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(54) **BENDABLE POSITIONING STRUCTURE OF OUTLET PIPE FOR FAUCET**

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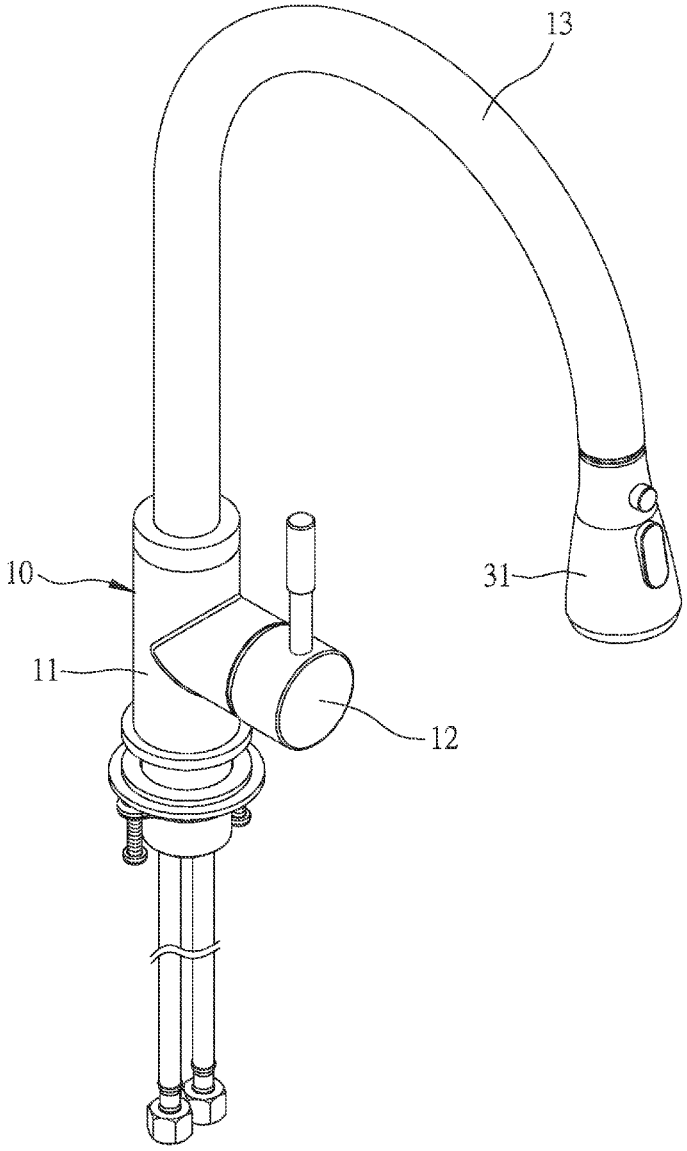
(57) **ABSTRACT**

A bendable positioning structure of an outlet pipe for a faucet contains a body, a spring tube, and a flexible connection tube. The body includes a columnar holder, the outlet pipe, and a fixer. The spring tube is fitted in the outlet pipe and is stopped and positioned by the fixer. The spring tube includes a large-diameter portion and a small-diameter portion which are alternatively formed along the spring tube. The flexible connection tube is slidably received in the spring tube to be limited by the small-diameter portion of the spring tube so that the flexible connection tube is fixed on a centrally-axial line of the output tube. An outer wall of an end of the flexible connection tube is connected with a water head, and the water head is engaged on the outlet pipe and is pulled outward with the flexible connection tube based on user requirements.



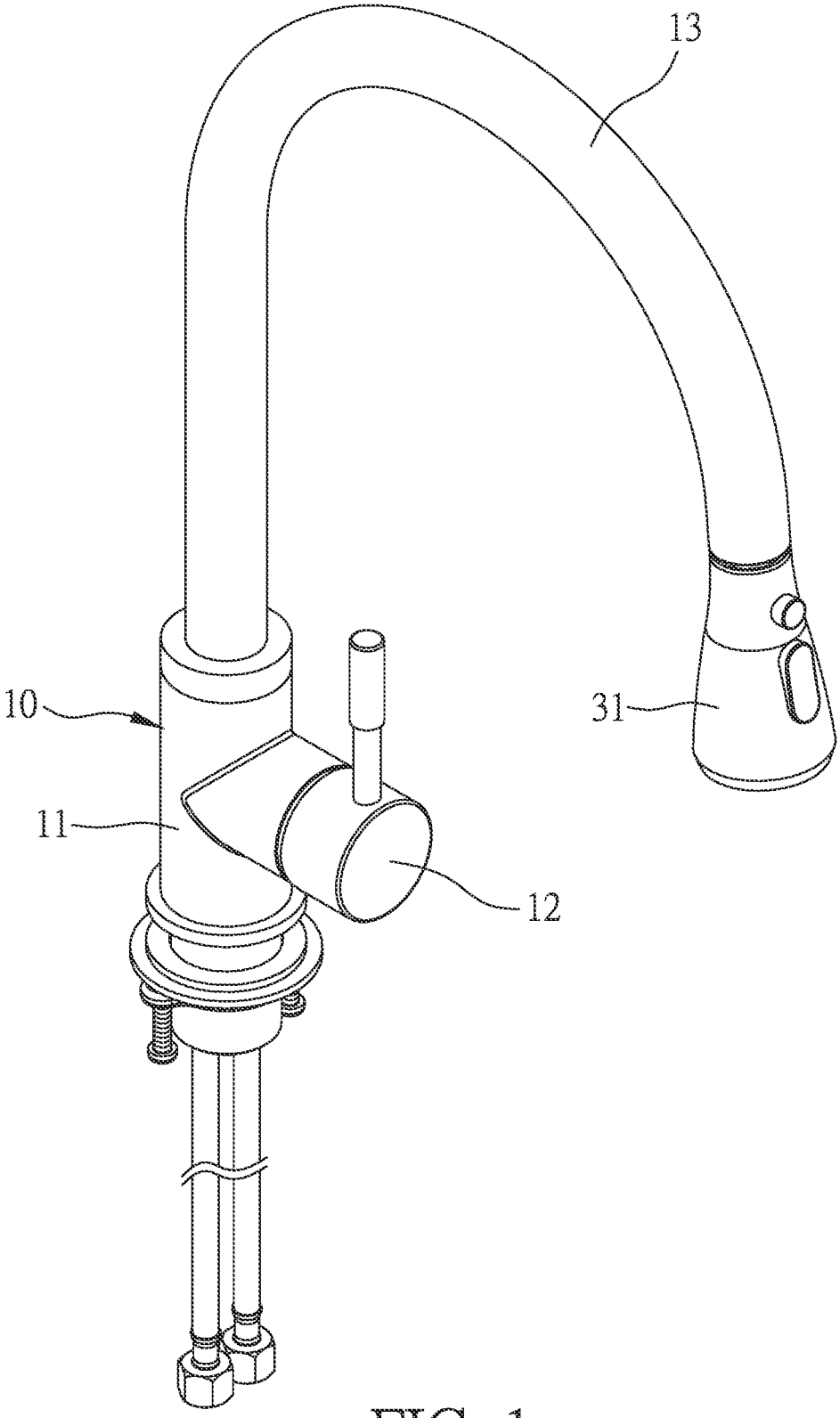


FIG. 1

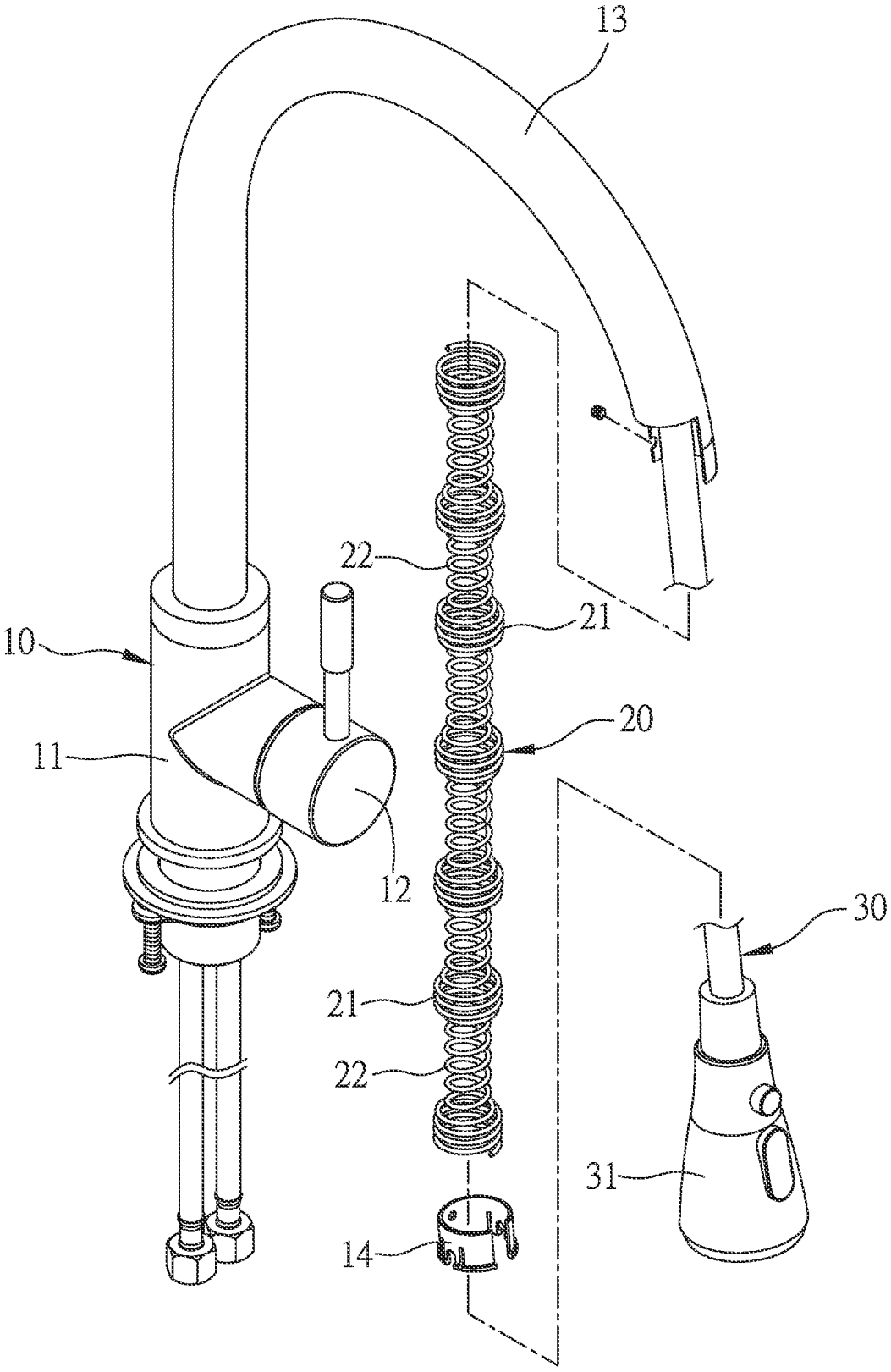


FIG. 2

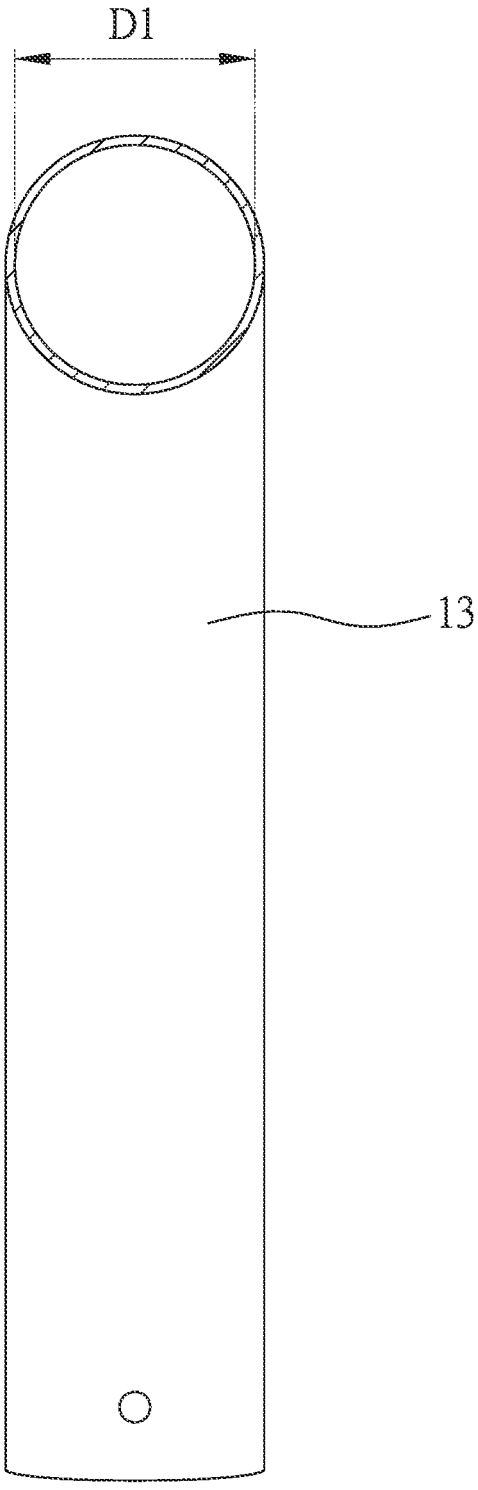


FIG. 3

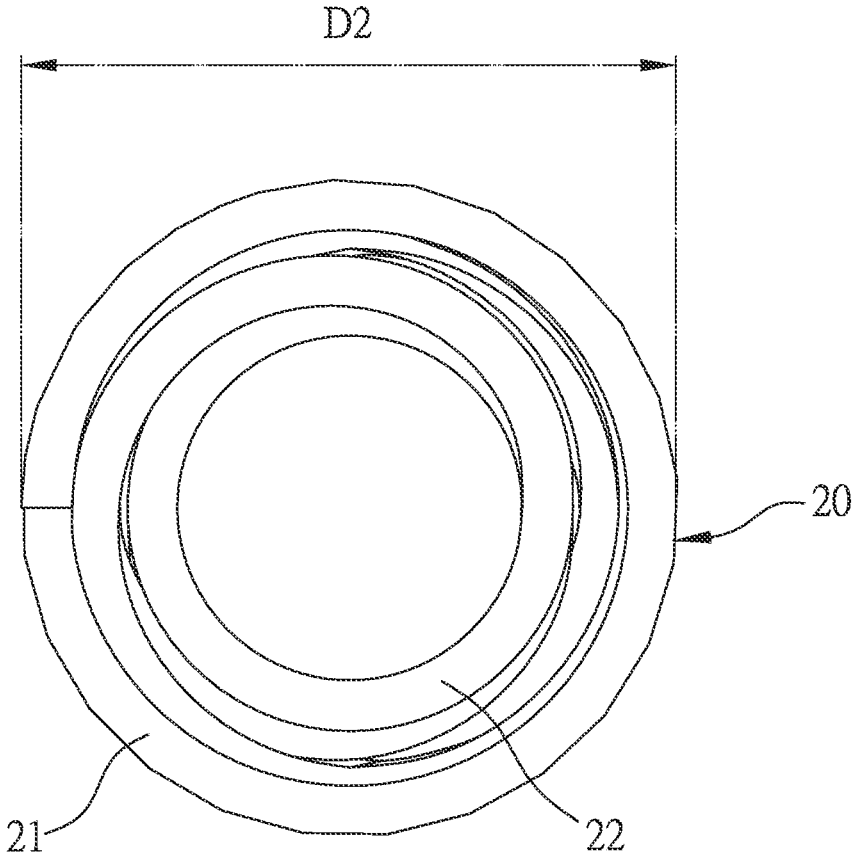


FIG. 4

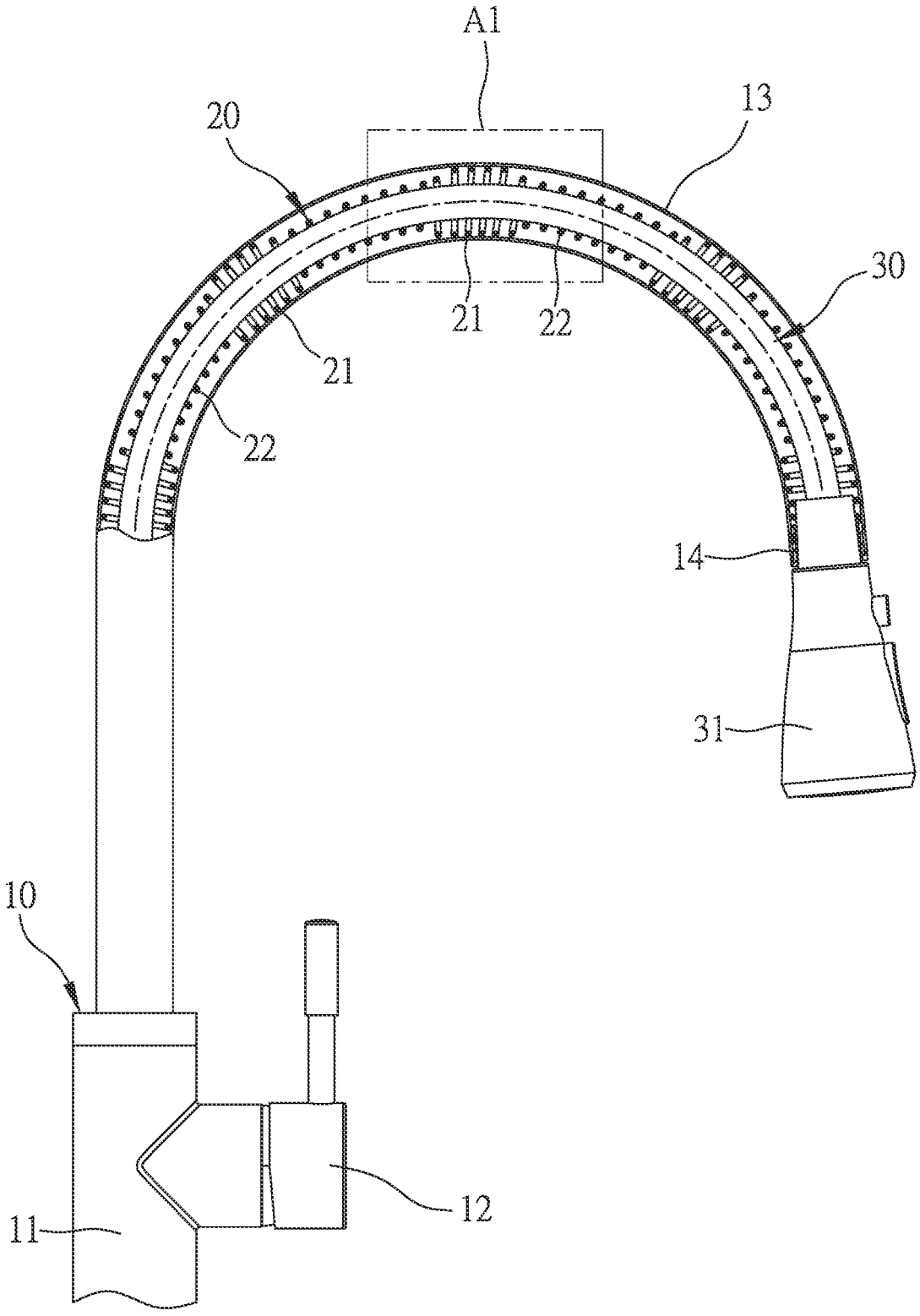


FIG. 5

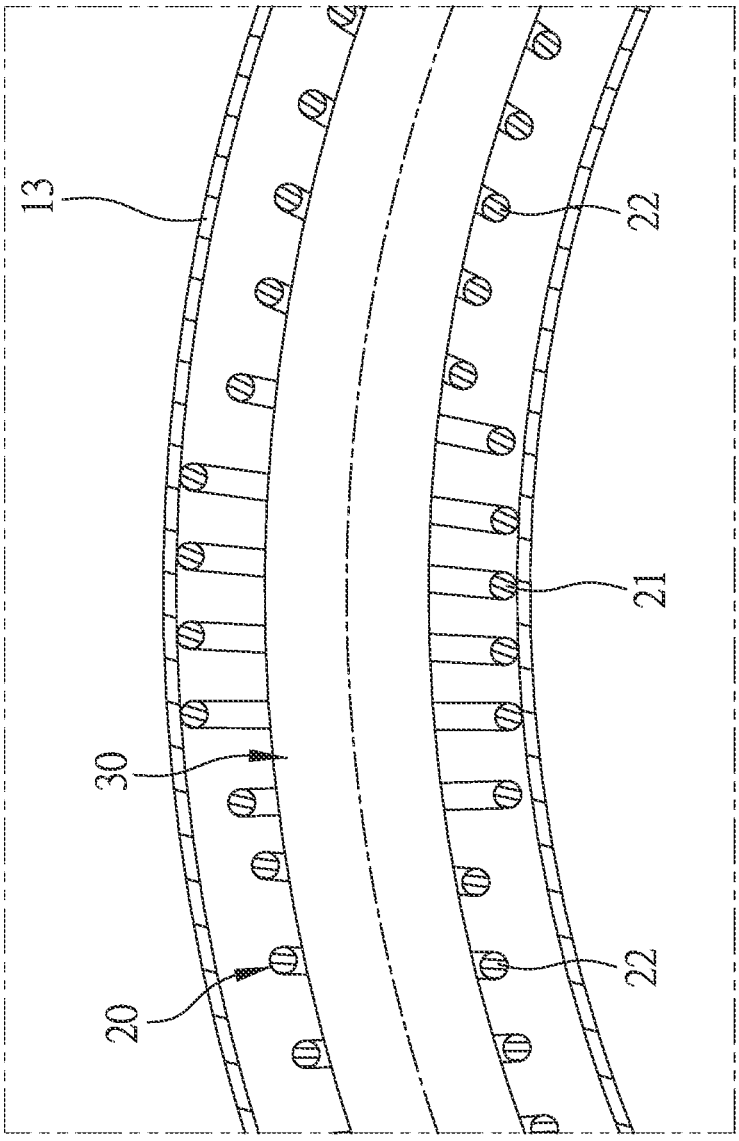


FIG. 6

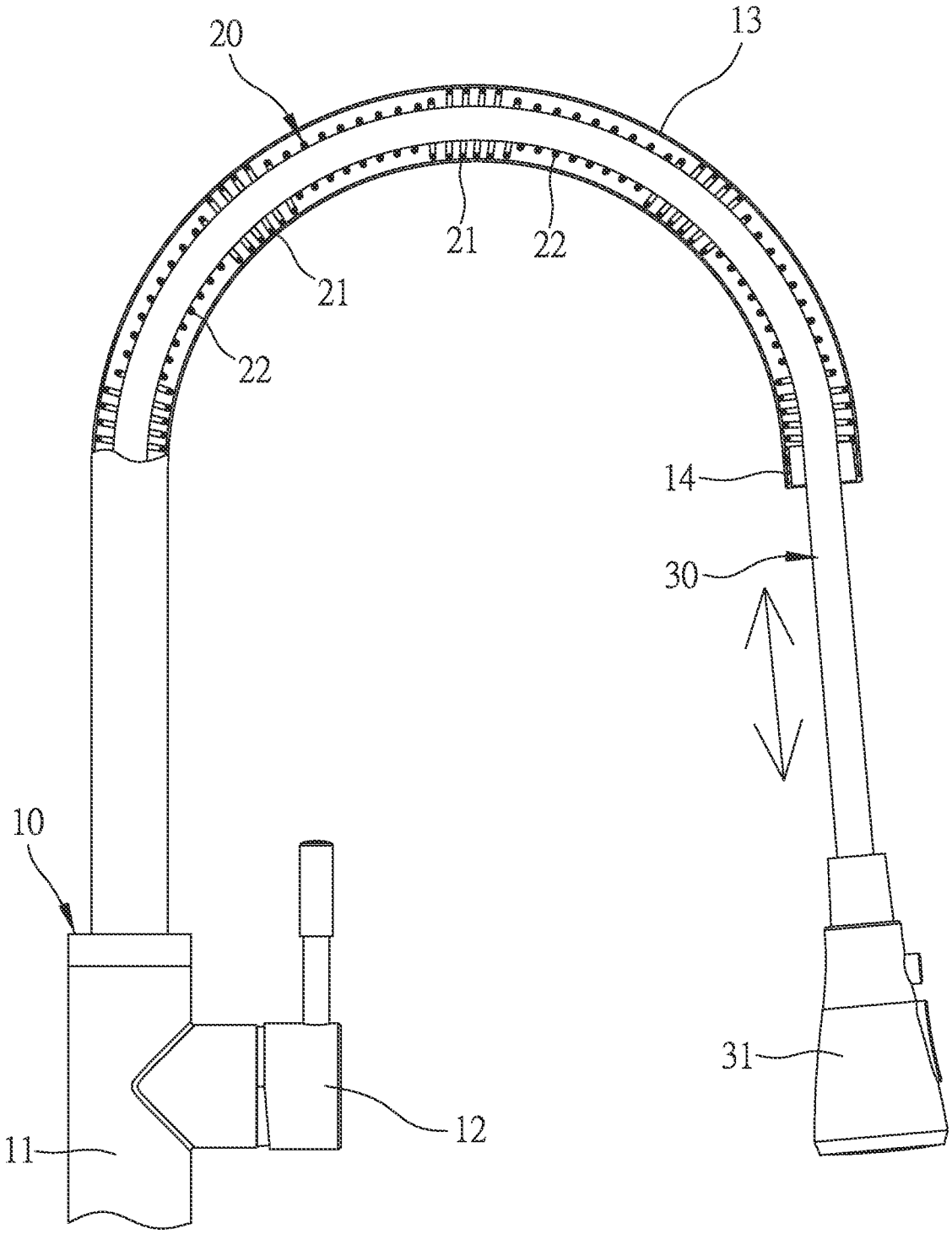


FIG. 7

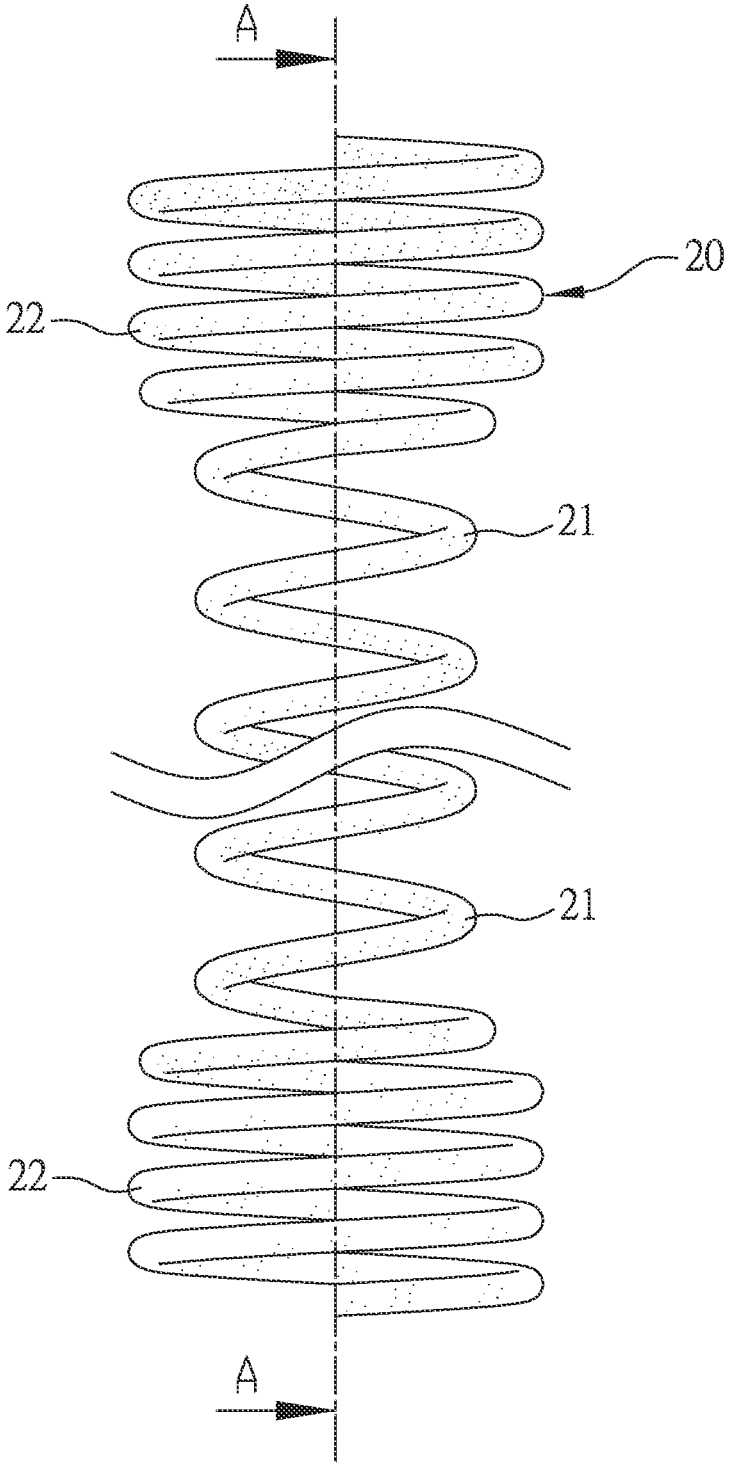


FIG. 8

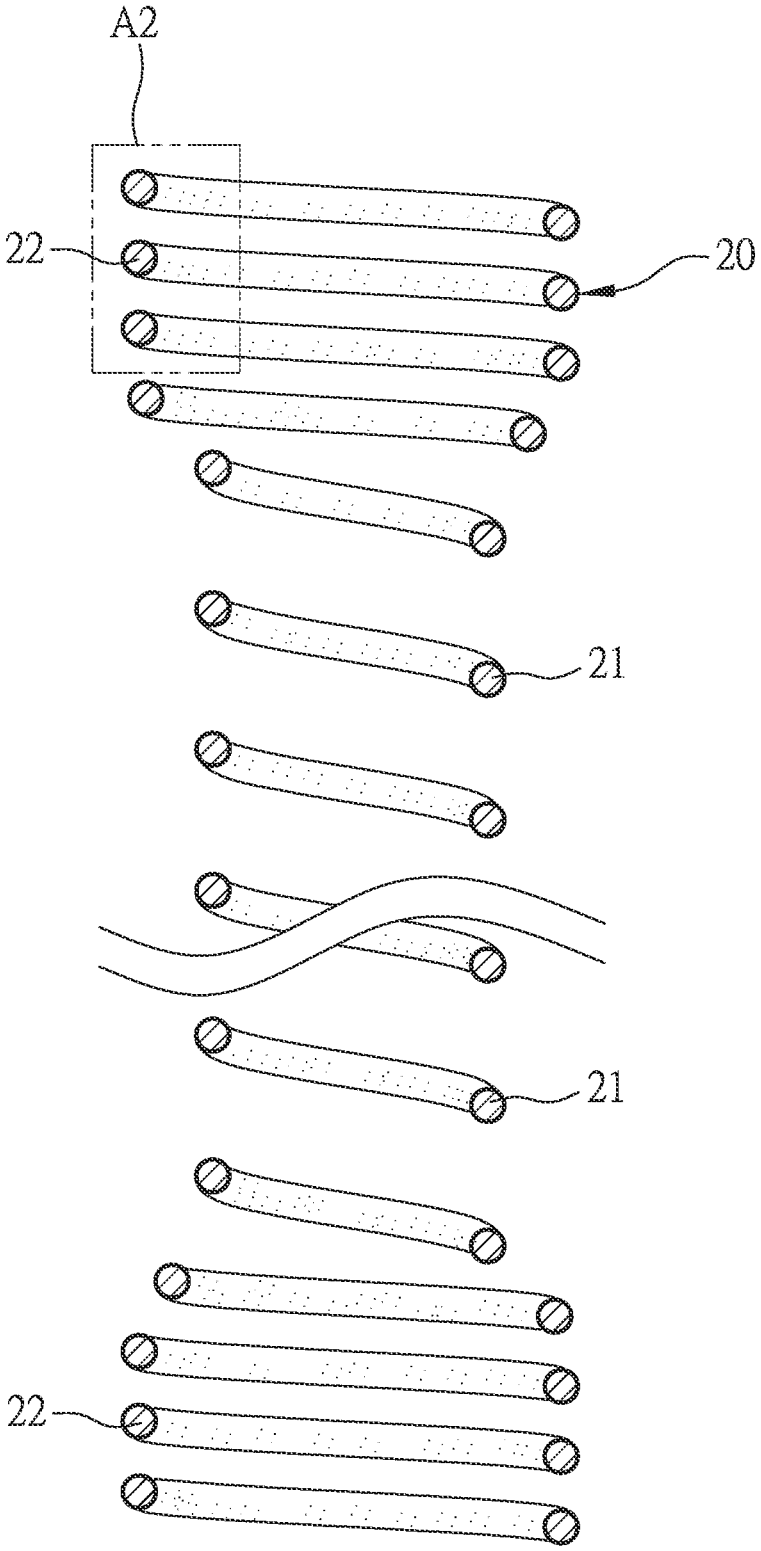


FIG. 9

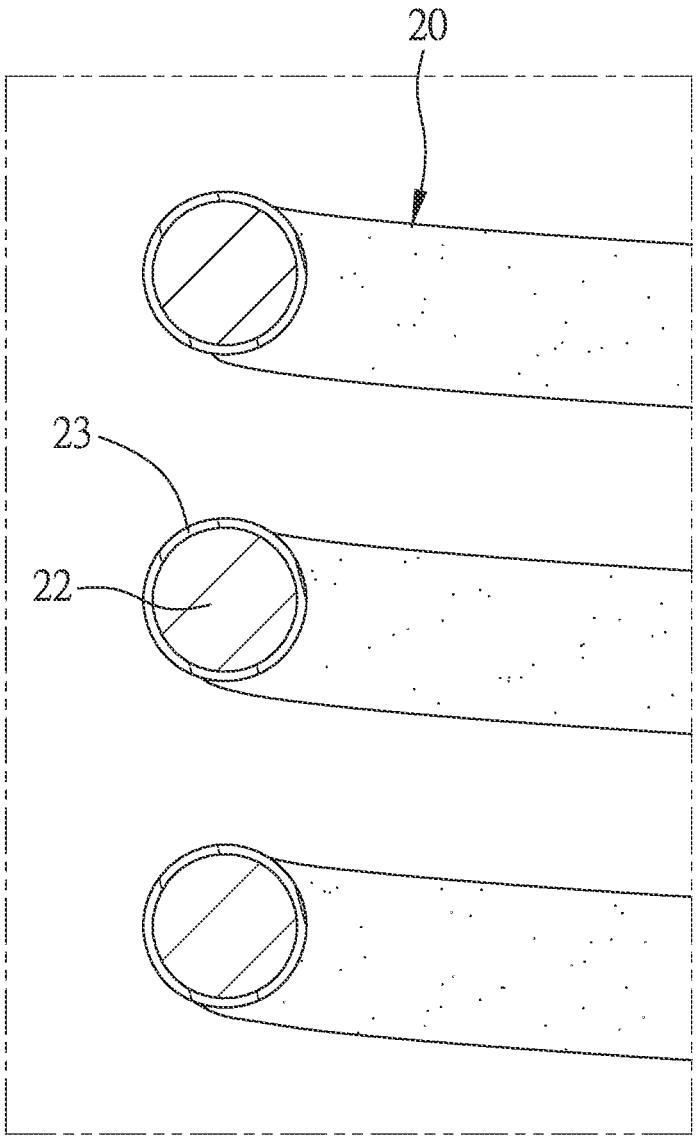


FIG. 10

BENDABLE POSITIONING STRUCTURE OF OUTLET PIPE FOR FAUCET

TECHNICAL FIELD

[0001] The present invention relates to a faucet, and more particularly to a bendable positioning structure of an outlet pipe for the faucet.

BACKGROUND

[0002] A faucet is one of the indispensable water supply tools in human life, and the development of the faucet has also contributed to the progress of human beings in the application of "washing methods". Different structural designs of faucets are used for washing to provide consumers with diversified styles. Because these faucets are designed for specific purposes, it is more convenient for people to use water.

[0003] Conventionally, the faucets installed on the sink are mostly designed in a vertical type. For the convenience of water control, a water control valve is set on the side of a body of a faucet, and an outlet pipe is fixed on a top of the body. However, this faucet is applied to clean a countertop, but a water supply range of the outlet pipe cannot cover the entire countertop, so an internally-connected faucet has been developed, wherein the outlet pipe has a flexible connection tube received therein, an end of the flexible connection tube is connected with a threaded tube of a control valve via a body of the internally-connected faucet, and the other end of the flexible connection tube is connected with a water head, wherein the water head is engaged on an outer wall of the outlet pipe, such that the flexible connection tube is pulled to a desired position with the water head when desiring to wash the countertop or to the other ranges based on user requirements, thus obtaining a flexible application.

[0004] However, the flexible connection tube of the outlet pipe of the conventional structure drops downward because of gravity causing friction between the flexible connection tube and an inner wall of the outlet pipe. Furthermore, a skewed movement and a block of the flexible connection tube will occur, when pulling the flexible connection tube outward or retracting the flexible connection tube inward.

[0005] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

SUMMARY

[0006] The primary aspect of the present invention is to provide a bendable positioning structure of an outlet pipe for a faucet by which a flexible connection tube is slidably received in a spring tube of the outlet pipe and is limited by a small-diameter portion of a spring tube so that the flexible connection tube is fixed on a centrally-axial line of the output tube, a friction between the flexible connection tube and an inner wall of the outlet pipe, a skewed movement and a block of the flexible connection tube are avoidable, when pulling the flexible connection tube outward or retracting the flexible connection tube inward.

[0007] To obtain the above-mentioned aspects, a bendable positioning structure of an outlet pipe for a faucet provided by the present invention contains a body, a spring tube, and a flexible connection tube.

[0008] The body includes a columnar holder, the outlet pipe connected to a top of the holder, and a fixer connected to an end of the outlet pipe away from the columnar holder.

[0009] The spring tube is made of a metal wire and is spirally tubular. The spring tube is fitted in the outlet pipe and is stopped and positioned by the fixer, the spring tube includes a large-diameter portion and a small-diameter portion which are alternatively formed along the spring tube. The large-diameter portion abuts against an inner wall of the outlet pipe.

[0010] The flexible connection tube is slidably received in the spring tube of the outlet pipe to be limited by the small-diameter portion of the spring tube so that the flexible connection tube is fixed on a centrally-axial line of the output tube. An outer wall of an end of the flexible connection tube is connected with a water head, and the water head is engaged on an edge of the outlet pipe and is pulled outward with the flexible connection tube based on user requirements.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** is a perspective view showing the assembly of a bendable positioning structure of an outlet pipe for a faucet according to a first embodiment of the present invention.

[0012] FIG. **2** is a perspective view showing the exploded components of the bendable positioning structure of the outlet pipe according to the first embodiment of the present invention.

[0013] FIG. **3** is a cross sectional view showing the assembly of a part of the bendable positioning structure of the outlet pipe according to the first embodiment of the present invention.

[0014] FIG. **4** is a side plan view showing the assembly of a part of the bendable positioning structure of the outlet pipe according to the first embodiment of the present invention.

[0015] FIG. **5** is a cross sectional view showing the assembly of the bendable positioning structure of the outlet pipe according to the first embodiment of the present invention.

[0016] FIG. **6** is an amplified cross-sectional view of a portion A**1** of FIG. **5**.

[0017] FIG. **7** is a cross sectional view showing the operation of the bendable positioning structure of the outlet pipe according to the first embodiment of the present invention.

[0018] FIG. **8** is a perspective view showing the assembly of a part of a bendable positioning structure of an outlet pipe for a faucet according to a second embodiment of the present invention.

[0019] FIG. **9** is a cross sectional view taken along the line A-A of FIG. **8**.

[0020] FIG. **10** is an amplified cross-sectional view of a portion A**2** of FIG. **9**.

DETAILED DESCRIPTION

[0021] With reference to FIGS. **1-6**, a bendable positioning structure of an outlet pipe for a faucet according to a first embodiment of the present invention comprises a body **10**, a spring tube **20**, and a flexible connection tube **30**.

[0022] The body **10** includes a columnar holder **11**, a water-supply control portion **12** connected on a side of the columnar holder **11**, the outlet pipe **13** connected on a top of the columnar holder **11**, being flexibly bendable and having

an internal diameter D1, and a fixer **14** connected with an end of the outlet pipe **13** away from the columnar holder **11** and being annular.

[0023] The spring tube **20** is made of a metal wire and is spirally tubular, wherein the spring tube **20** is deformably fitted in the outlet pipe **13** and is stopped and positioned by the fixer **14**, the spring tube **20** includes a large-diameter portion **21** and a small-diameter portion **22** which are alternatively formed along the spring tube **20**, wherein the large-diameter portion **21** has an external diameter D2 which is greater than or equal to the internal diameter DI of the outlet pipe **13**, and the large-diameter portion **21** abuts against an inner wall of the outlet pipe **13** so that the spring tube **20** is fitted in the outlet pipe **13** securely.

[0024] The flexible connection tube **30** is slidably received in the spring tube **20** of the outlet pipe **13** to be limited by the small-diameter portion **22** of the spring tube **20** so that the flexible connection tube **30** is fixed on a centrally-axial line of the output tube **13**, wherein an outer wall of an end of the flexible connection tube **30** is connected with a water head **31**, and the water head **31** is engaged on an edge of the outlet pipe **13** and is pulled outward with the flexible connection tube **30** based on user requirements.

[0025] In operation, the water-supply control portion **12** is operated to control a mixing ratio of cold water and hot water, a water supply, and a water stop, such that a water flow of the cold water and the hot water is supplied from the water head **31** of the flexible connection tube **30**. As desiring to wash a countertop or supplying the water flow within a large range, as shown in FIG. **7**, the water head **31** is pulled outward to a desired position with the flexible connection tube **30** and then is retracted inward so that the water head **31** moves back to an original position (now shown) automatically, and the flexible connection tube **30** is actuated by the water head **31** to retract back to an original position. Since an automatic return of the water head **31** and the flexible connection tube **30** is a well-known art, further remarks are omitted.

[0026] Referring to FIGS. **8-10**, a difference of a bendable positioning structure of an outlet pipe for a faucet of a second embodiment from that of the first embodiment of the present invention comprises a covering layer **23** covered on the spring tube **20** and configured to contact with the inner wall of the output tube **13** and the outer wall of the flexible connection tube **30**.

[0027] Thereby, the bendable positioning structure of the present invention has advantages as follows: the flexible connection tube **30** is slidably received in the spring tube **20** of the outlet pipe **13** and is limited by the small-diameter portion **22** of the spring tube **20** so that the flexible connection tube **30** is fixed on the centrally-axial line of the output tube **13**, a friction between the flexible connection tube **30** and the inner wall of the outlet pipe **13**, a skewed movement and a block of the flexible connection tube **30** are avoidable, when pulling the flexible connection tube **30** outward or retracting the flexible connection tube **30** inward.

[0028] While the first embodiments of the invention have been set forth for the purpose of disclosure, modifications of the disclosed embodiments of the invention as well as other embodiments thereof may occur to those skilled in the art. The scope of the claims should not be limited by the first embodiments set forth in the examples, but should be given the broadest interpretation consistent with the description as a whole.

What is claimed is:

1. A bendable positioning structure of an outlet pipe for a faucet comprising:

a body including a holder, the outlet pipe connected on a top of the holder, and a fixer connected with an end of the outlet pipe away from the holder;

a spring tube made of a metal wire and being spirally tubular, wherein the spring tube is fitted in the outlet pipe and is stopped and positioned by the fixer, the spring tube includes a large-diameter portion and a small-diameter portion which are alternatively formed along the spring tube, wherein the large-diameter portion abuts against an inner wall of the outlet pipe;

a flexible connection tube slidably received in the spring tube of the outlet pipe to be limited by the small-diameter portion of the spring tube so that the flexible connection tube is fixed on a centrally-axial line of the output tube, wherein an outer wall of an end of the flexible connection tube is connected with a water head, and the water head is engaged on an edge of the outlet pipe and is pulled outward with the flexible connection tube based on user requirements.

2. The bendable positioning structure as claimed in claim **1**, wherein the outlet pipe is flexibly bendable and has an internal diameter, and the large-diameter portion of the spring tube has an external diameter which is greater than or equal to the internal diameter of the outlet pipe.

3. The bendable positioning structure as claimed in claim **1**, wherein the holder of the body is columnar.

4. The bendable positioning structure as claimed in claim **1**, wherein the fixer is annular.

5. The bendable positioning structure as claimed in claim **1**, wherein the holder of the body has a water-supply control portion connected thereon.

6. The bendable positioning structure as claimed in claim **1**, wherein the spring tube includes a covering layer covered thereon.

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