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(54) **VALVE GROUP SWITCHED BY PUSH BUTTON AND SHOWER HEAD USING THE VALVE GROUP**

(57) A valve group switched by a push button and a shower head using the valve group are provided. The valve group comprises: a fixing part (150), a plurality of support cover bodies (400) and a switching mechanism (500), wherein the fixing part (150) is provided with a water inlet channel (110), multiple water dividing holes (211) which are communicated with the water inlet channel (110); the support cover bodies (400) are as many as the water dividing holes (211) and are rotationally mounted and connected to the fixing part (150) to be in one-to-one correspondence with the water dividing holes (211). The switching mechanism (500) comprises a switching shaft body (510) and a push button (520); the switching shaft body (510) which can slide on the fixing part (150) is mounted on the fixing part (150); the push button (520) which can slide left and right is mounted on the fixing part (150); the push button (520) and the switching shaft body (510) are connected in transmission, so that the push button (520) when sliding can drive the switching shaft body (510) to slide; the switching shaft body (510) is provided with a convex-concave structure (515); and the convex-concave structure (515) can select to support separate or all the support cover bodies (400) through the axial movement of the switching shaft body (510). The structure has a small and exquisite inner core,

so that the whole shower head has the advantages of slim and simple appearance, low switching force and brisk hand feeling.

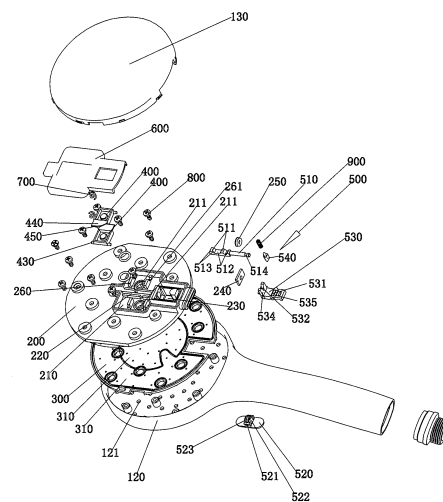


FIG. 2

Description

Field of the invention

[0001] The present invention relates to a push button switch valve and a shower head applied with said valve.

Background of the invention

[0002] Existing shower heads are available to choose different outlet functions, switch of the outlet functions are realized by rotating the outlet panel of the shower head, the shower head body is disposed with water diversion plate and fixation plate, they are respectively disposed with a plurality of through holes, when rotating the outlet panel of the shower head, the through holes of the water diversion plate and the fixation plate are aligned, so as to connect different outlet waterways, thus realizing switch of the outlet function. However, this kind of shower head needs large force to rotate the panel, the inner size is large, so that the appearance is not attractive enough, leading to a bad hand feel. An utility model with publication number CN202087439N in Chinese patent database is provided with a shower head switched by a single hand, the switch component of this structure comprises a switch rod and a push button, the top surface at the top portion of the switch rod forms a waterseal surface, the bottom surface thereof is concaved with a concaved hole for configuring waterseal ring and spring, the push button is protruded at the handle of the shower head main body, when the push button is switched, the switch rod is linked to move back and forth in side the water diversion cavity to alternately close the water diversion holes or the inlet holes to switch the waterways. Although this kind of shower head is applied with push button to drive the switch rod to move back and forth to switch the waterways, it needs to switch the rod body of the switch rod to directly close the water diversion holes or the inlet holes, so that it needs to overcome large friction force, and needs larger force to switch the push button, leading to a bad hand feel. Besides, the protruding to switch the gear positions is disposed at the head portion of the switch rod, it increases the use of the head portion of the switch rod, thus reducing the service life and increasing the cost.

Summary of the invention

[0003] The present invention is provided with a push buttons switch valve and a shower head applied with said valve, which overcomes the disadvantages of the existing technology.

[0004] One technical proposal of the present invention to solve the technical problem is that:

A push button switch valve, comprising:

a fixation portion (150) with an inlet passage

(110) and a plurality of water diversion holes (211) available to connect to the inlet passage (110);

a plurality of support covers (400) with same number with the water diversion holes, the support covers (400) rotatably assembled to the fixation portion (150) and respectively corresponding to the water diversion hole (211) one by one, so that the support covers (400) rotating between a sealing position to close the water diversion holes (211) and an open position to leave away from the water diversion holes (211); and

a switch mechanism (500) comprising a switch shaft (510) slidably assembled to the fixation portion (150) and a push button (520) slidably left and right assembled to the fixation portion (150), the push button (520) drivingly connected to the switch shaft (510), so that when sliding the push button (520), the switch shaft (510) driven to slide, the switch shaft (510) disposed with a convex-concave structure (515), axial movement of the switch shaft (510) making the convex-concave structure (515) alternately push at least one of the support covers (400) up. In another preferred embodiment, the switch shaft (510) is concaved with grooves (512) with same number with the support covers (400), bosses (511) are formed between two adjacent grooves (512), the bosses (511) and the grooves (512) form said convex-concave structure (515), each support cover (400) has a flange (410) coupled to the convex-concave structure, the distance between two adjacent flanges (410) is larger than the lateral length of a boss (511) and is smaller than the distance between two adjacent bosses (511).

[0005] In another preferred embodiment, the top end face of the boss (511) is a flat surface, each boss (511) is corresponding to one flange (410), each boss (511) moves between the left side of the top end face of the boss (511) the corresponding flange (410) contacted on, the right side of the top end face of the boss (511) the corresponding flange (410) contacted on and the position the corresponding flange (410) away from the top end face of the boss (511). In another preferred embodiment, the boss (511) is disposed with two side surfaces (513) connected to the left and right sides of the top end face of the boss (511), the distance between the two side surfaces (513) is gradually enlarged from top to bottom, the flange (410) is disposed with two fit surfaces (411) coupled to contact on the two side surfaces (513), the distance between the two fit surfaces (411) is gradually enlarged from bottom to top. In another preferred embodiment, each support cover (400) is disposed with a pivot side (470) and a pushed side (440), the pivot side is pivot joint to the fixation portion (150), the lower portion of the

pushed side (440) is arranged with the flange (410), the flanges (410) of the plurality of support covers (400) are spaced arranged along the axis of the switch shaft (510). In another preferred embodiment, the switch mechanism (500) further comprises a push-and-pull rod (530), which is slidably movably attached to the fixation portion (150) and is drivingly connected to the push button (520) and the switch shaft (510). In another preferred embodiment, the push-and-pull rod (530) is disposed with three concaved portions (531), protrudings (535) are formed between two adjacent concaved portions (531); a positioning pin (540) is further disposed and is slidably up and down assembled to the fixation portion (150), the push-and-pull rod (530) moves axially to drive the positioning pin (540) to slide up and down between the concaved portions (531) and the protrudings (535), so that the positioning pin (540) is respectively coupled to the three concaved portions (531) to form three positions, the distance the switch shaft (510) moves by the driven of the push-and-pull rod (530) moving axially a position is equal to the distance between the left side of the top end face of the boss (511) to the right side of the top end face of the boss (511). In another preferred embodiment, a second elastic element (900) is further disposed and is withstanding between the fixation portion and the positioning pin (540); the pivot side of the support cover (400) is disposed with a rotation shaft parallel to the axis of the switch shaft (510), the rotation shaft (430) is pivot joint to the fixation portion (150). In another preferred embodiment, it comprises two water diversion holes (211), two support covers (400) are spaced arranged along the axis of the switch shaft (510), the pivot sides of the support covers (400) are away from the switch shaft (510), the pushed sides of the two support covers (400) are disposed with inclined breaches. Another technical proposal of the present invention is that:

[0006] A shower applied with a push button switch valve, comprising:

a fixation portion (150) with an inlet passage (110), a plurality of water diversion holes (211) available to connect to the inlet passage (110) and a plurality of outlet functions connected to the water diversion holes (211) with same number with the water diversion holes (211);
a plurality of support covers (400) with same number with the water diversion holes, the support covers (400) rotatably assembled to the fixation portion (150) and respectively corresponding to the water diversion hole (211) one by one, so that the support covers (400) rotating between a sealing position to close the water diversion holes (211) and an open position to leave away from the water diversion holes (211); and
a switch mechanism (500) comprising a switch shaft (510) and a push button (520), the switch shaft (510) slidably assembled to the fixation portion (150), the push button (520) slidably left and right assembled

to the fixation portion (150), the push button (520) is drivingly connected to the switch shaft (510), so that when sliding the push button (520), the switch shaft (510) driven to slide, the switch shaft (510) is disposed with a convex-concave structure (515), axial movement of the switch shaft (510) making the convex-concave structure (515) alternately push the support covers (400) up to realize switch of waterways.

[0007] Compared to the existing technology, the technical proposal of the present invention has advantages as below:

1. the switch shaft is disposed with concave-convex structure, when sliding the push button, it the switch shaft is driven to slide, axial movement of the switch shaft makes the concave-convex structure push the plurality of the support covers up to realize switch of waterways, the structure is small in size, so that the entire shower head is brief in appearance, it switches light and handles light.
2. the distance between two adjacent flanges is larger than the lateral length of a boss and is smaller than the distance between two adjacent bosses, so that the flanges are pushed up alternately or synchronously by the bosses to realize switch of waterways, the switch structure is simple and novel, and it costs low.
3. the distance between the two side surfaces of the boss of the switch shaft is gradually enlarged from top to bottom, the distance between the two fit surfaces of the support cover is gradually enlarged from bottom to top, two fit surfaces of the flange of the support cover are coupled to the two side surfaces of the boss, so that it overcomes small friction force to switch the waterways, and it has long service life, and it is convenient to switch.
4. the push-and-pull bar is disposed with gear positions, thus making it with well switch hand feel.

Brief description of the drawings

[0008] The present invention will be further described with the drawings and the embodiments.

Fig.1 illustrates a schematic diagram of a shower of a preferred embodiment of the present invention.
Fig.2 illustrates an exploded and schematic diagram of the shower of the preferred embodiment.
Fig.3 illustrates a sectional diagram of the shower of the preferred embodiment.
Fig.4 illustrates a first sectional diagram of the shower of the preferred embodiment when the left support cover is pushed up.
Fig.5 illustrates a second sectional diagram of the shower of the preferred embodiment when both of the support covers are pushed up simultaneously.

Fig.6 illustrates a third sectional diagram of the shower of the preferred embodiment when the right support cover is pushed up.

Fig.7 illustrates a schematic diagram of the support cover of the preferred embodiment.

Fig.8 illustrates a schematic diagram of a switch shaft of the preferred embodiment.

Detailed description of the embodiments

[0009] Please refer to fig.1 to fig.8, a preferred embodiment of a shower applied with a push button switch valve comprises a fixation portion 150, support covers 400 and a switch mechanism 500.

[0010] The fixation portion 150 includes an inlet passage 110, a plurality of water diversion holes 211 connected to the inlet passage 110 and a plurality of outlet functions connected to the water diversion holes 211 one by one correspondingly with same number with the water diversion holes 211.

[0011] In this embodiment, there are two water diversion holes 211.

[0012] The fixation portion includes a shower body 100, a water diversion body 200 and a cover 300.

[0013] The shower body 100 includes a lower body 120 and a top cover 130 covering the lower body 120 in sealing way, the inlet passage 110 is disposed inside the lower body 120.

[0014] The water diversion body 200 is assembled inside the shower body 100 with a water diversion cavity 210 to connect to the inlet passage 110, the water diversion cavity 210 has a bottom wall, the bottom wall is disposed with said two water diversion holes 211. the water diversion cavity 210 is further disposed with an assembly groove 220 and an assembly cavity 230 inside, one end of the assembly groove is connected to the assembly cavity 230, the assembly groove 220 separates said two water diversion holes 211 front and rear. The fixation portion further includes a seal cover plate 600, which covers on the water diversion cavity 210 in sealing way, a first elastic element 700 is further disposed, the first elastic element 700 abuts between the seal cover plate 600 and the support cover 400. Preferred, the first elastic element 700 is a spring.

[0015] The cover 300 is assembled inside the shower body 100 below the water diversion body 200, it is disposed with two outlet cavities 310 respectively connected to the two water diversion holes 211 correspondingly, the outlet cavity 310 has a bottom surface, the bottom surface is disposed with a set of outlet nuzzles 320, water flows from the inlet passage 110 to the water diversion cavities 210 and then flows from the water diversion holes 211 to the outlet cavities 310, then flows out of the shower body 100 through the outlet nuzzles 320 to form two outlet waterways with outlet functions. this embodiment further includes a plurality of screws 800, the water diversion body 200 and the cover 300 are secured inside the lower body 120 by the screws 800; the lower body 120 has a

lower bottom surface, the lower bottom surface has a plurality of outlet holes 121 with same number with the outlet nuzzles 320, the outlet nuzzles 320 runs through the outlet holes 121 and contacted the outlet holes 121 in sealing way.

[0016] The support covers 400 have same number with the water diversion holes 211, the support covers 400 are rotatably assembled to the fixation portion 150 and corresponding to the plurality of water diversion holes 211 one by one, so that the support covers 400 rotate between a sealing position to close the water diversion holes 211 and a connection position to separate from the water diversion holes 211, and each support cover 400 is disposed with a flange 410 coupled to the switch mechanism 500. Preferred, each of the support covers 400 comprises a pivot side 470 and a pushed side 440, the pivot side 470 is pivotally connected to the fixation portion 150, the pushed side 440 is disposed with said flange 410 at the below, the flanges 410 of the support covers 400 are disposed with space along the axis of the switch shaft 510. in this embodiment, there are two support covers 400, two support covers are disposed front and rear with space along the axis of the switch shaft 510, two flanges 410 are disposed left and right. And the pivot sides 410 of the two support covers 400 are away from the switch shaft 510, the pushed sides of the two support covers 400 are disposed with inclined breach 450. Each of the pivot sides 470 of the support covers 400 is disposed with a rotation shaft 430 parallel to the axis of the switch shaft 510, the rotation shafts 430 are pivot joint to the fixation portion 150. in this embodiment, the left and right end faces of each of the water diversion holes 211 are respectively disposition with two spaced ribs 260, the rear portions of the two ribs 260 are respectively disposed with a shaft hole 261 coupled to the rotation shaft, two end portions of the rotation shaft 430 are respectively secured to the two shaft holes 261, so that the support covers 400 are rotatably connected to the water diversion body 200. The switch mechanism 500 is disposed with a switch shaft 510 and a push button 520, the switch shaft 510 is slidably assembled to the fixation portion 150, the push button 520 is slidably assembly to the fixation portion 150 to move left and right, the push button 520 and the switch shaft 510 are connected in driving way, so that the push button 520 can drive the switch shaft 510 to slide when it slides, the switch shaft 510 is disposed with concave-convex structure 515, axial movement of the switch shaft 510 makes the concave-convex structure 515 alternately push the support covers 400 up thus to switch the waterways. This structure is compact inside, so that the whole shower has a succinct appearance, and it needs light switch force and has light handle. The switch shaft 510 is disposed with a first end and a second end, the first end is connected to the push button 520 in driving way, the second end is disposed with said concave-convex structure 515, preferred, the second end of the switch shaft 510 is concaved with several grooves 512 with the same number with the support

covers 400, two adjacent grooves 512 form a projection 511 therebetween, the projections 511 and the grooves 512 are said concave-convex structure. Preferred, the top end face of the projection 511 is a flat surface. And the switch shaft 510 is slidably assembled to the assembly groove 220 of the water diversion body 200 and the first end of the switch shaft 510 inserts into the assembly cavity 230. in this embodiment, there are two grooves 512 and two projections 511.

[0017] Each projection 511 is corresponding to a flange 410, each projection 511 moves between the left side of the top end face of the boss 511 the corresponding flange 410 contacted on, the right side of the top end face of the boss 511 the corresponding flange 410 contacted on and the position the corresponding flange 410 away from the top end face of the boss 511. And the distance between two adjacent flanges 410 is larger than the lateral length of the boss 511 and is smaller than the distance between two adjacent bosses 511, so that the left flange 410 can be supported on the right side of the top end face of the left boss 511, the right flange 410 can be supported on the left side of the top end face of the right boss 511 at the same time, so that the two water diversion holes 211 are open at the same time, two sets of the outlet waterways are discharging water out at the same time. in this condition, moving the switch shaft right, so that when the left flange 410 is supported on the left side of the top end face of the left boss 511, the right flange 410 leaves away from the top end face of the right boss 511 and enters into the groove 512, the left water diversion hole 211 is open, the right water diversion hole 211 is closed, only one outlet waterway discharges water out; moving the switch shaft left, the right flange 410 is supported on the right side of the top end face of the right boss, the left flange 410 leaves away from the top end face of the left boss 511 and enters into the groove 512, the left water diversion hole 211 is closed, the right water diversion hole 211 is open, another outlet waterway discharges water out.

[0018] Preferred, the boss 511 is disposed with two side surfaces 513 connected to the left and right sides of the top end face of the boss 511, the distance between the two side surfaces 513 is gradually enlarged from top to bottom (trapezoidal shaped), the flange 410 is disposed with two fit surfaces 411 coupled to contact on the two side surfaces 513, the distance between the two fit surfaces 411 is gradually enlarged from bottom to top (downward-trapezoidal shaped), so that it overcomes small friction force to switch the waterways, it has long service life, and it is convenient to switch. The switch mechanism 500 further comprises a push-and-pull rod 530, which is slidably movably attached to the fixation portion 150 and is drivingly connected to the push button 520 and the switch shaft 510. The push-and-pull rod 530 is disposed with three concaved portions 531, a protruding 535 is formed between two adjacent concaved portions 531; a positioning pin 540 is further disposed and is slidably up and down assembled to the fixation portion

150, the push-and-pull rod 530 moves axially to drive the positioning pin 540 to slide up and down between the concaved portions 531 and the protrudings 535, so that the positioning pin 540 is respectively coupled to the three concaved portions 531 to form three positions, the distance the switch shaft 510 moves by the driven of the push-and-pull rod 530 moving axially a position is equal to the distance between the left side of the top end face of the boss 511 to the right side of the top end face of the boss 511. A second elastic element 900 is further disposed and is withstanding between the fixation portion and the positioning pin 540. In this embodiment, the push-and-pull rod 530 is slidably attached to the assembly cavity 230 and is connected to the first end of the switch shaft 510. the end face of the first end of the switch shaft 510 is concaved inwardly with positioning groove 532 coupled to the annular groove 514, the upper portion of the positioning groove 532 is V-shaped, the bottom position is squared-shaped, two end faces of the annular groove 514 respectively abuts against the left and right sides of the lower portion of the positioning groove 532 so as to assemble the switch shaft 510 and the push-and-pull rod together, and a lock block 533 is protruded disposed downwardly in the push-and-pull rod 530, the assembly cavity 230 is further disposed with a baffle 240 and a sealing ring 250, the annular groove 514 of the switch shaft 510 runs through the sealing ring 250 and the baffle 240 to couple to the positioning groove 532.

[0019] The push button 520 is slidably left and right attached to the shower head main body 100. the shower head main body 100 is further disposed with a hole, the push button 520 is disposed with two lock hooks 521 spaced arranged longitudinally, two lock hooks 521 are respectively locked to the two end faces of the hole, the push button 520 is further disposed with two protruding blocks spaced arranged laterally, two protruding blocks 522 are respectively arranged at the inner side of the two lock hooks 521, a lock hole 523 is formed by the two lock hooks 521 and the two protruding blocks 522, the lock block 533 and the lock hole 523 are coupled to assemble the push button 520 and the push-and-pull rod 530 together.

[0020] When used, turning on the switch, assumed that at the initial position, the gear position is at the leftmost concaved portion 531 of the push-and-pull rod 530, the left flange 410 is supported on the left side of the top end face of the left boss 511, the right flange 410 leaves away from the top end face of the right boss 511 and enters into the groove 512, the left water diversion hole 211 is open, the right water diversion hole 211 is closed, so that one outlet waterway discharges water out. Switching the push button 520 left, the gear position is switched, the gear position is at the central concaved portion 531, the switch shaft 510 is driven to move left, so that the left flange 410 is supported on the right side of the top end face of the left boss 511, the right flange 410 is supported on the left side of the top end face of the right boss 511 at the same time, so that two water diversion holes 211

are open at the same time, two sets of the outlet waterways discharge water out at the same time. keeping on switching the push button 520 left, the gear position is switched, the gear position is at the right concaved portion 531 of the push-and-pull rod 530, the switch shaft 510 is driven to move left, so that the right flange 410 is supported on the right side of the top end face of the right boss, the left flange 410 leaves away from the top end face of the left boss 511 and enters into the groove 512, so that the left water diversion hole 211 is closed, the right water diversion hole 211 is open, the other outlet waterway discharges water out.

[0021] Although the present invention has been described with reference to the preferred embodiments thereof for carrying out the patent for invention, it is apparent to those skilled in the art that a variety of modifications and changes may be made without departing from the scope of the patent for invention which is intended to be defined by the appended claims.

Industrial applicability

[0022] The present invention is provided with a push button switch valve and a shower head applied with said valve, the switch structure is small in size, so that the entire shower head is brief in appearance, it switches light and handles light with well industrial applicability.

Claims

1. A push button switch valve, wherein comprising:

a fixation portion (150) with an inlet passage (110) and a plurality of water diversion holes (211) available to connect to the inlet passage (110);

a plurality of support covers (400) with same number with the water diversion holes, the support covers (400) rotatably assembled to the fixation portion (150) and respectively corresponding to the water diversion hole (211) one by one, so that the support covers (400) rotating between a sealing position to close the water diversion holes (211) and an open position to leave away from the water diversion holes (211); and

a switch mechanism (500) comprising a switch shaft (510) slidably assembled to the fixation portion (150) and a push button (520) slidably left and right assembled to the fixation portion (150), the push button (520) drivingly connected to the switch shaft (510), so that when sliding the push button (520), the switch shaft (510) driven to slide, the switch shaft (510) disposed with a convex-concave structure (515), axial movement of the switch shaft (510) making the convex-concave structure (515) alternately push at least

one of the support covers (400) up.

2. The push button switch valve according to claim 1, wherein the switch shaft (510) is concaved with grooves (512) with same number with the support covers (400), bosses (511) are formed between two adjacent grooves (512), the bosses (511) and the grooves (512) form said convex-concave structure (515), each support cover (400) has a flange (410) coupled to the convex-concave structure, the distance between two adjacent flanges (410) is larger than the lateral length of a boss (511) and is smaller than the distance between two adjacent bosses (511).
3. The push button switch valve according to claim 2, wherein the top end face of the boss (511) is a flat surface, each boss (511) is corresponding to one flange (410), each boss (511) moves between the left side of the top end face of the boss (511) the corresponding flange (410) contacted on, the right side of the top end face of the boss (511) the corresponding flange (410) contacted on and the position the corresponding flange (410) away from the top end face of the boss (511).
4. The push button switch valve according to claim 3, wherein the boss (511) is disposed with two side surfaces (513) connected to the left and right sides of the top end face of the boss (511), the distance between the two side surfaces (513) is gradually enlarged from top to bottom, the flange (410) is disposed with two fit surfaces (411) coupled to contact on the two side surfaces (513), the distance between the two fit surfaces (411) is gradually enlarged from bottom to top.
5. The push button switch valve according to claim 2, wherein each support cover (400) is disposed with a pivot side (470) and a pushed side (440), the pivot side is pivot joint to the fixation portion (150), the lower portion of the pushed side (440) is arranged with the flange (410), the flanges (410) of the plurality of support covers (400) are spaced arranged along the axis of the switch shaft (510).
6. The push button switch valve according to any of claim 1, claim 2, claim 3, claim 4 and claim 5, wherein the switch mechanism (500) further comprises a push-and-pull rod (530), which is slidably movably attached to the fixation portion (150) and is drivingly connected to the push button (520) and the switch shaft (510).
7. The push button switch valve according to claim 6, wherein the push-and-pull rod (530) is disposed with three concaved portions (531), protrudings (535) are formed between two adjacent concaved portions

(531); a positioning pin (540) is further disposed and is slidably up and down assembled to the fixation portion (150), the push-and-pull rod (530) moves axially to drive the positioning pin (540) to slide up and down between the concaved portions (531) and the protrudings (535), so that the positioning pin (540) is respectively coupled to the three concaved portions (531) to form three positions, the distance the switch shaft (510) moves by the driven of the push-and-pull rod (530) moving axially a position is equal to the distance between the left side of the top end face of the boss (511) to the right side of the top end face of the boss (511).

8. The push button switch valve according to claim 7, wherein a second elastic element (900) is further disposed and is withstanding between the fixation portion and the positioning pin (540); the pivot side of the support cover (400) is disposed with a rotation shaft parallel to the axis of the switch shaft (510), the rotation shaft (430) is pivot joint to the fixation portion (150).

9. The push button switch valve according to claim 8, wherein comprising two water diversion holes (211), two support covers (400) are spaced arranged along the axis of the switch shaft (510), the pivot sides of the support covers (400) are away from the switch shaft (510), the pushed sides of the two support covers (400) are disposed with inclined breaches.

10. A shower applied with a push button switch valve, wherein comprising:

a fixation portion (150) with an inlet passage (110), a plurality of water diversion holes (211) available to connect to the inlet passage (110) and a plurality of outlet functions connected to the water diversion holes (211) with same number with the water diversion holes (211); a plurality of support covers (400) with same number with the water diversion holes, the support covers (400) rotatably assembled to the fixation portion (150) and respectively corresponding to the water diversion hole (211) one by one, so that the support covers (400) rotating between a sealing position to close the water diversion holes (211) and an open position to leave away from the water diversion holes (211); and
a switch mechanism (500) comprising a switch shaft (510) and a push button (520), the switch shaft (510) slidably assembled to the fixation portion (150), the push button (520) slidably left and right assembled to the fixation portion (150), the push button (520) is drivingly connected to the switch shaft (510), so that when sliding the push button (520), the switch shaft (510) driven to

slide, the switch shaft (510) is disposed with a convex-concave structure (515), axial movement of the switch shaft (510) making the convex-concave structure (515) alternately push the support covers (400) up to realize switch of waterways.

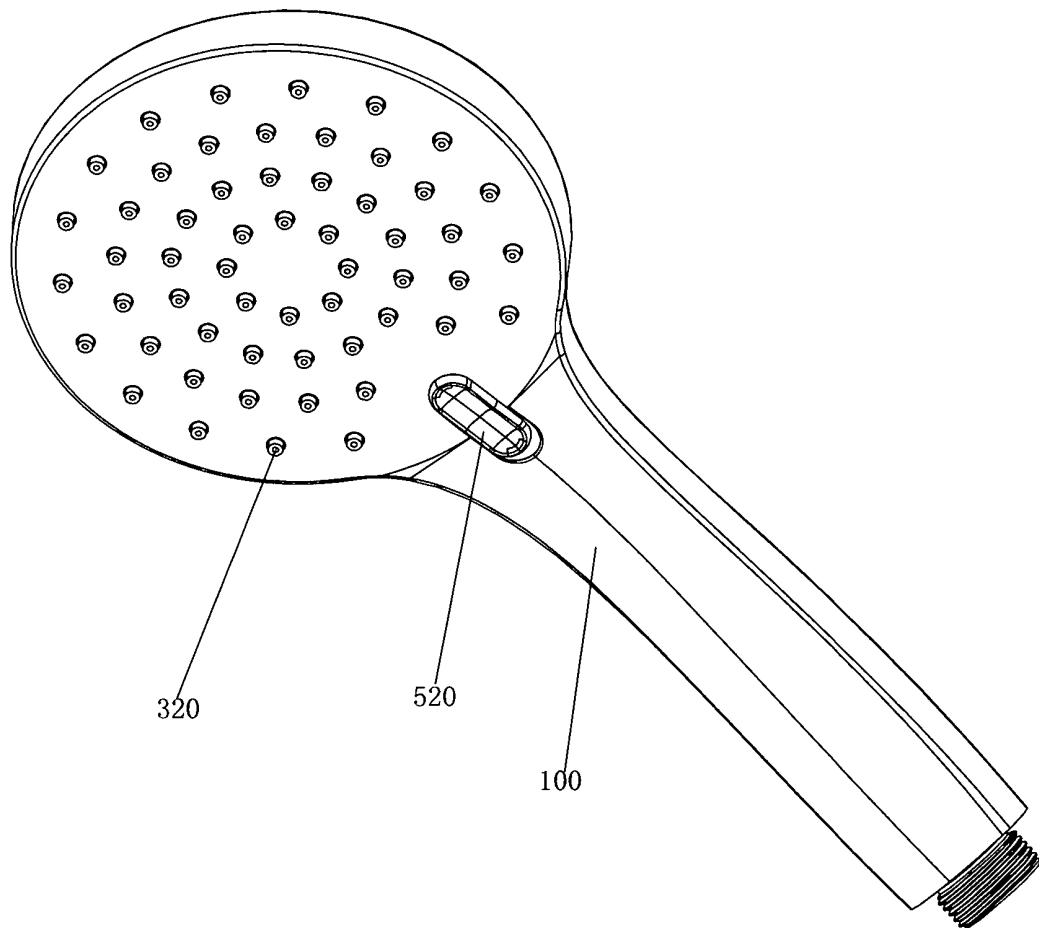


FIG. 1

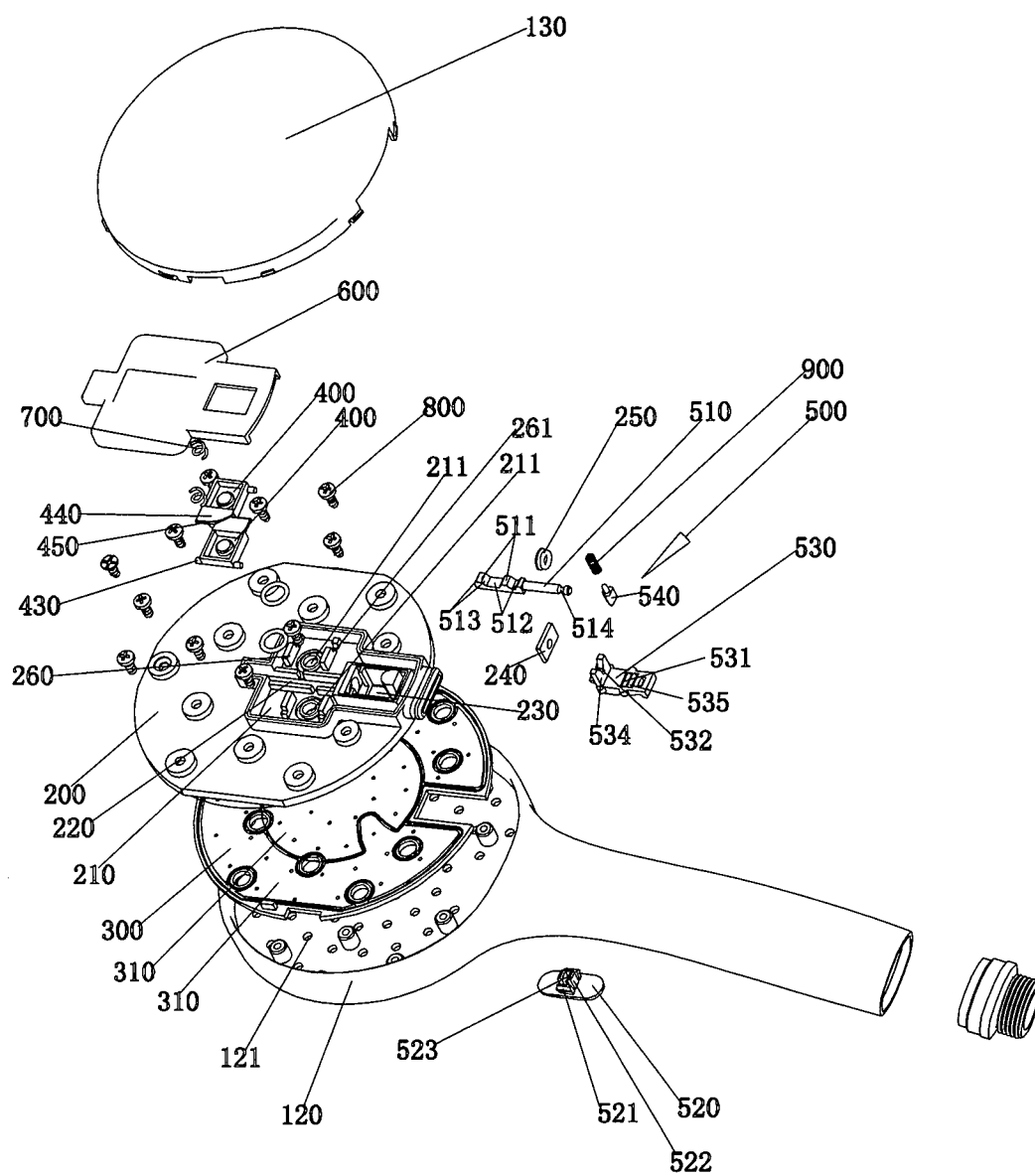


FIG. 2

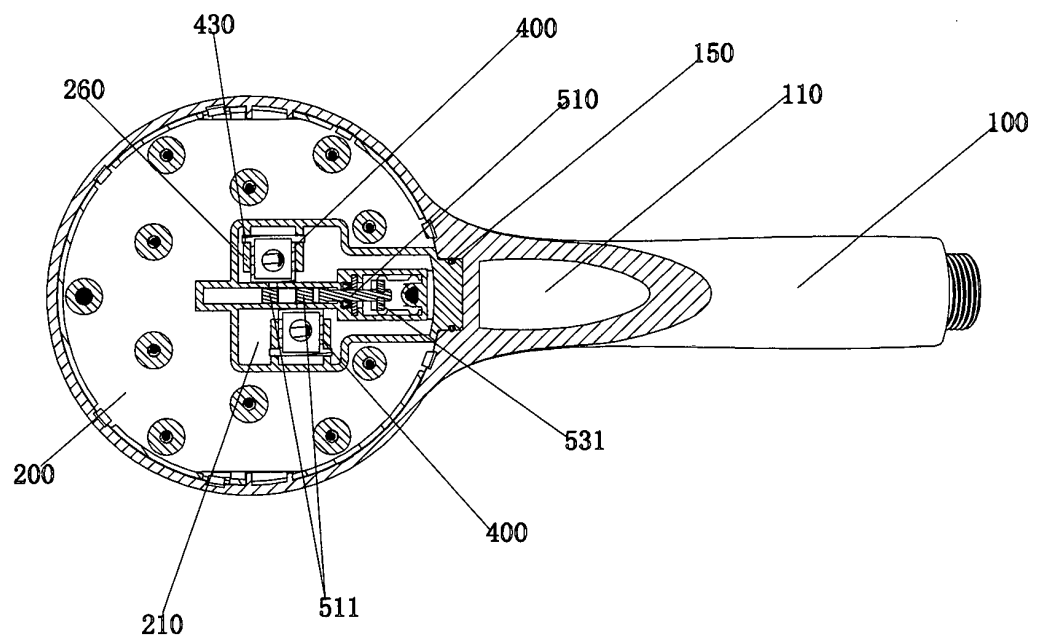


FIG. 3

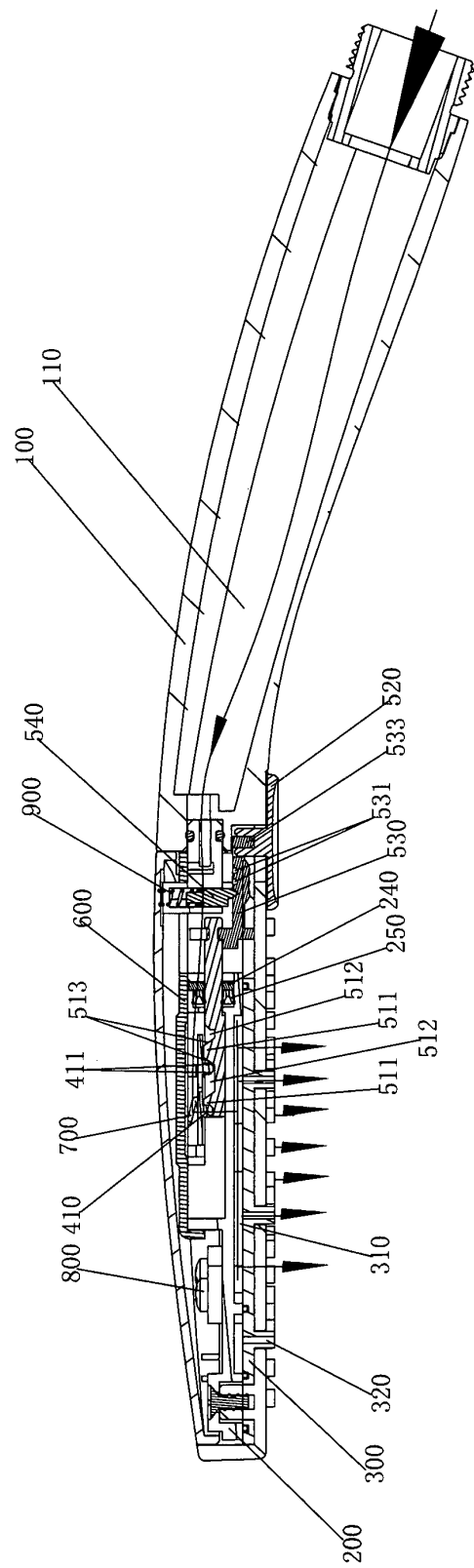


FIG. 4

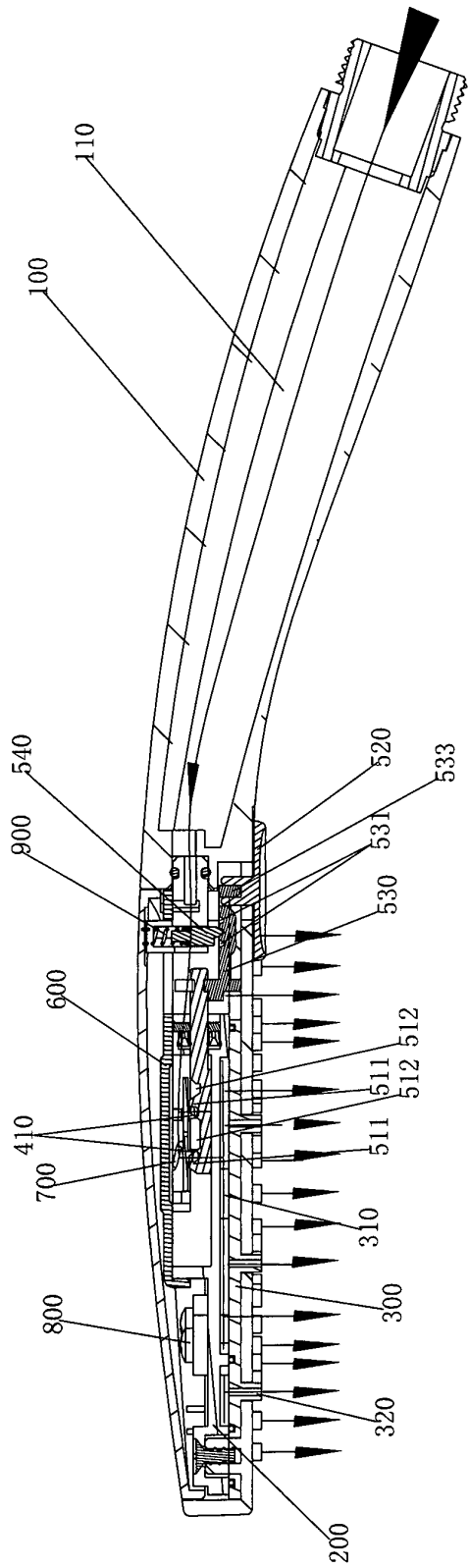


FIG. 5

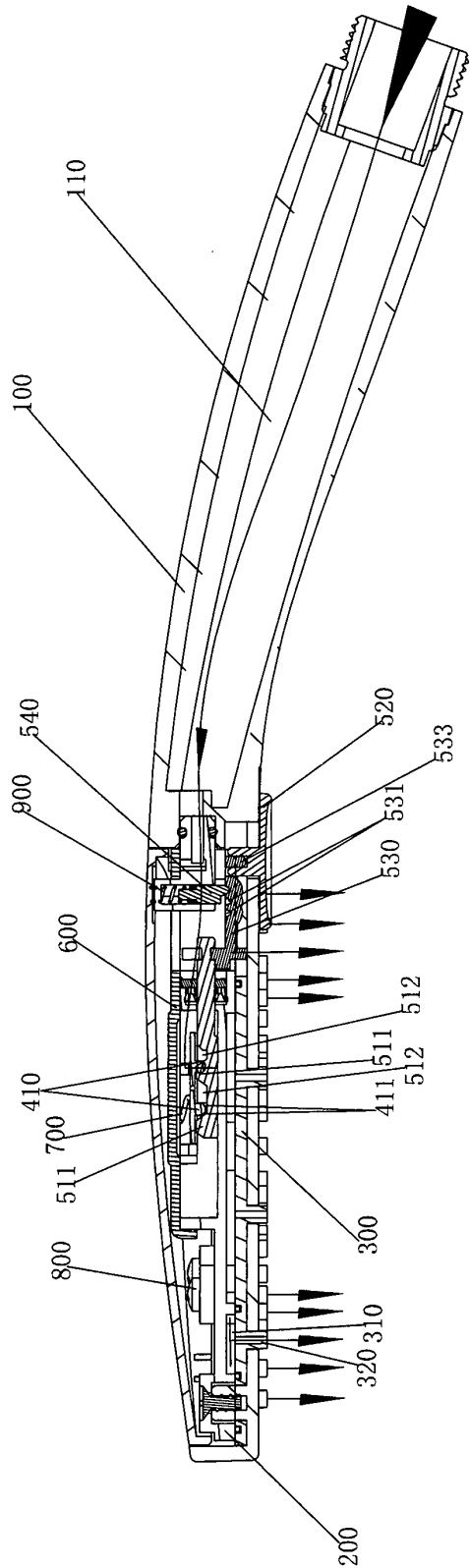


FIG. 6

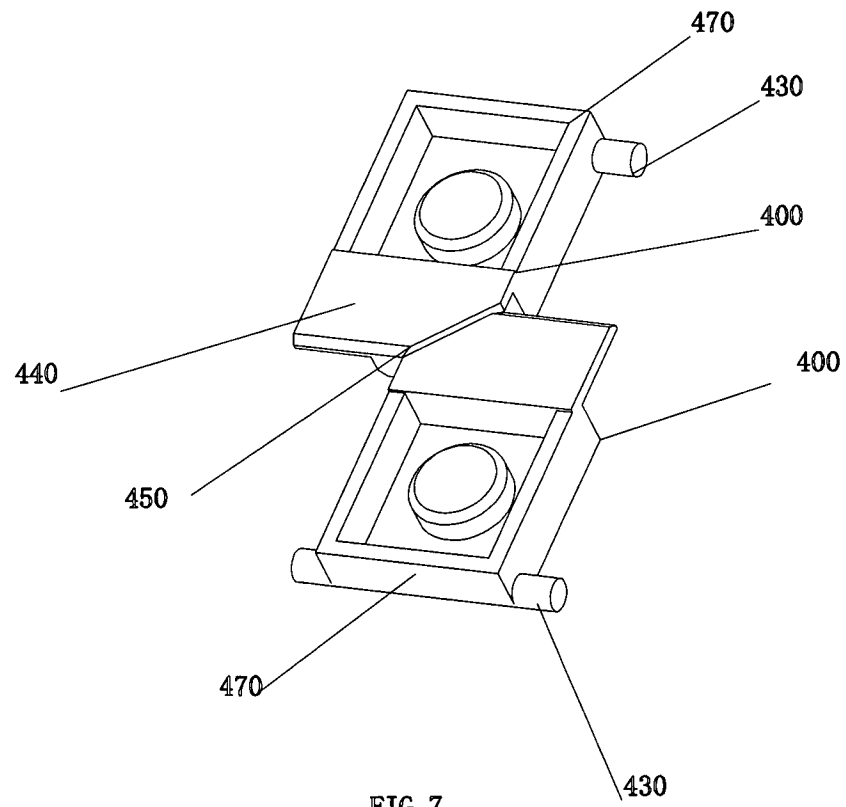


FIG. 7

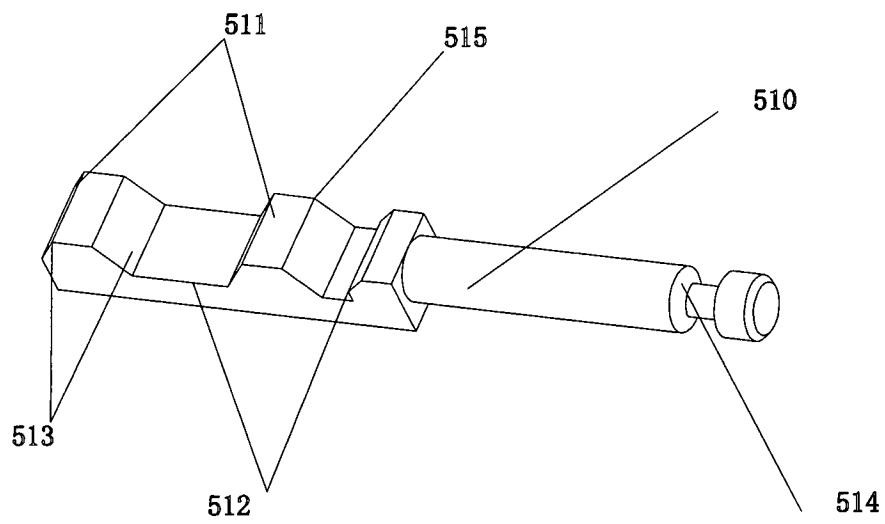


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2013/075215

A. CLASSIFICATION OF SUBJECT MATTER

See the extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B05B 1/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT, CNKI: ZHOU, Huasong; CHEN, Jianmin; XIAMEN SOLEX TECHNOLOGY, valve, shower, shower head, push button, push, pull, switch, concave, convex, shaft, bar, sealing cover, sealing plate, rotate, slide, top

WPI, EPODOC: shower, shower head, valve, push, button, switch, convex, concave, shaft, bar, seal+, cover, rotat+, slid+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 102671784 A (XIAMEN SOLEX TECHNOLOGY CO., LTD. et al.), 19 September 2012 (19.09.2012), claims 1-10	1-10
PX	CN 202638627 U (XIAMEN SOLEX TECHNOLOGY CO., LTD. et al.), 02 January 2013 (02.01.2013), claims 1-10	1-10
A	CN 202087439 U (XIAMEN LOTA INTERNATIONAL CO., LTD.), 28 December 2011 (28.12.2011), the whole document	1-10
A	CN 201067718 Y (ZHANG, Baochang), 04 June 2008 (04.06.2008), the whole document	1-10
A	CN 101428259 A (XIAMEN SOLEX TECHNOLOGY CO., LTD.), 13 May 2009 (13.05.2009), the whole document	1-10
A	CN 201720139 U (ZHEJIANG WANJI INDUSTRY CO., LTD.), 26 January 2011 (26.01.2011), the whole document	1-10
A	US 6622945 B1 (WU, J. et al.), 23 September 2003 (23.09.2003), the whole document	1-10

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

 Date of the actual completion of the international search
 08 July 2013 (08.07.2013)

 Date of mailing of the international search report
 15 August 2013 (15.08.2013)

 Name and mailing address of the ISA/CN:
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 Facsimile No.: (86-10) 62019451

 Authorized officer
CHENG, Chunwang
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2013/075215

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 102671784 A	19.09.2012	None	
CN 202638627 U	02.01.2013	None	
CN 202087439 U	28.12.2011	None	
CN 201067718 Y	04.06.2008	None	
CN 101428259 A	13.05.2009	WO 2010063203 A	10.06.2010
CN 201720139 U	26.01.2011	None	
US 6622945 B1	23.09.2003	None	

Form PCT/ISA/210 (patent family annex) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2013/075215

CONTINUATION: CLASSIFICATION OF SUBJECT MATTER

B05B 1/16 (2006.01) i

B05B 1/18 (2006.01) i

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202087439N [0002]