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(54) **PRIVATE PART WASHING NOZZLE**

WASCHDÜSE FÜR BIDET

BUSE DE LAVAGE POUR BIDET

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EP 3 138 972 B1

Description

TECHNICAL FIELD

[0001] This disclosure generally relates to a private part washing nozzle according to the preamble of claim 1 used for a human body private part washing apparatus.

BACKGROUND DISCUSSION

[0002] A known private part washing nozzle described in JP 2007 239245 A (which will be hereinafter referred to as Patent reference 1) includes a nozzle head which is attachable to and removable from a nozzle main body. The nozzle head is attached to and removable from the nozzle main body by rotating the nozzle head. A generic private part washing nozzle according to the preamble of claim 1 is shown in US 2011/203044 A1.

[0003] A need thus exists for a private part washing nozzle which is downsized and includes a nozzle head that is attachable and removable by rotation.

SUMMARY

[0004] This objective is achieved by a private part washing nozzle having the features of claim 1. Further advantageous developments of the present invention are set out in the dependent claims.

[0005] According to the present invention, a private part washing nozzle includes a nozzle head including a plurality of types of spray ports each spraying washing water, a head support body including a plurality of flow passages delivering the washing water to the respective plurality of types of spray ports, the head support body including a connection portion provided at a distal end side of the head support body, the connection portion being connected to the nozzle head, and the connection portion being provided at a position in such a manner that the connection portion is eccentric relative to a central axis of the nozzle head.

[0006] According to the above-described configuration, the connection portion is provided at the position in such a manner that the connection portion is eccentric relative to the central axis of the nozzle head, and thus elements necessary to the private part washing nozzle can be arranged at a first side relative to a central axis of the connection portion. That is, a portion at a second side relative to the central axis of the connection portion can be made smaller, and accordingly the nozzle can be downsized.

[0007] Preferably, the connection portion is a single connection portion.

[0008] According to the above-described configuration, the nozzle head can be attached to and removed from the head support body by rotating the nozzle head relative to the head support body.

[0009] Preferably, one of the plurality of flow passages provided at the head support body and delivering the washing water to the respective plurality of types of spray ports includes a linear configuration of which a central axis is coaxial to a central axis of the connection portion.

[0010] According to the above-described configuration, from among the plural flow passages formed at the head support body, any one of the flow passage includes the linear configuration of which the central axis is coaxial to the central axis of the connection portion. Accordingly, pressure loss is restricted from occurring at the flow passage. In addition, it can be restricted that an area or region which is occupied by the flow passage and the connection portion increases in the width direction, thereby leading to the reduction in size of the nozzle.

[0011] Preferably, the flow passage formed in the linear configuration including the central axis that is coaxial to the eccentric axis of the connection portion corresponds to the flow passage delivering the washing water to the spray port at which pressure of the washing water sprayed therefrom is the highest.

[0012] According to the above-described configuration, the pressure loss is restricted from occurring at the flow passage that requires washing pressure the most.

[0013] According to the present invention, the connection portion includes a multilayer pipe structure in which a plurality of pipe portions are arranged to overlap with each other in a radial direction, and a space portion formed inside the pipe portion arranged most inwardly in the radial direction corresponds to a part of the flow passage delivering the washing water to one of the plurality of types of spray ports, and a space portion formed between the plurality of pipe portions corresponds to a part of the flow passage delivering the washing water to another of the plurality of types of spray ports.

[0014] According to the above-described configuration, the connection portion includes the multilayer pipe structure, and accordingly the space portion inside the pipe portion which is arranged most inwardly in the radial direction forms part of the flow passage delivering the washing water to one of the plurality of types of spray ports, and the space portion formed between the plural pipe portions forms part of the flow passage delivering the washing water to another of the plural types of spray ports. That is, the plural flow passages are established by the one connection portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The foregoing and additional features and characteristics of this disclosure will become more apparent from the following detailed description considered with the reference to the accompanying drawings, wherein:

Fig. 1 is a view for schematically explaining a human body private part washing apparatus in which a private part washing nozzle according to an embodiment disclosed here is applied;

Fig. 2 is a perspective view of an external appearance of the private part washing nozzle according to

the embodiment;

Fig. 3A is a lateral view of the private part washing nozzle;

Fig. 3B is a cross-sectional view taken along line IIIB-IIIB in Fig. 3A;

Fig. 3C is a view illustrating a state in which a nozzle head is removed from a head support body illustrated in Fig. 3B;

Fig. 4A is a plan view of the private part washing nozzle;

Fig. 4B is a cross-sectional view taken along line IVB-IVB in Fig. 4A;

Fig. 4C is a view illustrating a state in which the nozzle head is removed from the head support body illustrated in Fig. 4B;

Fig. 5 is a view illustrating a structure in which a cover is provided, the cover which covers part of the head support body and/or part of a hose;

Fig. 6A is a view schematically illustrating a positional relationship among the respective portions in a hypothetical example in which a central axis of a nozzle head and a central axis of a connection portion match with each other; and

Fig. 6B is a view schematically illustrating flows in a first flow passage and a second flow passage in a hypothetical example in which a central axis of a nozzle head and a central axis of a connection portion match with each other, and a first port portion and a second port portion are set to be apart from the central axis by an equal distance.

DETAILED DESCRIPTION

[0016] A private part washing nozzle 1 according to an embodiment of this disclosure will be explained with reference to the drawings. In the explanation, a front and rear direction is a direction (an X direction illustrated in the drawings) along a long-side direction of the private part washing nozzle 1, and a side of a user using the private part washing nozzle 1 corresponds to a front side. An upper and lower direction is a direction (a Z direction illustrated in the drawings) that is orthogonal to the front and rear direction, and a side at which washing water is sprayed or discharged corresponds to an upper side. A width direction is a direction (a Y direction illustrated in the drawings) that is orthogonal to the front and rear direction and the upper and lower direction.

[0017] The private part washing nozzle 1 according to the present embodiment is applied to a human body private part washing apparatus 90. As illustrated in Fig. 1, the human body private part washing apparatus 90 is arranged inside an accommodation space portion 92 provided at a rear portion of a toilet seat 91, for example. The private part washing nozzle 1 moves back and forth, that is, moves to advance and retract, in a substantially front and rear direction. A structure for causing the private part washing nozzle 1 to advance and retract may be any structure. A structure may be used in which the private part washing nozzle 1 is moved to advance and retract by an electrical drive source including a motor. A structure may be used in which the private part washing nozzle 1 is caused to advance with the use of water pressure of water for washing and is caused to retract by a biasing member including a spring. A structure of the human body private part washing apparatus 90 other than the private part washing nozzle 1, for example, the structure of the drive mechanism of the nozzle, may be any kind and form (a similar structure to a publicly known structure may be used). Therefore, explanation thereof is omitted.

[0018] The private part washing nozzle 1 illustrated in Figs. 2 to 4C according to the present embodiment includes a nozzle head 10 (i.e., a nozzle head) and a head support body 20 (i.e., a head support body). The nozzle head 10 forms a distal end portion of the private part washing nozzle 1, and an spray port from which washing water is sprayed is provided at the nozzle head 10. The nozzle head 10 of the present embodiment is provided with plural types of spray ports. The plural types of spray ports are provided to correspond to respective modes of washing in a case where the private part washing nozzle 1 is applied to the human body private part washing apparatus 90. A hole constituting each of the plural types of spray ports does not need to be one. Plural holes may form one type of spray port.

[0019] The nozzle head 10 of the present embodiment is provided with two types of spray ports (that is, a first spray port 11 and a second spray port 12) (refer to Figs. 2 and 4A to 4C). The first spray port 11 and the second spray port 12 serve as spray ports of this disclosure. The first spray port 11 is for performing washing with a relatively high washing pressure (a powerful washing) and the second spray port 12 is for performing washing with a relatively low washing pressure (a mild washing). That is, a flow speed of the washing water sprayed from the first spray port 11 is larger than a flow speed of the washing water sprayed from the second spray port 12. For example, in a case where water pressures for delivering or transmitting the washing water to the respective spray ports are substantially same as each other, the pressure of the washing water sprayed from the first spray port 11 becomes higher than the pressure of the washing water sprayed from the second spray port 12 by setting a size (a cross-sectional area) of the smallest portion in the first spray port 11 to be smaller than a size (a cross-sectional area) of the smallest portion in the second spray port 12. In a case where the spray port is constituted by plural holes, the size of the spray port corresponds to total of sizes (cross-sectional areas) of the smallest portions of the respective plural holes.

[0020] As illustrated in the cross-sectional views of Figs. 3A to 4C, a first space portion 13 connected to the first spray port 11 and a second space portion 14 connected to the second spray port 12 are formed inside the nozzle head 10. The first space portion 13 is positioned at a front side (a distal end side) relative to the second space portion 14. The first space portion 13 and the sec-

ond space portion 14 are defined by a connection portion 21 (i.e., a connection portion) of the head support body 20. A fitting portion 15 including a cylindrical configuration is formed at a center of a wall defining or separating the first space portion 13 and the second space portion 14. The connection portion 21 engages with the fitting portion 15 (the connection portion 21 will be described below in detail). The washing water that has flowed into the first space portion 13 is sprayed or spouts from the first spray port 11 and the washing water that has flowed into the second space portion 14 is sprayed or spouts from the second spray port 12.

[0021] The head support body 20 is connected to a rear side of the nozzle head 10. The head support body 20 constitutes flow passages through which the washing water flows and is delivered to the nozzle head 10. The head support body 20 includes the connection portion 21 projecting towards the distal end side. The connection portion 21 includes an external appearance of an axial shape having a circular cross section. The nozzle head 10 is connected to the connection portion 21. The head support body 20 of the present embodiment is provided with the one connection portion 21, that is, the single connection portion 21. A specific configuration of the connection portion 21 will be described hereunder.

[0022] The connection portion 21 of the present embodiment includes a multilayer pipe structure in which plural pipe portions are arranged to overlap with each other in a radial direction. The number of the plural pipe portions is identical to the number of types of the spray ports. That is, the connection portion 21 of the present embodiment includes a double layer pipe structure formed of the two pipe portions, that is, a first pipe portion 211 and a second pipe portion 212. The first pipe portion 211 and the second pipe portion 212 serve as pipe portions of this disclosure. The first pipe portion 211 includes a portion projecting towards a distal end side relative to a distal end side opening of the second pipe portion 212. In a state where the nozzle head 10 and the head support body 20 are connected to each other, the first pipe portion 211 has entered inside the fitting portion 15 of the nozzle head 10. Due to the above-described configuration, a wall of the first pipe portion 211 serves as a partition wall defining or separating between the second space portion 14. A space portion provided inside the first pipe portion 211 forms a part of a flow passage delivering the washing water to the first space portion 13 of the nozzle head 10 (refer to Figs. 3B and 4B).

[0023] On the other hand, in a state where the nozzle head 10 and the head support body 20 are connected to each other, a space portion between an outer surface of the first pipe portion 211 and an inner surface of the second pipe portion 212 is connected to the second space portion 14 of the nozzle head 10. That is, the space portion between the first pipe portion 211 and the second pipe portion 212 forms a part of a flow passage delivering the washing water to the second space portion 14 of the nozzle head 10 (refer to Figs. 3B and 4B). Because the first pipe portion 211 is in a state of having entered inside the fitting portion 15 of the nozzle head 10 as described above, the washing water is restricted, due to the above-described state, from flowing from one of the first space portion 13 (the first pipe portion 211) and the second space portion 14 (the second pipe portion 212) to the other. A seal member, including an O-ring, may be interposed between the outer surface of the first pipe portion 211 and an inner surface of the fitting portion 15.

[0024] The connection portion 21 includes a configuration for maintaining the engagement of the head support body 20 and the nozzle head 10 with each other. The configuration can be any kind and form. In the configuration according to the present embodiment, as the nozzle head 10 is rotated in one direction relative to the head support body 20, the nozzle head 10 comes off the head support body 20. As the nozzle head 10 is rotated in the other direction relative to the head support body 20, the nozzle head 10 is engaged with the head support body 20. That is, the configuration is formed in which the nozzle head 10 is attachable to and removable from the head support body 20 by rotating the nozzle head 10. Accordingly, the user can clean the nozzle head 10 easily by removing only the nozzle head 10 from the human body private part washing apparatus 90. Such a configuration for attaching and removing the nozzle head 10 by the rotation of the nozzle head 10 is publicly known as described in Patent reference 1, and a specific configuration may be in any type and form. Therefore, detailed explanation thereof is omitted. A seal member, including an O-ring, may be interposed between an outer surface of the second pipe portion 212 and a portion of the nozzle head 10 (an inner surface of the nozzle head 10) with which the second pipe portion 212 engage. The above-described configuration for attaching and removing the nozzle head 10 by the rotation is formed or established because the single connection portion, that is, the connection portion 21, is provided at the head support body 20.

[0025] The head support body 20 is provided with a port portion 22. A water supply hose delivering the washing water is connected to the port portion 22. The number of the port portion 22 is identical to the number of types of the spray ports. In the present embodiment, two of the port portions are provided, that is, a first port portion 221 and a second port portion 222. The first port portion 221 and the second port portion 222 are cylindrical portions extended towards the rear side. A first water supply hose 81 is configured to be connected to the first port portion 221 (refer to Fig. 2). The first water supply hose 81 delivers the wash water that is to be sprayed from the first spray port 11. That is, the first port portion 221 forms part of the flow passage through which the washing water is delivered or sent to the first spray port 11 (the first space portion 13). A second water supply hose 82 is configured to be connected to the second port portion 222 (refer to Fig. 2). The second water supply hose 82 delivers the wash water that is to be sprayed from the second spray

port 12. That is, the second port portion 222 forms part of the flow passage through which the washing water is delivered to the second spray port 12 (the second space portion 14). As illustrated in Fig. 5, for example, a cover 83 formed in a cylindrical shape, and covering the head support body 20 and/or part of distal end sides of the hoses may be provided to the human body private part washing apparatus 90 to which the private part washing nozzle 1 of the present embodiment is applied.

[0026] The first pipe portion 211 and the first port portion 221 both of which form the flow passage of the washing water that is to be sprayed from the first spray port 11 are set such that a central axis of the first pipe portion 211 and a central axis of the first port portion 221 coincide with or identical to each other (refer to Fig. 3B, for example). That is, the flow passage including the space portion inside the first port portion 221 and the space portion inside the first pipe proton 211 and leading to the first space portion 13 (the first spray port 11) (which will be hereinafter referred to also as a first flow passage 201) is linear or in a straight state (that is, a central axis is straight).

[0027] On the other hand, the flow passage of the washing water that is to be sprayed from the second spray port 12, that is, the flow passage leading to the second space portion 14 (which will be hereinafter referred to also as a second flow passage 202), includes a space portion formed inside the second port portion 222 and the space portion formed between the first pipe portion 211 and the second pipe portion 212. A central axis of the second port portion 222 differs from the central axis of the first pipe portion 211 and of the second pipe portion 212. That is, in order to connect the space portion inside the second port portion 222, and the space portion formed between the first pipe portion 211 and the second pipe portion 212 to each other, an intermediate portion of the flow passage needs to be bent or curved, that is, the flow passage needs to be partly bent or curved. In the present embodiment, the space portion of the second port portion 222, and the space portion between the first pipe portion 211 and the second pipe portion 212 are connected to each other by a junction space portion 23 provided at the head support body 20 (refer to Fig. 3B). As described above, in the present embodiment, one of the two flow passages for supplying the washing water, that is, the first flow passage 201, is linear. On the other hand, the other of the two flow passages for supplying the washing water, that is, the second flow passage 202, includes the bent and curved portion. A pressure loss occurring in the flow passage during the delivery of the washing water is larger in the second flow passage 202 than in the first flow passage 201. The first flow passage 201 and the second flow passage 202 serve as flow passages of this disclosure.

[0028] For example, a positional relationship of the respective portions of the private part washing nozzle 1 including the above configuration will be described below. The central axis of the connection portion 21 (the central axis of the first pipe portion 211 and the second pipe portion 212) is eccentric relative to a central axis L1 (i.e., a central axis) of the nozzle head 10 (the central axis of the connection portion 21 will be hereinafter referred to also as an eccentric axis L2). That is, the eccentric axis L2 serving as the central axis of the connection portion 21 and the central axis L1 of the nozzle head 10 do not coincide with each other (refer to Figs. 3B and 4A, for example). More specifically, the central axis L1 of the nozzle head 10 is set to be positioned at a plane bisecting the nozzle head 10 in the width direction (which is a plane that is away from both end portions in the width direction by an equal distance; the same applies hereinafter), and the central axis (the eccentric axis L2) of the connection portion 21 is set to be positioned at a first side of the plane in the width direction. As described above, the first flow passage 201 is formed to be linear, and the part of the first flow passage 201 includes the first pipe portion 211 and the first port portion 221, and therefore the central axis of the first flow passage 201 is in a state of being eccentric to the central axis L1 of the nozzle head 10 (the state in which the central axis of the first flow passage 201 coincides with the eccentric axis L2). In the present embodiment, the central axis L1 of the nozzle head 10 and a central axis of the head support body 20 coincide with each other or identical to each other. That is, the plane bisecting the nozzle head 10 in the width direction and a plane bisecting the head support body 20 in the width direction match with each other. Consequently, it can be said that the central axis of the connection portion 21 (the eccentric axis L2) is eccentric from the central axis L1 of the head support body 20.

[0029] On the other hand, in the present embodiment, a central axis of the second port portion 222 serving as part of second flow passage 202 is also positioned to be eccentric to the central axis L1 of the nozzle head 10 and of the head support body 20 (refer to Figs. 3B and 4A, for example). Specifically, the central axis of the connection portion 21 (the first flow passage 201) is positioned at the first side, in the width direction, of the plane bisecting the nozzle head 10 in the width direction. The central axis of the second port portion 222 is positioned at a second side, in the width direction, of the plane bisecting the nozzle head 10 in the width direction. That is, at the port portion 22, it is set in such a manner that the central axis of the first flow passage 201 and the central axis of the second flow passage 202 are positioned to be apart from each other, and the central axis L1 of the nozzle head 10 and of the head support body 20 is positioned between the central axis of the first flow passage 201 and the central axis of the second flow passage 202. Because the central axis of the first flow passage 201 and the central axis of the second flow passage 202, which are arranged to be separated from each other at the port portion 22, come to be identical to each other at the connection portion 21 (the eccentric axis L2), and therefore the second flow passage 202 includes a bent or curved configuration in an intermediate portion of the

second flow passage 202, accordingly.

[0030] Due to the above-described positional relationships between the portions, the following advantages can be obtained. Hypothetically speaking, as schematically illustrated in Fig. 6A, in a case where a central axis of a connection portion 21a is configured to be coincide with the central axis of a nozzle head 10a and a head support body 20a, that is, to coincide with an axis L1a, a portion (indicated with M in Fig. 6A) at one side (a side opposite to a second port portion 222a) in the width direction relative to the coincided central axis L1a (a plane bisecting the nozzle head 10a and/or the head support body 20a in the width direction) corresponds to a wasted portion. In other words, any elements necessary to constitute the private part washing nozzle are not formed or arranged in the portion M. However, a size (a width) of the nozzle is increased accordingly because the portion M exists.

[0031] To the contrary, according to the private part washing nozzle 1 of the present embodiment, it is configured in such a manner that the connection portion 21 is eccentric to the central axis L1 of the nozzle head 10 and of the head support body 20, and accordingly the above-described wasted portion is not generated. More specifically, on the premise that the above-described configuration for attaching and removing the nozzle head 10 by the rotation is provided, that is, with the assumption that the nozzle head 10 is attachable to and removable from the head support body 20 by rotating the nozzle head 10, the connection portion 21 that is provided at the head support body 20 and is connected to the nozzle head 10 needs to be one. The single connection portion 21 serves as a rotational center at the attachment and removal of the nozzle head 10, and thus the connection portion 21 normally needs to be arranged coaxially with the central axis L1 of the nozzle head 10 and of the head support body 20. However, the private part washing nozzle 1 of the present embodiment includes the configuration in which the connection portion 21 is intentionally eccentric to the central axis L1 of the nozzle head 10 and of the head support body 20, and therefore the nozzle is restricted from being increased in size.

[0032] In addition, by utilizing the eccentricity of the connection portion 21, the first flow passage 201 including the linear configuration is provided at the first side in the width direction in the present embodiment. That is, the first flow passage 201 serving as one of the flow passages is formed in the linear configuration along the eccentric axis L2, instead of a configuration in which both the first flow passage 201 and the second flow passage 202 are formed in bent or curved configurations. Accordingly, the nozzle is restricted from being increased in size and pressure loss at the first flow passage 201 is restricted from occurring. More specifically, as schematically illustrated in Fig. 6B as a hypothetical example, in a case where a central axis L1b of a connection portion 21b is configured to be coincide with a central axis of a nozzle head 10b and/or a head support body 20b, and a first port portion 221b and a second port portion 222b are arranged to be away from the central axis L1b by an equal distance to each other, both a first flow passage 201b and a second flow passage 202b need to be formed in bent or curved configurations to restrict the nozzle from being increased in size. However, according to the private part washing nozzle 1 of the present embodiment, one of the flow passages is formed in the linear or straight configuration with the use of the configuration where the connection portion 21 is eccentric. Consequently, in the present embodiment, the advantages are obtained that not only the increased size of the nozzle is restricted but also the loss of the pressure at the flow passage having the linear configuration is restricted.

[0033] Further, in the present embodiment, the first flow passage 201, through which the washing water is delivered to the first spray port 11 at which the washing pressure is relatively high, is formed in the linear configuration. That is, the pressure loss is restricted at the first flow passage 201 through which the washing water to the first spray port 11, where the washing pressure is higher, is delivered (in other words, increment in the pressure loss is accepted or allowed at the second flow passage 202 through which the washing water is delivered to the second spray port 12, where the washing pressure can be relatively low). Consequently, a washing performance is enhanced in the present embodiment.

[0034] The embodiment disclosed here is explained above in detail, however, the present disclosure is not limited to the above-described embodiment. Various modifications and changes may be made without departing from the spirit and scope of this disclosure.

[0035] For example, in the above-described embodiment, the portion supporting the nozzle, that is, the connection portion 21, is illustrated as a member that is relatively short in the front and rear direction (a member that is shorter than the nozzle head 10), however, the embodiment is an example. For example, the size of the member may be changed appropriately as long as the member includes a distal end at which the nozzle head 10 is supported and the member is provided with the flow passages through which the washing water is delivered or sent to the respective spray ports.

[0036] In addition, in the above-described embodiment, the two kinds of spray ports are provided as the spray ports from which the washing water is sprayed, that is, the first spray port 11 and the second spray port 12. However, the number of kinds or types of the spray ports may be equal to or greater than three. In this case, the multilayer pipe structure of the connection portion 21 may include the same number of pipe portions as the number of the spray ports (for example, in a case where the three types of the spray ports are formed, a three layer pipe structure may be applied), and accordingly part of the flow passages delivering the washing water to the respective spray ports is structured. In addition, in this case, any one of the plural flow passages through which the washing water is delivered to the respective plural types of the spray ports may be formed in the linear con-

figuration. Further, the flow passage through which the washing water is delivered to the spray port at which the pressure of the washing water is the highest may ideally include the linear configuration.

[0037] A private part washing nozzle (1) includes a nozzle head (10) including a plurality of types of spray ports (11, 12) each spraying washing water, a head support body (20) including a plurality of flow passages (201, 202) delivering the washing water to the respective plurality of types of spray ports, the head support body including a connection portion (21) formed at a distal end side of the head support body, the connection portion being connected to the nozzle head, and the connection portion being provided at a position in such a manner that an eccentric axis (L2) of the connection portion is eccentric relative to a central axis (L1) of the nozzle head.

Claims

1. A private part washing nozzle (1) comprising:

   a nozzle head (10) including a plurality of types of spray ports (11, 12) each spraying washing water; and
   a head support body (20) including a plurality of flow passages (201, 202) delivering the washing water to the respective plurality of types of spray ports (11, 12), the head support body (20) including a connection portion (21) provided at a distal end side of the head support body (20), the connection portion (21) being connected to the nozzle head (10); wherein
   a central axis (L1) of the nozzle head (10) and a central axis of the head support body (20) coincide with each other; **characterized in that**
   the connection portion (21) being provided at a position in such a manner that, in a direction being orthogonal to both a direction in which the central axis (L1) of the nozzle head (10) extends and a direction in which a washing water is sprayed through the spray ports (11, 12), a central axis (L2) of the connection portion (21) is eccentric relative to the central axis (L1) of the nozzle head (10); **in that**
   the connection portion (21) includes a multilayer pipe structure in which a plurality of pipe portions (211, 212) are arranged to overlap with each other in a radial direction; and **in that**
   a space portion formed inside the pipe portion (211) arranged most inwardly in the radial direction corresponds to a part of the flow passage (201) delivering the washing water to one of the plurality of types of spray ports (11, 12), and a space portion formed between the plurality of pipe portions (211, 212) corresponds to a part of the flow passage (202) delivering the washing water to another of the plurality of types of spray ports (11, 12).

2. The private part washing nozzle (1) according to claim 1, wherein the connection portion (21) is a single connection portion (21).

3. The private part washing nozzle (1) according to either claim 1 or 2, wherein one of the plurality of flow passages (201, 202) provided at the head support body (20) and delivering the washing water to the respective plurality of types of spray ports (11, 12) includes a linear configuration of which a central axis is coaxial to the central axis (L2) of the connection portion (21).

4. The private part washing nozzle (1) according to claim 3, wherein the flow passage (201) formed in the linear configuration including the central axis that is coaxial to the central axis (L2) of the connection portion (21) delivers the washing water to the spray port (11) which sprays the washing water of the highest pressure among the pressures of the washing water sprayed from each of the plurality of types of spray ports (11, 12).

Patentansprüche

1. Intimbereichswaschdüse (1), mit:

   einem Düsenkopf (10), der eine Vielzahl von Arten von Sprühöffnungen (11, 12) umfasst, wobei jede ein Waschwasser versprüht; und
   einem Kopfstützkörper (20), der eine Vielzahl von Strömungsdurchlässen (201, 202) umfasst, die Waschwasser zu der jeweiligen Vielzahl von Arten von Sprühöffnungen (11, 12) liefern, wobei der Kopfstützkörper (20) einen Verbindungsabschnitt (21) umfasst, der an einer distalen Endseite des Kopfstützkörpers (20) vorgesehen ist, wobei der Verbindungsabschnitt (21) mit dem Düsenkopf (10) verbunden ist; wobei
   eine Mittelachse (L1) des Düsenkopfs (10) und eine Mittelachse des Kopfstützkörpers (20) miteinander übereinstimmen; **dadurch gekennzeichnet, dass**
   der Verbindungsabschnitt (21) an einer Position in einer solchen Weise vorgesehen ist, dass in einer Richtung, die senkrecht sowohl zu einer Richtung, in der sich die Mittelachse (L1) des Düsenkopfs (10) erstreckt, als auch einer Richtung ist, in der ein Waschwasser durch die Sprühöffnungen (11, 12) versprüht wird, eine Mittelachse (L2) des Verbindungsabschnitts (21) bezüglich der Mittelachse (L1) des Düsenkopfs (10) exzentrisch ist; dass
   der Verbindungsabschnitt (21) eine Rohrstruktur mit vielen Schichten umfasst, bei der eine

Vielzahl von Rohrabschnitten (211, 212) angeordnet ist, um einander in einer Radialrichtung zu überlappen; und dass
ein Raumabschnitt, der in dem Rohrabschnitt (211) ausgebildet ist, der am weitesten nach innen in der Radialrichtung angeordnet ist, einem Teil des Strömungsdurchlasses (201) entspricht, der das Waschwasser zu einer der Vielzahl von Arten von Sprühöffnungen (11, 12) liefert, und ein Raumabschnitt, der zwischen der Vielzahl von Rohrabschnitten (211, 212) ausgebildet ist, einem Teil des Strömungsdurchlasses (212) entspricht, der Waschwasser zu einer Anderen der Vielzahl von Arten von Sprühöffnungen (11, 12) liefert.

2. Intimbereichswaschdüse (1) nach Anspruch 1, wobei der Verbindungsabschnitt (21) ein einzelner Verbindungsabschnitt (21) ist.

3. Intimbereichswaschdüse (1) nach einem der Ansprüche 1 oder 2, wobei einer der Vielzahl von Strömungsdurchlässen (201, 202), der an dem Kopfstützkörper (20) vorgesehen ist und das Waschwasser zu der jeweiligen Vielzahl von Arten von Sprühöffnungen (11, 12) liefert, eine geradlinige Konfiguration umfasst, deren Mittelachse koaxial zu der Mittelachse (L2) des Verbindungsabschnitts (21) ist.

4. Intimbereichswaschdüse (1) nach Anspruch 3, wobei der Strömungsdurchlass (201), der in der geradlinigen Konfiguration ausgebildet ist, die die Mittelachse umfasst, die koaxial zu der Mittelachse (L2) des Verbindungsabschnitts (21) ist, das Waschwasser zu der Sprühöffnung (11) liefert, die das Waschwasser des höchsten Drucks unter den Drücken von dem Waschwasser versprüht, das von jeder der Vielzahl von Arten von Sprühöffnungen (11, 12) versprüht wird.

Revendications

1. Buse de lavage (1) pour parties intimes comprenant :

une tête de buse (10) comprenant une pluralité de types d'orifices de pulvérisation (11, 12) pulvérisant chacun de l'eau de lavage ; et
un corps de support de tête (20) comprenant une pluralité de passages d'écoulement (201, 202) délivrant l'eau de lavage à la pluralité respective de types d'orifices de pulvérisation (11, 12), le corps de support de tête (20) comprenant une partie de raccordement (21) prévue du côté de l'extrémité distale de corps de support de tête (20), la partie de raccordement (21) étant raccordée à la tête de buse (10) ; dans laquelle :

un axe central (L1) de la tête de buse (10) et un axe central du corps de support de tête (20) coïncident entre eux ; **caractérisée en ce que** :
la partie de raccordement (21) étant prévue dans une position de sorte que, dans une direction qui est orthogonale à la fois une direction dans laquelle l'axe central (L1) de la tête de buse (10) s'étend et une direction dans laquelle une eau de lavage est pulvérisée par les orifices de pulvérisation (11, 12), un axe central (L2) de la partie de raccordement (21) est excentrique par rapport à l'axe central (L1) de la tête de buse (10) ; **en ce que** :

la partie de raccordement (21) comprend une structure de tuyau à plusieurs couches dans laquelle une pluralité de parties de tuyau (211, 212) sont agencées pour se chevaucher dans une direction radiale ; et **en ce que**
une partie d'espace formée à l'intérieur de la partie de tuyau (211) agencée le plus à l'intérieur dans la direction radiale correspond à une partie du passage d'écoulement (201) délivrant l'eau de lavage à l'un de la pluralité de types d'orifices de pulvérisation (11, 12), et une partie d'espace formée entre la pluralité de parties de tuyau (211, 212) correspond à une partie du passage d'écoulement (202) distribuant l'eau de lavage à un autre de la pluralité de types d'orifices de pulvérisation (11, 12).

2. Buse de lavage (1) pour parties intimes selon la revendication 1, dans laquelle la partie de raccordement (21) est une partie de raccordement (21) unique.

3. Buse de lavage (1) pour parties intimes selon la revendication 1 ou 2, dans laquelle l'un de la pluralité de passages d'écoulement (201, 202) prévus au niveau du corps de support de tête (20) et distribuant l'eau de lavage à la pluralité respective de types d'orifices de pulvérisation (11, 12) comprend une configuration linéaire dont un axe central est coaxial à l'axe central (L2) de la partie de raccordement (21).

4. Buse de lavage (1) pour parties intimes selon la revendication 3, dans laquelle le passage d'écoulement (201) formé dans la configuration linéaire comprenant l'axe central qui est coaxial par rapport à l'axe central (L2) de la partie de raccordement (21) distribue l'eau de lavage à l'orifice de pulvérisation (11) qui pulvérise l'eau de lavage à la plus haute

pression parmi les pression de l'eau de lavage pulvérisée à partir de chacun de la pluralité de types d'orifices de pulvérisation (11, 12).

FIG. 1

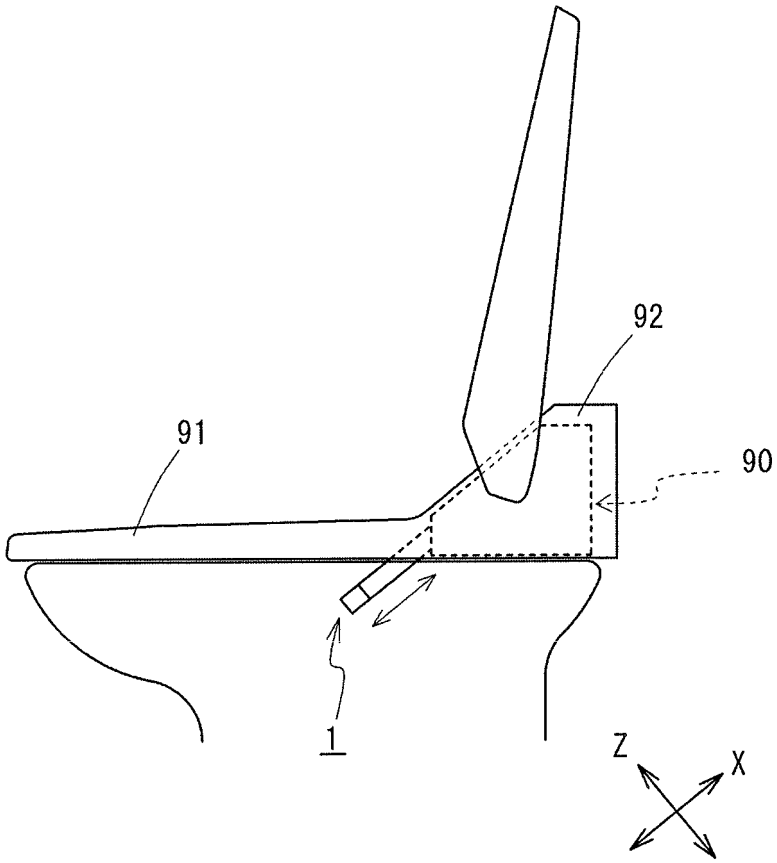


FIG. 2

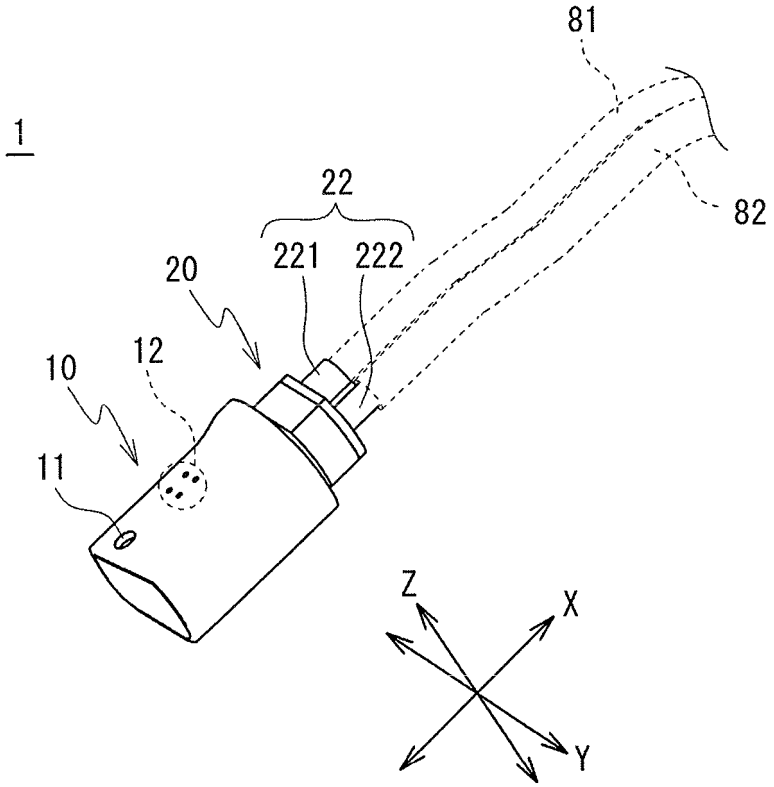


FIG. 3A

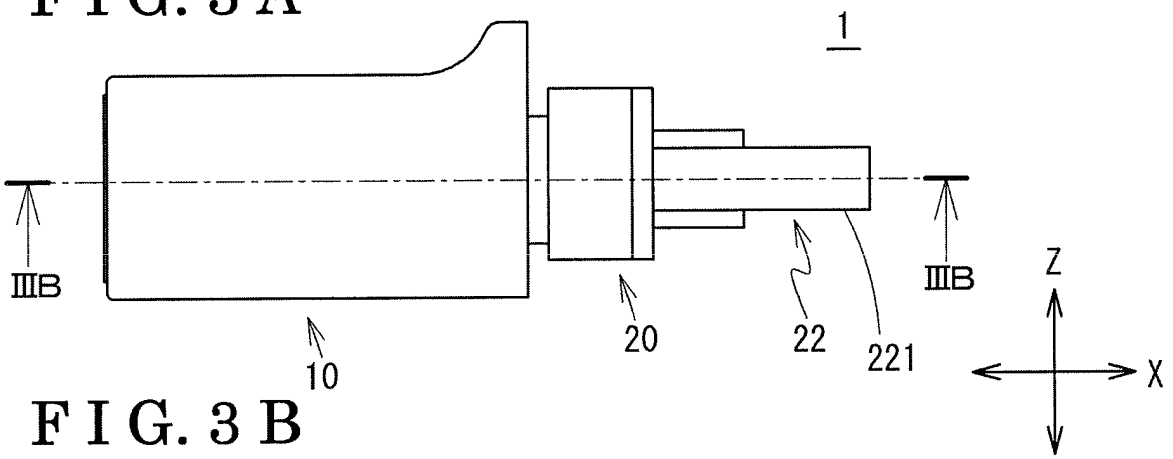


FIG. 3B

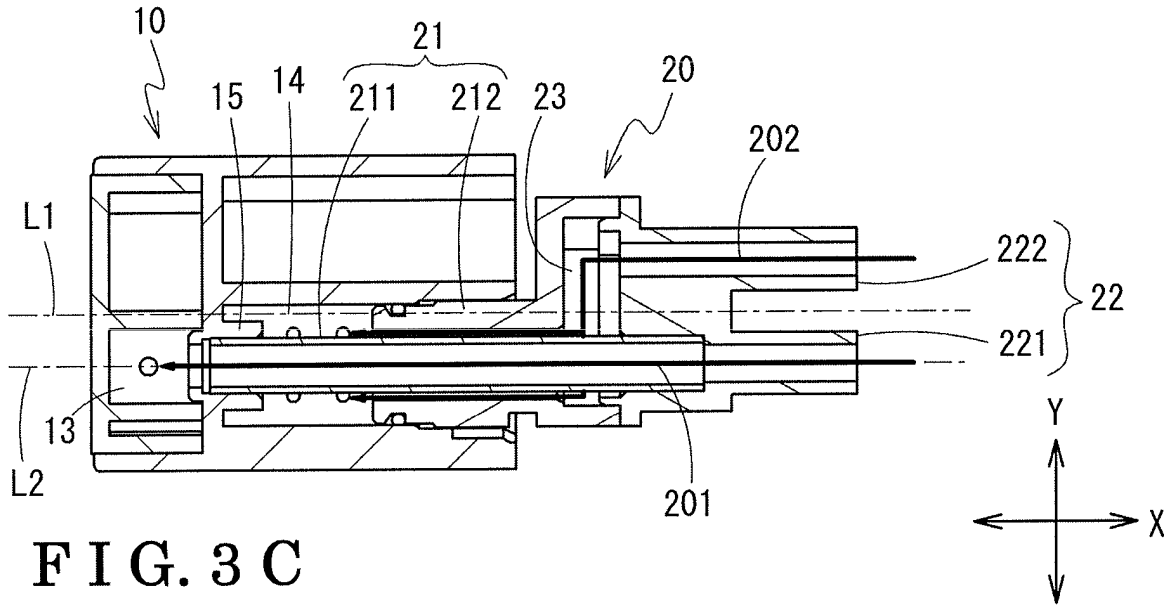


FIG. 3C

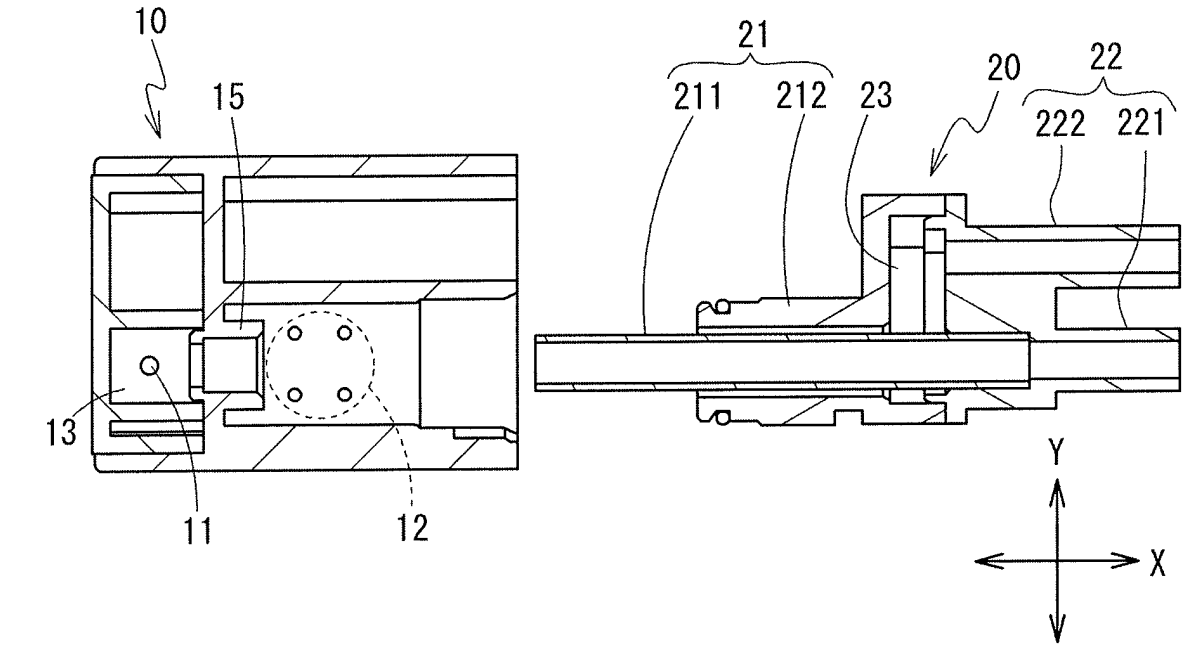


FIG. 4A

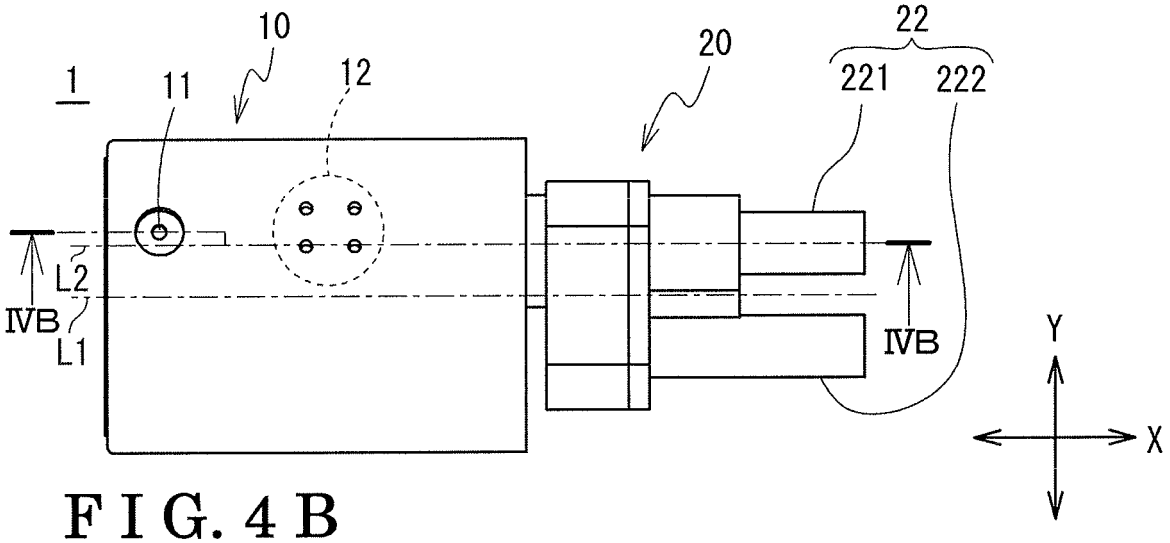


FIG. 4B

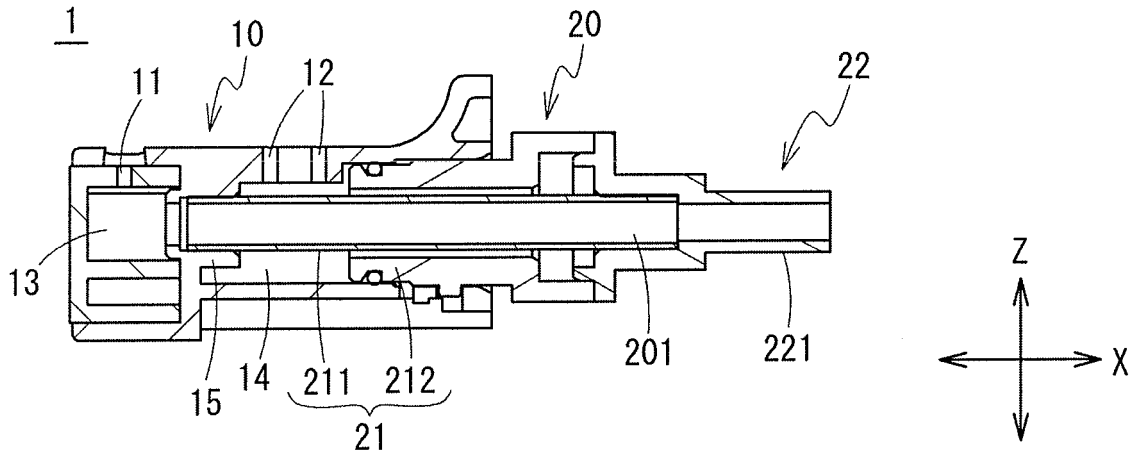


FIG. 4C

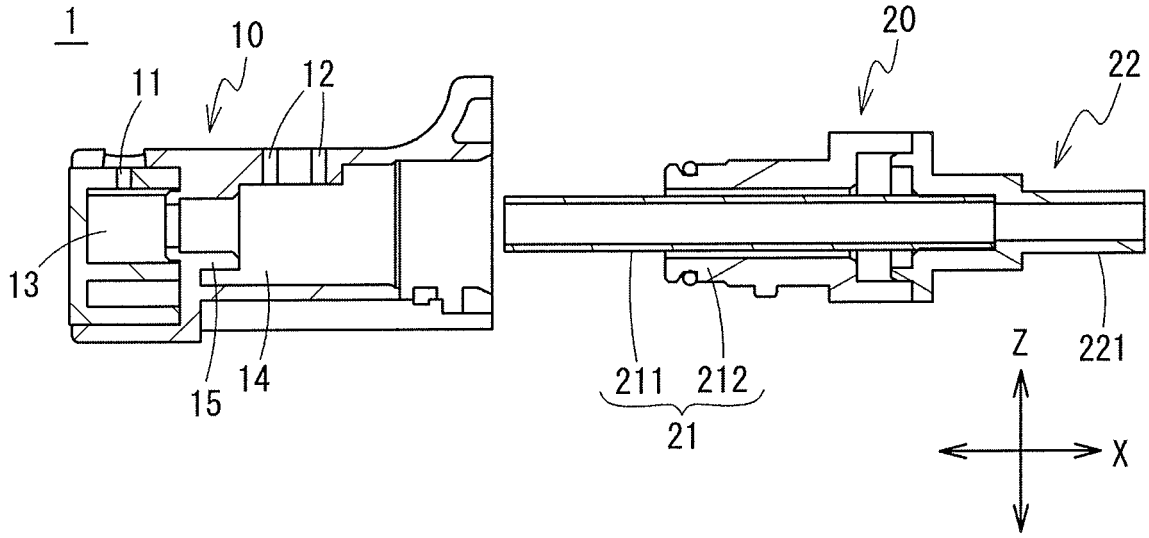


FIG. 5

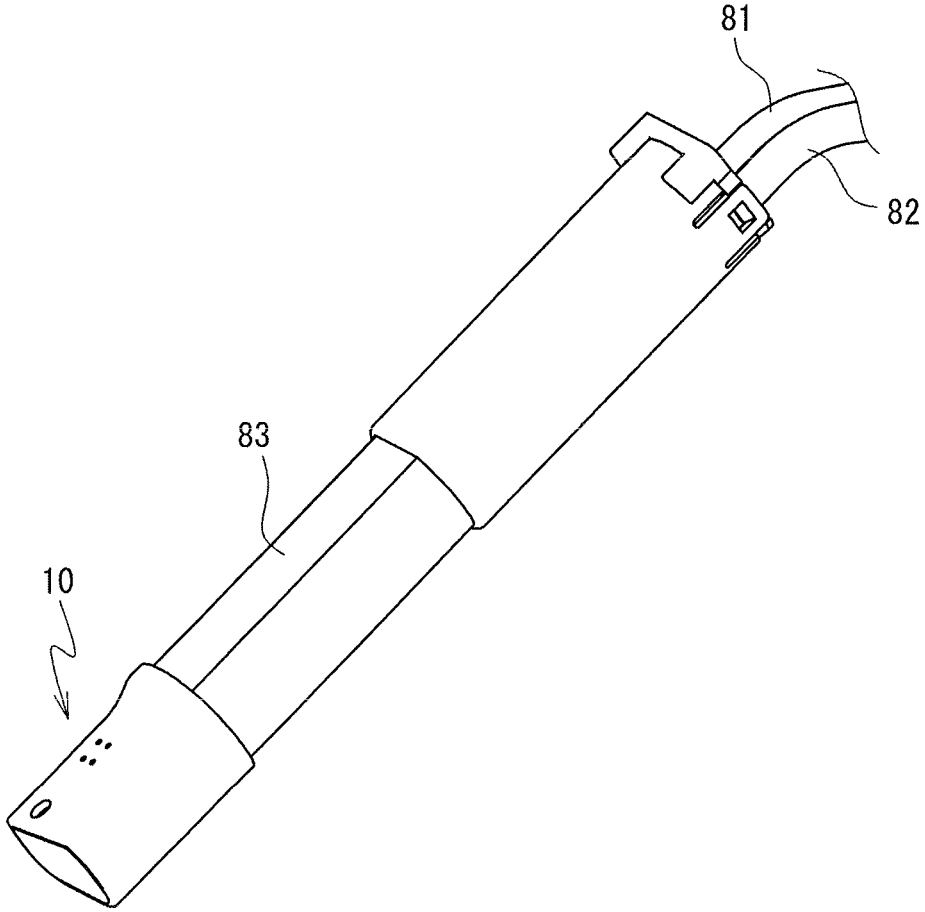


FIG. 6A

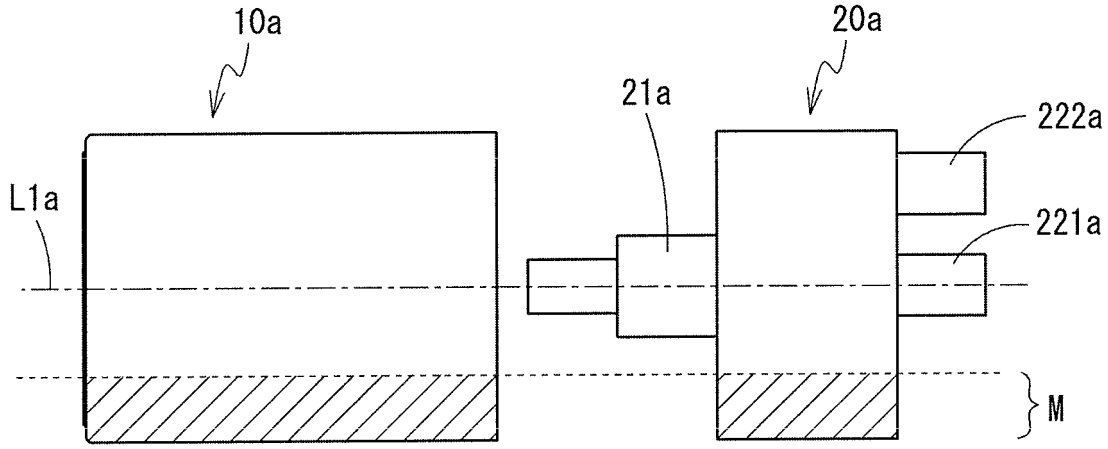
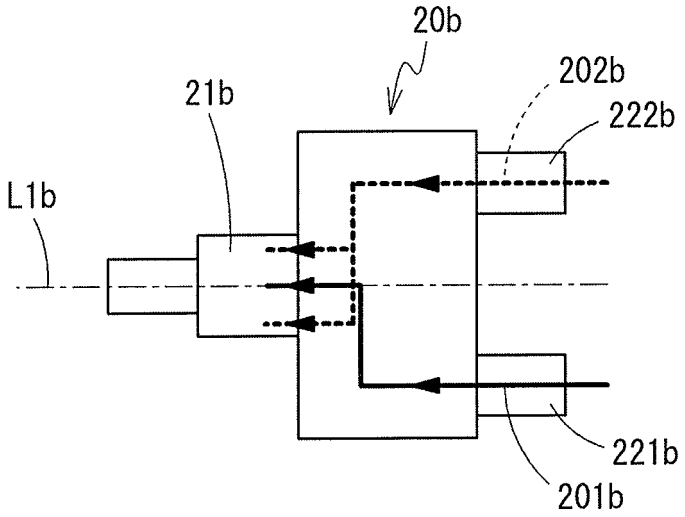


FIG. 6B



REFERENCES CITED IN THE DESCRIPTION

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- US 2011203044 A1 **[0002]**