DEVICE FOR QUANTITATIVELY DISPENSING PASTE

Technical Field

The invention relates to a container for material storage, and in particular, to a device for quantitatively dispensing paste.

Background Art

A dispensing device for paste-like substances is an apparatus that utilizes modern industrial techniques to extrude and discharge a paste body from a container in which it is stored. The entire dispensing process is required to be fast, efficient, and hygienic.

An application bearing the number 2015104360462, entitled "A Paste Quantitative Device," is capable of dispensing a paste-like substance; however, the device has an overly complex structure, rendering it susceptible to damage and inconvenient to maintain.

Another application bearing the number 2005200950284, entitled "Paste Quantitative Extrusion Box," enables paste extrusion by manual pressing of a button. However, this device is only suitable for ordinary everyday packaging and has a limited scope of application. Furthermore, its structural design necessitates manual operation, making it laborious and time-consuming.

The present application is based on the invention disclosed in publication number CN109229827B, titled "A Device for Quantitatively Taking Out a Paste-like Substance." The device of that invention comprises: a first tubular member, a second tubular member positioned within the first tubular member, a valve core secured to an output end of the second tubular member, wherein the valve core is configured to close or open a paste-discharge passage on the first tubular member when moving relative thereto, and a reset mechanism for restoring the second tubular member to its original position. The device of the invention is remarkably simple; in the disclosed embodiments, it consists of only three components, and practical application has demonstrated that its operational reliability is excellent.

During usage, the applicant has observed certain drawbacks. The valve body and the valve core lack any protective means, which may lead to contamination of the extruded paste. Additionally, the use of a spring as the power source for extrusion proves inconvenient, and the spring is prone to failure, thereby compromising the normal operation of the entire device. Therefore, improvements are required to address the above-mentioned technical issues.

Summary of the Invention

An objective of the invention is to provide a device for quantitatively dispensing, which features a more rational structural design, an ingenious concept, convenient operation, ease of assembly and disassembly, low manufacturing cost, convenient dispensing, and the capability to protect the valve body and valve core, thereby ensuring safer usage.

A device for quantitatively dispensing paste according to the invention comprises a valve body; a valve core is installed within the valve body; a valve seat is fixedly mounted on a bottom surface of the valve body, and a fixing protrusion is fixedly connected to an inner wall surface of the valve seat; fixing stop blocks are fixedly connected to an outer wall surface of the valve body; a second outer housing is sleeved onto an exterior of the valve body; a first outer housing is connected to a surface of the second outer housing; the first outer housing comprises two half-shells; baffles are respectively fixedly mounted on inner walls of the two half-shells, and positions of the baffles correspond to positions of the fixing stop blocks.

By sleeving the second outer housing onto the exterior of the valve body and connecting the first outer housing to the surface of the second outer housing, the provided first and second outer housings can protect the valve body and the valve core, preventing external dust and other contaminants from affecting them. This is particularly beneficial after the paste is extruded, as it effectively protects the paste residue remaining at a port end of the valve core, preventing contamination and thereby achieving a clean dispensing process.

There are four of the fixing stop blocks and four of the baffles; the fixing stop blocks are located on the outer wall surface of the valve body and are symmetrically disposed along a

centerline of the valve body; the baffles are arranged in groups of two, respectively positioned on the inner walls of the two half-shells.

The fixing stop blocks fixedly connected to the outer wall surface of the valve body and the baffles respectively fixedly mounted on the inner walls of the two half-shells; when the paste is squeezed from a bottom surface of the valve core into an interior of the valve core, and subsequently enters a cavity formed between the valve core and the valve body, the paste is then further squeezed onto surface of the valve core and extruded through a port of the valve core. As the paste is squeezed, the valve body moves upward, and the fixing stop blocks on its outer wall surface move upward correspondingly. Upon contact between the fixing stop blocks and the baffles, the baffles on the inner walls of the two half-shells are pushed upward. During this upward movement, the two half-shells separate, each moving in an arc trajectory towards opposite sides along the centerline of the valve body. The contact between the baffles and the fixing stop blocks provides a stopping and limiting function, facilitating the separation of the two half-shells without hindering the dispensing operation. Concurrently, this design also enables convenient merging of the two half-shells; during merging, the half-shells move in an arc trajectory from two sides towards center along the centerline, completing the reset action. Once merged, the two half-shells can protect the port of the valve core, offering convenient operation, safety, and reliability.

Limiting housings are fixedly connected within the first outer housing; the limiting housings are respectively disposed within each of the two half-shells.

By fixedly connecting the limiting housings within the first outer housing, additional protection is provided for the port of the valve core, achieving the purpose of dual protection.

The valve body comprises a small-diameter port and a large-diameter port; an iron ring is fixedly installed inside the valve body; and a first magnetic iron ring is fixedly installed on an inner wall of the valve body.

The provision of the small-diameter port and the large-diameter port allows for the installation of the valve core, facilitating convenient assembly and disassembly.

The valve core comprises an outlet tube, columns, a first open section, a connecting section, second magnetic iron rings, a fixing tube, supporting frames, and second open sections; the second magnetic iron rings are fixedly mounted on a surface of the fixing tube; the supporting frames are fixedly connected to an inner wall of the fixing tube; there are three supporting frames, with the second open sections formed between supporting frames; the connecting section is fixedly connected to surface of the supporting frames; the columns are fixedly connected to a surface of the connecting section; there are two columns, with the first open section formed between columns; and the outlet tube is fixedly connected to surface of the columns.

The first magnetic iron ring fixedly installed on the inner wall of the valve body and the second magnetic iron rings fixedly mounted on the surface of the fixing tube generate a repulsive force when the valve body moves upward along the valve core, and this repulsive force gradually increases; after the paste is squeezed out, the valve body moves downward to reset, and the repulsive force between the first and second magnetic iron rings gradually decreases, better facilitating the resetting of the valve body. Furthermore, the second magnetic iron rings fixedly mounted on the surface of the fixing tube can attract the iron ring fixedly installed on an inner side wall of the valve body, providing an auxiliary resetting function and serving to secure the valve core and valve body. This resetting and securing mechanism is effective, durable, easy to maintain, and offers a long service life.

A housing base is fixedly mounted on a bottom surface of the second outer housing; a fixing hole is provided on the bottom surface of the second outer housing; a first fixing ring is fixedly installed through the fixing hole; and the housing base is fixedly connected to a bottom surface of the first fixing ring.

The housing base fixedly mounted on the bottom surface of the second outer housing facilitates placement of the second outer housing on any surface, providing protection and support. The first fixing ring is fixedly installed through the fixing hole, and the housing base is fixedly connected to the bottom surface of the first fixing ring, ensuring secure and reliable fixation with a compact structure.

Magnets are provided on side wall surfaces of the first outer housing and the second outer housing.

By providing magnets on side wall surfaces of the first and second outer housings, the two half-shells can be more conveniently closed together after merging, ensuring firm and reliable closure with good sealing effect.

A hole is provided on a side wall surface of the second outer housing.

In a second structural configuration of the device for quantitatively dispensing paste according to the invention, the device comprises a valve body; a valve core is installed within the valve body; a fixing base is fixedly connected to a bottom end portion of the valve core; connecting bolts are respectively fixedly mounted on side walls of the fixing base; a first diagonal pull rod and a second diagonal pull rod are hingedly connected to the connecting bolts; the connecting bolts are located at one end of each of the first diagonal pull rod and the second diagonal pull rod; an other end of the first diagonal pull rod is hingedly connected to a side wall of a first transverse connecting rod via the connecting bolts; a first supporting frame body is fixedly connected to a surface of the first transverse connecting rod; and a second fixing ring is fixedly connected to a side wall of the first transverse connecting rod; an other end of the second diagonal pull rod is hingedly connected to a side wall of a second transverse connecting rod via connecting bolts; a second supporting frame body is fixedly connected to a surface of the second transverse connecting rod; and the second fixing ring is fixedly connected to a side wall of the second transverse connecting rod; the second fixing ring is hingedly connected to both side walls of the valve body via the connecting bolts; a semicircular bracket is fixedly connected to side wall surfaces of the first supporting frame body and the second supporting frame body; and a soft protective film is wrapped over the first supporting frame body, the second supporting frame body, and the semicircular bracket, with a bottom end of the soft protective film being secured to a side wall of the fixing base.

With the first diagonal pull rod and the second diagonal pull rod respectively mounted on both sides of the side walls of the fixing base, when the paste fills the valve core, it is squeezed and extruded through the port of the valve core. At this point, the paste drives the

valve body to move upward along the valve core. During this upward movement, the first supporting frame body, the first transverse connecting rod, the second supporting frame body, and the second transverse connecting rod are driven to move upward. Through the hinged connections provided by the connecting bolts, the angle between the first diagonal pull rod and the second diagonal pull rod decreases. Because the first diagonal pull rod is hinged to the first transverse connecting rod and the second diagonal pull rod is hinged to the second transverse connecting rod, the first and second diagonal pull rods pull the first and second transverse connecting rods downward. Since the first supporting frame body and the second supporting frame body are hinged to each other, the angle between them increases, achieving an open state. After the paste is extruded from the port of the valve core, pressure is released, and the valve body moves downward along the valve core; second magnetic iron rings fixedly mounted on the surface of the fixing tube attract an iron ring fixedly installed on an inner side wall of the valve body, achieving reset. Through the first and second diagonal pull rods, the first and second transverse connecting rods are pushed upward, and the angle between the first and second diagonal pull rods decreases, causing the first and second supporting frame bodies to close. Because the soft protective film is wrapped over the first and second supporting frame bodies and the semicircular bracket, it effectively protects the dispensing port of the valve core, ensuring cleanliness and hygiene, preventing paste contamination, and offering simple and convenient operation.

The valve body comprises a small-diameter port and a large-diameter port; the iron ring is fixedly installed inside the valve body; and the first magnetic iron ring is fixedly installed on an inner wall of the valve body.

The valve core comprises an outlet tube, columns, a first open section, a connecting section, a second magnetic iron rings, a fixing tube, supporting frames, and second open sections; the second magnetic iron rings are fixedly mounted on a surface of the fixing tube; the supporting frames are fixedly connected to an inner wall of the fixing tube; there are three supporting frames, with second open sections formed between supporting frames; the connecting section is fixedly connected to surface of the supporting frames; the columns are fixedly connected to a surface of the connecting section; there are two columns, with the first

open section formed between columns; the outlet tube is fixedly connected to surface of the columns; and the fixing tube is fixedly connected within the fixing base.

In a third structural configuration of the device for quantitatively dispensing paste according to the invention, the device comprises a valve body; a valve core is installed within the valve body; a fixing base is fixedly connected to a bottom end portion of the valve core; supporting seats are respectively fixedly mounted on side walls of the fixing base; there are two supporting seats, symmetrically disposed along a centerline of the fixing base; each supporting seat is configured in a U-shape; a third supporting frame body and a first gear are hingedly connected to a side wall of each supporting seat via fixing bolts, and the third supporting frame body is fixedly connected to the first gear; a fourth supporting frame body and a second gear are hingedly connected to a side wall of the supporting seat via the fixing bolts, and the fourth supporting frame body is fixedly connected to the second gear; a rack is meshingly engaged between the first gear and the second gear; and the rack is fixedly mounted on a side wall surface of the valve body via connecting rods; a semicircular bracket is fixedly connected to side wall surface of the third supporting frame body and the fourth supporting frame body; and a soft protective film is wrapped over the third supporting frame body, the fourth supporting frame body, and the semicircular bracket, with a bottom end of the soft protective film being secured to the side wall of the fixing base.

The supporting seats are respectively mounted on both sides of side walls of the fixing base, the third supporting frame body and the first gear are hingedly connected to the side wall of each supporting seat via fixing bolts, and the third supporting frame body is fixedly connected to the first gear; the fourth supporting frame body and the second gear are hingedly connected to the side wall of the supporting seat via the fixing bolts, and the fourth supporting frame body is fixedly connected to the second gear; the rack is meshingly engaged between the first gear and the second gear; and the rack is fixedly mounted on the side wall surface of the valve body via the connecting rods; when the paste fills the valve core, it is squeezed and extruded through the port of the valve core. At this point, the paste drives the valve body to move upward along the valve core. During this upward movement, the rack rotates relative to the first gear and the second gear, thereby driving the third supporting

frame body and the fourth supporting frame body to open. After the paste is extruded through the port of the valve core, pressure is released, and the valve body moves downward along the valve core. The second magnetic iron rings fixedly mounted on a surface of the fixing tube attract an iron ring fixedly installed on an inner side wall of the valve body, achieving reset. The rotation of the rack relative to the first and second gears causes the third and fourth supporting frame bodies to close. Because the soft protective film is wrapped over the third and fourth supporting frame bodies and the semicircular bracket, it effectively protects the dispensing port of the valve core, ensuring cleanliness and hygiene, preventing paste contamination, and offering simple and convenient operation.

The valve body comprises a small-diameter port and a large-diameter port; the iron ring is fixedly installed inside the valve body; and a first magnetic iron ring is fixedly installed on an inner wall of the valve body.

The valve core comprises an outlet tube, columns, a first open section, a connecting section, second magnetic iron rings, a fixing tube, supporting frames, and second open sections; the second magnetic iron rings are fixedly mounted on the surface of the fixing tube; the supporting frames are fixedly connected to an inner wall of the fixing tube; there are three supporting frames, with second open sections formed between supporting frames; the connecting section is fixedly connected to surface of the supporting frames; the columns are fixedly connected to a surface of the connecting section; there are two columns, with the first open section formed between columns; the outlet tube is fixedly connected to surface of the columns; and the fixing tube is fixedly connected within the fixing base.

Beneficial Effects of the invention:

1) Fixing stop blocks are fixedly connected to the outer wall surface of the valve body, and baffles are respectively fixedly mounted on the inner walls of the two half-shells; when the paste is squeezed from the bottom surface of the valve core into the interior of the valve core, then enters the cavity formed by the valve core and the valve body, the paste is then squeezed further onto the surface of the valve core and extruded through the port of the valve core; as the paste is squeezed, the valve body moves upward, and the fixing stop blocks

provided on the outer wall surface of the valve body also move upward; after the fixing stop blocks contact the baffles, the baffles on the inner walls of the two half-shells are pushed up; during the pushing-up process, the two half-shells separate, and the two half-shells can respectively move along an arc trajectory toward both sides along the centerline of the valve body; the baffles contact the fixing stop blocks, and the fixing stop blocks play a role of stopping and limiting the baffles, facilitating the separation of the two half-shells without affecting the operation and operation of paste dispensing, and also facilitating the merging of the two half-shells; when merging, the two half-shells can respectively move along an arc trajectory from both sides to the center along the centerline of the valve body to complete resetting; after the two half-shells are merged, they can protect the port of the valve core, with convenient operation, safety and reliability.

2) By fixedly connecting the limiting housings within the first outer housing, additional protection is afforded to the port of the valve core, achieving the goal of dual protection.

3) The first magnetic iron ring on the inner wall of the valve body and the second magnetic iron rings on the surface of the fixing tube generate a repulsive force that increases as the valve body moves upward along the valve core. After the paste is squeezed out, the valve body moves downward to reset, and at this time, the repulsive force generated by the first magnetic iron ring and the second magnetic iron rings causes the repulsive force to gradually decrease, better achieving the resetting of the valve body. Additionally, the second magnetic iron rings attract the iron ring on the inner side wall of the valve body, providing auxiliary resetting and securing functions. This mechanism is effective, durable, easy to maintain, and has a long service life.

4) A housing base is fixedly mounted on a bottom surface of the second outer housing, which facilitates placing the second outer housing on any surface, providing protection and support for the second outer housing; a fixing ring is fixedly installed through a fixing hole; the bottom surface of the fixing ring is fixedly connected to a housing base; the fixation is safe and reliable, and the structure is compact.

5) By providing magnets on the side wall surfaces of the first outer housing and second

outer housing, the two half-shells are conveniently and firmly closed together after merging, providing a reliable closure.

6) The device of the invention features a more rational structural design, an ingenious concept, convenient operation, ease of assembly and disassembly, low manufacturing cost, and convenient dispensing. The multiple protective configurations effectively safeguard the valve body and valve core, enhancing safety and reliability. The device offers various options for operators, has been successfully put into use with excellent results, and is worthy of widespread promotion and application.

Brief Description of Accompany Drawings

FIG. 1 is a structural view of the invention;

FIG. 2 is a side view of the invention;

FIG. 3 is a structural view of a half-shell in the invention;

FIG. 4 is a bottom view of FIG. 3;

FIG. 5 is a top view of the second outer housing in the invention;

FIG. 6 is a structural view of the valve body and the valve core in the invention;

FIG. 7 is a structural view of the valve body in the invention;

FIG. 8 is a bottom view of the valve body in the invention;

FIG. 9 is a structural view of the iron ring and the first magnetic iron ring in the invention;

FIG. 10 is a structural view of the valve core in the invention;

FIG. 11 is a bottom view of the valve core in the invention;

FIG. 12 is a structural view of the valve seat in the invention;

FIG. 13 is a top view of the valve seat in the invention;

FIG. 14 is a structural view of the second embodiment of the invention;

FIG. 15 is a structural view of the first supporting frame body in the invention;

FIG. 16 is a structural view of the semicircular bracket in the invention;

FIG. 17 is a structural view of the soft protective film in the invention;

FIG. 18 is a structural view of the third embodiment of the invention;

FIG. 19 is a structural view of the supporting seat in the invention;

FIG. 20 is a structural view of the third supporting frame body in the invention; and

FIG. 21 is a structural view of the connecting rod in the invention.

In the drawings: first outer housing 1, limiting housing 101, baffle 102, second outer housing 2, hole 201, fixing hole 202, housing base 3, first fixing ring 301, magnet 4, valve body 5, small-diameter port 501, large-diameter port 502, iron ring 503, first magnetic iron ring 504, fixing stop block 6, valve core 7, outlet tube 701, column 702, first open section 703, connecting section 704, second magnetic iron ring 705, fixing tube 706, supporting frame 707, second open section 708, valve seat 8, fixing protrusion 801, fixing base 9, first supporting frame body 10, first transverse connecting rod 11, first diagonal pull rod 12, second supporting frame body 13, second fixing ring 14, second transverse connecting rod 15, connecting bolt 16, second diagonal pull rod 17, semicircular bracket 18, third supporting frame body 19, first gear 20, supporting seat 21, fourth supporting frame body 22, rack 23, second gear 24, fixing bolt 25, connecting rod 26, soft protective film 27.

Specific Embodiment of the invention

Embodiment 1

The invention will be further described below with reference to the accompanying drawings.

The invention comprises a first outer housing 1, limiting housings 101, baffles 102, a second outer housing 2, a fixing hole 202, a housing base 3, a first fixing ring 301, magnets 4, a valve body 5, a small-diameter port 501, a large-diameter port 502, an iron ring 503, a first magnetic iron ring 504, fixing stop blocks 6, a valve core 7, an outlet tube 701, columns702, a first open section 703, a connecting section 704, second magnetic iron rings 705, a fixing tube 706, supporting frames 707, second open sections 708, a valve seat 8, and a fixing protrusion 801. The specific structure comprises the valve body 5; the valve core 7 is installed within the valve body 5; the valve seat 8 is fixedly mounted on a bottom surface of the valve body 5; the fixing protrusion 801 is fixedly connected to an inner wall surface of the valve seat 8; the fixing stop block 6 is fixedly connected to an outer wall surface of the valve body 5; the second outer housing 2 is sleeved onto an exterior of the valve body 5; the first outer housing 1 is connected to a surface of the second outer housing 2; the first outer

housing 1 comprises two half-shells; the baffles 102 are respectively fixedly mounted on the inner walls of the two half-shells; and the positions of the baffles 102 correspond to positions of the fixing stop blocks 6.

There are four of the fixing stop blocks 6 and four of the baffles 102; the fixing stop blocks 6 are located on the outer wall surface of the valve body 5 and are symmetrically disposed along a centerline of the valve body 5; the baffles 102 are arranged in groups of two, respectively positioned on the inner walls of the two half-shells.

The limiting housings 101 are fixedly connected within the first outer housing 1; the limiting housings 101 are respectively disposed within each of the two half-shells.

The valve body 5 comprises the small-diameter port 501 and the large-diameter port 502; the iron ring 503 is fixedly installed inside the valve body 5; and the first magnetic iron ring 504 is fixedly installed on an inner wall of the valve body 5.

The valve core 7 comprises the outlet tube 701, the columns 702, the first open section 703, the connecting section 704, the second magnetic iron rings 705, the fixing tube 706, the supporting frames 707, and the second open sections 708; the second magnetic iron rings 705 are fixedly mounted on the surface of the fixing tube 706; the supporting frames 707 are fixedly connected to the inner wall of the fixing tube 706; there are three supporting frames 707, with the second open sections 708 formed supporting frames 707; the connecting section 704 is fixedly connected to the surface of the supporting frames 707; the columns 702 are fixedly connected to the surface of the connecting section 704; there are two columns 702, with the first open section 703 formed between columns 702; and the outlet tube 701 is fixedly connected to the surface of the column 702.

The first outer housing 1 is connected to the surface of the second outer housing 2 via a silicone soft film.

The housing base 3 is fixedly mounted on the bottom surface of the second outer housing 2; the fixing hole 202 is provided on the bottom surface of the second outer housing 2; the first fixing ring 301 is fixedly installed through the fixing hole 202; and the housing base 3 is fixedly connected to the bottom surface of the first fixing ring 301.

The magnets 4 are provided on the side wall surfaces of the first outer housing 1 and the second outer housing 2.

Method of use: the valve core 7 can be installed within the large-diameter port 502 and the small-diameter port 501 of the valve body 5; the outlet tube 701 of the valve core 7 extends out of the small-diameter port 501; the fixing tube 706 of the valve core 7 extends out of the large-diameter port 502; and the fixing tube 706 is secured within the fixing hole 202 of the second outer housing 2. When the fixing tube 706 is connected to a port end of a paste-containing pipe, the paste enters through the fixing tube 706, passes through the second open sections 708 and the first open section 703, and finally reaches the outlet tube 701, from which it is extruded. As the paste is squeezed, the valve body 5 moves upward, and the fixing stop blocks 6 on the outer wall surface of the valve body 5 move upward correspondingly. Upon contact between the fixing stop blocks 6 and the baffles 102, the baffles 102 on the inner walls of the two half-shells are pushed upward; during this upward movement, the two half-shells separate, each moving in an arc trajectory towards opposite sides along the centerline of the valve body 5. The contact between the baffles 102 and the fixing stop blocks 6 provides a stopping and limiting function, facilitating the separation of the two half-shells without hindering the dispensing operation, and also allowing for their convenient merging. Upon merging, the half-shells move in an arc trajectory from the sides towards center along the centerline, completing the reset action; once closed, the two half-shells protect a port of the valve core 7, offering convenient operation, safety, and reliability.

The housing base 3 fixedly mounted on the bottom surface of the second outer housing 2 facilitates placement of the second outer housing 2 on any surface, providing protection and support. The first fixing ring 301 is fixedly installed through the fixing hole 202, and the housing base 3 is fixedly connected to the bottom surface of the first fixing ring 301, ensuring secure and reliable fixation with a compact structure.

The magnets 4 provided on the side wall surfaces of the first outer housing 1 and the second outer housing 2 facilitate the convenient closing of the two half-shells after merging, ensuring firm and reliable closure.

Embodiment 2

The invention comprises a first outer housing 1, limiting housings 101, baffles 102, a second outer housing 2, a fixing hole 202, a housing base 3, a first fixing ring 301, magnets 4, a valve body 5, a small-diameter port 501, a large-diameter port 502, an iron ring 503, a first magnetic iron ring 504, fixing stop blocks 6, a valve core 7, an outlet tube 701, columns 702, a first open section 703, a connecting section 704, second magnetic iron rings 705, a fixing tube 706, supporting frames 707, second open sections 708, a valve seat 8, a fixing protrusion 801, a fixing base 9, a first supporting frame body 10, a first transverse connecting rod 11, a first diagonal pull rod 12, a second supporting frame body 13, a fixing ring 14, a second transverse connecting rod 15, connecting bolts 16, a second diagonal pull rod 17, a semicircular bracket 18, a third supporting frame body 19, a first gear 20, a supporting seat 21, a fourth supporting frame body 22, a rack 23, a second gear 24, a fixing bolt 25, a connecting rod 26, and a soft protective film 27. The specific structure comprises the valve body 5; the valve core 7 is installed within the valve body 5; the fixing base 9 is fixedly connected to a bottom end portion of the valve core 7; the connecting bolts 16 are respectively fixedly mounted on side walls of the fixing base 9; the first diagonal pull rod 12 and the second diagonal pull rod 17 are hingedly connected to the connecting bolts 16; the connecting bolts 16 are located at one end of each of the first diagonal pull rod 12 and the second diagonal pull rod 17; an other end of the first diagonal pull rod 12 is hingedly connected to a side wall of the first transverse connecting rod 11 via the connecting bolts 16; the first supporting frame body 10 is fixedly connected to a surface of the first transverse connecting rod 11; the fixing ring 14 is fixedly connected to a side wall of the first transverse connecting rod 11; an other end of the second diagonal pull rod 17 is hingedly connected to a side wall of the second transverse connecting rod 15 via the connecting bolts 16; the second supporting frame body 13 is fixedly connected to a surface of the second transverse connecting rod 15; the fixing ring 14 is fixedly connected to a side wall of the second transverse connecting rod 15; the fixing ring 14 is hingedly connected to both side walls of the valve body 5 via the connecting bolts 16; the semicircular bracket 18 is fixedly connected to side wall surfaces of the first supporting frame body 10 and the second supporting frame

body 13; the soft protective film 27 is wrapped over the first supporting frame body 10, the second supporting frame body 13, and the semicircular bracket 18; and a bottom end of the soft protective film 27 is secured to a side wall of the fixing base 9.

The valve body 5 comprises the small-diameter port 501 and the large-diameter port 502; the iron ring 503 is fixedly installed inside the valve body 5; and the first magnetic iron ring 504 is fixedly installed on the inner wall of the valve body 5.

The valve core 7 comprises the outlet tube 701, the columns 702, the first open section 703, the connecting section 704, the second magnetic iron rings 705, the fixing tube 706, the supporting frames 707, and the second open sections 708; the second magnetic iron rings 705 are fixedly mounted on the surface of the fixing tube 706; the supporting frames 707 are fixedly connected to the inner wall of the fixing tube 706; there are three supporting frames 707, with the second open sections 708 formed between supporting frames 707; the connecting section 704 is fixedly connected to the surface of the supporting frames 707; the columns 702 are fixedly connected to the surface of the connecting section 704; there are two columns 702, with the first open section 703 formed between columns 702; the outlet tube 701 is fixedly connected to the surface of the column 702; and the fixing tube 706 is fixedly connected within the fixing base 9.

The soft protective film 27 is made of a silicone soft film, PP, or PVC.

Method of use: the soft protective film 27 can be respectively wrapped over the first supporting frame body 10 and the semicircular bracket 18, and over the second supporting frame body 13 and the semicircular bracket 18; the bottom end of the soft protective film 27 is secured to the side wall surface of the fixing base 9. The valve core 7 can be installed within the large-diameter port 502 and the small-diameter port 501 of the valve body 5; the outlet tube 701 extends out of the small-diameter port 501; the fixing tube 706 extends out of the large-diameter port 502; and the fixing tube 706 is secured within the fixing hole 202 of the second outer housing 2. When the fixing tube 706 is connected to a port end of a paste-containing pipe, the paste enters through the fixing tube 706, passes through the second open sections 708 and the first open section 703, and finally reaches the outlet tube 701, from

which it is extruded. At this point, the paste drives the valve body 5 to move upward along the valve core 7. During this upward movement, the first supporting frame body 10, the first transverse connecting rod 11, the second supporting frame body 13, and the second transverse connecting rod 15 are driven to move upward. Through the hinged connections provided by the connecting bolts 16, the angle between the first diagonal pull rod 12 and the second diagonal pull rod 17 decreases. Because the first diagonal pull rod 12 is hinged to the first transverse connecting rod 11 and the second diagonal pull rod 17 is hinged to the second transverse connecting rod 15, the first diagonal pull rod 12 and the second diagonal pull rod 17 pull the first transverse connecting rod 11 and second transverse connecting rod 15 downward. Since the first supporting frame body 10 and the second supporting frame body 13 are hinged to each other, the angle between them increases, achieving an open state. After the paste is extruded from the port of the valve core 7, pressure is released, and the valve body 5 moves downward along the valve core 7. The second magnetic iron ring 705 fixedly mounted on the surface of the fixing tube 706 attracts the iron ring 503 fixedly installed on an inner side wall of the valve body 5, achieving reset. Through the first diagonal pull rod 12 and the second diagonal pull rod 17 drive the first transverse connecting rod 11 and second transverse connecting rod 15 upward, and the angle between the the first diagonal pull rod 12 and the second diagonal pull rod 17 decreases, causing the the first supporting frame body 10 and the second supporting frame body 13 to close. Because the soft protective film 27 is wrapped over the first supporting frame body 10, the second supporting frame body 13 and the semicircular bracket 18, it effectively protects the dispensing port of the valve core 7, ensuring cleanliness and hygiene, preventing paste contamination, and offering simple and convenient operation.

Embodiment 3

The invention comprises a first outer housing 1, limiting housings 101, baffles 102, a second outer housing 2, a hole 201, a fixing hole 202, a housing base 3, a first fixing ring 301, magnets 4, a valve body 5, a small-diameter port 501, a large-diameter port 502, fixing stop blocks 6, a valve core 7, an outlet tube 701, columns 702, a first open section 703, a connecting section 704, second magnetic iron rings 705, a fixing tube 706, supporting frames

707, second open sections 708, a valve seat 8, a fixing protrusion 801, a fixing base 9, a first supporting frame body 10, a first fixing plate 11, a first diagonal pull rod 12, a second supporting frame body 13, a second fixing ring 14, a second transverse connecting rod 15, connecting bolts 16, a second diagonal pull rod 17, a semicircular bracket 18, a third supporting frame body 19, a first gear 20, a supporting seat 21, a fourth supporting frame body 22, a rack 23, a second gear 24, a fixing bolt 25, connecting rods 26, and a soft protective film 27. The specific structure comprises the valve body 5; the valve core 7 is installed within the valve body 5; the fixing base 9 is fixedly connected to the bottom end portion of the valve core 7; the supporting seats 21 are respectively fixedly mounted on the side walls of the fixing base 9; there are two supporting seats 21, symmetrically disposed along the centerline of the fixing base 9; each supporting seat 21 is configured in a U-shape; the third supporting frame body 19 and the first gear 20 are hingedly connected to the side wall of each supporting seat 21 via fixing bolts 25, and the third supporting frame body 19 is fixedly connected to the first gear 20; the fourth supporting frame body 22 and the second gear 24 are hingedly connected to the side wall of the supporting seat 21 via the fixing bolts 25, and the fourth supporting frame body 22 is fixedly connected to the second gear 24; the rack 23 is meshingly engaged between the first gear 20 and the second gear 24; the rack 23 is fixedly mounted on the side wall surface of the valve body 5 via connecting rods 26; the semicircular bracket 18 is fixedly connected to side wall surfaces of the third supporting frame body 19 and the fourth supporting frame body 22; and the soft protective film 27 is wrapped over the third supporting frame body 19, the fourth supporting frame body 22, and the semicircular bracket 18, with the bottom end of the soft protective film 27 being secured to the side wall of the fixing base 9.

The valve body 5 comprises the small-diameter port 501 and the large-diameter port 502; the iron ring 503 is fixedly installed inside the valve body 5; and the first magnetic iron ring 504 is fixedly installed on the inner wall of the valve body 5.

The valve core 7 comprises the outlet tube 701, the columns 702, the first open section 703, the connecting section 704, the second magnetic iron rings 705, the fixing tube 706, the supporting frames 707, and the second open sections 708; the second magnetic iron rings 705

is fixedly mounted on the surface of the fixing tube 706; the supporting frames 707 are fixedly connected to the inner wall of the fixing tube 706; there are three supporting frames 707, with the second open sections 708 formed between supporting frames 707; the connecting section 704 is fixedly connected to the surface of the supporting frames 707; the columns 702 are fixedly connected to the surface of the connecting section 704; there are two columns 702, with the first open section 703 formed between columns 702; the outlet tube 701 is fixedly connected to the surface of the column 702; and the fixing tube 706 is fixedly connected within the fixing base 9.

Method of use: the soft protective film 27 can be respectively wrapped over the third supporting frame body 19 and the semicircular bracket 18, and over the fourth supporting frame body 22 and the semicircular bracket 18; the bottom end of the soft protective film 27 is secured to the side wall surface of the fixing base 9. The valve core 7 can be installed within the large-diameter port 502 and the small-diameter port 501 of the valve body 5; the outlet tube 701 extends out of the small-diameter port 501; the fixing tube 706 extends out of the large-diameter port 502; and the fixing tube 706 is secured within the fixing hole 202 of the second outer housing 2. When the fixing tube 706 is connected to a port end of a paste-containing pipe, the paste enters through the fixing tube 706, passes through the second open sections 708 and the first open section 703, and finally reaches the outlet tube 701, from which it is extruded. At this point, the paste drives the valve body 5 to move upward along the valve core 7. During this upward movement, the rack 23 rotates relative to the first gear 20 and the second gear 24, thereby driving the third supporting frame body 19 and the fourth supporting frame body 22 to open. After the paste is extruded through the port of the valve core 7, pressure is released, and the valve body 5 moves downward along the valve core 7. The second magnetic iron rings 705 fixedly mounted on the surface of the fixing tube 706 attracts the iron ring 503 fixedly installed on the inner side wall of the valve body 5, achieving reset. As the valve body 5 moves downward, the rotation of the rack 23 relative to the first gear 20 and the second gear 24 causes the third supporting frame body 19 and the fourth supporting frame body 22 to close. Because the soft protective film 27 is wrapped over the third supporting frame body 19 and the fourth supporting frame body 22 and the

semicircular bracket 18, it effectively protects the dispensing port of the valve core 7, ensuring cleanliness and hygiene, preventing paste contamination, and offering simple and convenient operation.

CLAIMS

1. A device for quantitatively dispensing paste, comprising a valve body (5); a valve core (7) is installed within the valve body (5); a valve seat (8) is fixedly mounted on a bottom surface of the valve body (5), and a fixing protrusion (801) is fixedly connected to an inner wall surface of the valve seat (8); fixing stop blocks (6) are fixedly connected to an outer wall surface of the valve body (5); a second outer housing (2) is sleeved onto an exterior of the valve body (5); a first outer housing (1) is connected to a surface of the second outer housing (2); the first outer housing (1) comprises two half-shells; baffles (102) are respectively fixedly mounted on inner walls of the two half-shells, and positions of the baffles (102) correspond to positions of the fixing stop blocks (6).

2. The device for quantitatively dispensing paste of claim 1, wherein there are four of the fixing stop blocks (6) and four of the baffles (102); the fixing stop blocks (6) are located on the outer wall surface of the valve body (5) and are symmetrically disposed along a centerline of the valve body (5); the baffles (102) are arranged in groups of two, respectively positioned on inner walls of the two half-shells.

3. The device for quantitatively dispensing paste of claim 2, wherein limiting housings (101) are fixedly connected within the first outer housing (1); the limiting housings (101) are respectively disposed within each of the two half-shells.

4. The device for quantitatively dispensing paste of claim 3, wherein the valve body (5) comprises a small-diameter port (501) and a large-diameter port (502); an iron ring (503) is fixedly installed inside the valve body (5); and a first magnetic iron ring (504) is fixedly installed on an inner wall of the valve body (5).

5. The device for quantitatively dispensing paste of claim 4, wherein the valve core (7)

comprises an outlet tube (701), columns (702), a first open section (703), a connecting section (704), second magnetic iron rings (705), a fixing tube (706), supporting frames (707), and second open sections (708); the second magnetic iron rings (705) are fixedly mounted on a surface of the fixing tube (706); the supporting frames (707) are fixedly connected to an inner wall of the fixing tube (706); there are three supporting frames (707), with the second open sections (708) formed between supporting frames (707); the connecting section (704) is fixedly connected to surface of the supporting frames (707); the columns (702) are fixedly connected to a surface of the connecting section (704); there are two columns (702), with the first open section (703) formed between columns (702); and the outlet tube (701) is fixedly connected to surface of the columns (702).

6. The device for quantitatively dispensing paste of claim 5, wherein a housing base (3) is fixedly mounted on a bottom surface of the second outer housing (2); a fixing hole (202) is provided on the bottom surface of the second outer housing (2); a first fixing ring (301) is fixedly installed through the fixing hole (202); and the housing base (3) is fixedly connected to a bottom surface of the first fixing ring (301).

7. The device for quantitatively dispensing paste of claim 6, wherein magnets (4) are provided on side wall surfaces of the first outer housing (1) and the second outer housing (2).

8. A device for quantitatively dispensing paste, comprising a valve body (5); a valve core (7) is installed within the valve body (5); a fixing base (9) is fixedly connected to a bottom end portion of the valve core (7); connecting bolts (16) are respectively fixedly mounted on side walls of the fixing base (9); a first diagonal pull rod (12) and a second diagonal pull rod (17) are hingedly connected to the connecting bolts (16); the connecting bolts (16) are located at one end of each of the first diagonal pull rod (12) and the second diagonal pull rod (17); an other end of the first diagonal pull rod (12) is hingedly connected to a side wall of a first transverse connecting rod (11) via the connecting bolts (16); a first supporting frame body

(10) is fixedly connected to a surface of the first transverse connecting rod (11); and a second fixing ring (14) is fixedly connected to a side wall of the first transverse connecting rod (11); an other end of the second diagonal pull rod (17) is hingedly connected to a side wall of a second transverse connecting rod (15) via connecting bolts (16); a second supporting frame body (13) is fixedly connected to a surface of the second transverse connecting rod (15); and the second fixing ring (14) is fixedly connected to a side wall of the second transverse connecting rod (15); the second fixing ring (14) is hingedly connected to both side walls of the valve body (5) via the connecting bolts (16); a semicircular bracket (18) is fixedly connected to side wall surfaces of the first supporting frame body (10) and the second supporting frame body (13); and a soft protective film (27) is wrapped over the first supporting frame body (10), the second supporting frame body (13), and the semicircular bracket (18), with a bottom end of the soft protective film (27) being secured to a side wall of the fixing base (9).

9. The device for quantitatively dispensing paste of claim 8, wherein the valve body (5) comprises a small-diameter port (501) and a large-diameter port (502); an iron ring (503) is fixedly installed inside the valve body (5); and the first magnetic iron ring (504) is fixedly installed on an inner wall of the valve body (5).

10. The device for quantitatively dispensing paste of claim 8, wherein the valve core (7) comprises an outlet tube (701), columns (702), a first open section (703), a connecting section (704), a second magnetic iron rings (705), a fixing tube (706), supporting frames (707), and second open sections (708); the second magnetic iron rings (705) are fixedly mounted on a surface of the fixing tube (706); the supporting frames (707) are fixedly connected to an inner wall of the fixing tube (706); there are three supporting frames (707), with second open sections (708) formed between supporting frames (707); the connecting section (704) is fixedly connected to surface of the supporting frames (707); the columns (702) are fixedly connected to a surface of the connecting section (704); there are two

columns (702), with the first open section (703) formed between columns (702); the outlet tube (701) is fixedly connected to surface of the columns (702); and the fixing tube (706) is fixedly connected within the fixing base (9).

11. A device for quantitatively dispensing paste, comprising a valve body (5); a valve core (7) is installed within the valve body (5); a fixing base (9) is fixedly connected to a bottom end portion of the valve core (7); supporting seats (21) are respectively fixedly mounted on side walls of the fixing base (9); there are two supporting seats (21), symmetrically disposed along a centerline of the fixing base (9); each supporting seat (21) is configured in a U-shape; a third supporting frame body (19) and a first gear (20) are hingedly connected to a side wall of each supporting seat (21) via fixing bolts (25), and the third supporting frame body (19) is fixedly connected to the first gear (20); a fourth supporting frame body (22) and a second gear (24) are hingedly connected to a side wall of the supporting seat (21) via the fixing bolts (25), and the fourth supporting frame body (22) is fixedly connected to the second gear (24); a rack (23) is meshingly engaged between the first gear (20) and the second gear (24); and the rack (23) is fixedly mounted on a side wall surface of the valve body (5) via connecting rods (26); a semicircular bracket (18) is fixedly connected to side wall surface of the third supporting frame body (19) and the fourth supporting frame body (22); and a soft protective film (27) is wrapped over the third supporting frame body (19), the fourth supporting frame body (22), and the semicircular bracket (18), with a bottom end of the soft protective film (27) being secured to a side wall of the fixing base (9).

12. The device for quantitatively dispensing paste of claim 11, wherein the valve body (5) comprises a small-diameter port (501) and a large-diameter port (502); an iron ring (502) is fixedly installed inside the valve body (5); and a first magnetic iron ring (504) is fixedly installed on an inner wall of the valve body (5).

13. The device for quantitatively dispensing paste of claim 11, wherein the valve core (7)

comprises an outlet tube (701), columns (702), a first open section (703), a connecting section (704), second magnetic iron rings (705), a fixing tube (706), supporting frames (707), and second open sections (708); the second magnetic iron rings (705) are fixedly mounted on a surface of the fixing tube (706); the supporting frames (707) are fixedly connected to an inner wall of the fixing tube (706); there are three supporting frames (707), with second open sections (708) formed between supporting frames (707); the connecting section (704) is fixedly connected to surface of the supporting frames (707); the columns (702) are fixedly connected to a surface of the connecting section (704); there are two columns (702), with the first open section (703) formed between columns (702); the outlet tube (701) is fixedly connected to surface of the columns (702); and the fixing tube (706) is fixedly connected within the fixing base (9).