

TITLE OF INVENTION: MECHANICAL GRIPPER FOR COFFEE POWDER SPOON WITH A CUP FORK

Technical Field

The present invention relates to the technical field of automatic coffee making devices, and in particular, to a mechanical gripper for coffee powder spoon with a cup fork.

Background

With the further development of the fourth industrial revolution, the trend of automation replacing labor force is increasingly enhancing, and there are more and more developments and applications of mechanical arms. In the process of using a mechanical arm to replace manual work to make handmade coffee, in order to complete the extraction process to obtain coffee concentrate, the mechanical arm needs to first moves to a bean grinder to receive coffee powder, then moves to a powder distributor to uniformly distribute the coffee powder, then moves to a powder pressing machine to press the coffee powder, and finally moves to a coffee machine to perform coffee extraction; all these making processes need to use a coffee powder spoon. The coffee powder spoon is a key device for making coffee, and how the mechanical arm accurately grips the coffee powder spoon and uses same to operate in various production processes will affect the quality of a finished coffee product. Furthermore, the existing mechanical arm and coffee spoon are not easily separated, and it is not convenient to replace the coffee spoon.

Summary

An object of the present invention is to provide a mechanical gripper for coffee powder spoon with a cup fork, so as to solve the problems mentioned in the Background. In order to achieve the described object, the present invention provides the following technical solution: a mechanical gripper for coffee powder spoon with a cup fork, comprising: a mechanical arm powder spoon gripper base and a coffee powder spoon gripper; wherein the coffee powder spoon gripper is detachably connected to the mechanical arm powder spoon gripper base, the mechanical arm powder spoon gripper base comprises a gripper connecting base, the gripper connecting base is connected to the front end of a mechanical arm by a connecting flange, a mounting cavity is provided inside the gripper connecting base, an electromagnet is mounted inside the mounting cavity, and a cup fork is connected to a lower part of the gripper connecting base; and

the coffee powder spoon gripper comprises a powder spoon connecting flange, a magnetic

attachment block is fixed inside the powder spoon connecting flange, the powder spoon connecting flange is connected to one end of a connecting tube, and the other end of the connecting tube is connected to a coffee powder spoon.

Preferably, the gripper connecting base is provided with positioning holes, two positioning holes are provided and are located at two sides of the electromagnet, guide sleeves are mounted inside the positioning holes, guide pins are mounted on the magnetic attachment block, and the positions and structures of the guide pins correspond to those of the guide sleeves.

Preferably, a mounting groove is provided on an upper part of the gripper connecting base, and a proximity switch is mounted inside the mounting groove.

Preferably, the cup fork comprises a fork body and a connecting rod, one end of the connecting rod is connected to the gripper connecting base, and the other end of the connecting rod is connected to the fork body, the fork body is of an arc-shaped structure, and the fork body and the connecting rod are of an integrated structure.

Technical effects and advantages of the present invention are as follows: different from an electric, pneumatic and hydraulic grippers used by a general mechanical arm, the present apparatus uses an electromagnet attachment principle; the gripper in such a connection manner has a simple structure and reliable function, facilitates gripper switching, has a low cost and has fewer matching facilities.

Brief Description of the Drawings

Fig. 1 is a schematic structural diagram of a mechanical arm powder spoon gripper base of the present invention;

Fig. 2 is a schematic structural diagram of a coffee powder spoon gripper of the present invention; and

Fig. 3 is a schematic diagram of working of the present invention.

In the accompanying drawings: 1 - mechanical arm powder spoon gripper base, 2 - coffee powder spoon gripper, 3 - gripper connecting base, 4 - connecting flange, 5 - mechanical arm, 6 - mounting cavity, 7 - electromagnet, 8 - cup fork, 9 - powder spoon connecting flange, 10 - magnetic attachment block, 11 - connecting tube, 12 - coffee powder spoon, 13 - positioning hole, 14 - guide sleeve, 15 - guide pin, 16 - mounting groove, 17 - proximity switch, 18 - fork body, 19 - connecting rod.

Detailed Description of the Embodiments

In order to make the implementation technical means, creative features, achievement goals and effects of the present invention readily understand, the present invention will be further described below with reference to specific drawings. In the illustration of the present invention, it should be noted that unless otherwise explicitly specified and limited, terms "mount", "connect to", and "connecting" should be understood broadly, and for example, may be fixed connection, and may also be detachable connection, or integral connection or mechanical connection, and may also be electrical connection; may be direct connection, and may also be indirect connection by means of an intermediate medium, and may also be interior communication between two elements.

Embodiment 1

A mechanical gripper for coffee powder spoon with a cup fork as shown in Figs. 1 and 2, comprising: a mechanical arm powder spoon gripper base 1 and a coffee powder spoon gripper 2; wherein the coffee powder spoon gripper 2 is detachably connected to the mechanical arm powder spoon gripper base 1, the mechanical arm powder spoon gripper base 1 comprises a gripper connecting base 3, the gripper connecting base 3 is connected to the front end of a mechanical arm 5 by a connecting flange 4, a mounting cavity 6 is provided inside the gripper connecting base 3, an electromagnet 7 is mounted inside the mounting cavity 6, and a cup fork 8 is connected to a lower part of the gripper connecting base 3; and

the coffee powder spoon gripper 2 comprises a powder spoon connecting flange 9, a magnetic attachment block 10 is fixed inside the powder spoon connecting flange 9, the powder spoon connecting flange 9 is connected to one end of a connecting tube 11, and the other end of the connecting tube 11 is connected to a coffee powder spoon 12.

Embodiment 2

A mechanical gripper for coffee powder spoon with a cup fork as shown in Figs. 1 and 2, comprising: a mechanical arm powder spoon gripper base 1 and a coffee powder spoon gripper 2; wherein the coffee powder spoon gripper 2 is detachably connected to the mechanical arm powder spoon gripper base 1, the mechanical arm powder spoon gripper base 1 comprises a gripper connecting base 3, the gripper connecting base 3 is connected to the front end of a mechanical arm 5 by a connecting flange 4, a mounting cavity 6 is provided inside the gripper connecting base 3, an electromagnet 7 is mounted inside the mounting cavity 6, and a cup fork 8 is connected to a lower part of the gripper connecting base 3;

the coffee powder spoon gripper 2 comprises a powder spoon connecting flange 9, a magnetic

attachment block 10 is fixed inside the powder spoon connecting flange 9, the powder spoon connecting flange 9 is connected to one end of a connecting tube 11, and the other end of the connecting tube 11 is connected to a coffee powder spoon 12;

the gripper connecting base 3 is provided with positioning holes 13, two positioning holes 13 are provided and are located at two sides of the electromagnet 7, guide sleeves 14 are mounted inside the positioning holes 13, guide pins 15 are mounted on the magnetic attachment block 7, and the positions and structures of the guide pins 15 correspond to those of the guide sleeves 14;

a mounting groove 16 is provided on an upper part of the gripper connecting base 3, and a proximity switch 17 is mounted inside the mounting groove 16; and

the cup fork 8 comprises a fork body 18 and a connecting rod 19, one end of the connecting rod 19 is connected to the gripper connecting base 3, and the other end of the connecting rod is connected to the fork body 18, the fork body 18 is of an arc-shaped structure, and the fork body 18 and the connecting rod 19 are of an integrated structure.

The process flow and working principle of the present invention are: as shown in Fig. 3, the mechanical arm 5 is mounted at a designated position as required; when the mechanical arm 5 needs to use the apparatus, the mechanical arm 5 drives the mechanical arm powder spoon gripper base 1 to reach the front of a gripper box where the coffee powder spoon gripper 2 is placed; when the proximity switch 17 detects that the distance between the mechanical arm powder spoon gripper base and the coffee powder spoon gripper 2 reaches a set value, a power source of the electromagnet 7 mounted on the mechanical arm powder spoon gripper base 1 is turned on, such that the electromagnet 7 has magnetic energy to firmly attract and attach the magnetic attachment block 10 on the coffee powder spoon gripper 2; meanwhile, the two guide pins 15 on the coffee powder spoon gripper 2 are inserted into the guide sleeves 14 on the mechanical arm powder spoon gripper base 1, which can ensure that the mechanical arm powder spoon gripper base 1 grips an accurate position of the coffee powder spoon gripper 2; and when the coffee powder spoon does not need to be used, the power source of the electromagnet 7 is turned off, and then the connection between the coffee powder spoon gripper 2 and the mechanical arm powder spoon gripper base 1 can be disconnected, and the mechanical arm powder spoon gripper base 1 can grip a coffee cup by the cup fork 8, for subsequent operations.

Finally, it should be noted: the described content merely relates to preferred embodiments of the present invention, and is not intended to limit the present invention. Although the present invention has been illustrated in detail with reference to the described embodiments, a person skilled in the art would still modify the technical solutions disclosed in the described embodiments or make

equivalent replacements to some technical features in the embodiments. Any modifications, equivalent replacements, improvements, etc. made within the spirit and principle of the present invention shall all fall within the scope of protection of the present invention.

Claims

1. A mechanical gripper for coffee powder spoon with a cup fork, comprising a mechanical arm powder spoon gripper base and a coffee powder spoon gripper; characterized in that the coffee powder spoon gripper is detachably connected to the mechanical arm powder spoon gripper base; the mechanical arm powder spoon gripper base comprises a gripper connecting base, the gripper connecting base is connected to the front end of a mechanical arm by a connecting flange, a mounting cavity is provided inside the gripper connecting base, an electromagnet is mounted inside the mounting cavity, and a cup fork is connected to a lower part of the gripper connecting base; and

the coffee powder spoon gripper comprises a powder spoon connecting flange, a magnetic attachment block is fixed inside the powder spoon connecting flange, the powder spoon connecting flange is connected to one end of a connecting tube, and the other end of the connecting tube is connected to a coffee powder spoon.
2. The mechanical gripper for coffee powder spoon with a cup fork according to claim 1, characterized in that the gripper connecting base is provided with positioning holes, two positioning holes are provided and are located at two sides of the electromagnet, guide sleeves are mounted inside the positioning holes, guide pins are mounted on the magnetic attachment block, and the positions and structures of the guide pins correspond to those of the guide sleeves.
3. The mechanical gripper for coffee powder spoon with a cup fork according to claim 1, characterized in that a mounting groove is provided on an upper part of the gripper connecting base, and a proximity switch is mounted inside the mounting groove.
4. The mechanical gripper for coffee powder spoon with a cup fork according to claim 1, characterized in that the cup fork comprises a fork body and a connecting rod, one end of the connecting rod is connected to the gripper connecting base, and the other end of the connecting rod is connected to the fork body, the fork body is of an arc-shaped structure, and the fork body and the connecting rod are of an integrated structure.