middle of both sides of the body 8 through a fixing ear 9. The mechanical leg 10 facilitates the support for the body 8, and control the movement of the body 8. One end of the mechanical leg 10 is provided with a connecting frame 12 through a hinge joint 11. The mechanical leg 10 and the fixing ear 9 are arranged in an integral structure, and the connection port of the mechanical leg 10 is shaped to be U-shaped structure. The U-shaped connection port of the mechanical leg 10 facilitates the joint connection with the support leg 13.

[0034] The intelligent inspection robot works as follows. When the device is in use, the remote control signal can be received through the wireless signal transceiver rod 27, and the detected information can be transmitted to the main monitoring room. The control signal of the control panel 26 can be received through the wireless signal receiver 18. The signal receiver 18 receives the control command to control the operation of the hydraulic rod 17. The extension of the hydraulic rod 17 controls the bending and straightening of the mechanical leg 10 to make it walk automatically. The electric wheel 16 facilitates the sliding movement of the support foot 14.

Working principle: When the device is in use, the remote control signal can be received through the wireless signal transceiver rod 27, and the detection screen information can be transmitted to the main monitoring room, and the control signal of the control panel 26 can be received through the wireless signal receiver 18. The signal receiver 18 receives the control command to control the operation of the hydraulic rod 17, and the extension of the hydraulic rod 17 controls the bending and straightening of the mechanical leg 10 to make it walk automatically. The electric wheel 16 facilitates the sliding movement of the supporting foot 14. Through the interaction between the electromagnetic head 23 and the magnetic levitation base plate 22, it is convenient to control the fixing seat 21 to levitation and improve the technology sense. Through the monitor 1 and the picture capturing port 2, environment images surround the robot can be captured in real time. The robot can monitor the status of the factory and inspect the working status of the staff. Furthermore, the bionic hand 6 can be used to carry goods and improve the functionality of the present intelligent inspection robot.

[0035] For those skilled in the art, it is obvious that the present disclosure is not limited to the details of the foregoing exemplary embodiments. Obviously, those skilled in the art can implement the present disclosure in other specific forms without departing from the spirit or basic characteristics of the present disclosure. Therefore, the embodiments should be regarded as exemplary and non-limiting. The scope of the present disclosure is defined by the appended claims rather than the above description, and therefore it is intended that all changes falling within the meaning and scope of equivalent elements of the claims are included in the present disclosure. Any reference signs in the claims should not be regarded as limiting the claims involved.

WHAT IS CLAIMED IS:

1. An intelligent inspection robot, comprising a body (8), characterized in that a support leg (13) is mounted under the body (8); a support foot (14) is mounted at the bottom of the support leg (13); one end of the support foot (14) is provided with a connecting frame (15); one end of the connecting frame (15) is provided with an electric wheel (16); one end of the supporting leg (13) is equipped with a wireless signal receiver (18); a hydraulic rod (17) is mounted on an inner side of the wireless signal receiver (18); power supplies (7) are separately mounted on both sides of the other end of the body (8); a support tube (24) is mounted at the top of the power supply (7); an electromagnetic head (23) is mounted at the top of the support tube (24); a magnetic levitation base plate (22) is mounted above the electromagnetic head (23); a fixing seat (21) is mounted at the top of the magnetic levitation base plate (22); a connecting frame (15) is mounted on the inner side of the fixing seat (21); a hinge block (20) is mounted on one end of the connecting frame (19); a fixing rod (4) is mounted above the fixing seat (21); a rotating shaft (3) is mounted on the top of the fixing rod (4); a monitor (1) is mounted at the top of the rotating shaft (3); a picture capturing port (2) is provided on the monitor (1); baffles (5) are provided on both sides of one end of the body (8); bionic hands (6) are provided on sides of the baffles (5).

2. The intelligent inspection robot according to claim 1, characterized in that the monitor (1) is arranged in an octahedral structure, and each of eight faces of the monitor (1) are provided with the picture capturing port (2).

3. The intelligent inspection robot according to claim 1 or 2, characterized in that the electromagnetic head (23) and the magnetic levitation base plate (22) are mounted oppositely to each other, and the magnetic levitation base plate (22) and the electromagnetic head (23) are mutually repelled by magnetic fields.

4. The intelligent inspection robot according to claim 1 or 3, characterized in that there are two electromagnetic heads (23), and the two electromagnetic heads (23) are respectively located on both sides of one end of the body (8).

5. The intelligent inspection robot according to claim 1 or 2, characterized in that two bionic hands (6) are provided, and the two bionic hands (6) are respectively mounted on sides of the baffle (5).

6. The intelligent inspection robot according to claim 1 or 4, characterized in that the hinge block (20) is located between the two connection frames (19); a clamp (29) is mounted at one end of the hinge block (20), and the hinge block (20) is fixedly connected to the fixing rod (4) through the clamp (29).

7. The intelligent inspection robot according to claim 1 or 6, characterized in that the hinge block (20) is rotatably connected with the connecting frame (29).

8. The intelligent inspection robot according to claim 1 or 2, characterized in that a protective cover (25) is mounted on the top of the body (8), and a charging plug (28) is mounted on one end of the body (8).

9. The intelligent inspection robot according to claim 1 or 7, characterized in that a control panel (26) is mounted on the front of the body (8), and a wireless signal transceiver rod (27) is mounted at the top of the body (8).

10. The intelligent inspection robot according to claim 1 or 9, characterized in that a mechanical leg (10) is mounted at the middle of both sides of the body (8) through a fixing ear (9); one end of the mechanical leg (10) is provided with a connecting frame (12) through an hinge joint (11); the mechanical leg (10) and the fixing ear (9) are arranged in an integral structure, and a connection port of the mechanical leg (10) is shaped to be U-shaped structure.

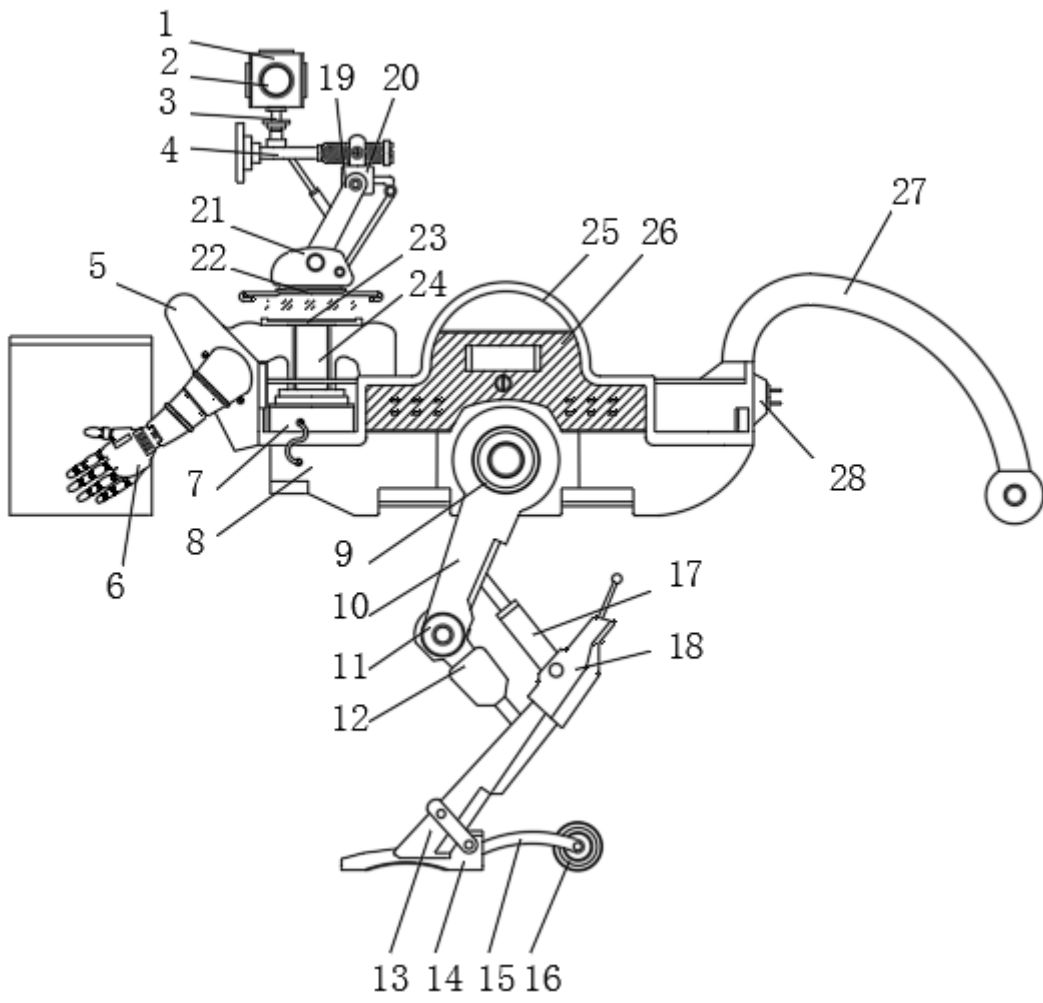


Fig. 1

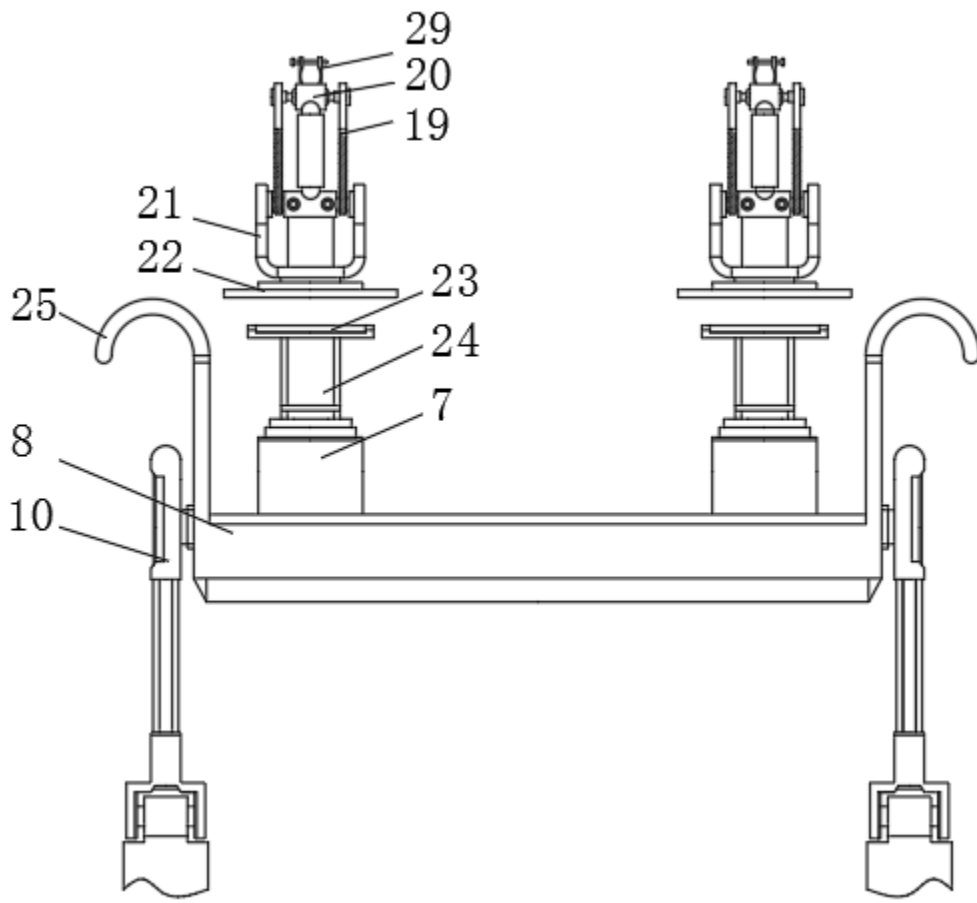


Fig. 2

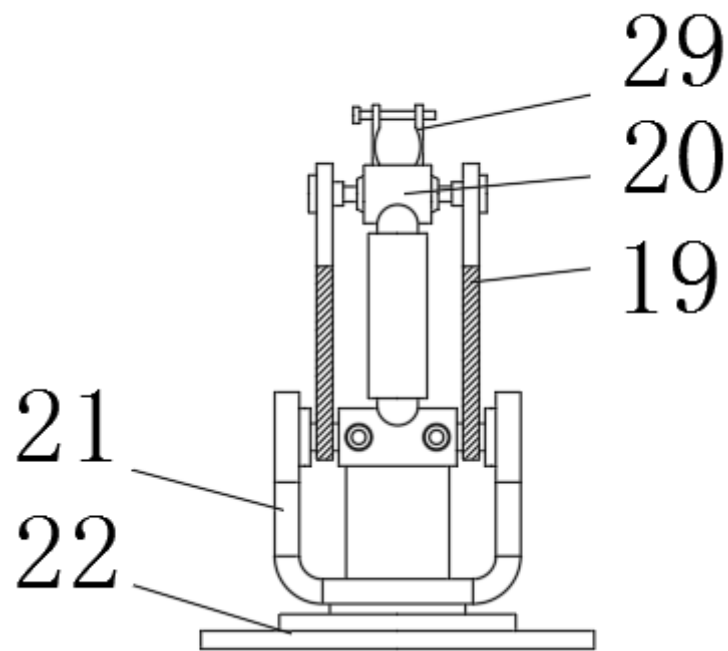


Fig. 3

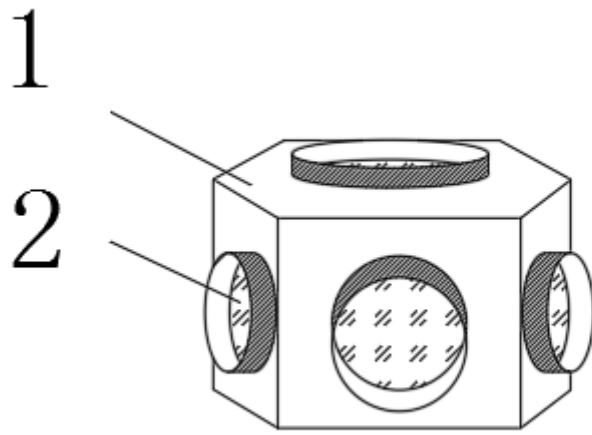


Fig. 4