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(54) **DRAIN PLUG ASSEMBLY**

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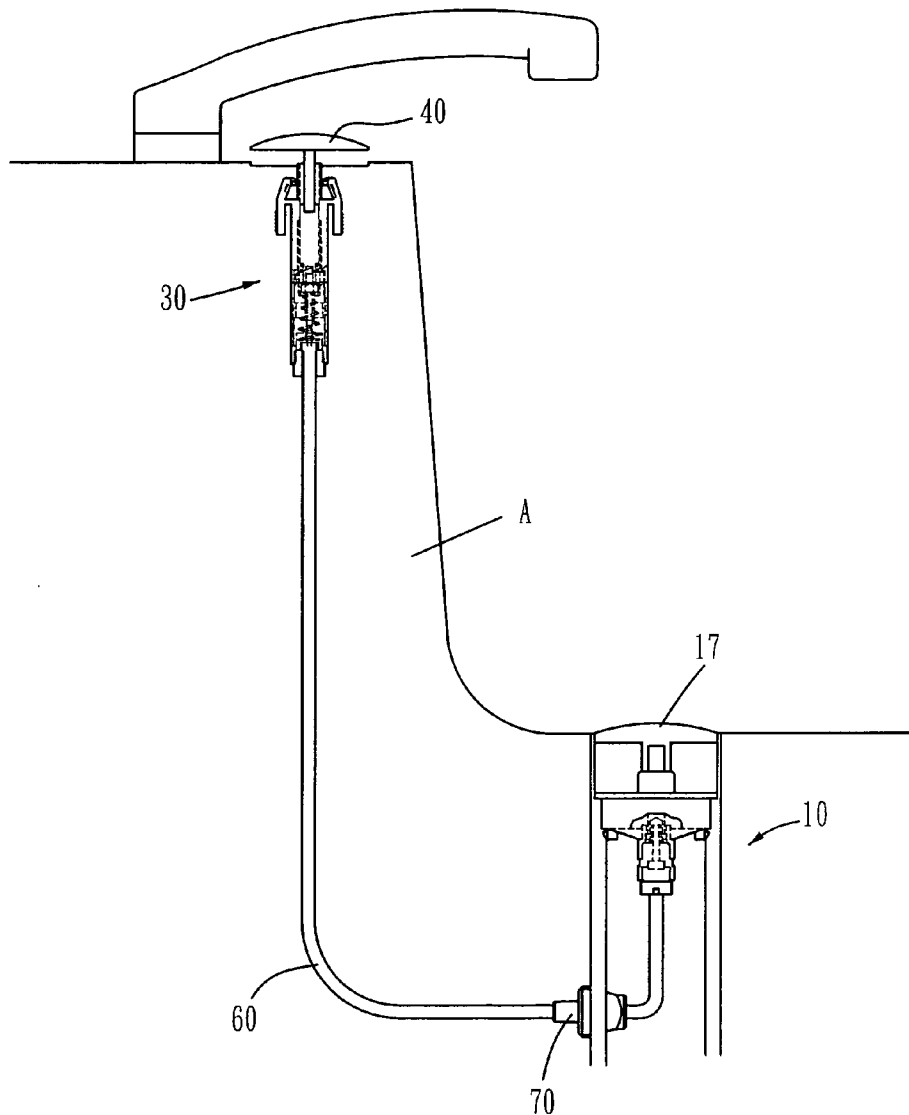
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(57) **ABSTRACT**

A drain plug assembly includes an operation unit including a button and a cable is connected between the button and a plug unit which is located in a drain hole of a drain pipe. The cable that is located close to the button is received in a part of a sink and the cable that is located close to the plug unit is received in the drain pipe. A positioning unit is located between the button and the cable so as to control the button at different positions and to drive the cable to move the plug unit. A hose is mounted to the cable. When pushing the button, the cable is moved upward to push the plug upward for draining purpose. The cable is well protected and does not expose so that the cable is not tangled, pulled or damaged by foreign objects.



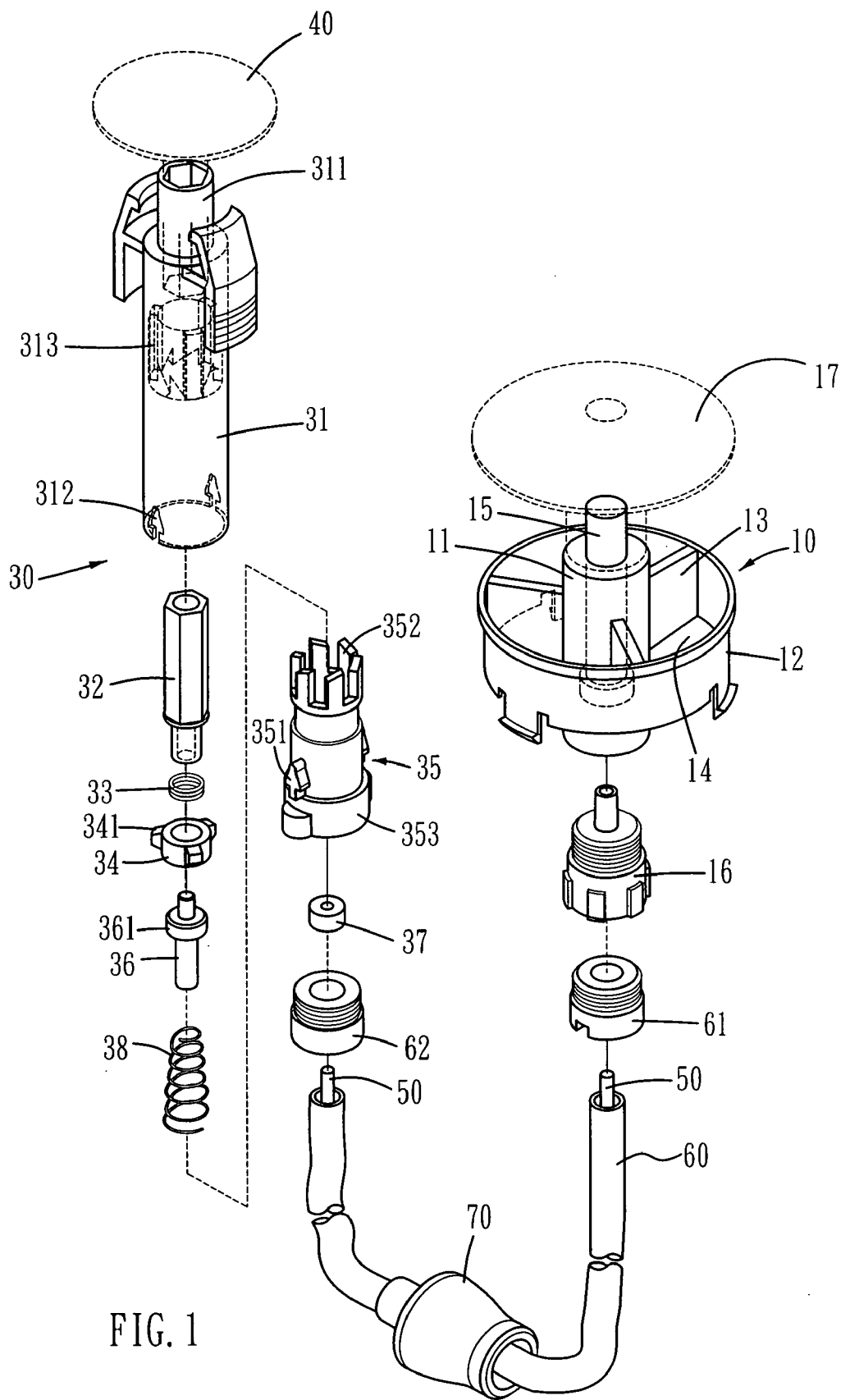


FIG. 1

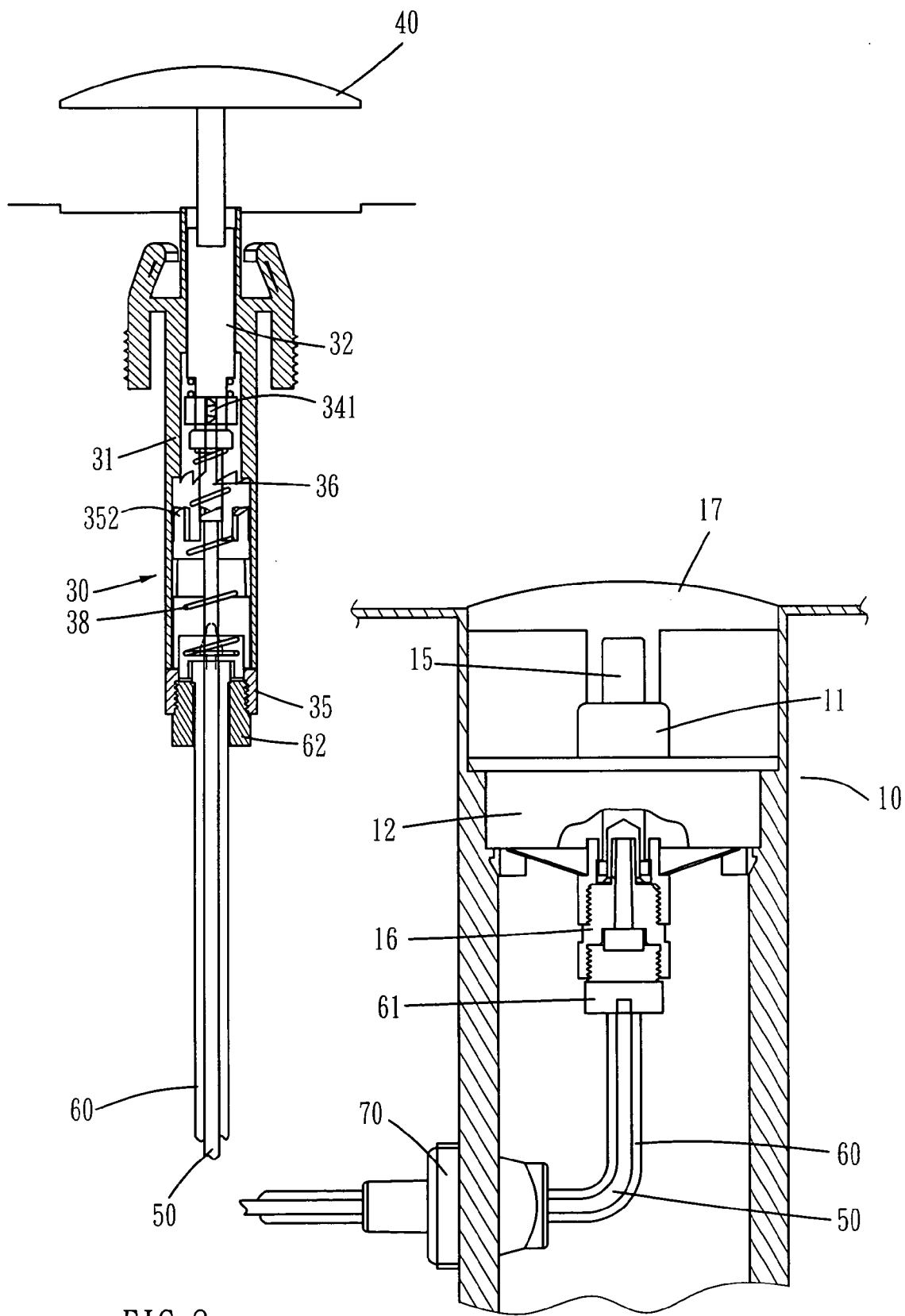
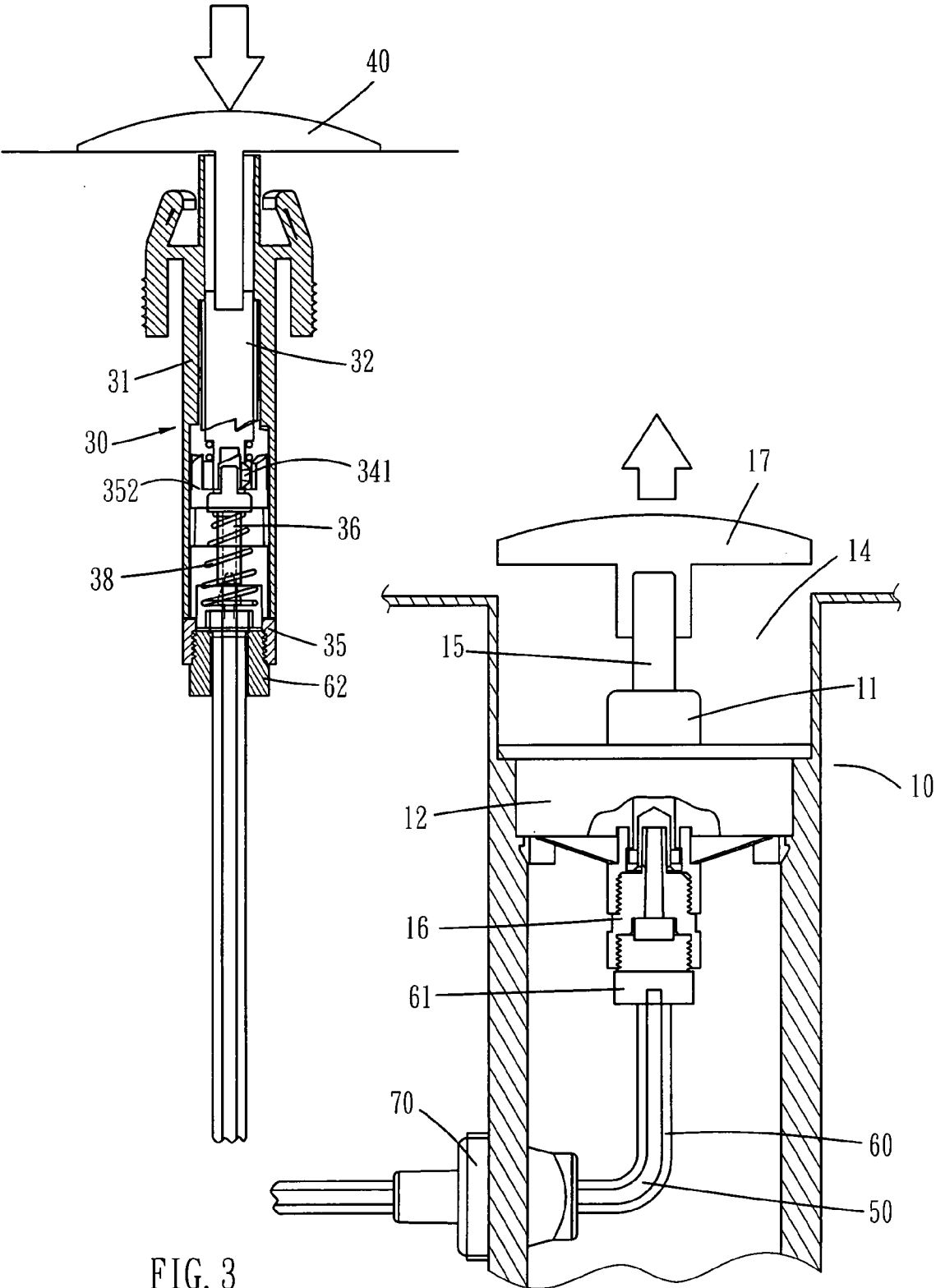


FIG. 2



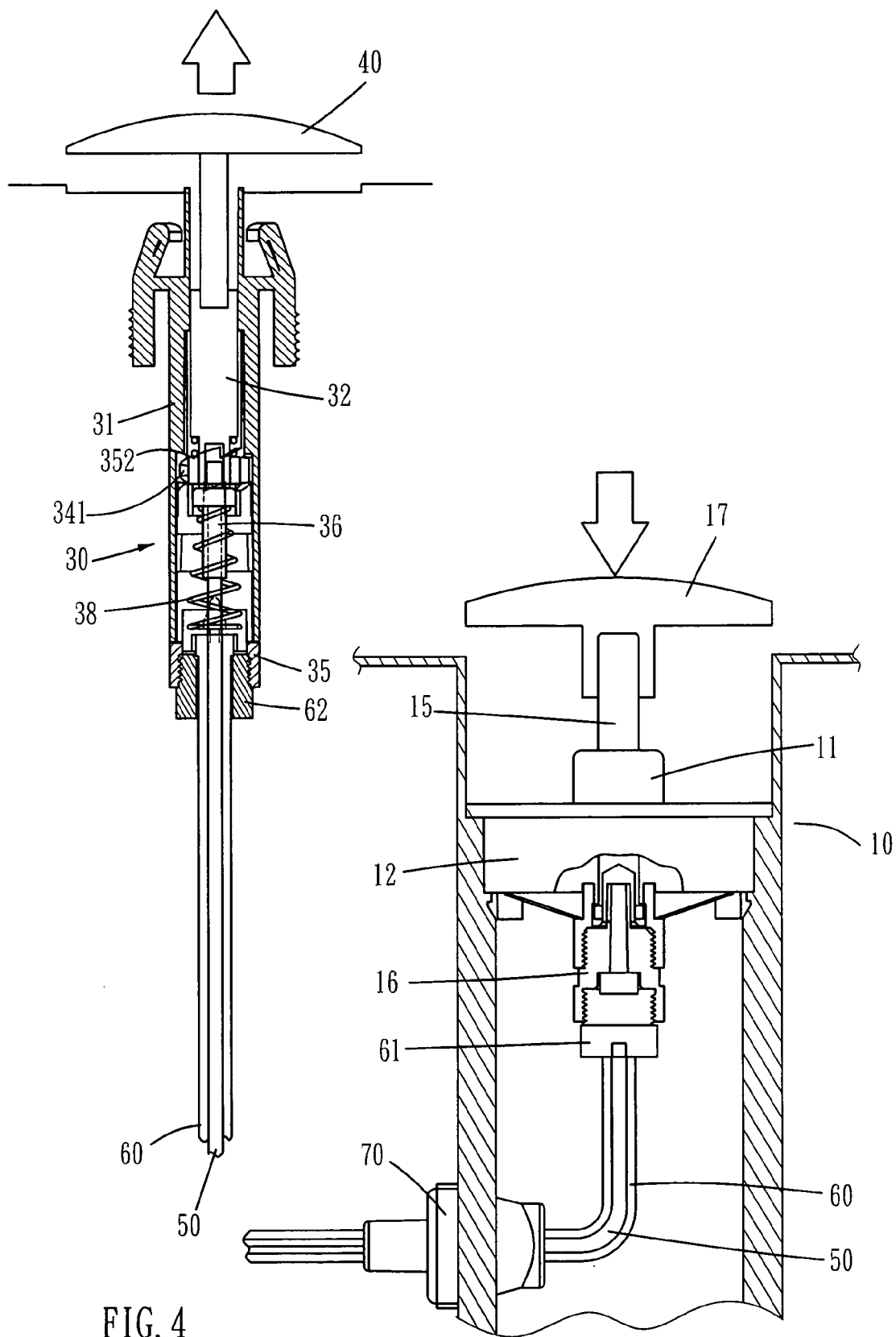


FIG. 4

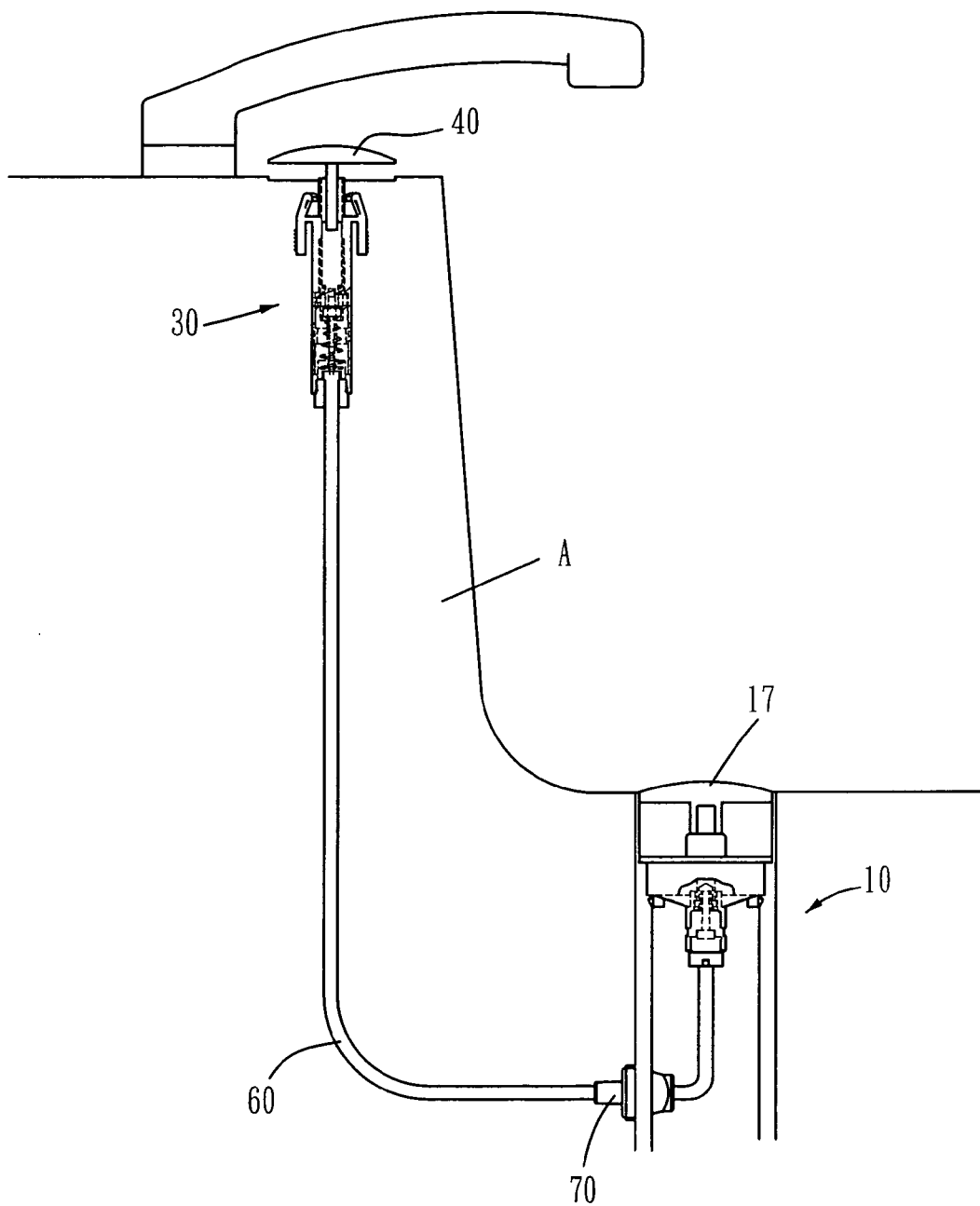


FIG. 5

DRAIN PLUG ASSEMBLY

BACKGROUND OF THE INVENTION

[0001] (1) Field of the Invention

[0002] The present invention relates to a drain plug assembly for bathroom or kitchen sink.

[0003] (2) Description of the Prior Art

[0004] A conventional drain plug assembly used for bathroom or kitchen sink generally includes a link system connected with a lift rod which is located on the sink and the plug is connected to the link system. When lifting the lift rod, the plug is lowered to seal the drain hole in the sink and when pushing the lift rod, the plug is pushed a distance from the drain hole. The link system requires a certain space and some bathrooms or kitchens may not have sufficient space for the link system.

[0005] U.S. Pat. No. 6,347,417 discloses a drain plug device which includes a button on the wall and a wire is connected between the plug and the button so that when pushing the button, the plug is controlled to seal the drain hole or to open the drain hole. However, the wire is exposed and can be easily tangled by objects or even be damaged unintentionally or intentionally.

[0006] The present invention intends to provide a drain plug assembly wherein the cable for controlling the plug is protected.

SUMMARY OF THE INVENTION

[0007] The present invention relates to a drain plug assembly for kitchen or bathroom sink and comprises an operation unit including a button and a cable which has one end connected to an underside of the button and the other end of the cable is connected to a plug unit which is located in a drain hole of a drain pipe. The first end of the cable that is located close to the button is received in a part of a sink and the second end of the cable that is located close to the plug unit is received in the drain pipe. A positioning unit is located between the button and the cable so as to control the button at different positions and to drive the cable to move the plug unit. A hose is mounted to the cable.

[0008] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is an exploded view to show the drain plug assembly of the present invention;

[0010] FIG. 2 is a partial cross sectional view to show the first position of the button;

[0011] FIG. 3 is a partial cross sectional view to show the second position of the button;

[0012] FIG. 4 is a partial cross sectional view to show the third position of the button, and

[0013] FIG. 5 shows the drain plug assembly is installed to a bathroom sink.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Referring to FIG. 1, the drain plug assembly of the present invention comprises a plug unit 10 and an operation unit which includes a button 40 and a cable 50 which has one

end connected to an underside of the button 40 and the other end of the cable 50 is connected to the plug unit 10. The button 40 is located at a wall beside the sink or just beneath the faucet as shown in FIG. 5. The plug unit 10 is located in a drain hole of a drain pipe of the sink and the first end of the cable 50 that is located close to the button 40 is received in a part "A" of the sink (FIG. 5) and the second end of the cable 50 that is located close to the plug unit 10 is received in the drain pipe.

[0015] The plug unit 10 includes a central tube 11 and a plurality of radial plates 13 extend radially from the central tube 11 and are connected to a collar 12. A plurality of through holes 14 are defined between the central tube 11, the radial plates 13 and the collar 12, water in the sink drains from the through holes 14. A protrusion 15 extends from a first end of the central tube 11 and is connected to a plug 17 which is used to seal the drain hole. A connector 16 is connected to a second end of the central tube 11 and a first connection member 61 is threadedly connected to the connector 16. The second end of the cable 50 extends through the first connection member 61 and the connector 16 and is connected to the protrusion 15 in the central tube 11.

[0016] A positioning unit 30 is located between the button 40 and the cable 50 so as to control the button 40 at different positions and to drive the cable 50 to move the plug unit. The positioning unit 30 includes a cylindrical case 31 and a tube 311 extends from an end of the cylindrical case 31. A polygonal passage is defined through the tube 311 and a polygonal rod 32 is movably inserted into the polygonal passage. An end of the polygonal rod 32 is connected to the button 40 and the other end of the polygonal rod 32 is connected with a rotational member 34. The rotational member 34 includes a plurality of radial blocks 341 extending radially therefrom. A first spring 33 is mounted to the polygonal rod 32. An inner piece 35 is inserted into the other end of the cylindrical case 31 and includes a plurality of spikes 352 which are located in the cylindrical case 31. Each of the spikes 352 includes an inclined top surface. The cylindrical case 31 includes two indication notches 312 defined in the open bottom thereof and the inner piece 35 includes two engaging blocks 351 which are engaged with the indication notches 312 when inserting the inner piece 35 into the cylindrical case 31. A plurality of ribs 313 are formed on the inner wall of the cylindrical case 31 and each rib 313 includes two inclined surfaces like an arrow head. The first end of the cable 50 extends through a second connection member 62, a washer 37 and the inner piece 35 and is connected to a push rod 36 located at a center of the spikes 352. The second connection member 62 is threadedly connected to the connection end 353 of the inner piece 35. The push rod 36 includes a flange 361 and the rotational member 34 is mounted to the push rod 36 and is rested on the flange 361. A second spring 38 is mounted to a lower section of the push rod 36 and pushes the flange 361 upward.

[0017] A hose 60 mounted to the cable 50 and a seal member 70 is connected to the hose 60 and located between the sink "A" and the drain pipe. The hose 60 has one section located in the drain pipe and the other section is hidden in the part "A" of the sink. The seal member 70 is located at the wall of the drain pipe so as to prevent the draining water from passing through the wall of the drain pipe where the hose passes.

[0018] As shown in FIGS. 2 to 4, the second spring 38 applies an upward force to the polygonal rod 32 such that the button 40 is located at its highest position and the plug 17 seals the through holes 14. When pushing the button down-

ward to push the polygonal rod 32 downward, the radial blocks 341 on the rotational member 34 are moved along the inclined surfaces of the spikes 352 and move into the recesses between the spikes 352. The push rod 36 and the cable 50 are then pushed to let the second end of the cable 50 push the protrusion 15 of the plug unit 10, such that the plug 17 is lifted and an opening is defined between the plug 17 and the through holes 14 as shown in FIG. 3.

[0019] When releasing the button 40 as shown in FIG. 4, the second spring 38 pushes the polygonal rod 32 upward and the radial blocks 341 are engaged with the first inclined surfaces of the ribs 313, the button 40 is slightly moved upward. In this position, there is a distance between the button 40 and the operation unit. The cable 50 is moved backward to lower the protrusion 15 and the plug 17, the gap is still existed between the plug 17 and the through holes 14.

[0020] When pushing the button 40 again, the radial blocks 341 are moved in the recesses between the ribs 313 via the second inclined surfaces of the ribs 313. In this position, the plug 17 seals the through holes 14.

[0021] As shown in FIG. 5, due to the flexibility of the cable 50 and the hose 60, the operation unit can be installed behind the faucet or on the wall so that the user of different heights can easily operate the operation unit. The hose 60 and the cable 50 can be arranged along the part "A" of the sink and hidden by the part "A" so that they are not damaged by foreign objects.

[0022] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

- 1. A drain plug assembly comprising:
an operation unit including a button and a cable which has one end connected to an underside of the button and the

other end of the cable connected to a plug unit which is located in a drain hole of a drain pipe, the first end of the cable that is located close to the button is received in a part of a sink and the second end of the cable that is located close to the plug unit is received in the drain pipe; a positioning unit located between the button and the cable so as to control the button at different positions and to drive the cable to move the plug unit, and a hose mounted to the cable.

2. The drain plug assembly as claimed in claim 1, wherein the plug unit includes a central tube and a plurality of radial plates extend radially from the central tube and are connected to a collar, a protrusion extends from a first end of the central tube and a connector is connected to a second end of the central tube, a plug is connected to the protrusion.

3. The drain plug assembly as claimed in claim 2, wherein the second end of the cable extends through the connector and is connected to the protrusion in the central tube.

4. The drain plug assembly as claimed in claim 1, wherein a seal member is connected to the hose and located between the sink and the drain pipe.

5. The drain plug assembly as claimed in claim 1, wherein the positioning unit includes a cylindrical case and a tube extends from an end of the cylindrical case, a polygonal passage is defined through the tube and a polygonal rod is movably inserted into the polygonal passage, an end of the polygonal rod is connected to the button and the other end of the polygonal rod is connected with a rotational member, a first spring is mounted to the polygonal rod, an inner piece is inserted into the other end of the cylindrical case and includes a plurality of spikes which are located in the cylindrical case.

6. The drain plug assembly as claimed in claim 5, wherein the first end of the cable extends through the inner piece and is connected to a push rod located at a center of the spikes, the push rod is connected to the rotational member.

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