

(19)



(11)

EP 3 381 565 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
08.04.2020 Bulletin 2020/15

(51) Int Cl.:
B05B 1/16 (2006.01) **B05B 9/01** (2006.01)
F16L 37/14 (2006.01) **B08B 3/02** (2006.01)

(21) Application number: **18156402.2**

(22) Date of filing: **13.02.2018**

(54) SPRAY GUN AND WASHING APPARATUS

SPRITZPISTOLE UND WASCHVORRICHTUNG

PISTOLET DE PULVÉRISATION ET APPAREIL DE LAVAGE

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **28.03.2017 CN 201710193177**

(43) Date of publication of application:
03.10.2018 Bulletin 2018/40

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Description**BACKGROUND OF THE INVENTION****1. Technical Field**

[0001] The present invention relates to washer technology and, more particularly, to a spray gun and a washing apparatus.

2. Description of Related Art

[0002] A commercially-available high-pressure washer has a three-on-one flow ejector which includes a high-pressure fan-shaped nozzle, a rotating nozzle, and a low-pressure liquid sucking nozzle, allowing users to rotate the flow ejector to a corresponding angle as needed, so as to switch between the three nozzles.

[0003] The aforesaid product has two drawbacks as follows:

To use the three nozzles of the flow ejector, it is necessary for its internal flow paths to have different axial cross-sectional areas. In particular, rotation of the flow ejector requires a large cross-sectional area of internal flow; as a result, the axial direction of an applied force is not aligned with the overall axial direction of the flow ejector. For this reason, while the flow ejector is operating, the points which an applied force generated from internal water pressure is actually exerted upon are not aligned with the actual support points of pins pointed in fixed axial directions and symmetrically distributed, thereby generating a bending moment internally. The bending moment causes internal warpage. Given time, the warpage causes the flow ejector to leak and even jam.

[0004] U-shaped pins which are symmetrically distributed are used to mount rotating elements axially and steadily in a casing of the flow ejector. After long use, especially while the high-pressure fan-shaped nozzle and the rotating nozzle are operating, internal plastic limiting ledges are pressed and deformed or in severe situations even pressed and damaged, and in consequence the U-shaped pins jam, rendering it difficult to switch between the high-pressure fan-shaped nozzle, the rotating nozzle, and the low-pressure liquid sucking nozzle. It is because the contact between the U-shaped pins of round cross-sectional areas and the plastic limiting ledges is linear contact, and the contact area is too small.

BRIEF SUMMARY OF THE INVENTION

[0005] It is an objective of the present invention to overcome the drawbacks of the prior art by providing a spray gun and washing apparatus, so as to not only eliminate the effect of a bending moment generated by internal structure of the spray gun in operation, but also increase the contact area of the pin component such that two components in contact with each other are prevented from being pressed and deformed to the detriment of smooth

rotation.

[0006] To solve known technical problems, the present invention discloses a spray gun, comprising:

a front mounting base having a plurality of receiving cavities extending in axial direction of the front mounting base;

a rear mounting base having an eccentric flow duct extending in axial direction of the rear mounting base, wherein the front mounting base is rotatably connected to the rear mounting base; and

a pin component whereby the front mounting base and the rear mounting base are axially fixed in place; characterized in that: the front mounting base has at least three pinholes, the rear mounting base has at least one circumferential groove extending in circumferential direction of the rear mounting base, the pin component has at least three pin portions inserted into the pinholes and the circumferential groove, respectively, to provide axial support to the circumferential groove laterally; the front mounting base and the rear mounting base are axially fixed in place and supported by the pin portions; and axial support points formed as a result of contact between the circumferential groove and the pin portions are located at least three different positions in circumferential direction of the circumferential groove, respectively. A prior art spray gun known from US6,113,009.

[0007] Furthermore, the pin component comprises at least one of a linearly shaped pin with one said pin portion, a U-shaped pin with two said pin portions of equal length, and a hook-shaped pin with two said pin portions of unequal length.

[0008] Furthermore, two said pin portions of the U-shaped pin are connected to two said pin portions of the hook-shaped pin by an arcuate connecting portion; the front mounting base has a receiving recess for receiving the connecting portion; two ends of the receiving recess are in communication with outer ends of two pinholes for mounting the same U-shaped pin or hook-shaped pin in place, respectively; after the U-shaped pin or hook-shaped pin has been inserted, the connecting portion is embedded in the receiving recess.

[0009] Furthermore, the front mounting base has a protruding portion protruding from an outer surface of the front mounting base, and a surface of the protruding portion is an arcuate surface using an axis of the front mounting base as a central axis, allowing the receiving recess to form on the surface of the protruding portion.

[0010] Furthermore, a cross section of the pin portion is kidney-shaped such that support surfaces are formed on two sides of the pin portion, and the support surfaces of the pin portion are in surface contact with the pinholes and the circumferential groove.

[0011] Furthermore, the rear mounting base further has a limiting flange, and a rear end of the front mounting base has a positioning annular surface; the front mount-

ing base and the rear mounting base are connected such that the pinholes are aligned with the circumferential groove as soon as the positioning annular surface abuts against the limiting flange.

[0012] Furthermore, the spray gun further comprises:

A plurality of nozzles disposed in the receiving cavities, respectively;

A switch turntable having a plurality of water holes aligned with the receiving cavities, respectively, with the switch turntable rotatably connected to the front mounting base relative to the rear mounting base; and

A nozzle base for fixing one of the nozzles to the switch turntable.

[0013] Furthermore, the nozzles comprises a high-pressure nozzle, a lotus nozzle and a low-pressure liquid sucking nozzle, with the lotus nozzle connected to the switch turntable through the nozzle base.

[0014] Furthermore, the spray gun further comprises:

A front casing having a front end surface on which a plurality of through holes is formed, with the front casing connected to the front mounting base to form a package thereof, wherein the through holes are aligned with front end openings of the receiving cavities, respectively; and

a rear casing connected to the rear mounting base.

[0015] Furthermore, the pin component and the pinholes have a tight fit, whereas the pin component and the circumferential groove have a clearance fit.

[0016] The present invention further discloses a washing apparatus of the aforesaid spray gun, the washing apparatus comprising:

a body having a water supply system;

a water pipe connected to the water supply system; and

a spray gun connected to the water supply system through the water pipe;

characterized in that the rear mounting base has a rear end connected to an outlet end of the water pipe to form a water flow channel.

[0017] The present invention has advantageous effects as follows: eliminating the effect of a bending moment generated by internal structure of the spray gun in operation; and increasing the contact area of the pin component such that two components in contact with each other are prevented from being pressed and deformed to the detriment of smooth rotation.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0018]

FIG. 1 is an exploded view of a spray gun according to a preferred embodiment of the present invention; FIG. 2 is a cross-sectional view of the spray gun according to the preferred embodiment shown in FIG. 1;

FIG. 3 is a cross-sectional view taken along line A-A in FIG. 2;

FIG. 4 is a schematic view of operation of the spray gun according to the preferred embodiment shown in FIG. 1;

FIG. 5 is a schematic view of a rear mounting base according to the preferred embodiment shown in FIG. 1;

FIG. 6 is a cross-sectional view of the spray gun according to another preferred embodiment of the present invention;

FIG. 7 is a cross-sectional view taken along line B-B in FIG. 6;

FIG. 8 is a cross-sectional view taken along line C-C in FIG. 6;

FIG. 9 is a schematic view of distribution of pin components according to another preferred embodiment of the present invention;

FIG. 10 is a schematic view of distribution of the pin components according to yet another preferred embodiment of the present invention;

FIG. 11 is a cross-sectional view of the spray gun according to another preferred embodiment of the present invention; and

FIG. 12 is a cross-sectional view taken along line in D-D in FIG. 11.

DETAILED DESCRIPTION OF THE INVENTION

[0019] The present invention is described further below with reference to accompanying drawings. Embodiments presented below are intended to explain the technical solutions of the present invention rather than limit the scope of the claims of the present invention.

First Embodiment

[0020] A washing apparatus comprises a body, a water pipe, and a spray gun. The body has a water supply system. The spray gun is connected to the water supply system through the water pipe to eject water.

[0021] Referring to FIG. 1, the spray gun comprises a front casing 10, a front mounting base 20, a pin component 80, nozzles, a nozzle base 70, a switch turntable 30, a rear mounting base 50 and a rear casing 40.

[0022] Referring to FIG. 2, the front casing 10 has a front end surface, and the front end surface has thereon three through holes 10a. The front casing 10 is connected to the front mounting base 20 to form a package thereof for esthetical and decorative purposes. The rear casing 40 is connected to the rear mounting base 50.

[0023] The front mounting base 20 has four pinholes 20c lying on the same plane and three receiving cavities

20a extending in axial direction of the front mounting base 20. Front end openings of the receiving cavities 20a are aligned with the through holes 10a, respectively. Two of the four pinholes 20c are disposed along tangential direction of the circumferential groove 50b, and the other two pinholes 20c are disposed along radial direction of the circumferential groove 50b.

[0024] The nozzles are in the number of three, namely a high-pressure nozzle 60, a lotus nozzle 90 and a low-pressure liquid sucking nozzle. The three nozzles are disposed in the receiving cavities 20a, respectively.

[0025] The switch turntable 30 has three water holes 30a aligned with the receiving cavities 20a, respectively. The switch turntable 30 is rotatably connected to the front mounting base 20 relative to the rear mounting base 50 and rotates synchronously with the front mounting base 20, so as to switch between different flow paths of the nozzles. The lotus nozzle 90 is mounted at one of the water holes 30a of the switch turntable 30 through the nozzle base 70.

[0026] Referring to FIG. 5, the rear mounting base 50 has a circumferential groove 50b extending in circumferential direction of the rear mounting base 50 and an eccentric flow duct 50a extending in axial direction of the rear mounting base 50. The rear end of the rear mounting base 50 is connected to a water pipe. The front mounting base 20 is rotatably connected to the front of the rear mounting base 50. Any one of the water holes 30a is coaxially aligned with the eccentric flow duct 50a while the switch turntable 30 is rotating.

[0027] Referring to FIG. 3, the pin component 80 is provided in the form of two hook-shaped pins. The hook-shaped pins each have a long pin portion 80a, a short pin portion 80a, and an arcuate connecting portion 80b which connects the two pin portions 80a. The cross section of each pin portion 80a is kidney-shaped such that support surfaces are formed on two sides of each pin portion 80a. The pin portions 80a are in surface contact with the pinholes 20c and the circumferential groove 50b through the support surfaces. The aforesaid structure effectively increases the contact area of the pin portions 80a such that the contact surface will not be partially pressed and damaged, thereby preventing the spray gun from becoming jammed during its service life. After the hook-shaped pins have been mounted in place, the long pin portion 80a is inserted into the pinholes 20c disposed along tangential direction of the circumferential groove 50b, and the short pin portion 80a is inserted into the pinholes 20c disposed along radial direction of the circumferential groove 50b; hence, the four pin portions 80a of the two hook-shaped pins, together with the circumferential groove 50b, provide axial support (the dark areas in FIG. 4 indicate the contact surfaces formed as a result of contact between the circumferential groove 50b and the support surfaces of the pin portions 80a.) The arrangement of the pinholes 20c is adjusted to allow support points on the lateral sides of the circumferential groove 50b and the pin portions 80a to be aligned along

circumferential direction of the circumferential groove 50b and distributed uniformly. The aforesaid structure eliminates the effect of a bending moment generated by internal structure while the high-pressure nozzle is operating, and prevents warpage between the front mounting base 20 and the rear mounting base 50, so as to prevent the spray gun from leaking or jamming. With the pin portions 80a being of different length, the pin portions 80a and the respective pinholes 20c have a tight fit in order to prevent the hook-shaped pins from escaping from the pinholes 20c.

[0028] To ensure firm axial connection of the front mounting base 20 and the rear mounting base 50 and ensure smooth rotation of the front mounting base 20 and the rear mounting base 50 relative to each other, the pin component 80 has a tight fit with the pinholes 20c and has a clearance fit with the circumferential groove 50b. Hence, the pin component 80 is inserted firmly into the pinholes 20c without affecting rotation relative to the circumferential groove 50b.

[0029] The connecting portions 80b of the hook-shaped pins mounted in place are exposed. Two protruding portions 20d are formed on the outer surface of the front mounting base 20. Surfaces of the protruding portions 20d are arcuate surfaces which use the axis of the front mounting base 20 as a central axis. A receiving recess 20b is formed on each of the arcuate surfaces. Two ends of the receiving recess 20b are in communication with outer ends of the two pin portions 80a of the same hook-shaped pin. After the hook-shaped pins have been mounted in place, the two pin portions 80a are inserted into the pinholes 20c, respectively, such that the front mounting base 20 and the rear mounting base 50 are fixed in place, whereas the connecting portions 80b are embedded in the receiving recess 20b.

[0030] The pin portions 80a must be flush with a mounting plane in order to be smoothly inserted into the pinholes 20c and the circumferential groove 50b. To allow the pin portions 80a to become flush with the mounting plane quickly, the rear end of the front mounting base 20 has a positioning annular surface 20e, and a limiting flange 50c is disposed on the rear mounting base and behind the circumferential groove 50b. The pinholes 20c and the circumferential groove 50b lie on the same mounting plane, when the front mounting base 20 and the rear mounting base 50 are connected to therefore cause the positioning annular surface 20e to abut against the limiting flange 50c.

[0031] Referring to FIG. 4, the spray gun comprises a high-pressure nozzle 60, a lotus nozzle 90 and a low-pressure liquid sucking nozzle and is capable of switching there between by a full rotation. Adjustments can be made to the manufacturing process of the high-pressure nozzle 60 to change its droplet shape and ejection angle; and the range of its adjustable ejection angle is 0-60°, preferably 25-30°. The lotus nozzle 90 features round droplets, functions in the same manner as a standalone lotus spray gun, and operates at a pressure of 40~80 bar

adjustable to meet the need for a complete spray gun. To work with a washing detergent which the spray gun comes with and allow the spray gun to operate as a whole, the low-pressure nozzle mixes the washing detergent with water by low-pressure siphoning and then carries out a washing process. Each internal flow path is an eccentric structure to ensure that an incoming water flow and an outgoing water flow take place along the same straight line (the arrow in FIG. 4 indicates the direction of water flow in a specific operating mode), regardless of the position at which the nozzle is operating.

Second Embodiment

[0032] Referring to FIG. 6, 7 and 8, unlike the first embodiment, the second embodiment has distinguishing technical features as follows: the rear mounting base 50 has two circumferential grooves 50b; the front mounting base 20 has two groups of pinholes 20c disposed within two planes, respectively; and each group of pinholes 20c is aligned with a corresponding one of the circumferential grooves 50b to mount a hook-shaped pin in place. Hence, four support points formed as a result of the aforesaid structure in the second embodiment are also located at different positions along the circumferential direction, and thus the second embodiment achieves the same technical effect as the first embodiment.

Third Embodiment

[0033] The third embodiment, which is a simple variant of the second embodiment, has distinguishing technical features as follows: the pin component 80 is provided in the form of two U-shaped pins; the U-shaped pins each have two pin portions 80a of equal length and the arcuate connecting portion 80b connecting the two pin portions 80a; the paired pinholes 20c are symmetrically arranged along tangential direction of a corresponding one of the circumferential grooves 50b; and the directions of the two groups of the pinholes 20c are perpendicular to each other such that four support points are located at different positions in the circumferential direction. Hence, the third embodiment achieves the same technical effect as the first embodiment.

Fourth Embodiment

[0034] Referring to FIG. 9, the fourth embodiment, which is another simple variant of the second embodiment, has distinguishing technical features as follows: one pin portion 80a of each hook-shaped pin is inserted into one pinhole 20c of one of the groups of the pinholes 20c; another pin portion 80a of the hook-shaped pin is inserted into one pinhole 20c of the other group of the pinholes 20c; hence, the two pin portions 80a of the same hook-shaped pin lie on different fixing planes, respectively.

Fifth Embodiment

[0035] Referring to FIG. 10, the fifth embodiment, which is another simple variant of the third embodiment, has distinguishing technical features as follows: one pin portion 80a of each hook-shaped pin is inserted into one pinhole 20c of one of the groups of the pinholes 20c; another pin portion 80a of the hook-shaped pin is inserted into one pinhole 20c of the other group of the pinholes 20c; hence, the two pin portions 80a of the same U-shaped pin lie on different fixing planes, respectively.

Sixth Embodiment

[0036] Referring to FIGs. 11 and 12, unlike the first embodiment, the sixth embodiment has distinguishing technical features as follows: the pin component is provided in the form of three linearly shaped pins; the linearly shaped pins each have one pin portion 80a; the front mounting base has three pinholes 20c lying on the same plane; the pinholes 20c are disposed along tangential direction of the circumferential grooves 50b. Therefore, three support points formed as a result of the aforesaid structure are also located at different positions along the circumferential direction. Hence, the sixth embodiment achieves the same technical effect as the first embodiment.

Seventh Embodiment

[0037] The seventh embodiment, which is another simple variant of the sixth embodiment, has distinguishing technical features as follows: the pinholes 20c are disposed along radial direction of the circumferential groove 50b such that the pin portions 80a point at the center of the circumferential groove 50b. The aforesaid structure also achieves the same technical effect as the first embodiment. In the seventh embodiment, the pinholes are shallow, and thus short screws or dowels with outer threads are inserted into the pinholes to mesh with them. In doing so, the screws or dowels are fixed firmly to the front mounting base 20.

[0038] The aforesaid five embodiments are preferred embodiments of the present invention and feature pin components of the same type. A variant embodiment of the present invention features a combination of pins of different types, for example, one linearly shaped pin and one hook-shaped pin, one linearly shaped pin and one U-shaped pin, one hook-shaped pin and one U-shaped pin, two linearly shaped pins and one hook-shaped pin, two linearly shaped pins and one U-shaped pin. Persons skilled in the art can combine the types of the pin components and determine the number of the circumferential grooves according to technical concepts of the present invention, so as to come up with different preferred solutions.

[0039] The statement "support points are located at different positions along the circumferential direction of

the circumferential groove" above means the following: the support points are distributed along the circumferential direction of the circumferential groove; among projections formed at any cross section is at least one projection attributed to one support point; the at least one projection attributed to one support point is not collinear with the projections of any two other support points. Therefore, three support points are sufficient to effectuate axial support. Hence, the present invention solves a problem with the prior art, that is, warpage will occur readily if the line connecting two support points serves as an axis.

[0040] According to the present invention, components to be rarely demounted are connected by screws, whereas components to be regularly demounted are connected by engagement.

[0041] The present invention is illustrated above by preferred embodiments. It should be understood that persons skilled in the art can make some improvements and variations to the preferred embodiments of the present invention without departing from technical principles of the present invention, and that the improvements and variations shall be deemed falling within the scope of the claims of the present invention.

Claims

1. A spray gun, comprising:

a front mounting base (20) having a plurality of receiving cavities (20a) extending in axial direction of the front mounting base (20);
a rear mounting base (50) having an eccentric flow duct (50a) extending in axial direction of the rear mounting base (50), wherein the front mounting base (20) is rotatably connected to the rear mounting base (50); and
a pin component (80) whereby the front mounting base (20) and the rear mounting base (50) are axially fixed in place;

characterized in that: the front mounting base (20) has at least three pinholes (20c), the rear mounting base (50) has at least one circumferential groove (50b) extending in circumferential direction of the rear mounting base (50), the pin component (80) has at least three pin portions (80a) inserted into the pinholes (20c) and the circumferential groove (50b), respectively, to provide axial support to the circumferential groove (50b) laterally; the front mounting base (20) and the rear mounting base (50) are axially fixed in place and supported by the pin portions (80a); and axial support points formed as a result of contact between the circumferential groove (50b) and the pin portions (80a) are located at least three different positions in circumferential direction of the circumferential groove (50b), re-

spectively.

2. The spray gun of claim 1, **characterized in that** the pin component comprises at least one of a linearly shaped pin with one said pin portion (80a), a U-shaped pin with two said pin portions (80a) of equal length, and a hook-shaped pin with two said pin portions (80a) of unequal length.
3. The spray gun of claim 2, **characterized in that:** two said pin portions (80a) of the U-shaped pin are connected to two said pin portions (80a) of the hook-shaped pin by an arcuate connecting portion (80b); the front mounting base has a receiving recess (20b) for receiving the connecting portion (80b); two ends of the receiving recess (20b) are in communication with outer ends of two pinholes (20c) for mounting the same U-shaped pin or hook-shaped pin in place, respectively; after the U-shaped pin or hook-shaped pin has been inserted, the connecting portion (80b) is embedded in the receiving recess (20b).
4. The spray gun of claim 3, **characterized in that** the front mounting base (20) has a protruding portion (20d) protruding from an outer surface of the front mounting base (20), and a surface of the protruding portion (20d) is an arcuate surface using an axis of the front mounting base (20) as a central axis, allowing the receiving recess (20b) to form on the surface of the protruding portion (20d).
5. The spray gun of claim 1, **characterized in that** a cross section of the pin portion (80a) is kidney-shaped such that support surfaces are formed on two sides of the pin portion (80a), and the support surfaces of the pin portion (80a) are in surface contact with the pinholes (20c) and the circumferential groove (50b).
6. The spray gun of claim 1, **characterized in that:** the rear mounting base (50) further has a limiting flange (50c), and a rear end of the front mounting base has a positioning annular surface (20e); the front mounting base (20) and the rear mounting base (50) are connected such that the pinholes (20c) are aligned with the circumferential groove (50b) as soon as the positioning annular surface (20e) abuts against the limiting flange (50c).
7. The spray gun of claim 1, further comprising:
 - a plurality of nozzles disposed in the receiving cavities (20a), respectively;
 - a switch turntable (30) having a plurality of water holes (30a) aligned with the receiving cavities (20a), respectively, with the switch turntable (30) rotatably connected to the front mounting base (20) relative to the rear mounting base (50); and

a nozzle base (70) for fixing one of the nozzles to the switch turntable (30).

8. The spray gun of claim 7, **characterized in that** the nozzles comprises a high-pressure nozzle (60), a lotus nozzle (90) and a low-pressure liquid sucking nozzle, with the lotus nozzle (90) connected to the switch turntable (30) through the nozzle base (70). 5
9. The spray gun of claim 1, further comprising: 10
a front casing (10) having a front end surface on which a plurality of through holes (10a) is formed, with the front casing (10) connected to the front mounting base (20) to form a package thereof, wherein the through holes (10a) are aligned with front end openings of the receiving cavities (20a), respectively; and 15
a rear casing (40) connected to the rear mounting base (50). 20
10. The spray gun of claim 1, **characterized in that** the pin component (80) and the pinholes (20c) have a tight fit, whereas the pin component (80) and the circumferential groove (50b) have a clearance fit. 25
11. A washing apparatus, comprising:
a body having a water supply system;
a water pipe connected to the water supply system; and
a spray gun connected to the water supply system through the water pipe;
characterized in that: the spray gun is the spray gun of any one of claims 1-9; the rear mounting base (50) has a rear end connected to an outlet end of the water pipe to form a water flow channel. 30
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Patentansprüche

1. Sprühpistole, welche umfasst:

eine vordere Befestigungsbasis (20) mit mehreren Aufnahmeausparungen (20a), die sich in Axialrichtung der vorderen Befestigungsbasis (20) erstrecken;
eine hintere Befestigungsbasis (50) mit einem exzentrischen Strömungskanal (50a), der sich in Axialrichtung der hinteren Befestigungsbasis (50) erstreckt, worin die vordere Befestigungsbasis (20) mit der hinteren Befestigungsbasis (50) drehbar verbunden ist; und
eine Stiftkomponente (80), worin die vordere Befestigungsbasis (20) und die hintere Befestigungsbasis (50) axial am Ort befestigt sind;
dadurch gekennzeichnet, dass: die vordere 45
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Befestigungsbasis (20) mindestens drei Stiftlöcher (20c) aufweist, die hintere Befestigungsbasis (50) mindestens eine sich in eine Umfangsrichtung der hinteren Befestigungsbasis (50) erstreckende Umfangsrille (50b) aufweist, die Stiftkomponente (80) mindestens drei in die Stiftlöcher (20c) und die Umfangsrille (50b) entsprechend eingesetzte Stiftbereiche (80a) aufweist, um der Umfangsrille (50b) eine axiale Unterstützung seitlich bereitzustellen, die vordere Befestigungsbasis (20) und die hintere Befestigungsbasis (50) am Ort befestigt und durch die Stiftbereiche (80a) unterstützt sind; und durch den Kontakt zwischen der Umfangsrille (50b) und den Stiftbereichen (80a) ausgebildete axiale Unterstützungspunkte an mindestens drei verschiedenen Position in der Umfangsrichtung der Umfangsrille (50b) entsprechend angeordnet sind.

2. Sprühpistole nach Anspruch 1, **dadurch gekennzeichnet, dass** die Stiftkomponente mindestens eins von einem gerade geformten Stift mit einem der Stiftbereiche (80a), einem U-förmigen Stift mit zwei der Stiftbereiche (80a) gleicher Länge, und einem hakenförmigen Stift mit zwei der Stiftbereiche (80a) unterschiedlicher Länge umfasst.
3. Sprühpistole nach Anspruch 2, **dadurch gekennzeichnet, dass:** zwei der Stiftbereiche (80a) des U-förmigen Stiftes durch einen bogenförmigen Verbindungsbereich (80b) mit zwei der Stiftbereiche (80a) des hakenförmigen Stiftes verbunden sind; die vordere Befestigungsbasis eine Aufnahmevertiefung (20b) zum Aufnehmen der Verbindungsbereiche (80b) aufweist; zwei Enden der Aufnahmevertiefung (20b) mit äußeren Enden der zwei Stiftlöcher (20c) zum Befestigen des gleichen U-förmigen Stiftes oder des hakenförmigen Stiftes am Ort entsprechend in Verbindung stehen; und nachdem der U-förmige Stift oder der hakenförmige Stift eingesetzt wurde, der Verbindungsbereich (80b) in der Aufnahmevertiefung (20b) eingelassen ist.
4. Sprühpistole nach Anspruch 3, **dadurch gekennzeichnet, dass** die vordere Befestigungsbasis (20) einen vorstehenden Bereich (20d) aufweist, der von einer äußeren Oberfläche der vorderen Befestigungsbasis (20) hervorsteht, und eine Oberfläche des vorstehenden Bereiches (20d) eine bogenförmige Oberfläche ist, die eine Achse der vorderen Befestigungsbasis (20) als eine zentrale Achse verwendet, wodurch die Aufnahmevertiefung (20b) auf der Oberfläche des vorstehenden Bereiches (20d) ausgebildet werden kann.
5. Sprühpistole nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Querschnitt des Stiftbereiches

(80a) nierenförmig ist, so dass Unterstützungsoberflächen auf zwei Seiten des Stiftbereiches (80a) ausgebildet werden, und die Unterstützungsoberflächen des Stiftbereiches (80a) mit den Stiftlöchern (20c) und der Umfangsrille (50b) in Oberflächenkontakt stehen.

6. Sprühpistole nach Anspruch 1, **dadurch gekennzeichnet, dass:** die hintere Befestigungsbasis (50) weiter einen beschränkenden Flansch (50c) aufweist, und ein Hinterende der vorderen Befestigungsbasis eine ringförmige Anordnungsoberfläche (20e) aufweist; worin die vordere Befestigungsbasis (20) und die hintere Befestigungsbasis (50) derart verbunden sind, dass die Stiftlöcher (20c) an der Umfangsrille (50b) ausgerichtet sind, sobald die ringförmige Anordnungsoberfläche (20e) gegen den beschränkenden Flansch (50c) anstößt.

7. Sprühpistole nach Anspruch 1, welche weiter umfasst:

mehrere Düsen, die in den Aufnahmeaussparungen (20a) entsprechend angeordnet sind; eine Umschaltdrehscheibe (30) mit mehreren an den Aufnahmeaussparungen (20a) entsprechend ausgerichteten Wasserlöchern (30a), worin die Umschaltdrehscheibe (30) mit der vorderen Befestigungsbasis (20) relativ zu der hinteren Befestigungsbasis (50) drehbar verbunden ist; und eine Düsenbasis (70) zum Befestigen einer der Düsen an der Umschaltdrehscheibe (30).

8. Sprühpistole nach Anspruch 7, **dadurch gekennzeichnet, dass** die Düsen eine Hochdruck-Düse (60), eine Lotus-Düse (90) und eine flüssigkeitssaugende Niederdruck-Düse umfassen, worin die Lotus-Düse (90) durch die Düsenbasis (70) mit der Umschaltdrehscheibe (30) verbunden ist.

9. Sprühpistole nach Anspruch 1, welche weiter umfasst:

ein Vordergehäuse (10) mit einer Vorderendoberfläche auf der mehrere Durchgangslöcher (10a) ausgebildet sind, worin das Vordergehäuse (10) mit der vorderen Befestigungsbasis (20) verbunden ist, um eine Einheit damit auszubilden, worin die Durchgangslöcher (10a) an den Vorderendöffnungen der Aufnahmeaussparungen (20a) entsprechend ausgerichtet sind; und ein Hintergehäuse (40), das mit der hinteren Befestigungsbasis (50) verbunden ist.

10. Sprühpistole nach Anspruch 1, **dadurch gekennzeichnet, dass** die Stiftkomponente (80) und die Stiftlöcher (20c) eine enge Passung aufweisen, wo-

hingegen die Stiftkomponente (80) und die Umfangsrille (50b) eine Spielpassung aufweisen.

11. Reinigungsvorrichtung, welche umfasst:

einen Körper mit einem Wasserversorgungssystem; eine Wasserleitung, die mit dem Wasserversorgungssystem verbunden ist; und eine Sprühpistole, die durch die Wasserleitung mit dem Wasserversorgungssystem verbunden ist; **dadurch gekennzeichnet, dass:** die Sprühpistole die Sprühpistole nach einem der Ansprüche 1-9 ist; die hintere Befestigungsbasis (50) ein mit einem Auslassende der Wasserleitung verbundenes Hinterende aufweist, um einen Wasserströmungskanal auszubilden.

Revendications

1. Pistolet de pulvérisation comprenant :

une base de montage avant (20) présentant une pluralité de cavités de réception (20a) s'étendant dans la direction axiale de la base de montage avant (20) ;

une base de montage arrière (50) présentant un conduit d'écoulement excentrique (50a) s'étendant dans la direction axiale de la base de montage arrière (50), la base de montage avant (20) étant reliée de façon rotative à la base de montage arrière (50) ; et

un élément de broche (80) qui permet de fixer axialement en place la base de montage avant (20) et la base de montage arrière (50) ;

caractérisé en ce que: la base de montage avant (20) présente au moins trois trous d'épingle (20c), la base de montage arrière (50) présente au moins une rainure circonférentielle (50b) s'étendant dans la direction circonférentielle de la base de montage arrière (50), l'élément de broche (80) présente au moins trois parties de broche (80a) introduites respectivement dans les trous d'épingle (20c) et la rainure circonférentielle (50b) pour fournir latéralement un support axial à la rainure circonférentielle (50b) ; la base de montage avant (20) et la base de montage arrière (50) sont fixées axialement en place et supportées par les parties de broche (80a) ; et des points de support axial formés suite à un contact entre la rainure circonférentielle (50b) et les parties de broche (80a) sont situés respectivement en au moins trois positions différentes dans la direction circonférentielle de la rainure circonférentielle (50b).

2. Pistolet de pulvérisation selon la revendication 1, **caractérisé en ce que** l'élément de broche comprend au moins l'une d'une broche de forme linéaire avec une dite partie de broche (80a), une broche en forme de U avec deux dites parties de broche (80a) de longueur égale et une broche en forme de crochet avec deux dites parties de broche (80a) de longueur inégale. 5

3. Pistolet de pulvérisation selon la revendication 2, **caractérisé en ce que**: deux dites parties de broche (80a) de la broche en forme de U sont reliées à deux dites parties de broche (80a) de la broche en forme de crochet par une partie de liaison arquée (80b) ; la base de montage avant comporte un évidement de réception (20b) destiné à recevoir la partie de liaison (80b) ; deux extrémités de l'évidement de réception (20b) sont en communication avec les extrémités externes de deux trous d'épingle (20c) pour le montage en place respectivement de la même broche en forme de U ou de la broche en forme de crochet ; après l'introduction de la broche en forme de U ou de la broche en forme de crochet, la partie de liaison (80b) est incorporée dans l'évidement de réception (20b). 10 15 20 25

4. Pistolet de pulvérisation selon la revendication 3, **caractérisé en ce que** la base de montage avant (20) présente une partie en saillie (20d) faisant saillie à partir d'une surface externe de la base de montage avant (20) et une surface de la partie en saillie (20d) est une surface arquée utilisant un axe de la base de montage avant (20) en tant qu'axe central, permettant la formation de l'évidement de réception (20b) sur la surface de la partie en saillie (20d). 30 35

5. Pistolet de pulvérisation selon la revendication 1, **caractérisé en ce qu'une** section transversale de la partie de broche (80a) est en forme de rein de telle sorte que des surfaces de support sont formées sur deux côtés de la partie de broche (80a) et les surfaces de support de la partie de broche (80a) sont en contact superficiel avec les trous d'épingle (20c) et la rainure circonférentielle (50b). 40 45

6. Pistolet de pulvérisation selon la revendication 1, **caractérisé en ce que**: la base de montage arrière (50) présente en outre une bride de limitation (50c) et une extrémité arrière de la base de montage avant présente une surface annulaire de positionnement (20e) ; la base de montage avant (20) et la base de montage arrière (50) sont reliées de telle sorte que les trous d'épingle (20c) sont alignés sur la rainure circonférentielle (50b) dès que la surface annulaire de positionnement (20e) vient en butée contre la bride de limitation (50c). 50 55

7. Pistolet de pulvérisation selon la revendication 1,

comprenant en outre :

une pluralité de buses disposées respectivement dans les cavités de réception (20a) ;
 une plaque tournante de commutation (30) présentant une pluralité de trous d'eau (30a) alignés respectivement sur les cavités de réception (20a), la plaque tournante de commutation (30) étant reliée de manière rotative à la base de montage avant (20) par rapport à la base de montage arrière (50); et
 une base de buse (70) destinée à fixer l'une des buses à la plaque tournante de commutation (30).

8. Pistolet de pulvérisation selon la revendication 7, **caractérisé en ce que** les buses comprennent une buse haute pression (60), une buse en lotus (90) et une buse d'aspiration de liquide basse pression, la buse en lotus (90) étant reliée à la plaque tournante de commutation (30) via la base de buse (70).

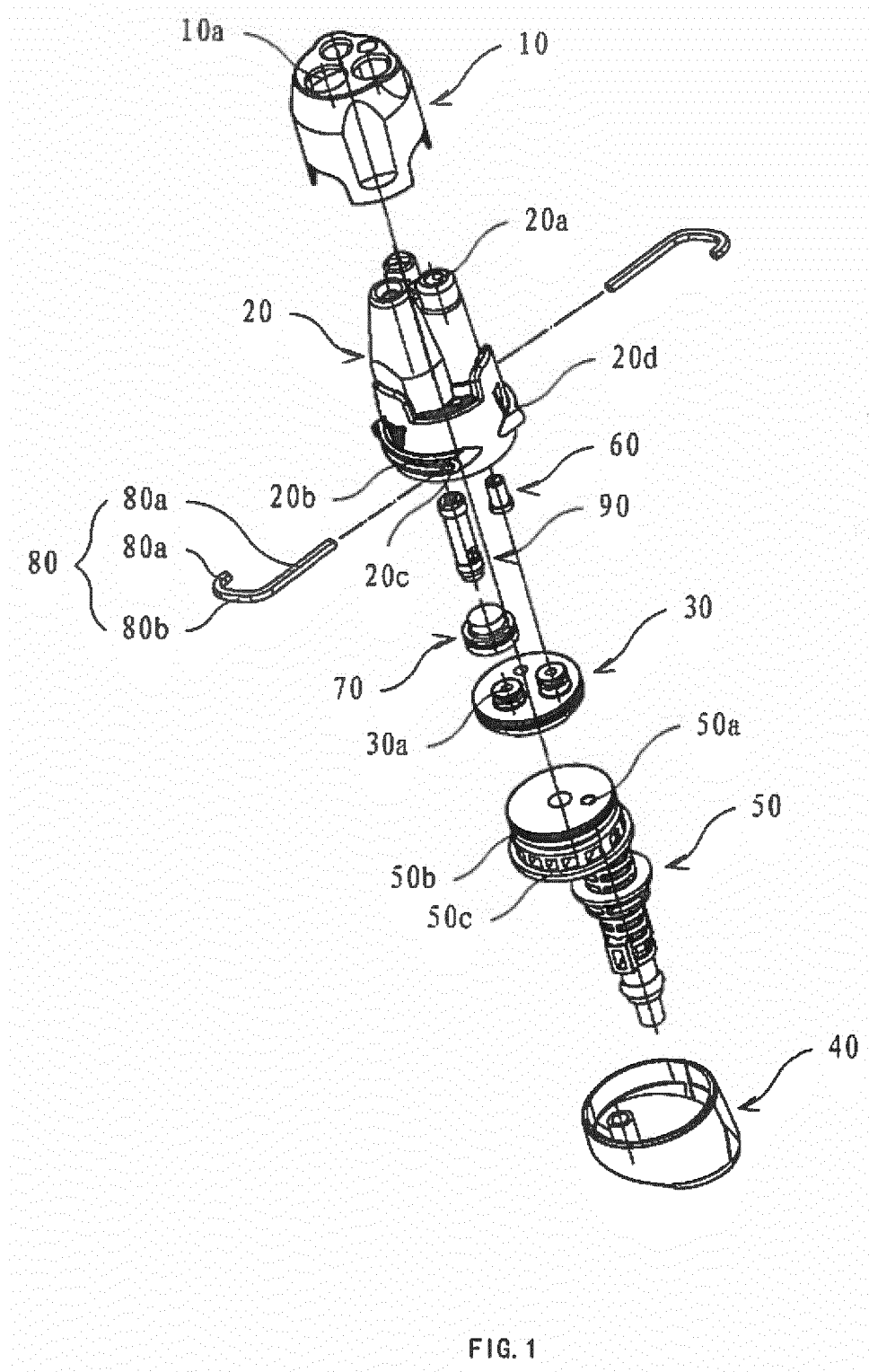
9. Pistolet de pulvérisation selon la revendication 1, comprenant en outre :

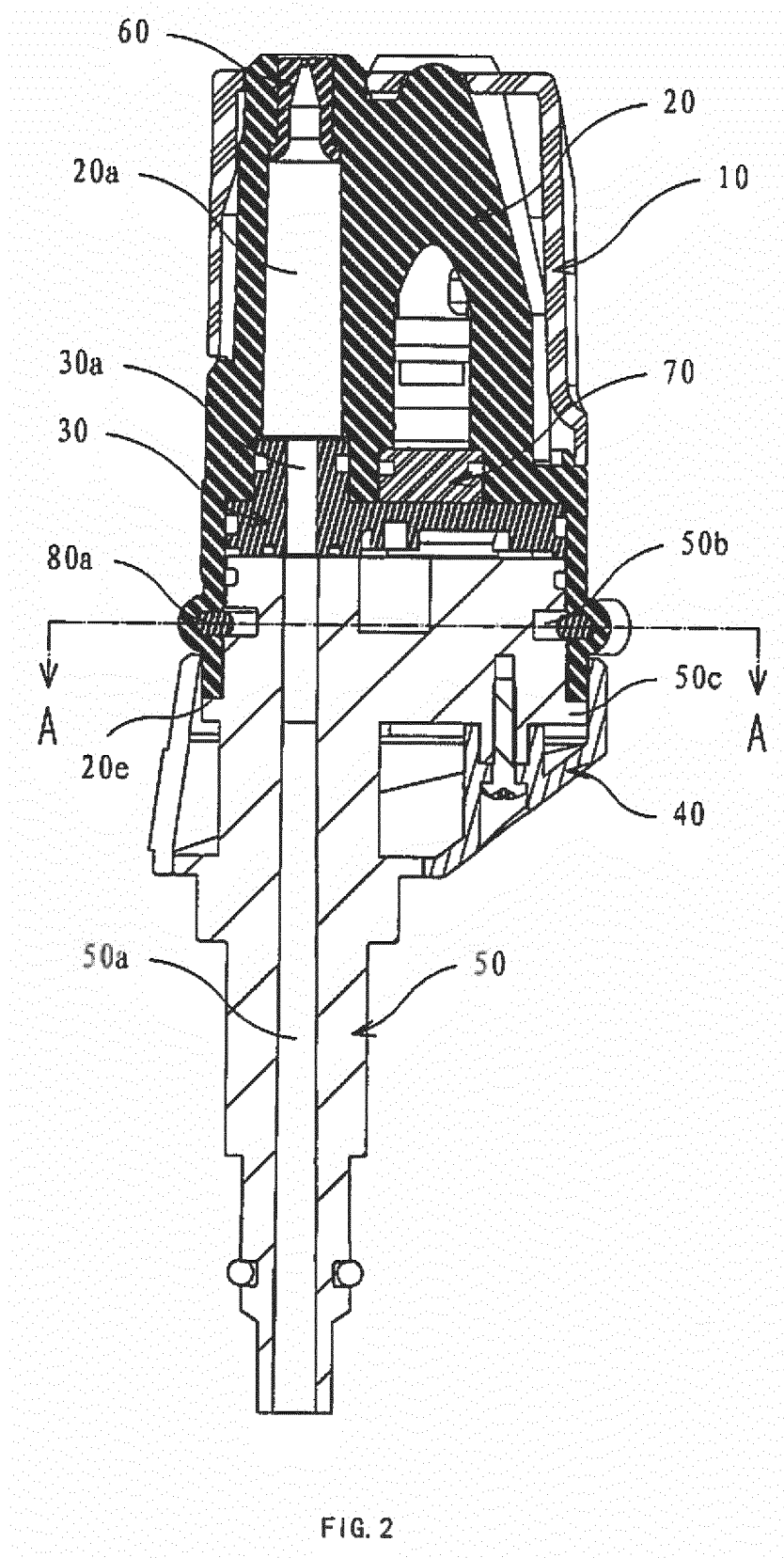
un carter avant (10) présentant une surface d'extrémité avant sur laquelle une pluralité de trous traversants (10a) est formé, le carter avant (10) étant relié à la base de montage avant (20) pour former un emballage de celui-ci, les trous traversants (10a) étant alignés respectivement sur les ouvertures d'extrémité avant des cavités de réception (20a) ; et
 un carter arrière (40) relié à la base de montage arrière (50).

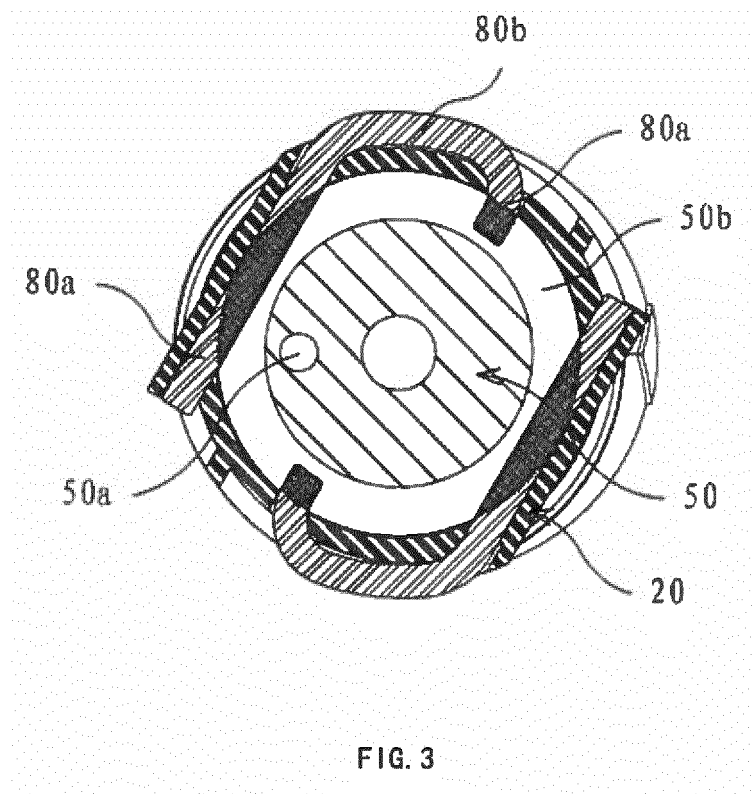
10. Pistolet de pulvérisation selon la revendication 1, **caractérisé en ce que** l'élément de broche (80) et les trous d'épingle (20c) ont un ajustement serré, tandis que l'élément de broche (80) et la rainure circonférentielle (50b) ont un ajustement avec jeu.

11. Appareil de lavage comprenant :

un corps présentant un système d'alimentation en eau ;
 un tuyau d'eau relié au système d'alimentation en eau; et
 un pistolet de pulvérisation relié au système d'alimentation en eau via le tuyau d'eau ;
caractérisé en ce que: le pistolet de pulvérisation est le pistolet de pulvérisation selon l'une quelconque des revendications 1 à 9; la base de montage arrière (50) présente une extrémité arrière reliée à une extrémité de sortie du tuyau d'eau pour former un canal d'écoulement d'eau.







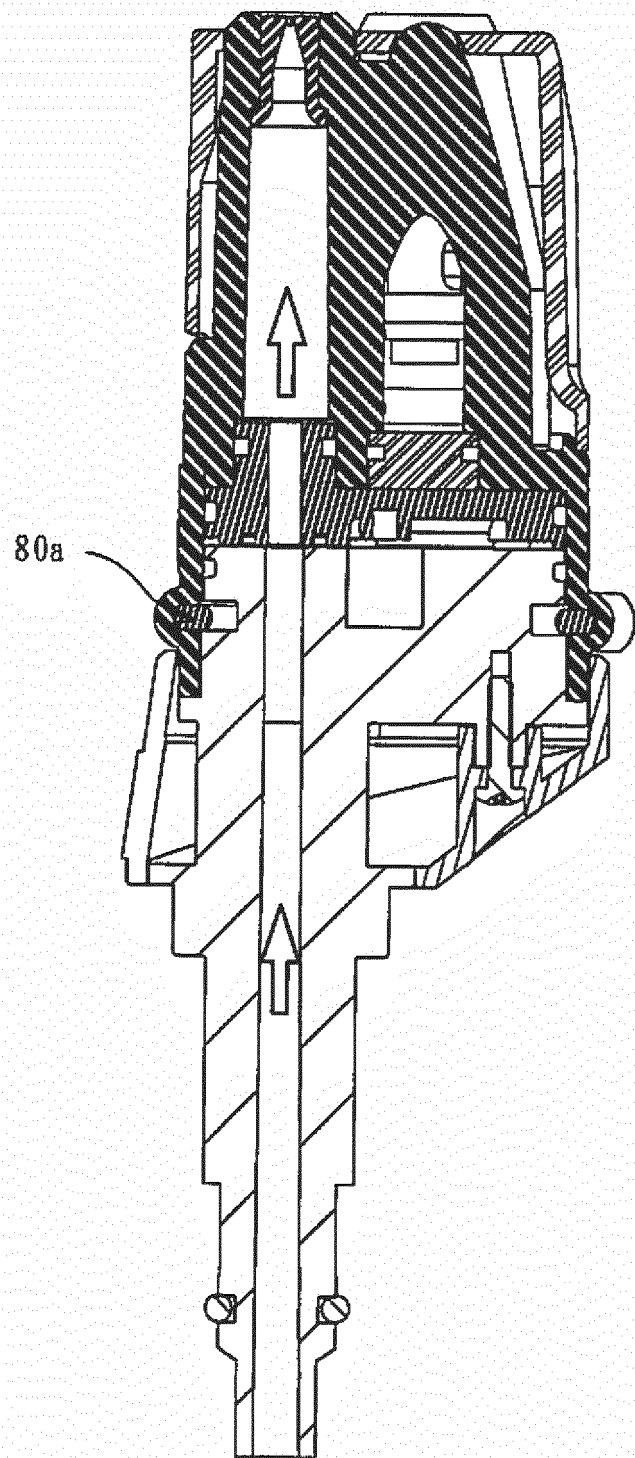
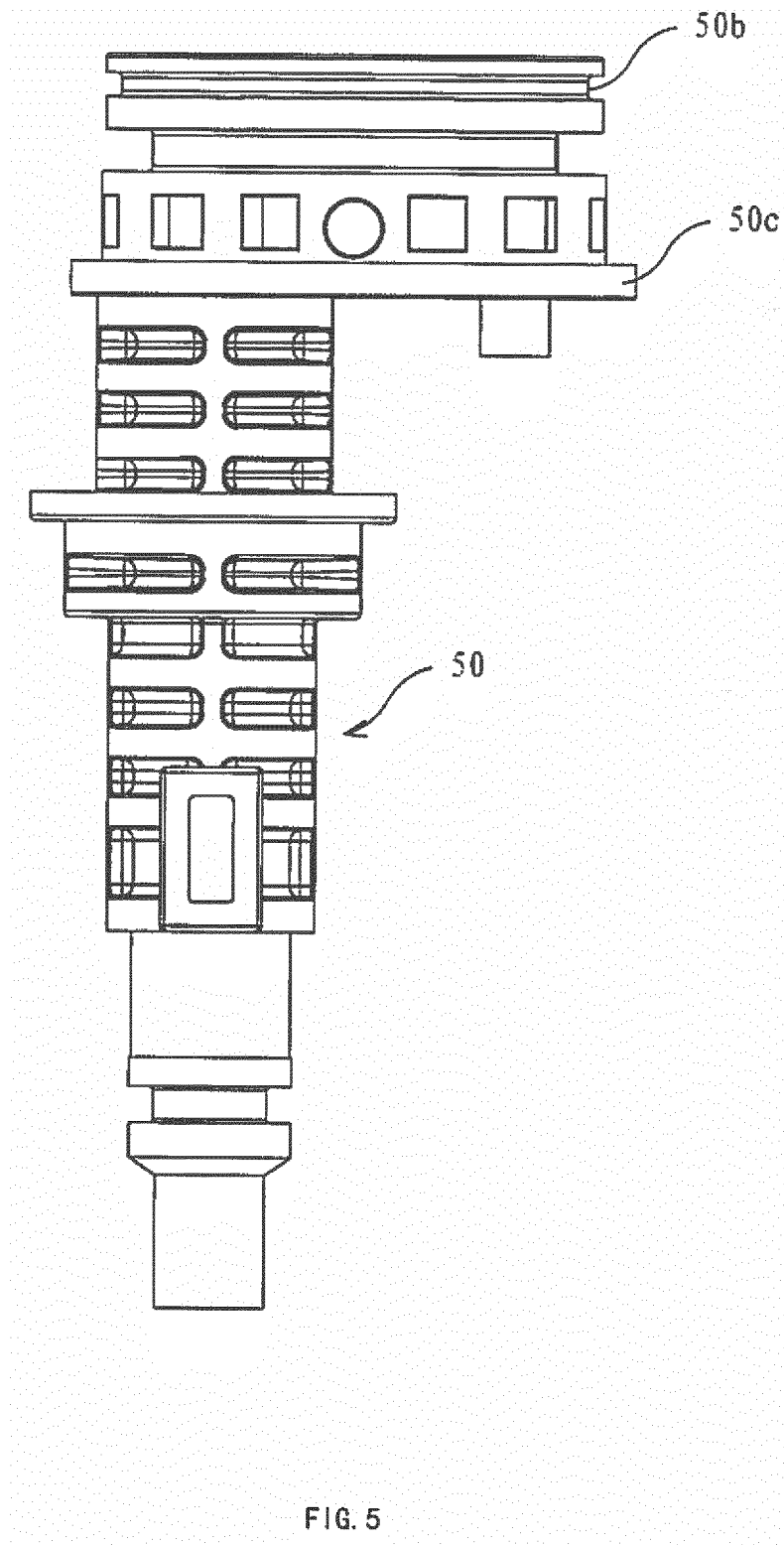
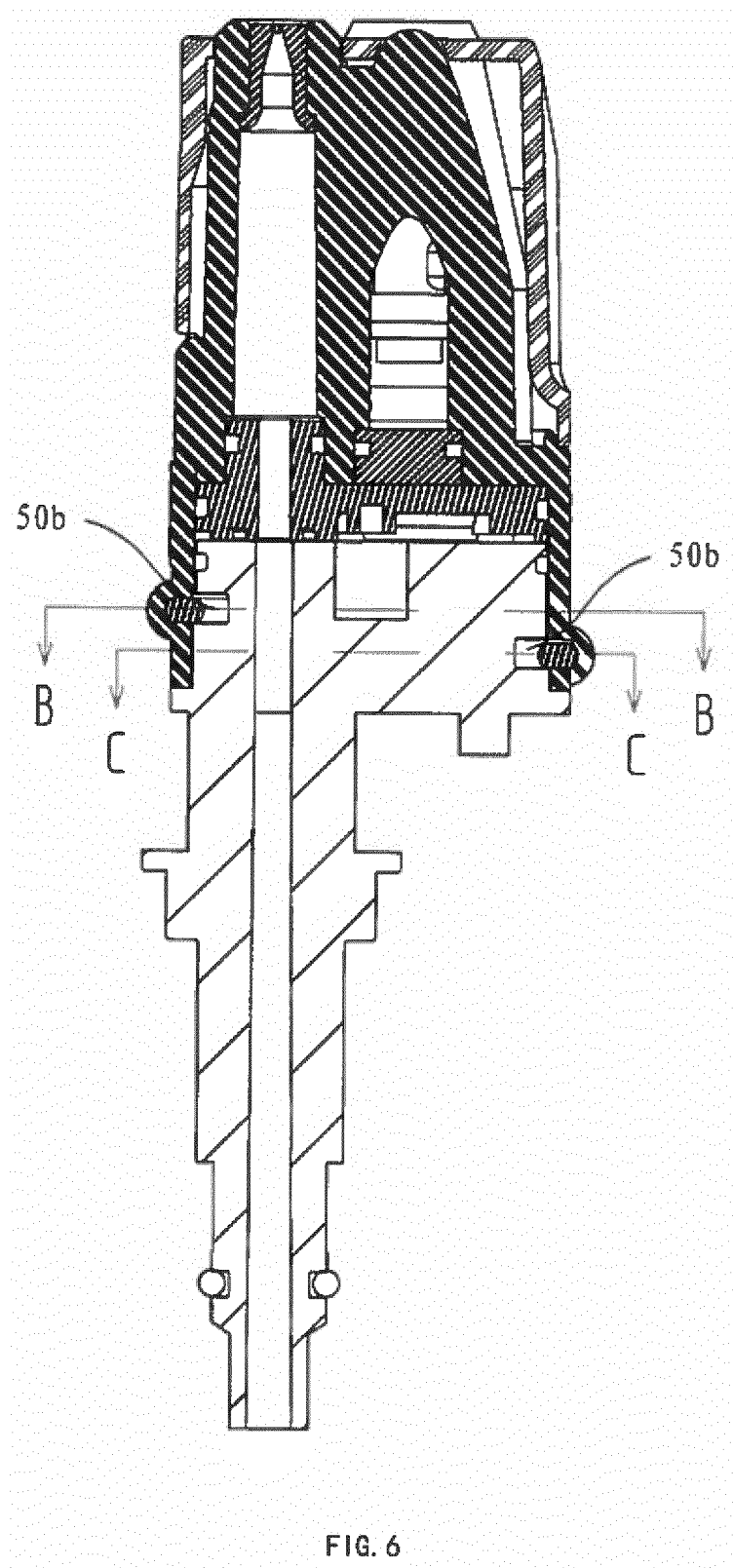


FIG. 4





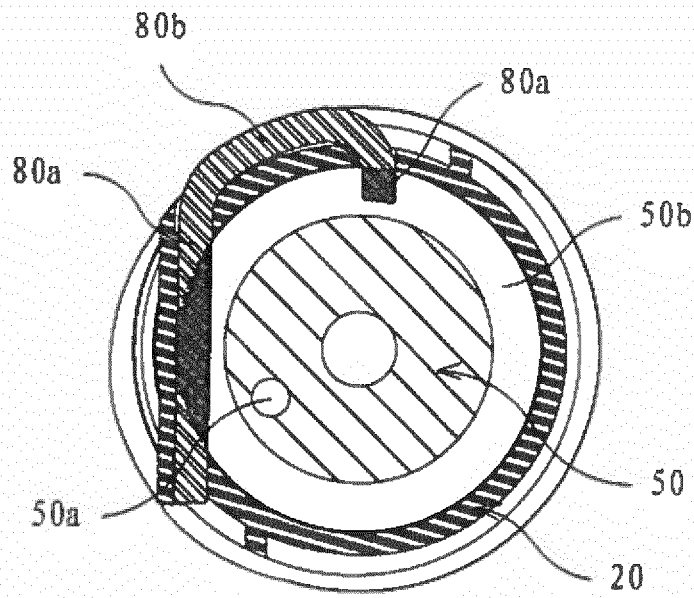


FIG. 7

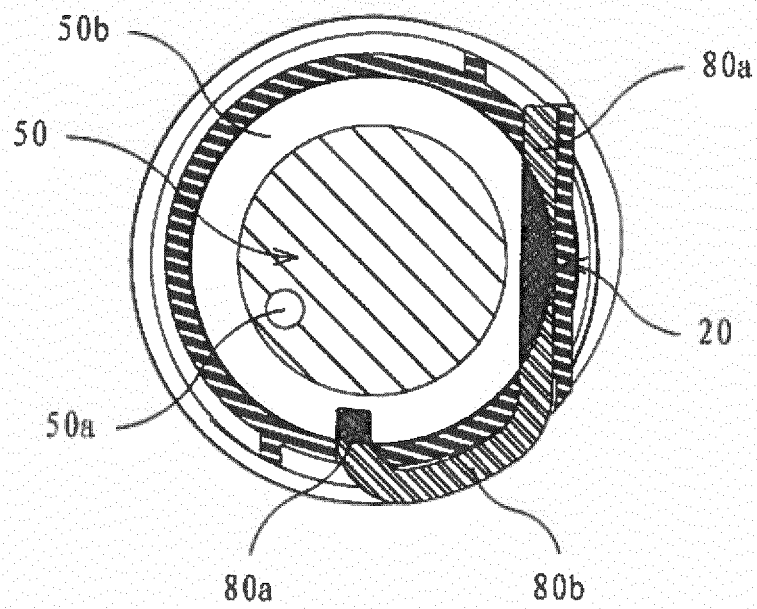


FIG. 8

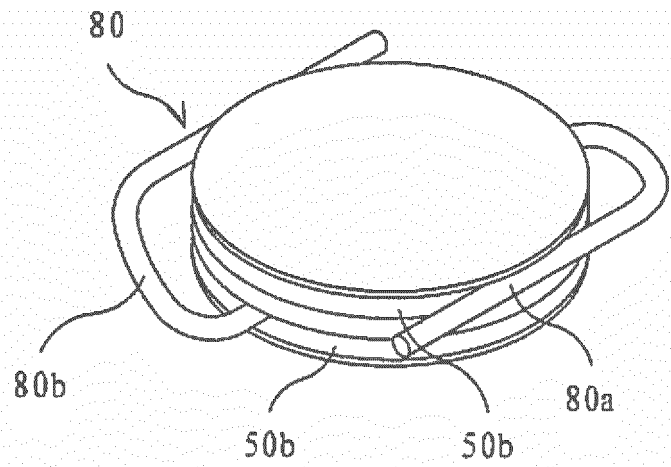


FIG. 9

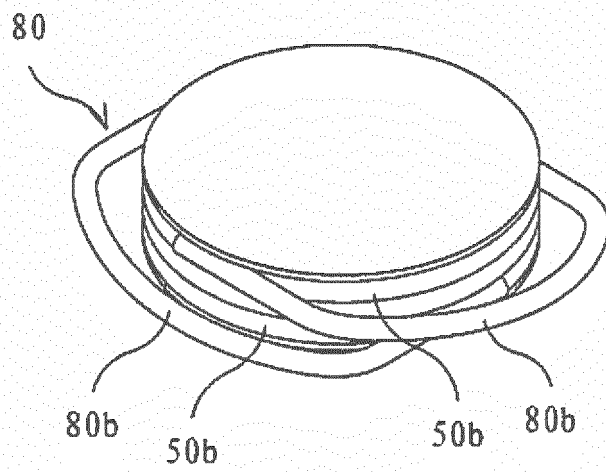
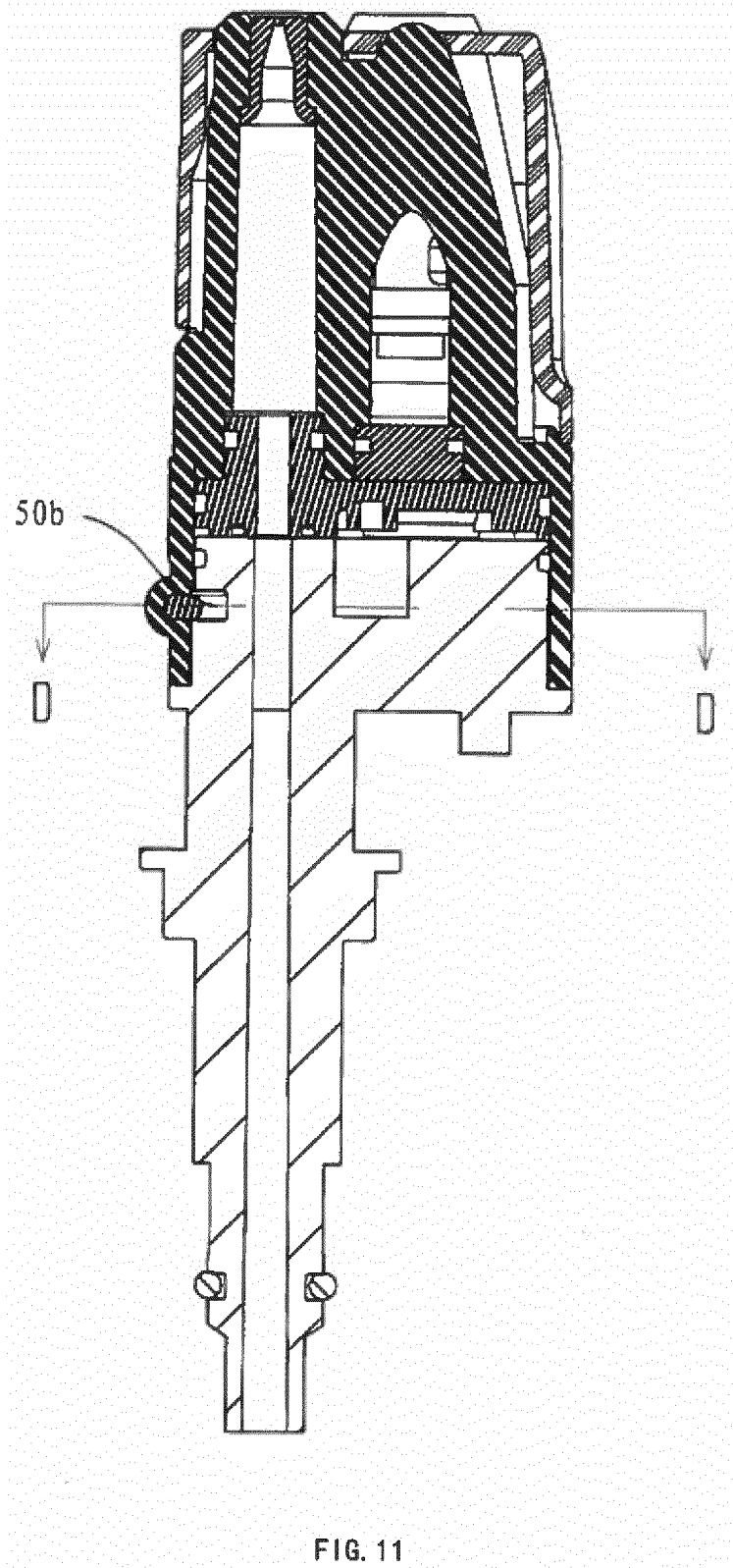


FIG. 10



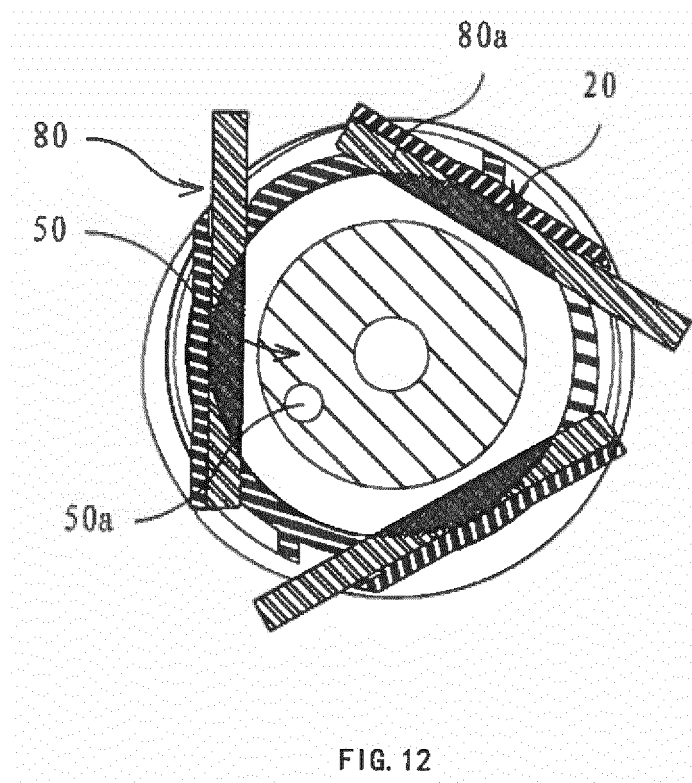


FIG. 12

REFERENCES CITED IN THE DESCRIPTION

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