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(54) QUICK CONNECTOR STRUCTURE

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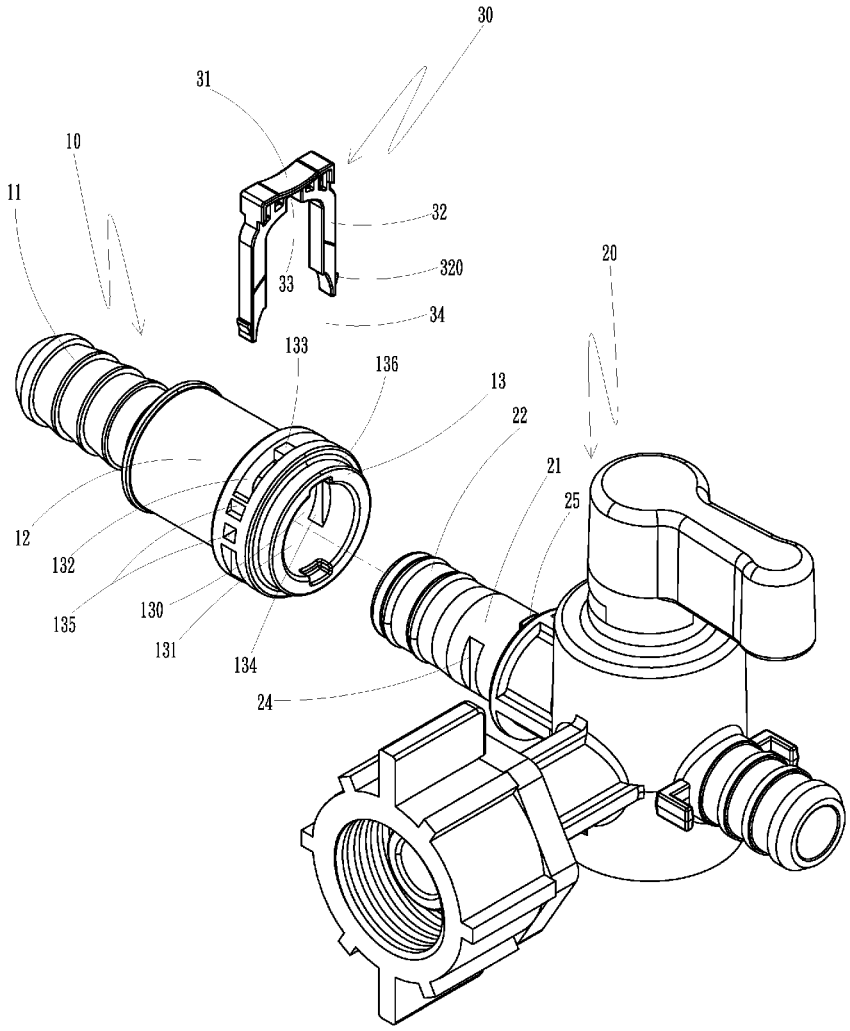
(57) **ABSTRACT**

A quick connector structure includes a fitting connector, a connector, and a U-shaped positioning snap pin. The fitting connector is a pipe connector, a three-way valve connector, or a washing machine valve connector. The fitting connector is combined with a pipe body. The U-shaped positioning snap pin ensures the stability of the connection between the fitting connector and the connector. The quick connector structure enables rapid positioning and assembly, reducing the assembly difficulty in a smaller or concealed space and achieving the effects of assembly stability and convenience.



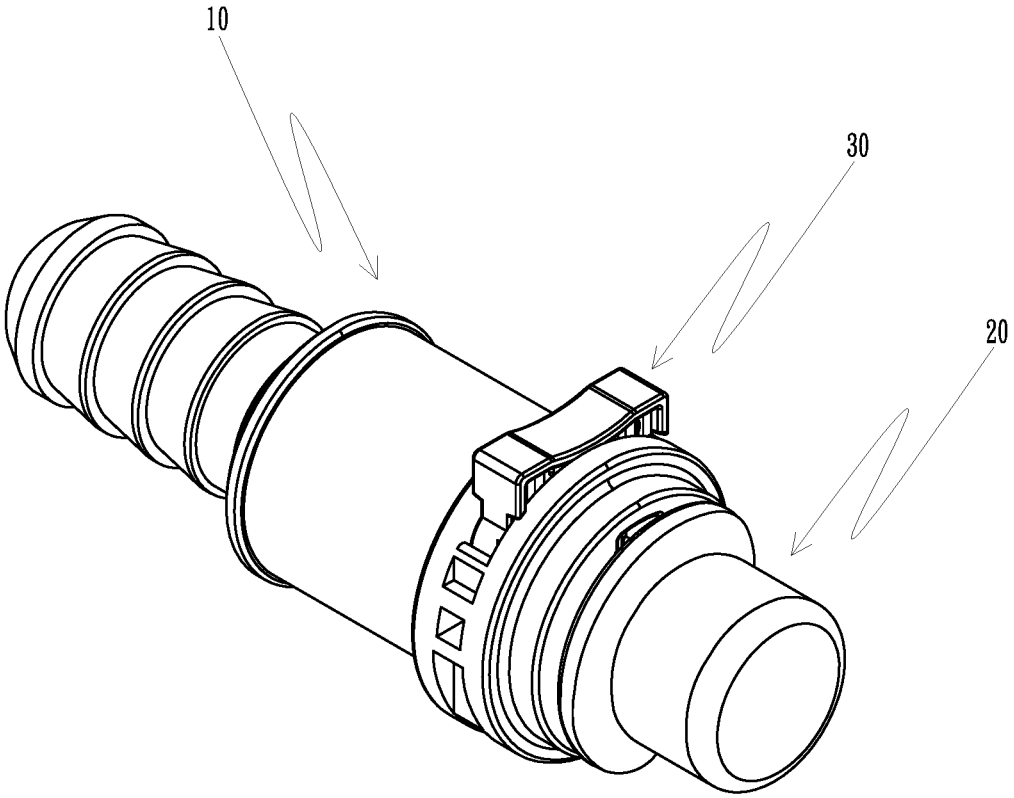


FIG.1

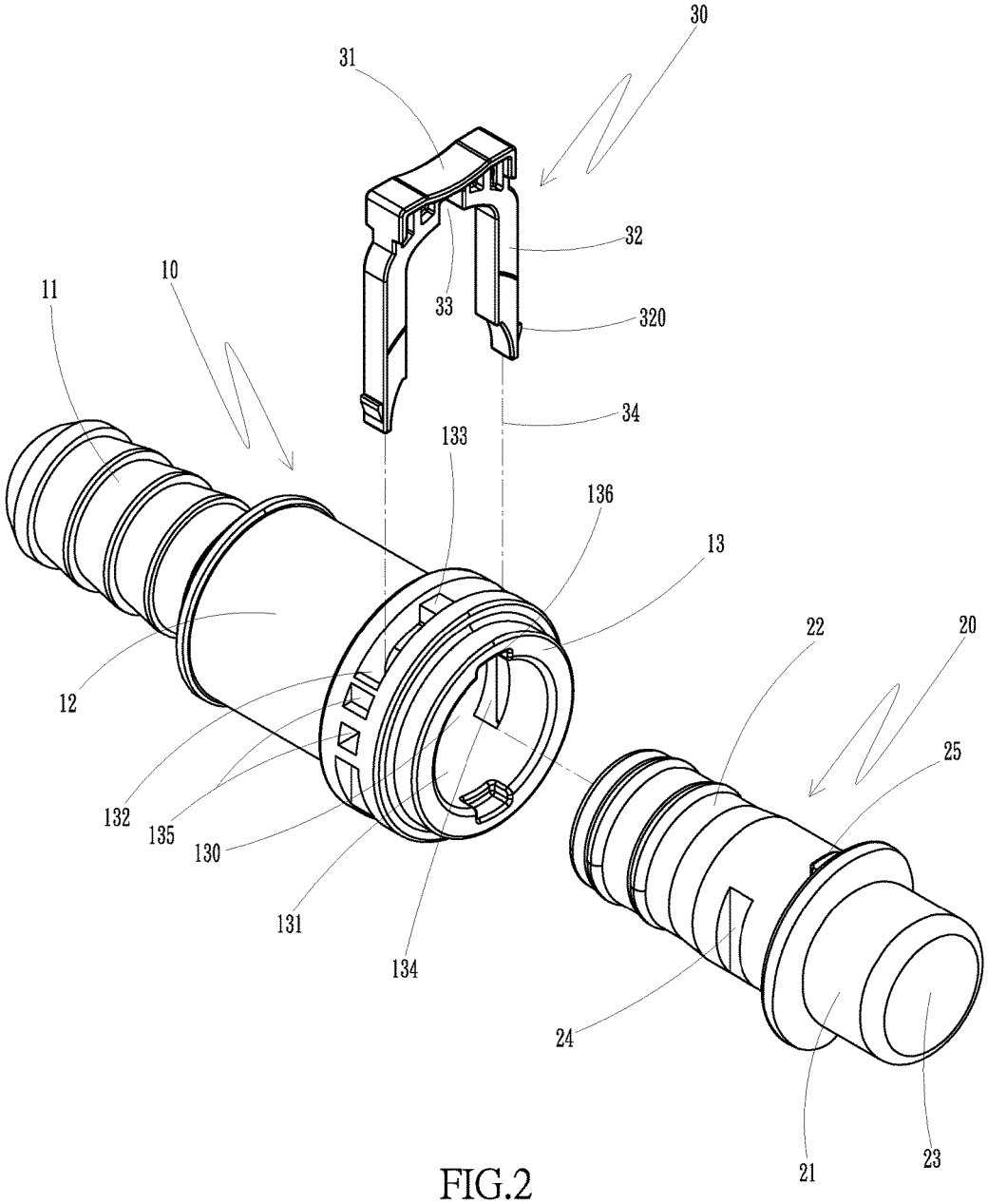

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FIG.2

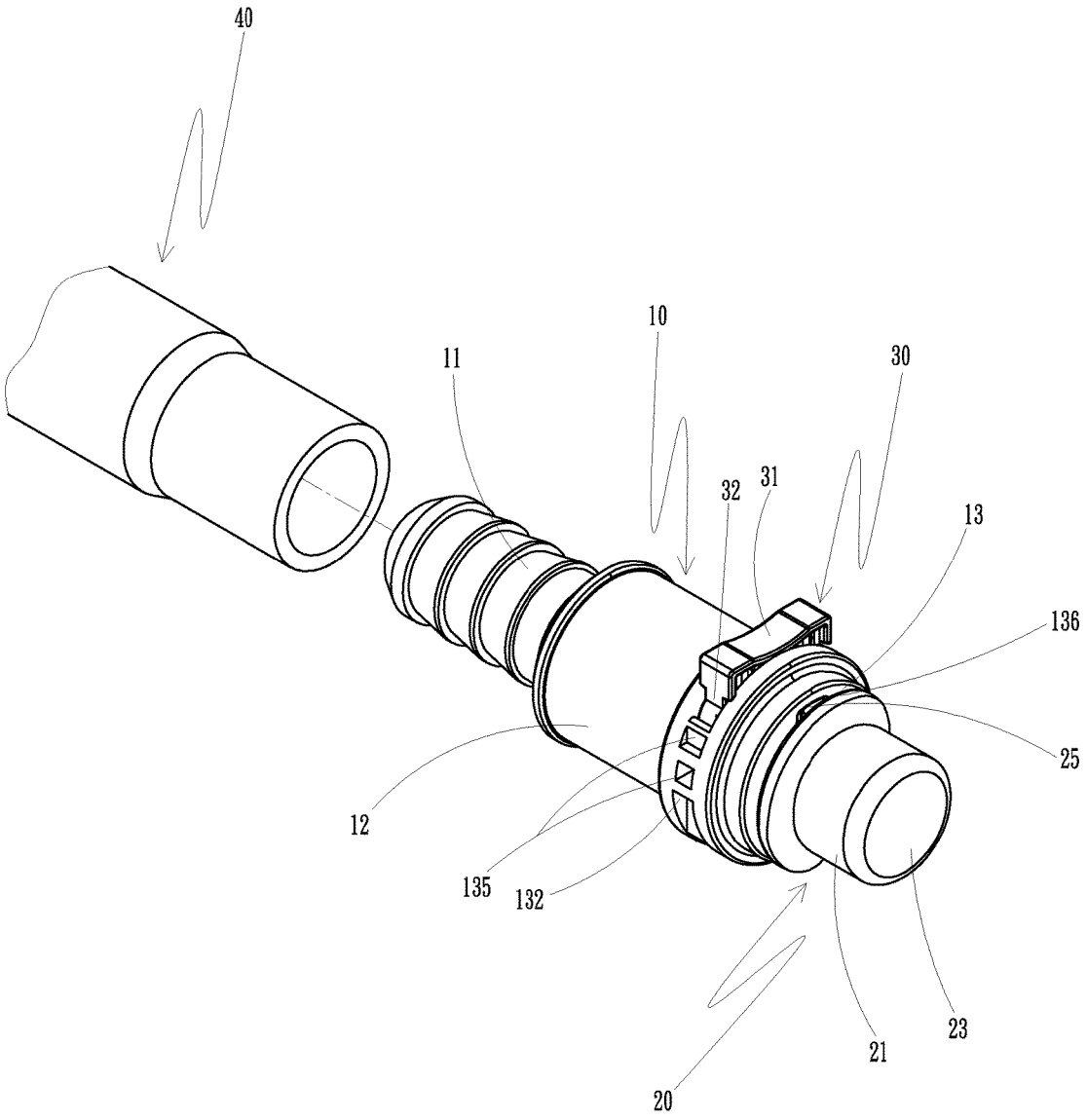

FIG.3

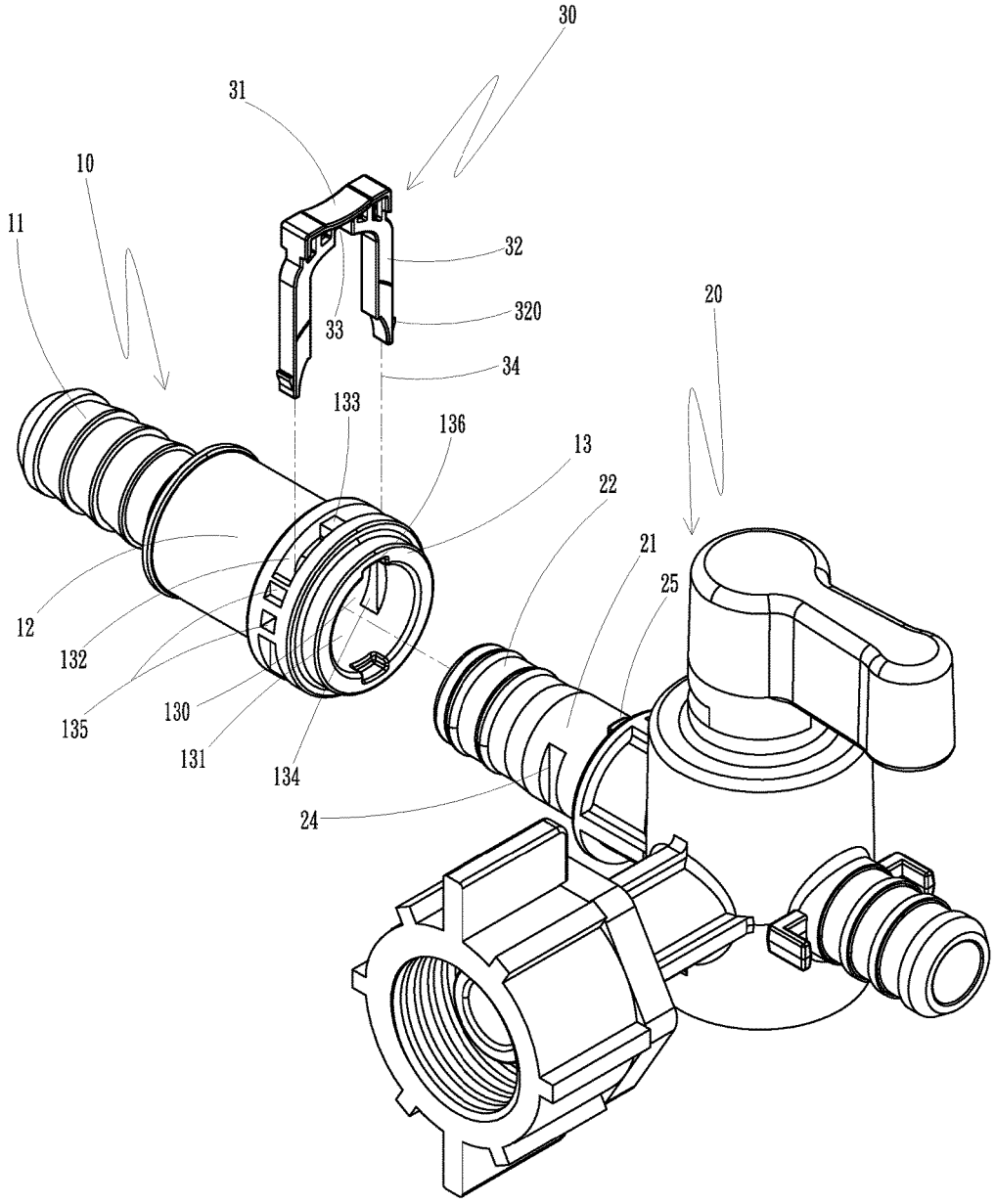
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FIG.4

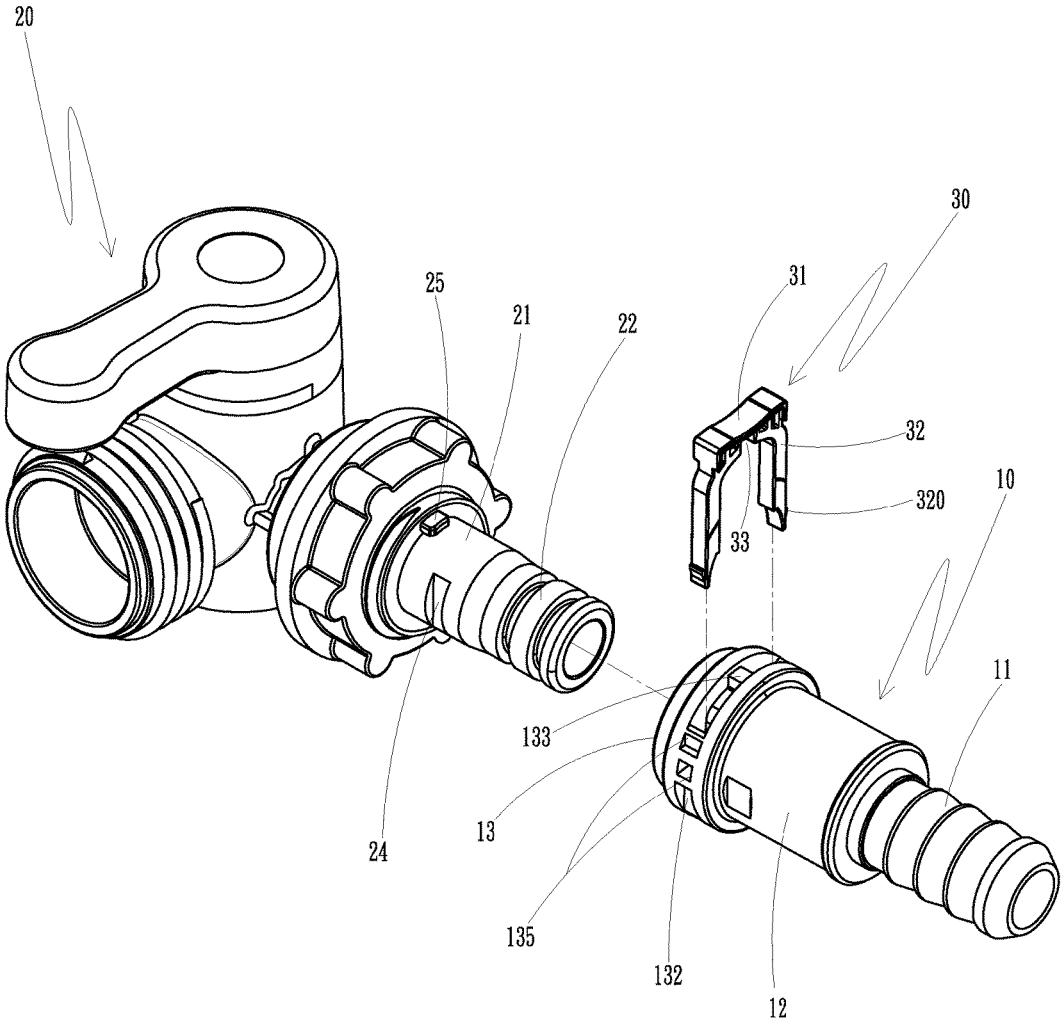

FIG.5

PRIOR ART

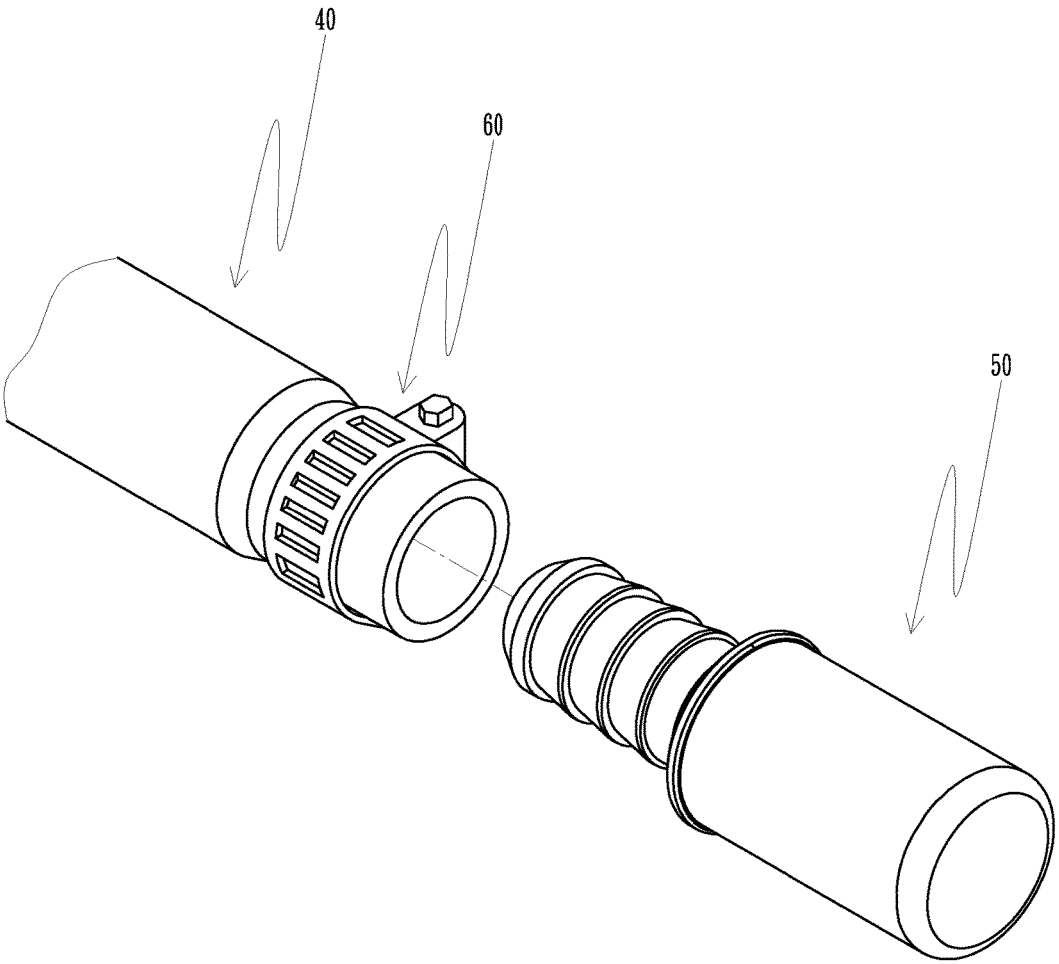

FIG.6

PRIOR ART

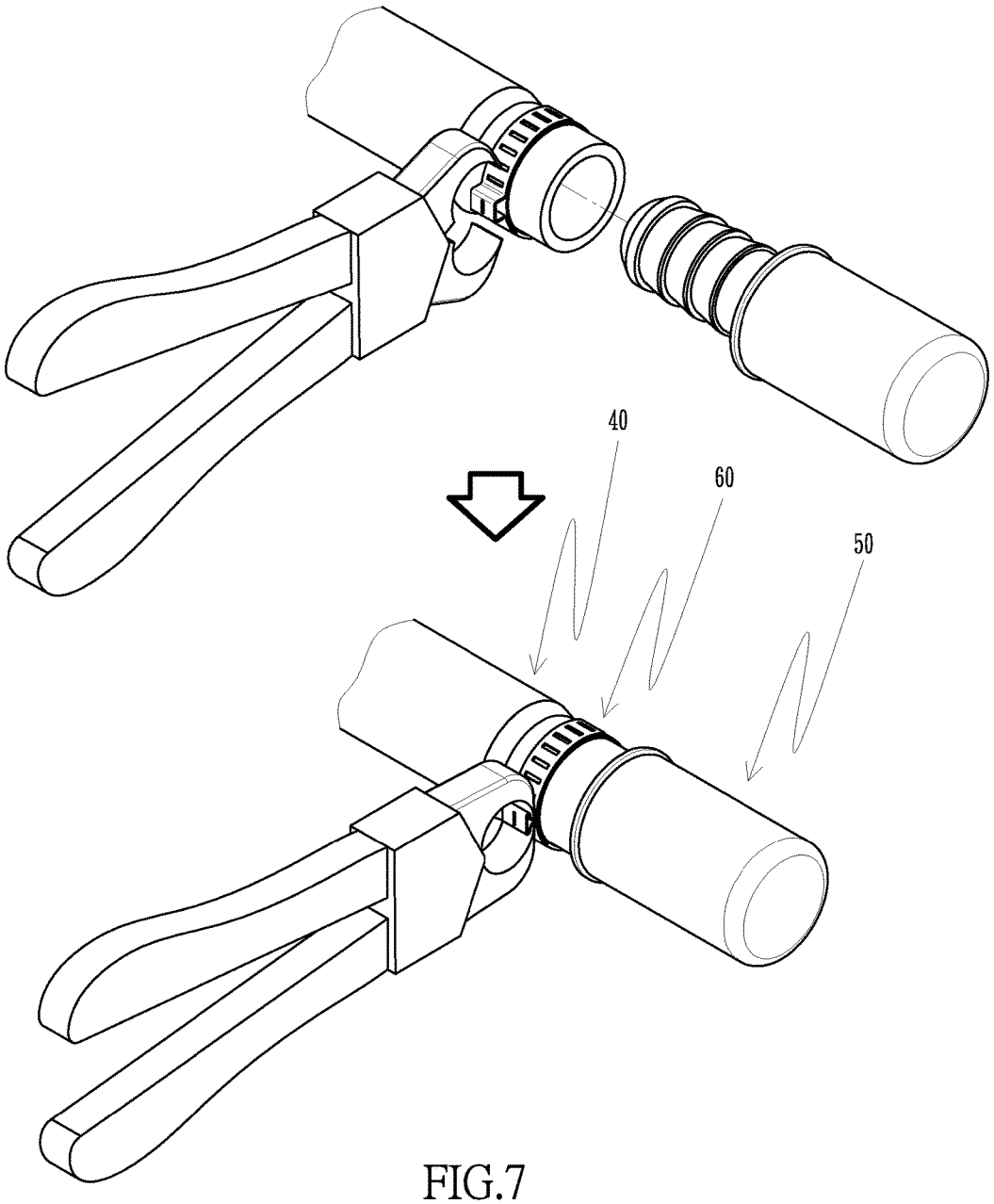

FIG.7

QUICK CONNECTOR STRUCTURE

FIELD OF THE INVENTION

[0001] The invention relates to a quick connector structure and, in particular, to a quick connector structure used in pipe connections.

BACKGROUND OF THE INVENTION

[0002] FIGS. **6** and **7** show two usage states of a conventional pipe connector. A pipe body **40** is directly fitted to a pipe connector **50**. In order to prevent the pipe body **40** from being detached from the pipe connector **50**, one often uses an adjustable pipe clamp device **60** to tighten or hold the connection. Each fitting part in the pipeline requires one such pipe clamp device **60**. This is inconvenient for pipe connections. Moreover, the pipe connections are often in a smaller or concealed space. After the pipe body **40** and the pipe connector **50** are fitted, it becomes extremely difficult to adjust the pipe clamp device **60**. Due to the limited space, the use of tools is quite inconvenient. Hence, improvements are required.

SUMMARY OF THE INVENTION

[0003] In view of the foregoing problems in convenience and stability of pipe connections, it is an objective of the invention to provide a quick connector structure.

[0004] A primary objective of the invention is to provide a quick connector structure, which includes a fitting connector, a connector, and a U-shaped positioning snap pin. The fitting connector is a pipe connector, a three-way valve connector, or a washing machine valve connector. The fitting connector is provided with a connector part, a connector body part, and a fitting part. A fitting hole is formed in the fitting part through the connector part and the connector body part. The fitting hole has a hole inner wall. Both sides of the fitting part are respectively formed with a longitudinal snap hole, with a resisting block is disposed in between. Both sides of the longitudinal snap holes are formed with one snap opening and at least one side snap opening on the hole inner wall. The upper and lower sides of the opening of the longitudinal snap holes are respectively formed with a positioning groove. The connector is provided with a connector body part and a connection end, with a duct hole formed through them. Near the connection end, the left and right sides of the connector body part are respectively formed with a positioning snap groove. Near the connection end, the upper and lower side of the connector body part are respectively formed with a positioning bump. The fitting hole formed in the fitting part of the fitting connector fits to the connection end. The snap openings on both sides of the hole inner wall of the fitting hole are opposite to the positioning snap grooves provided on both sides of the connection end. The two positioning grooves of the longitudinal snap holes provided in the fitting hole of the fitting part are positioned by the two positioning bumps formed on the connector body part. The U-shaped positioning snap pin has a pin base, both sides of which are extended downward by two pin body parts in an elastic way. The outer sides of the two pin body parts are respectively protruded with a snap protrusion. Between the two pin body parts is provided with a positioning inner recess. The two pin body parts achieve positioning along a positioning line, respectively. The two pin body parts follow the positioning lines to snap the longitudinal snap holes provided on both sides of the fitting part, simultaneously snapping the snap grooves formed on both sides of the connection end. The snap protrusions formed on the outer sides of the two pin body parts engage against the side snap openings on the hole inner wall on both sides of the longitudinal snap holes. The positioning inner recess formed between the two pin body parts snap the resisting block formed on the fitting part. The combination between the connector part of the fitting connector and a pipe, the U-shaped positioning snap pin can stabilize the connection between the fitting connector and the connector. This enables a quick positioning assembly and reduces the difficulty in assembly in a smaller or concealed space, achieving the effects of stability and convenience in assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. **1** is a three-dimensional assembly view of the disclosed quick connector structure;

[0006] FIG. **2** is a three-dimensional exploded view of the disclosed quick connector structure;

[0007] FIG. **3** shows the disclosed quick connector structure being used to connect two pipes;

[0008] FIG. **4** shows a first embodiment of the disclosed quick connector structure used at a three-way valve connector;

[0009] FIG. **5** shows a second embodiment of the disclosed quick connector structure used at a washing machine valve connector;

[0010] FIG. **6** shows one use of a conventional pipe connector; and

[0011] FIG. **7** shows another use of a conventional pipe connector.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0012] The aforementioned and other objectives and advantages of this disclosure will become clearer in light of the following detailed description of an illustrative embodiment of this invention described in connection with the drawings.

[0013] Please refer to FIGS. **1** and **2**, which are three-dimensional assembly view and three-dimensional exploded view of the disclosed quick connector structure, respectively.

[0014] The disclosed quick connector structure includes a fitting connector **10**, a connector **20**, and a U-shaped positioning snap pin **30**. The fitting connector **10** is a pipe connector, a three-way valve connector, or a washing machine valve connector.

[0015] The fitting connector **10** is provided with a connector part **11**, a connector body part **12**, and a fitting part **13**. A fitting hole **130** is formed in the fitting part **13** through the connector part **11** and the connector body part **12**. The fitting hole **130** has a hole inner wall **131**. Both sides of the fitting part **13** are respectively formed with a longitudinal snap hole **132**, with a resisting block **133** is disposed in between. Both sides of the longitudinal snap holes **132** are formed with one snap opening **134** and at least one side snap opening **135** on the hole inner wall **131**. The upper and lower sides of the opening of the longitudinal snap holes **132** are respectively formed with a positioning groove **136**.

[0016] The connector **20** is provided with a connector body part **21** and a connection end **22**, with a duct hole **23** formed through them. Near the connection end **22**, the left and right sides of the connector body part **21** are respectively formed with a positioning snap groove **24**. Near the connection end **22**, the upper and lower side of the connector body part **21** are respectively formed with a positioning bump **25**. The fitting hole **130** formed in the fitting part **13** of the fitting connector **10** fits to the connection end **22**. The snap openings **134** on both sides of the hole inner wall **131** of the fitting hole **130** are opposite to the positioning snap grooves **24** provided on both sides of the connection end **22**. The two positioning grooves **136** of the longitudinal snap holes **132** provided in the fitting hole **130** of the fitting part **13** are positioned by the two positioning bumps **25** formed on the connector body part **21**.

[0017] The U-shaped positioning snap pin **30** has a pin base **31**, both sides of which are extended downward by two pin body parts **32** in an elastic way. The outer sides of the two pin body parts **32** are respectively protruded with a snap protrusion **320**. Between the two pin body parts **32** is provided with a positioning inner recess **33**. The two pin body parts **32** achieve positioning along a positioning line **34**, respectively. The two pin body parts **32** follow the positioning lines **34** to snap the longitudinal snap holes **132** provided on both sides of the fitting part **13**, simultaneously snapping the snap grooves **24** formed on both sides of the connection end **22**. The snap protrusions **320** formed on the outer sides of the two pin body parts **32** engage against the side snap openings **135** on the hole inner wall **131** on both sides of the longitudinal snap holes **132**. The positioning inner recess **33** formed between the two pin body parts **32** snap the resisting block **133** formed on the fitting part **13**.

[0018] The above description details the disclosed quick connector structure.

[0019] Please refer to FIGS. **2** to **5**, which show respectively a three-dimensional exploded view of the disclosed quick connector structure, the disclosed quick connector structure being used to connect two pipes, a first embodiment of the disclosed quick connector structure used at a three-way valve connector, and a second embodiment of the disclosed quick connector structure used at a washing machine valve connector. The fitting connector **10** is a pipe connector, a three-way valve connector, or a washing machine valve connector. The fitting hole **130** formed in the fitting part **13** of the fitting connector **10** is fitted to the connection end **22** of the connector **20**. The two snap openings **134** formed on both sides of the hole inner wall **131** of the fitting hole **130** are opposite to the positioning snap grooves **24** formed on both sides of the connection end **22**. The two pin body parts **32** formed on the U-shaped positioning snap pin **30** go through the longitudinal snap holes **132** on both sides of the fitting part **13**, simultaneously snapping the positioning snap grooves **24** on both sides of the connection end **22**. The snap protrusions **320** formed on the outer sides of the two pin body parts **32** engage against the side snap openings **135** on both sides of the longitudinal snap holes **132** on the hole inner wall **131**. The positioning inner recess **33** formed between the two pin body parts **32** snaps the resisting block **133** formed on the fitting part **13**. The connector part **11** of the fitting connector **10** is combined with the pipe **40**. The U-shaped positioning snap pin **30** ensures the stability of the connection between the fitting connector **10** and the connector **20**. This enables a quick positioning assembly and reduces the difficulty in assembly in a smaller or concealed space, achieving the effects of stability and convenience in assembly.

[0020] While the invention is described in some detail hereinbelow with reference to certain illustrated embodiments, it is to be understood that there is no intent to limit it to those embodiments. On the contrary, the aim is to cover all modifications, alternatives and equivalents falling within the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A quick connector structure, comprising:

a fitting connector, which is provided with a connector part, a connector body part, and a fitting part, with a fitting hole formed in the fitting part through the connector part and the connector body part, the fitting hole being formed with a hole inner wall, and both sides of the fitting part being respectively formed with a longitudinal snap hole;

a connector, which is provided with a connector body part and a connection end, with a duct hole formed through the connector body part and the connection end, both sides of the connector body part near the connection end being respectively formed with a positioning snap groove, the fitting hole formed in the fitting part of the fitting connector being fitted to the connection end, and the snap openings formed on both sides of the hole inner wall of the fitting hole being opposite to the snap grooves formed on both sides of the connection end; and

a U-shape positioning pin, which is provided with a pin base whose both side are extended downward with two pin body parts in an elastic way, with the two pin body parts going through the longitudinal snap holes formed on both sides of the fitting part and simultaneously engaging against the positioning snap grooves formed on both sides of the connection end.

2. The quick connector structure of claim **1**, wherein the fitting connector is a pipe connector, a three-way valve connector, or a washing machine valve connector.

3. The quick connector structure of claim **1**, wherein the upper and lower sides of the longitudinal snap holes formed on the fitting part of the fitting connector are respectively formed with a positioning groove, the upper and lower sides of the connector body part of the connector near the connection end are respectively formed with a positioning bump, and the two positioning grooves of the longitudinal snap holes formed in the fitting hole of the fitting part are positioned by the two positioning bumps formed on the connector body part.

4. The quick connector structure of claim **1**, wherein a resisting block is provided between the longitudinal snap holes on both sides of the fitting part of the fitting connector, a positioning inner recess is formed between the two pin body parts of the U-shaped positioning snap pin, and the positioning inner recess snaps the resisting block of the fitting part.

5. The quick connector structure of claim **1**, wherein both sides of each of the longitudinal snap holes on both sides of the fitting part of the fitting connector are formed with at least one side snap opening on the hole inner wall, the outer sides of the two pin body parts of the U-shaped positioning snap pin are protruded outward with a snap protrusion, and

the snap protrusions engage against the side snap openings formed on the hole inner wall on both sides of the longitudinal snap holes.

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