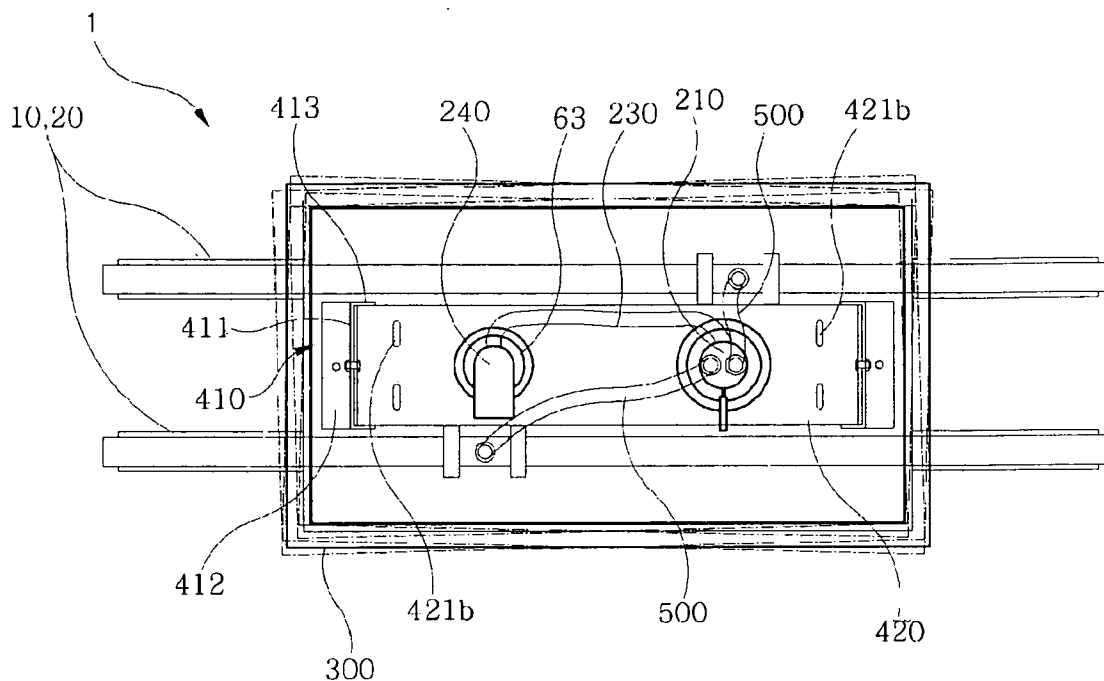




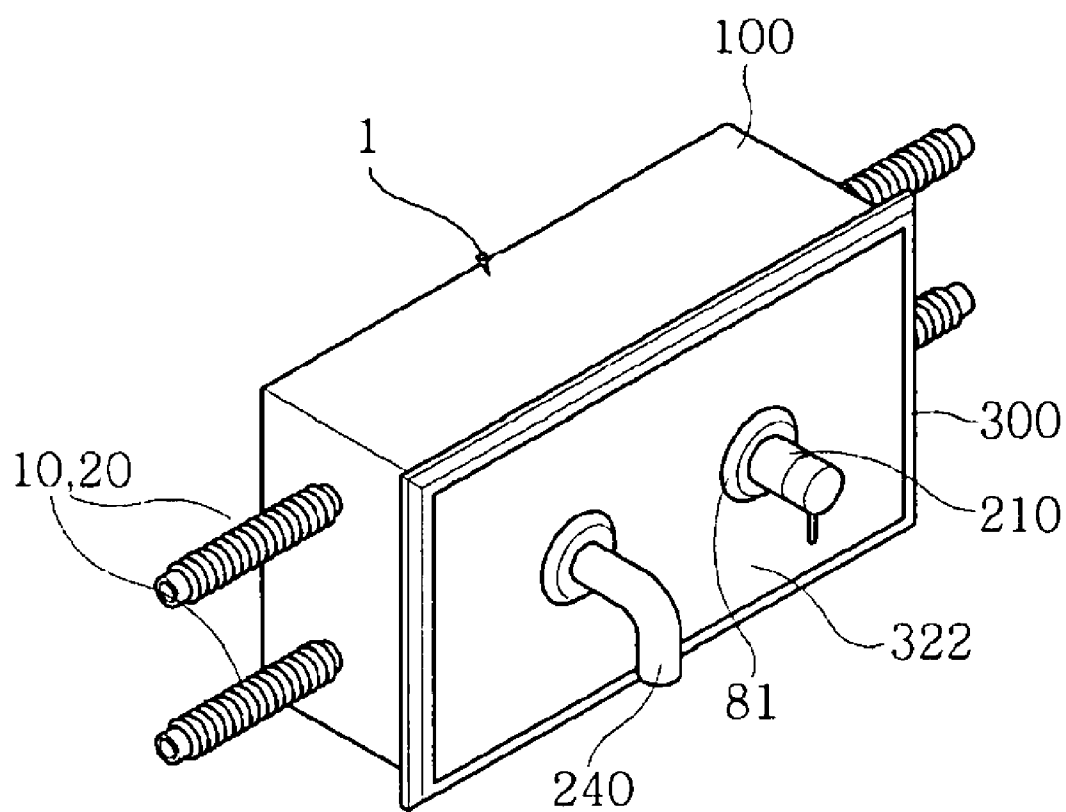
US 20090145493A1

(19) **United States**(12) **Patent Application Publication**
Lee(10) **Pub. No.: US 2009/0145493 A1**(43) **Pub. Date: Jun. 11, 2009**(54) **BUILT-IN WALL WATER SERVICE BOX**(30) **Foreign Application Priority Data**(75) Inventor: **Yeong-Chun Lee**, Gyeonggi-do
(KR)Nov. 23, 2004 (KR) 10-2004-0096397
Feb. 28, 2005 (KR) 10-2005-0016410**Publication Classification**Correspondence Address:
BOOTH UDALL, PLC
1155 W. Rio Salado Pkwy., Suite 101
Tempe, AZ 85281 (US)(51) **Int. Cl.**
E03B 7/00 (2006.01)
(52) **U.S. Cl.** **137/360**(57) **ABSTRACT**(73) Assignee: **PIP CO., LTD.**, Bucheon-si (KR)(21) Appl. No.: **11/719,388**(22) PCT Filed: **Nov. 23, 2005**(86) PCT No.: **PCT/KR2005/003962**§ 371 (c)(1),
(2), (4) Date: **May 15, 2007**

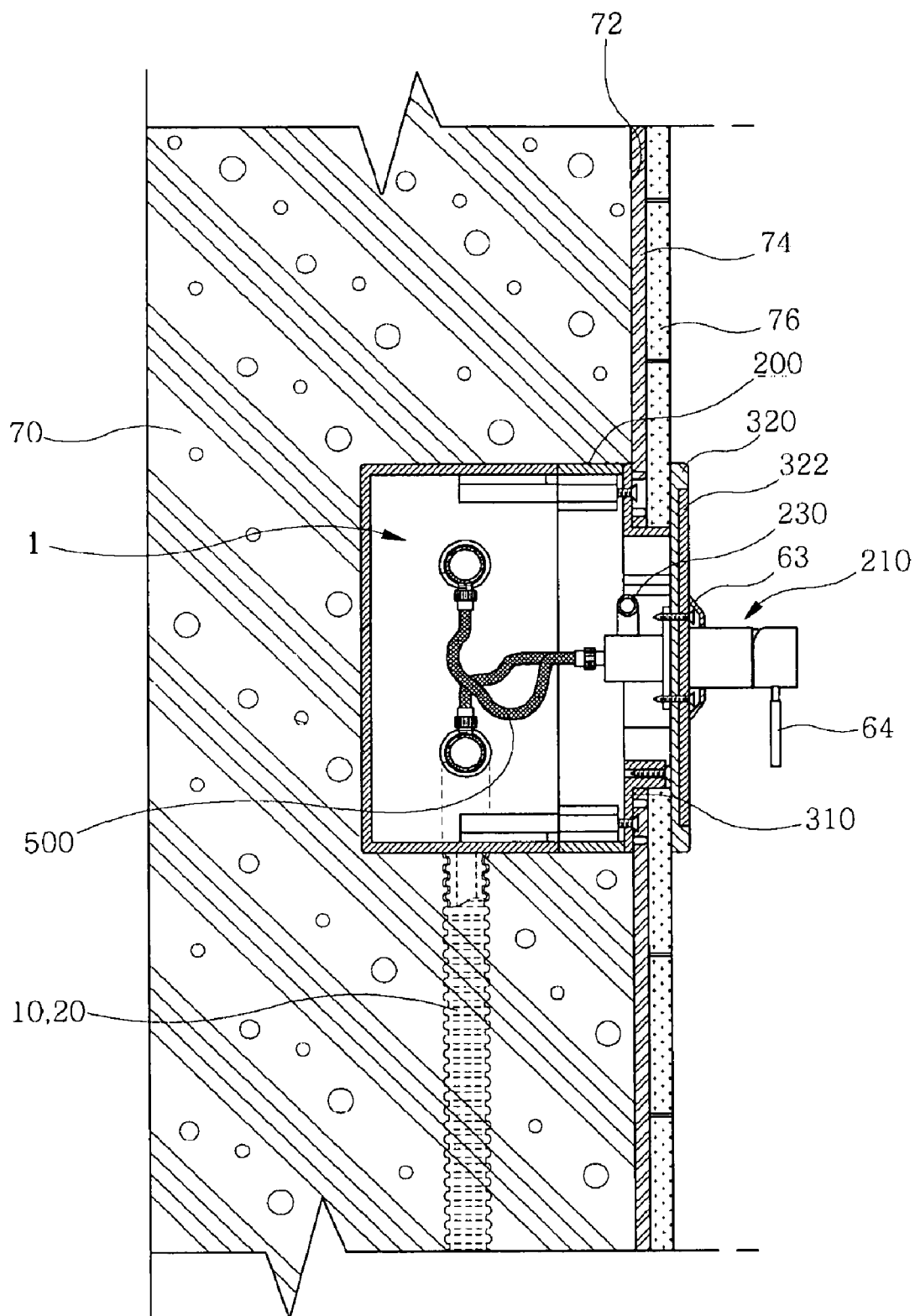
Disclosed herein is a built-in wall water service box. The water service box of the present invention includes a case (100) which is connected to cold and hot water pipes (10, 20) and is open at a front end thereof, and a faucet unit (200) which is provided in the case (100) and mixes cold and hot water, which enters the case (100), with each other. The water service box further includes a cover (300) which protects the faucet unit (200) and is coupled to the open front end of the case (100), and a cover flush-mounting unit (400) which is provided between the case (100) and the cover (300) to adjust a gap between the cover (300) and the case (100) embedded in a wall.



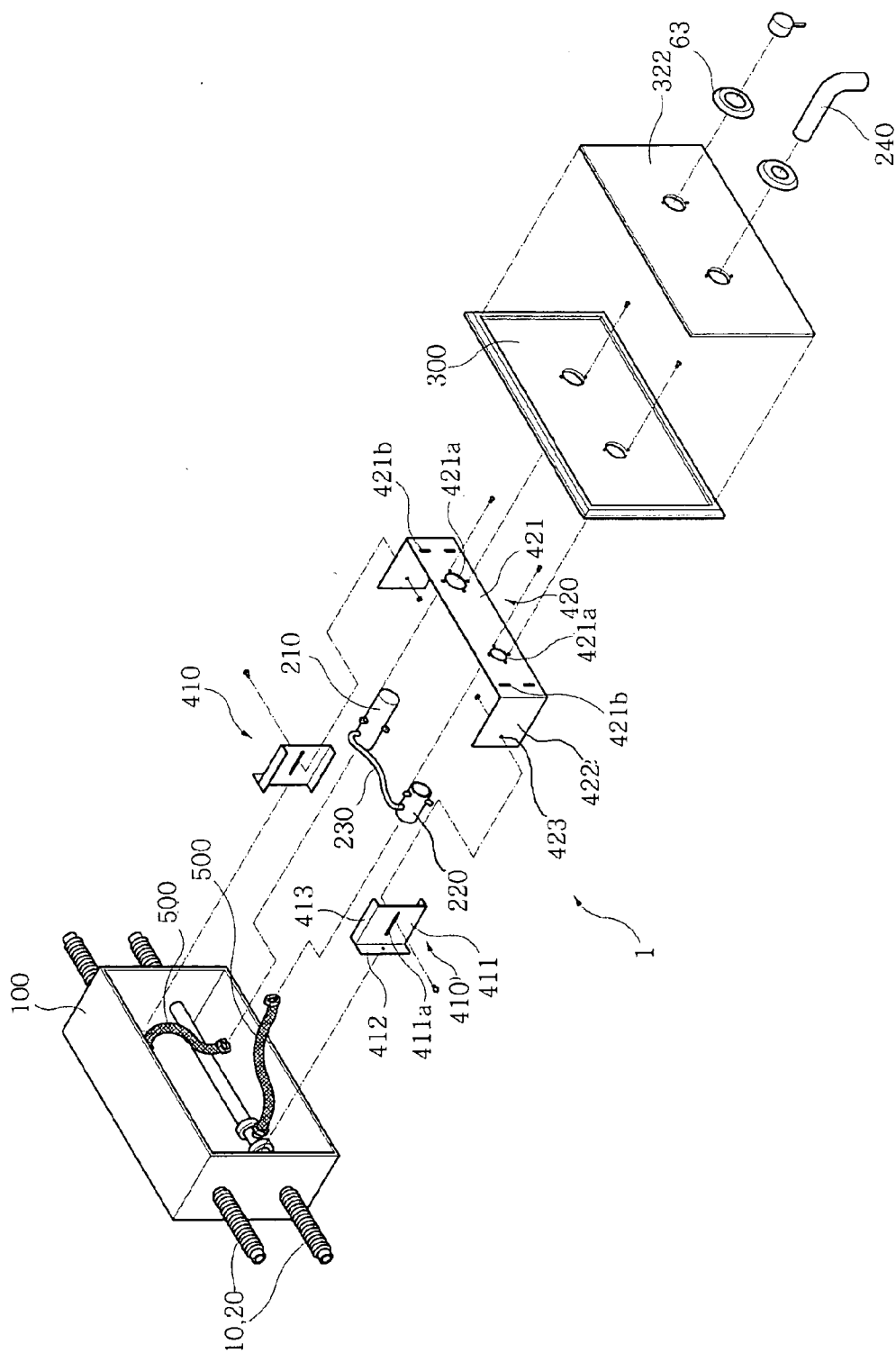
[Fig. 1]



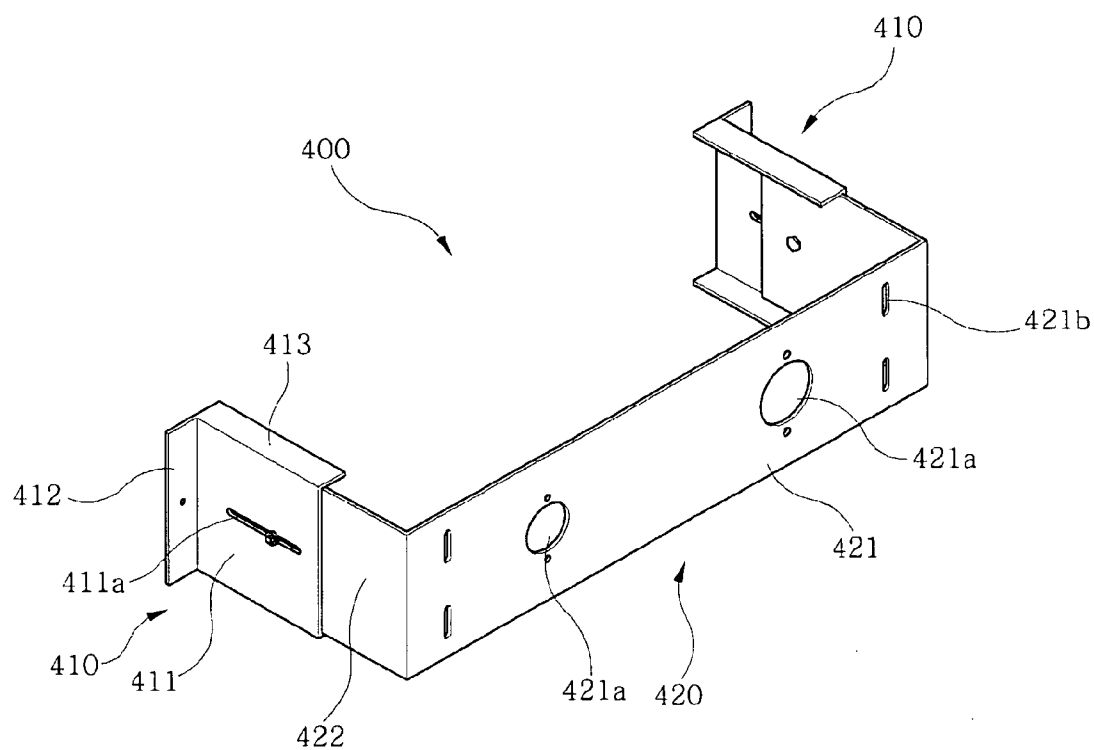
[Fig. 3]



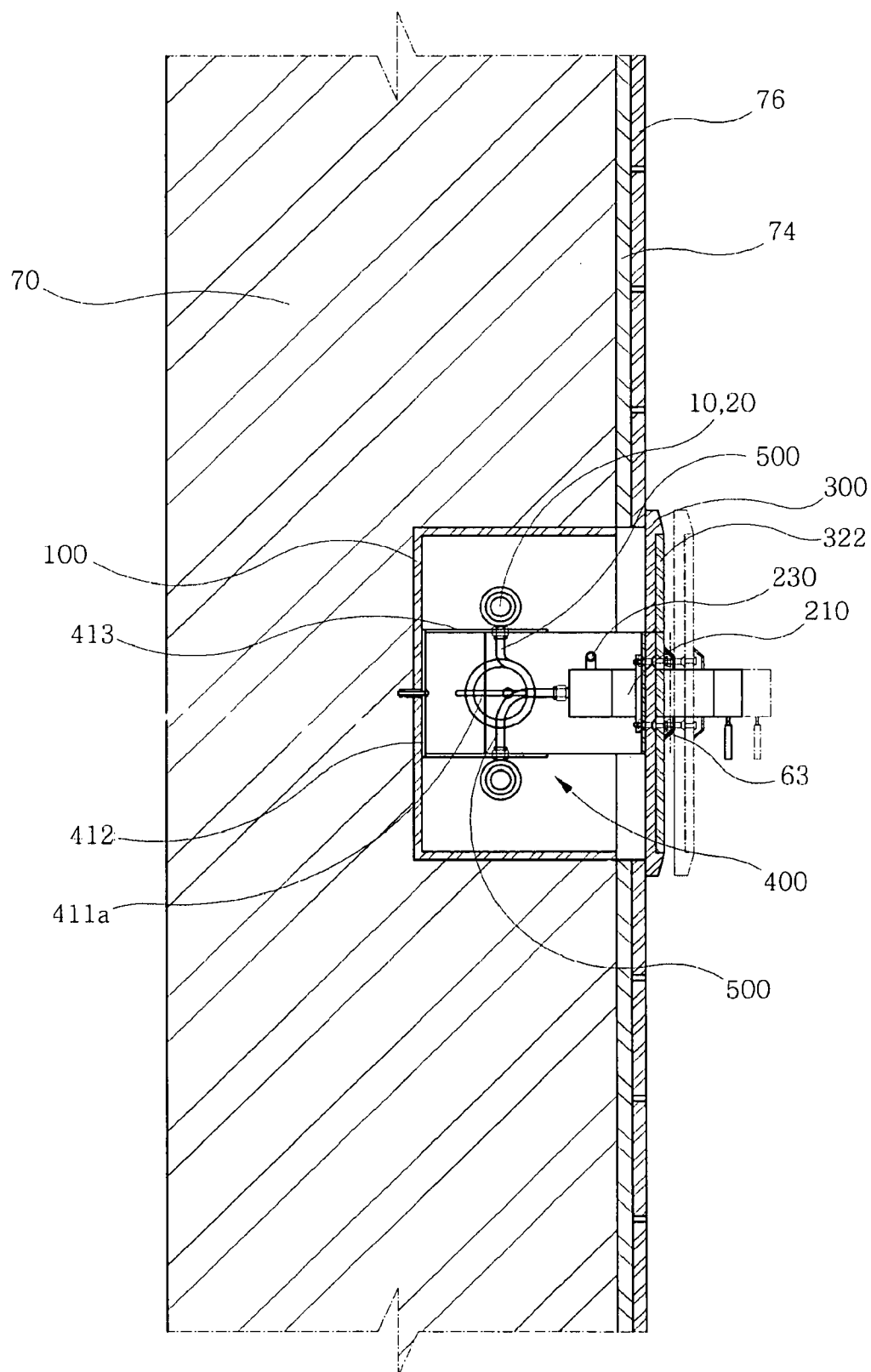
[Fig. 4]

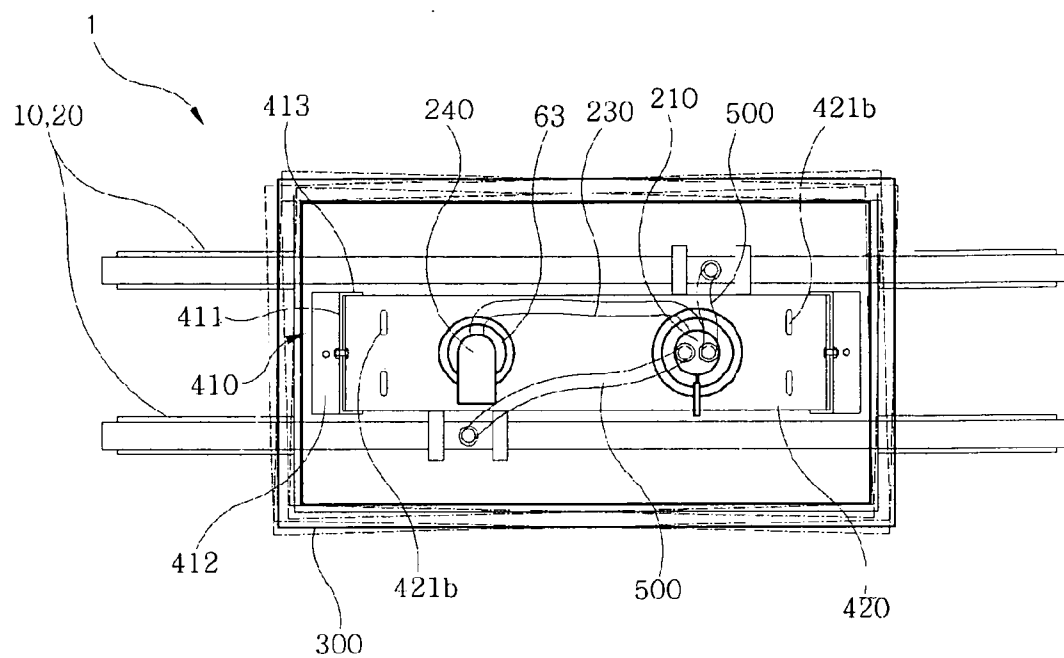


[Fig. 5]



[Fig. 6]





BUILT-IN WALL WATER SERVICE BOX**TECHNICAL FIELD**

[0001] The present invention relates, in general, to built-in wall water service boxes and, more particularly, to a built-in wall water service box which makes it possible for a user to easily check the state of water flow of cold and hot water pipes, which are embedded in the wall, and in which a faucet unit is coupled to parts of the cold and hot water pipes, which pass through the water service box, so as to mix and distribute cold and hot water, so that, even if a malfunction, for example, water leakage or water service interruption, occurs after construction has been finished, the water service box can be easily disassembled and reassembled, and which has a cover flush-mounting unit so that a gap between a cover and the wall can be easily adjusted, thus ensuring a good appearance.

BACKGROUND ART

[0002] Generally, water service boxes are embedded in inner walls of buildings, such as residential buildings, apartment buildings, office buildings and hotels. In the construction or expansion of such a building, cold and hot water pipes are guided from the outside to a distribution box, previously installed below a vanity sink, near built-in furniture, or at a predetermined position in a dressing room. Furthermore, the cold and hot water pipes extend to desired locations, for example, a bathroom, a boiler room, a multi-use room, a laundry room, a kitchen, etc., such that cold and hot water can be supplied to the desired locations in the cold and hot water pipes.

[0003] Each of the cold and hot water pipes, which are connected to desired locations from the distribution box, has a double pipe structure in which a flexible inner pipe is inserted into a corrugated cover pipe. The cold and hot water pipes having the double pipe structure are supplied to water service boxes of a bathroom, a laundry room and a multi-use room through floors of rooms and the kitchen. Connection pipes are connected to the water service boxes which are installed at desired locations, thus supplying cold and hot water to cold and hot water lines of a bathtub, a washstand, a toilet, and a laundry room.

[0004] However, in the conventional piping system, the water service boxes cannot be connected to each other. Therefore, because cold and hot water pipes are independently connected to all water service boxes during a construction process, a piping structure is complex, and a piping installation process is inefficient. Furthermore, it is problematic in that repair and replacement processes cannot be easily conducted after the piping installation process is finished. Meanwhile, water service boxes, which have structures such that repair and replacement processes are conveniently conducted, have been proposed. However, these water service boxes still have problems. That is, in finish work of building construction, a rim part of the front end of the water service box must be flush with the wall to ensure a good appearance. However, in the conventional water service boxes, in the case that the thickness of the wall becomes relatively thick during finish work, a cover, which is coupled to the front end of the water service box, may not be flush with the wall or may be misaligned with a desired position, thus deteriorating the appearance thereof.

DISCLOSURE OF INVENTION**Technical Problem**

[0005] Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art,

and an object of the present invention is to provide a built-in wall water service box which has a structure such that a user can easily check the state of water flow of cold and hot water pipes, which are embedded in the wall, and in which a faucet unit is coupled to parts of the cold and hot water pipes, which pass through the water service box, so as to mix and distribute cold and hot water, so that, even if a malfunction, for example, water leakage or water interruption, occurs after construction has been finished, the water service box can be easily disassembled and reassembled, and which has a cover flush-mounting unit so that a gap between a cover and the wall can be easily adjusted, thus ensuring a good appearance.

Technical Solution

[0006] In order to accomplish the above objects, the present invention provides a built-in wall water service box, including: a case connected to cold and hot water pipes and being open at a front end thereof; a faucet unit provided in the case and mixing cold and hot water, entering the case, with each other; a cover protecting the faucet unit and coupled to the open front end of the case; and a cover flush-mounting unit provided between the case and the cover to adjust a gap between the cover and the case embedded in a wall.

[0007] The built-in wall water service box may further include a distribution pipe coupled at a predetermined position to each of the cold and hot water pipes in the case, the distribution pipe comprising a flexible tube.

[0008] The cold and hot water pipes, which have double pipe structures and enter the case, may branch in one direction so that the case communicates with another water service box through the branched cold and hot water pipes.

[0009] The faucet unit may include a plurality of mixing valves supplied with cold and hot water from the distribution pipes; a connection pipe connecting the mixing valves to each other and comprising a flexible tube; and a water discharge pipe to discharge cold and hot water from the connection pipe.

[0010] The cover may include an inner cover body coupled to a front end of the cover flush-mounting unit or the front end of the case; an outer cover body fastened to a front surface of the inner cover body, so that the mixing valves are fastened through central positions of the outer cover body; and a decorative plate provided on an outer surface of the outer cover body.

[0011] The decorative plate may be made of material, such as marble, crystal or stainless steel, having a high durability.

[0012] The outer cover body may be integrally coupled at predetermined positions thereof to the mixing valves.

[0013] The cover flush-mounting unit may have a rectangular shape, corresponding to a shape of the open front end of the case, and has a predetermined thickness, with a rectangular opening formed through the cover flush-mounting unit, and bolt holes formed through the cover flush-mounting unit at positions adjacent to each corner of an outer surface thereof and corresponding to each locking hole of the case.

[0014] The cover flush-mounting unit may include: a plurality of stationary supports, each stationary support having a support plate, through which a horizontal position adjustment hole is formed at a predetermined position, a fastening plate extending from an edge of the support plate at a predetermined angle and fastened at a predetermined position to an inner surface of the case using a locking means, and a guide plate extending from each of upper and lower edges of the support plate at a predetermined angle; and a movable adjustment body, having a coupling plate, through which a plurality

of coupling holes and vertical position adjustment holes are formed, and guides formed by bending opposite ends of the coupling plate, with a coupling hole formed at a predetermined position through each guide, so that each guide is inserted between the guide plates of each of the stationary supports and is coupled to the support plate using coupling means inserted both into the coupling hole of the guide and into the horizontal position adjustment hole of the stationary support.

[0015] The horizontal position adjustment hole of the support plate of each stationary support may be a slot having a predetermined length so that the cover is movable with respect to the case in forward and backward directions.

[0016] The guide plates of each stationary support may be integrally provided on the upper and lower edges of the support plate.

[0017] Each of the vertical position adjustment holes of the movable adjustment body may have a slot shape extending a predetermined length in an upward and downward direction.

Advantageous Effects

[0018] In the present invention, a built-in wall water service box has a structure such that a user can easily check the state of water flow of cold and hot water pipes, which are embedded in the wall. Furthermore, a faucet is coupled to parts of the cold and hot water pipes, which pass through the water service box, so as to mix and distribute cold and hot water, so that, even if a malfunction, for example, water leakage or water interruption, occurs after construction has been finished, the water service box can be easily disassembled and reassembled. As well, the present invention has a cover flush-mounting unit so that a gap between a cover and the wall can be easily adjusted, thus ensuring a good appearance.

DESCRIPTION OF DRAWINGS

[0019] FIG. 1 is a perspective view showing the external shape of a built-in wall water service box, according to the present invention;

[0020] FIG. 2 is an exploded perspective view showing a built-in wall water service box, according to a first embodiment of the present invention;

[0021] FIG. 3 is a sectional view showing the installation of the built-in wall water service box of FIG. 2;

[0022] FIG. 4 is an exploded perspective view showing a built-in wall water service box, according to a first embodiment of the present invention;

[0023] FIG. 5 is a perspective view of a cover flush-mounting unit of the built-in wall water service box of FIG. 4;

[0024] FIG. 6 is a sectional view showing the installation of the built-in wall water service box of FIG. 4; and

[0025] FIG. 7 is a schematic front view schematically showing use of the built-in wall water service box of FIG. 4.

BEST MODE

[0026] Hereinafter, the present invention will be described in detail with reference to the attached drawings.

[0027] As shown in FIG. 1, a built-in wall water service box of the present invention is connected to cold and hot water pipes 10 and 20. The water service box includes a case 100 which is open at a front end thereof and has a hexahedral shape, a faucet unit 200 which is installed in the case 100 and has a structure such that cold and hot water are mixed with each other, a cover 300 which covers the faucet unit 200 and

openably closes the open front end of the case 100, and a cover flush-mounting unit 400 which is provided between the case 100 and the cover 300 to adjust a gap between the case 100 and the cover 300 upon installation of the water service box in a wall.

[0028] In the water service box of the present invention, the cold and hot water pipes 10 and 20, which enter the case 100, branch in one direction such that the case 100 is connected to another water service box.

[0029] This structure makes it possible for the cold and hot water pipes 10 and 20 to be easily connected to several desired locations upon application of the present invention to multi-family dwellings or public housing, such as apartment buildings, office buildings and hotels.

[0030] For this, a distribution pipe 500 is coupled at a predetermined position to each of the cold and hot water pipes 10 and 20. The distribution pipe 500 is preferably a flexible hose.

[0031] The distribution pipes 500 which comprise the flexible hoses can more flexibly couple the cold and hot water pipes 10 and 20 to mixing valves 210 and 220. That is, to effectively respond to undesirable setting conditions, for example, cases in which the mixing valves 210 and 220 are not aligned with the cold and hot water pipes 10 and 20, or the distance between the mixing valves 210 and 220 and the cold and hot water pipes 10 and 20 does not correspond to a desired value, it is preferred that the distribution pipe 500 be flexible hose.

[0032] Meanwhile, the faucet unit 200 includes the mixing valves 210 and 220 which are supplied with cold and hot water from the distribution pipes 500, a connection pipe 230 which connects the mixing valves 210 and 220 to each other and comprises a flexible tube, and a water discharge pipe 240 which discharges cold and hot water from the connection pipe 230.

[0033] The mixing valves 210 and 220 comprise separate cylindrical valves, in which one cylindrical valve 210 is supplied with cold water, and the other cylindrical valve 220 is supplied with hot water. The two cylindrical valves 210 and 220 communicate with each other through the connection pipe 230, so that cold and hot water are mixed. The mixed water is discharged through the water discharge pipe 240 provided in the cylindrical valve 220.

[0034] In a first embodiment, as shown in FIGS. 2 and 3, the cover 300 comprises an inner cover body 310 and an outer cover body 320.

[0035] Therefore, even if the cover 300 is misaligned with the desired position of a wall 70 after the installation of the water service box has been finished, the orientation of the cover 300 can be correctly adjusted. In detail, the cover 300 includes the inner cover body 310 which is coupled to a front end of the cover flush-mounting unit 400 or the front end of the case 100, and the outer cover body 320 which is provided on the outer surface of the inner cover body 310. The mixing valves 210 and 220 are fastened at central positions through the outer cover body 320. The cover 300 further includes a decorative plate 322 which is provided on the outer surface of the outer cover body 320.

[0036] Furthermore, a repair opening 32 is formed through the inner cover body 310. The repair opening 32 has an appropriate size such that, when repair work is required due to a problem such as water leakage after the installation of the water service box has been finished, a user can insert a tool or his/her hands into the case 100. As well, a plurality of fric-

tional protrusions 33 is provided on the outer surface of the inner cover body 310 such that mortar 74 or tiles 76 can be easily applied to the outer surface of the inner cover body 310.

[0037] Furthermore, a rim part 34, which defines the repair opening 32 therein, protrudes a predetermined length from the inner cover body 310. Locking holes 35a, 35b are formed at three positions in the rim part 34, so that the outer cover body 320 is fastened to the inner cover body 310 by locking bolts 22 tightened into the locking holes 35a, 35b.

[0038] Of the locking holes 35a, 35b, the locking hole 35b, which is formed at a lower position, comprises one hole, such that the locking hole 35b serves as a center point when the outer cover body 320 is coupled to the inner cover body 310. Each of the locking holes 35a, which are formed at opposite sides of an upper position, comprises a plurality of holes in consideration of tolerance between the inner and outer cover bodies 310 and 320 in the outer cover body installation process.

[0039] Bolt holes 45 are formed through the outer cover body 320, which is coupled to the front end of the inner cover body 310, at three positions corresponding to the locking holes 35a, 35b of the inner cover body 310. Coupling holes 47 are formed at approximately central positions through the outer cover body 320, so that the mixing valves 210 and 220 and the water discharge pipe 240 of the faucet unit 200 are integrally fastened to the outer cover body 320 through the coupling holes 47.

[0040] The decorative plate 322 is provided on the outer surface of the outer cover body 320 to ensure a good appearance of the water service box 1 installed in the wall 70.

[0041] The decorative plate 322 is made of material having superior durability, for example, marble, crystal or stainless steel.

[0042] Meanwhile, after inner wall construction of a building has been finished, it is preferred to make the cover 300 flush with the surface of the wall 70 during the process of installing the water service box 1.

[0043] To achieve the above-mentioned purpose, the cover flush-mounting unit 400 is used. In the first embodiment, the cover flush-mounting unit 400 has a rectangular shape corresponding to the open front end of the case 100 and has a predetermined thickness. Furthermore, a rectangular opening is formed through the cover flush-mounting unit 400. A bolt hole is formed through the cover flush-mounting unit 400 at a position adjacent to each corner of the outer surface thereof and corresponding to each locking hole of the case 100, so that the cover flush-mounting unit 400 is coupled to the case 100 using locking bolts 22.

[0044] When the case 100 is excessively deeply embedded in the wall 70, the cover flush-mounting unit 400 having the above-mentioned structure is interposed between the case 100 and the inner cover body 310 to make the cover 300 flush with the wall 70.

[0045] In this case, the cover flush-mounting unit 400 is coupled to the inner cover body 310 of the cover 300 using locking bolts 36. Particularly, the cover flush-mounting unit 400 should stably support the cover 300 including the outer cover body 320, to which the mixing valves 210 and 220 and the water discharge pipe 230 are coupled, and has a structure such that the cover 300 can be slightly shifted on the cover flush-mounting unit 400 in an upward, downward, left, or right direction.

[0046] Meanwhile, a built-in wall water service box having a cover flush-mounting unit 400 according to a second

embodiment is shown in FIGS. 4 through 7. In this embodiment, the cover flush-mounting unit 400 includes a plurality of stationary supports 410 and a movable adjustment body 420. Each stationary support 410 includes a support plate 411, through which a horizontal slot 411a is formed at a predetermined position, and a fastening plate 412 which extends from a rear edge of the support plate 411 at a predetermined angle and is fastened at a predetermined position to the inner surface of the case 100 using a locking means. Each stationary support 410 further includes a guide plate 413 which extends from each of upper and lower edges of the support plate 411 at a predetermined angle. The movable adjustment body 420 includes a coupling plate 421 through which a plurality of coupling holes 421a and vertical slots 421b are formed, and guides 422 which are formed by bending opposite ends of the coupling plate 421. A coupling hole 423 is formed at a predetermined position through each guide 422, such that each guide 422 is inserted between the guide plates 413 of the stationary support 410 and is coupled to the support plate 411 using a coupling bolt inserted into the coupling hole 423 and the horizontal slot 411a of the stationary support 410.

[0047] That is, the cover flush-mounting unit 400 has a structure such that the movable adjustment body 420 is movably coupled between the stationary support 410.

[0048] In detail, the guides 422 are formed by bending predetermined lengths of the opposite ends of the movable adjustment body 420 in a predetermined direction. The vertical slots 421b are formed at predetermined positions through the coupling plate 421 which couples the guides 422 to each other. The coupling holes 421a, through which the mixing valves 210 and 220 and the water discharge pipe 240 are fitted, are formed through the coupling plate 421 at positions spaced apart from the vertical slots 421b by predetermined distances.

[0049] Furthermore, because the horizontal slots 411a are formed through the support plates 411 of the supports 410, the cover 300 is movable with respect to the case 100 in forward and backward directions.

[0050] In other words, the supports 410 serve to adjust the exposed or protruding length of the cover 300 from the wall. The cover 300 can be protruded by the support plates 411 having the horizontal slots 411a. These supports 410 are fastened to the rear wall of the case 100 by the locking means, such as anchor bolts or locking bolts, tightened through locking holes of the fastening plate 412 of the supports 410.

[0051] The guide plates 413 of each support 410 are integrally provided on the upper and lower edges of the support plate 411, so that the guide plates 413 guide sliding movement of each guide 413 of the movable adjustment body 420.

[0052] Furthermore, each of the vertical slots 421b of the movable adjustment body 420 has a predetermined length, so that vertical tolerance of the cover 300 with respect to the movable adjustment body 420 can be easily adjusted.

[0053] To install the cover flush-mounting unit 400, the movable adjustment body 420 is fastened to the horizontal slots 411a of the support plates 411 after the protruding length of the movable adjustment body 420 has been determined. Thereafter, the mixing valves 210 and 220, which are connected to each other through the flexible connection pipe 230, and the water discharge pipe 240 are fitted into the associated coupling holes 421a formed through the movable adjustment body 420, and they are then fastened to the movable adjustment body 420 using locking bolts.

[0054] Subsequently, the cover 300 is coupled to the movable adjustment body 420 using locking bolts. At this time, after the movable adjustment body 420 is preliminarily coupled to the horizontal slots 411a of the supports 410 and the cover 300 is preliminarily coupled to the vertical slots 421b of the movable adjustment body 420, the position of the cover 300 is adjusted such that cover 300 is flush with the wall 70. Thereafter, the parts, which have been preliminarily coupled, are securely tightened. Subsequently, the decorative plate 322 is coupled to the cover 300, thus completing the installation of the water service box.

[0055] Here, the decorative plate 322 may be made of transparent synthetic resin, such that the user can observe the state of the cold and hot water pipes 10 and 20 and the distribution pipes 500, which are coupled to the cold and hot water pipes 10 and 20, through the transparent decorative plate 322 after the installation of the water service box in the wall 70 has been finished.

Mode for Invention

INDUSTRIAL APPLICABILITY

[0056] As describe above, the present invention provides a built-in wall water service box which has a structure such that a user can easily check the state of water flow of cold and hot water pipes, which are embedded in the wall, and in which a faucet is coupled to parts of the cold and hot water pipes, which pass through the water service box, so as to mix and distribute cold and hot water, so that, even if a malfunction, for example, water leakage or water interruption, occurs after construction has been finished, the water service box can be easily disassembled and reassembled, and which has a cover flush-mounting unit so that a gap between a cover and the wall can be easily adjusted, thus ensuring a good appearance.

1. A built-in wall water service box, comprising:
 - a case connected to cold and hot water pipes and being open at a front end thereof;
 - a faucet unit provided in the case and mixing cold and hot water, entering the case, with each other;
 - a cover protecting the faucet unit and coupled to the open front end of the case; and
 - a cover flush-mounting unit provided between the case and the cover to adjust a gap between the cover and the case embedded in a wall.
2. The built-in wall water service box according to claim 1, further comprising:
 - a distribution pipe coupled at a predetermined position to each of the cold and hot water pipes in the case, the distribution pipe comprising a flexible tube.
3. The built-in wall water service box according to claim 1, wherein the cold and hot water pipes, which have double pipe structures and enter the case, branch in one direction so that the case communicates with another water service box through the branched cold and hot water pipes.
4. The built-in wall water service box according to claim 1, wherein the faucet unit comprises:
 - a plurality of mixing valves supplied with cold and hot water from the distribution pipes;
 - a connection pipe connecting the mixing valves to each other and comprising a flexible tube; and
 - a water discharge pipe to discharge cold and hot water from the connection pipe.
5. The built-in wall water service box according to claim 1, wherein the cover comprises:
 - an inner cover body coupled to a front end of the cover flush-mounting unit or the front end of the case;

an outer cover body fastened to a front surface of the inner cover body, so that the mixing valves are fastened through central positions of the outer cover body; and a decorative plate provided on an outer surface of the outer cover body.

6. The built-in wall water service box according to claim 5, wherein the decorative plate is made of material, such as marble, crystal or stainless steel, having a high durability.

7. The built-in wall water service box according to claim 5, wherein the outer cover body is integrally coupled at predetermined positions thereof to the mixing valves.

8. The built-in wall water service box according to claim 1, wherein the cover flush-mounting unit has a rectangular shape, corresponding to a shape of the open front end of the case, and has a predetermined thickness, with a rectangular opening formed through the cover flush-mounting unit, and bolt holes formed through the cover flush-mounting unit at positions adjacent to each corner of an outer surface thereof and corresponding to each locking hole of the case.

9. The built-in wall water service box according to claim 1, wherein the cover flush-mounting unit comprises:

- a plurality of stationary supports, each stationary support comprising: a support plate, through which a horizontal position adjustment hole is formed at a predetermined position; a fastening plate extending from an edge of the support plate at a predetermined angle and fastened at a predetermined position to an inner surface of the case using a locking means; and a guide plate extending from each of upper and lower edges of the support plate at a predetermined angle; and

- a movable adjustment body, comprising: a coupling plate, through which a plurality of coupling holes and vertical position adjustment holes are formed; and guides formed by bending opposite ends of the coupling plate, with a coupling hole formed at a predetermined position through each guide, so that each guide is inserted between the guide plates of each of the stationary supports and is coupled to the support plate using coupling means inserted both into the coupling hole of the guide and into the horizontal position adjustment hole of the stationary support.

10. The built-in wall water service box according to claim 9, wherein the horizontal position adjustment hole of the support plate of each stationary support is a slot having a predetermined length so that the cover is movable with respect to the case in forward and backward directions.

11. The built-in wall water service box according to claim 9, wherein the guide plates of each stationary support are integrally provided on the upper and lower edges of each support plate.

12. The built-in wall water service box according to claim 9, wherein each of the vertical position adjustment holes of the movable adjustment body has a slot shape extending a predetermined length in an upward and downward direction.

13. The built-in wall water service box according to claim 3, wherein the faucet unit comprises:

- a plurality of mixing valves supplied with cold and hot water from the distribution pipes;
- a connection pipe connecting the mixing valves to each other and comprising a flexible tube; and
- a water discharge pipe to discharge cold and hot water from the connection pipe.

14. The built-in wall water service box according to claim 6, wherein the outer cover body is integrally coupled at predetermined positions thereof to the mixing valves.