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(54) **ASSEMBLY STRUCTURE OF HAND SANITIZER MACHINE AND LIQUID STORAGE BOTTLE**

(57) The present application discloses an assembly structure and a liquid storage bottle of a hand wash liquid soap dispenser. The assembly structure of a hand wash liquid soap dispenser includes a main body casing and a liquid storage bottle, and further includes an external snapping head snap-fitted on a bottle mouth of the liquid storage bottle. A plurality of protruded flexible snaps are arranged at intervals on an outer periphery of an upper end of the external snapping head. A recessed groove to be engaged with the outer periphery of the external snapping head is provided on a bottom part of the main body casing, and a plurality of first snaps or snap grooves corresponding to the flexible snaps are provided on an inner wall of the recessed groove. A suction nozzle extending downward and protruding beyond the recessed groove is disposed on one side of the recessed groove, and a recessed hole for the suction nozzle to be inserted in and sealed is provided on the external snapping head. A through-hole communicating with an inside of the liquid storage bottle is provided on a bottom part of the recessed hole. The present application achieves a snap connection between the liquid storage bottle and the main body casing through the external snapping head, which reduces the assembly steps between the two and provides a simple structure.

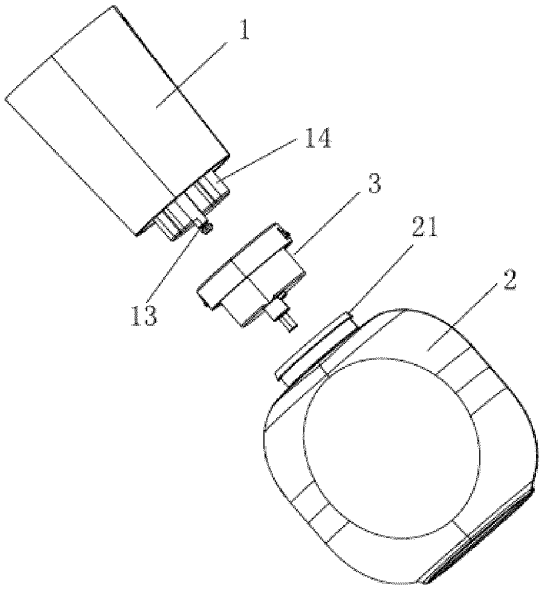

Fig. 2

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Description

TECHNICAL FIELD

[0001] The present application relates to the technical field of personal care, particularly to an assembly structure and a liquid storage bottle of a hand wash liquid soap dispenser.

BACKGROUND TECHNOLOGY

[0002] Hand wash liquid soap is a kind of personal care cleaning product that is often used in daily life, usually placed in the kitchen, toilets etc. Hand wash liquid soap is generally stored in a container, and is dispensed out of the container by pressing a pressing means provided on the top of the container. In order to meet the needs of users of convenience and avoiding cross-contamination caused by contact, some automatic hand wash liquid soap dispensers have emerged, which use an electric main body to suck up the hand wash liquid soap in the storage bottle and achieve the purpose of delivery. This saves the manual pressing process. However, the connection between the main body and the storage bottle of the automatic hand wash liquid soap dispenser is basically a screw or thread connection in prior art. It needs to be rotated for multiple times, or to an aligned position to be engaged when replacing a liquid storage bottle. This results in complex assembly steps, hence increases the user's workload and reduces the user's comfort.

SUMMARY OF THE APPLICATION

[0003] An objective of the present application is to provide an assembly structure of a hand wash liquid soap dispenser which overcomes the defects in the prior art. An external snapping head is provided to connect a liquid storage bottle and a main body casing, thereby reducing the assembly steps of the two and simplifying the overall structure.

[0004] In order to solve the above technical problems, the present application provides an assembly structure of a hand wash liquid soap dispenser, which includes a main body casing and a liquid storage bottle, and further includes an external snapping head snap-fitted on a bottle mouth of the liquid storage bottle. A plurality of protruded flexible snaps are arranged at intervals on an outer periphery of an upper end of the external snapping head. A recessed groove to be engaged with the outer periphery of the external snapping head is provided on a bottom part of the main body casing, and a plurality of first snaps or snap grooves corresponding to the flexible snaps are provided on an inner wall of the recessed groove. A suction nozzle extending downward and protruding beyond the recessed groove is disposed on one side of the recessed groove, and a recessed hole for the suction nozzle to be inserted in and sealed is provided on the external snapping head. A through-hole communicating with an inside of the liquid storage bottle is provided on a bottom part of the recessed hole.

[0005] Further, a positioning recess is provided in a central part of a top end of the external snapping head, and a boss which extends downward and is to be inserted into the positioning recess is provided in a central part of the recessed groove. The suction nozzle is disposed on one side of the boss and is protruded downward and beyond a lower end of the boss. The recessed hole is located on one side of a bottom part of the positioning recess.

[0006] Further, two vertical guiding columns are provided on an inner wall of the positioning recess and respectively located at two sides of the recessed hole. One side of the boss is recessed and formed with guiding grooves which cooperate with the guiding columns, and the suction nozzle is located in the middle of the guiding grooves.

[0007] Further, an air aperture in communication with an inside of the liquid storage bottle is provided at one side of the recessed hole on the bottom part of the positioning recess. Outer sides of the two guiding columns are respectively in abutment with both sides of the guiding grooves. An air flow channel connecting external air and the air aperture is provided between the guiding columns and the suction nozzle.

[0008] Further, a snapping edge protruding in a radial direction is provided on an outer side of an upper end of the bottle mouth of the liquid storage bottle. A cap-shaped portion sleeved on an outer periphery of the bottle mouth of the liquid storage bottle is formed on the outer periphery of the upper end of the external snapping head. An inner side of the cap-shaped portion is provided with a plurality of protruded second snaps distributed at intervals in an annular array and snap-fitted to a lower end surface of the snapping edge.

[0009] Further, the top end of the external snapping head is provided with arc-shaped holes running through in an up and down direction at positions corresponding to the second snaps.

[0010] Further, at least one positioning protrusion projecting radially outwards from the snapping edge is provided on the outer periphery of the bottle mouth of the liquid storage bottle, and a U-shaped bayonet for the positioning protrusion to fit in is provided on a lower end of the cap-shaped portion.

[0011] Further, the assembly structure of the hand wash liquid soap dispenser includes a bottle cap that is covered on the outer periphery of the external snapping head for sealing, and a rubber plug disposed in the positioning recess for sealing the recessed hole and the air aperture. A plurality of protruded rotation stoppers for screwing the flexible snaps in are provided on an inner side of the bottle cap, and a receiving groove for receiving the flexible snap is provided in the rotation stopper. One side of the receiving groove is an opening into which the flexible snap is screwed, and a protruded arc-shaped limiter is provided at the opening. A lower end of the rotation

stopper on a side corresponding to the opening is provided with an outwardly inclining guiding inclined edge. The other side of the receiving groove has a rib for stopping the flexible snap. A lower end of the rubber plug is provided with two plug pillars which are protruded and inserted into the recessed hole and the air aperture respectively.

[0012] A liquid storage bottle is further provided, which includes a bottle body, an external snapping head snapped to a bottle mouth of the bottle body, and a bottle cap covered onto an outer periphery of the external snapping head. A plurality of protruded flexible snaps are provided at intervals on an outer periphery of an upper end of the external snapping head, and a plurality of protruded rotation stoppers for screwing the flexible snaps into are provided on an inner side of the bottle cap. A positioning recess is provided in a central part of a top end of the external snapping head, and one side of the positioning recess is provided with a recessed hole and an air aperture that communicate with an inside and an outside of the bottle body. The positioning recess is also provided with a rubber plug for sealing the recessed hole and the air aperture.

[0013] Further, a receiving groove for receiving the flexible snap is provided in the rotation stopper. One side of the receiving groove is an opening into which the flexible snap is screwed, and a protruded arc-shaped limiter is provided at the opening. A lower end of the rotation stopper on a side corresponding to the opening is provided with an outwardly inclining guiding inclined edge. The other side of the receiving groove has a rib for stopping the flexible snap. A lower end of the rubber plug is provided with two plug pillars which are inserted into the recessed hole and the air aperture respectively.

[0014] Further, a snapping edge protruding in a radial direction is provided on an outer side of an upper end of the bottle mouth of the liquid storage bottle. A cap-shaped portion is formed on the outer periphery of the upper end of the external snapping head, which is sleeved on an outer periphery of the bottle mouth of the liquid storage bottle. An inner side of the cap-shaped portion is provided with a plurality of protruded second snaps distributed at intervals in an annular array and snap-fitted to a lower end surface of the snapping edge.

[0015] Further, a top end of the external snapping head is provided with arc-shaped holes running through in an up and down direction at positions corresponding to the second snaps.

[0016] Further, at least one positioning protrusion projecting radially outwards from the snapping edge is provided on the outer periphery of the bottle mouth of the liquid storage bottle, and a lower end of the cap-shaped portion is provided with a U-shaped bayonet for the positioning protrusion to fit in.

[0017] The present application has following advantageous effects:

The present application realizes a snap connection between the liquid storage bottle and the main body casing through the external snapping head snap-fitted on the bottle mouth and the snaps provided on the external snapping head, such that the main body casing can be pressed downward and snap-fitted to the external snapping head. The entire assembly process is simple and effortless, with less assembly steps of the two and a simple overall structure. Compared to the suction nozzle which is located in the center at the lower end of the main body casing in the existing technology, the present application provides a suction nozzle located on one side of the recessed groove at the lower end of the main body casing, and a recessed hole matched with the suction nozzle on the external snapping head, in order to avoid self-rotation after the main body casing is assembled, so that the rotation may be stopped by the cooperation of the suction nozzle and the recessed hole. The present application has the characteristics of a simple structure and easy and quick assembly.

[0018] Additional aspects and advantages of the present application will be partially shown in the following description, which will become obvious from the following description, or be understood through the practice of the present application.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The drawings described here are used to provide a further understanding of the present application, form part of this application, and not to be construed as an undue limitation of the present invention. In the drawings:

Fig. 1 is a schematic diagram of the assembly structure of the hand wash liquid soap dispenser in Embodiment 1;

Fig. 2 is an exploded view of the assembly structure of the hand wash liquid soap dispenser in Embodiment 1;

Fig. 3 is a schematic diagram of the main body casing in Embodiment 1;

Fig. 4 is a top view of the external snapping head in Embodiments 1 and 2;

Fig. 5 is a cross-sectional view of the external snapping head in Embodiments 1 and 2;

Fig. 6 is a schematic diagram of the external snapping head in Embodiments 1 and 2;

Fig. 7 is a schematic diagram of the bottle body of the liquid storage bottle in Embodiments 1 and 2;

Fig. 8 is a schematic diagram of the liquid storage bottle in Embodiments 2;

Fig. 9 is an exploded view of the liquid storage bottle in Embodiments 2;

Fig. 10 is a schematic diagram of the bottle cap in the embodiments;

Fig. 11 is a schematic diagram of the rubber plug in the embodiments; and

Fig. 12 is a schematic diagram of the rubber plug and the external snapping head after being connected in the embodiments.

DESCRIPTION OF THE EMBODIMENTS

[0020] In order to more fully understand the technical content of the present application, the present application will be further described and explained in conjunction with the drawings and specific embodiments. It should be noted that descriptions such as "first" and "second" in the context are used to distinguish different parts and the like, and do not represent the order, nor limit the "first" and "second" as different types.

[0021] The technical proposals in the embodiments of the present application will be described clearly and completely in conjunction with the drawings in the embodiments of the present application. Obviously, the described embodiments are merely part of embodiments of the present invention, rather than all of the embodiments. Based on the embodiments of the present application, all other embodiments obtained by those skilled in the art without creative work fall within the scope of protection of the present application.

Embodiment 1

[0022] As shown in Figs. 1-7, the assembly structure of the hand wash liquid soap dispenser of the present application includes a main body casing 1 and a liquid storage bottle 2, and further includes an external snapping head 3 snap-fitted on a bottle mouth 21 of the liquid storage bottle 2. Two protruded flexible snaps 31 are arranged symmetrically on an outer periphery of an upper end of the external snapping head 3. A recessed groove 11 to be engaged with the outer periphery of the external snapping head 3 is provided on a bottom part of the main body casing 1, and two first snaps 12 or snap grooves corresponding to the flexible snaps 31 are provided on an inner wall of the recessed groove 11. A suction nozzle 13 extending downward and protruding beyond the recessed groove 11 is disposed on one side of the recessed groove 11, and a recessed hole 32 for the suction nozzle 13 to be inserted in and sealed is provided on the external snapping head 3. The recessed hole 32 and the suction nozzle 13 are sealed by interference fit, and a through-hole 321 communicating with an inside of the liquid storage bottle 2 is provided on a bottom part of the recessed hole 32. In the practical application, a suction tube is sleeved on the suction nozzle, and a lower end of the suction tube passes through the through-hole 321 and extends downward into the bottom of the liquid storage bottle, drawing out the liquid in the liquid storage bottle. As mentioned above, the snap connection between the liquid storage bottle and the main body casing is realized through the external snapping head snap-fitted on the bottle mouth and the snaps provided on the external snapping head, such that the assembly may be completed by pressing and snap-fitting the main body casing to the external snapping head. The entire assembly process is simple and effortless, with less assembly steps of the two and a simple overall structure. Compared to the suction nozzle which is located in the center at the lower end of the main body casing in the existing technology, the present application provides a suction nozzle located on one side of the recessed groove at the lower end of the main body casing, and a recessed hole matched with the suction nozzle on the external snapping head, in order to avoid self-rotation after the main body casing is assembled, so that the rotation may be stopped by the cooperation of the suction nozzle and the recessed hole.

[0023] In the present embodiment, a positioning recess 33 which is recessed downward into the bottle mouth of the liquid storage bottle is provided in a central part of a top end of the external snapping head 3, and a boss 14 which extends downward into the positioning recess 33 is provided in a central part of the recessed groove 11. The suction nozzle 13 is disposed on one side of the boss 14 and is protruded downward and beyond a lower end of the boss 14. The recessed hole 32 is located on one side of a bottom part of the positioning recess 33. Therefore, the main body casing and the external snapping head can be easily assembled through the cooperation of the boss and the positioning recess. In order to further achieve the precise alignment and the quick assembly of the suction nozzle and the recessed hole, two vertical guiding columns 331 that are protruded are provided on an inner wall of the positioning recess 33, and the two guiding columns 331 are symmetrically located at two sides of the recessed hole 32. One side of the boss 14 is recessed and formed with guiding grooves 141 which can accommodate and cooperate with the two guiding columns 331, and outer sides of the two guiding columns are respectively in abutment with two sides of the guiding grooves. The suction nozzle 13 is located in the middle of the guiding grooves 141, therefore, when the boss is to be inserted into the positioning recess, the guiding columns have to be aligned with the guiding grooves before being guided downward, finally the suction nozzle in the middle of the guiding grooves is inserted into the recessed hole between the two guiding columns, using the cooperation of the boss and the positioning recess to achieve guiding and positioning.

[0024] Furthermore, in order to facilitate the insertion of the boss into the positioning recess, the corners of the guiding columns are designed as transition curved surfaces, and the corners of the boss contacting the transi-

tion curved surfaces of the guiding columns are also designed as curved surfaces in coordination therewith, so that the smoothness between two curved surfaces may facilitate the assembly between the boss and the positioning recess.

[0025] Specifically, an air aperture 34 in communication with the inside of the liquid storage bottle 2 is provided on the bottom part of the positioning recess 33. Gas flows into the bottle through the air aperture when drawing liquid out of the bottle. The air aperture 34 is located at one side of the recessed hole 32. After the boss is fitted into the positioning recess, a gap (not shown) exists between the guiding columns 331 and the suction nozzle 13 acts as an air flow channel connecting the external air and the air aperture 34.

[0026] Specifically, a snapping edge 211 protruding in a radial direction is provided on an outer side of an upper end of the bottle mouth 21 of the liquid storage bottle 2. A cap-shaped portion 35 is formed on the outer periphery of the upper end of the external snapping head 3, which is sleeved on an outer periphery of the bottle mouth 21 of the liquid storage bottle 2. The flexible snaps 31 are provided on the cap-shaped portion 35, and their upper end forms an inclined surface for the first snaps to be pressed down and flexibly compress the flexible snaps backward. An inner side of the cap-shaped portion 35 is provided with four protruded second snaps 351 distributed at intervals in an annular array and snap-fitted to a lower end surface of the snapping edge 211 such that the external snapping head is snap-fitted to the bottle mouth. Additionally, the top end of the external snapping head 3 is provided with arc-shaped holes 352 running through in an up and down direction at positions corresponding to the four second snaps 351, in order to facilitate the detachment of the external snapping head. When detaching, a matching tool (such as a flat-blade screwdriver, etc.) is inserted downward through the arc-shaped hole 352 to the second snap 351, and then pried outward to separate it from the snapping edge 211.

[0027] Specifically, a positioning protrusion 212 projecting radially outwards from the snapping edge 211 is provided on the outer periphery of the bottle mouth of the liquid storage bottle to prevent the external snapping head from rotating by itself, and the positioning protrusion 212 is located on or below the snapping edge. A lower end of the cap-shaped portion 35 is provided with a U-shaped bayonet 353 for the positioning protrusion 212 to fit in, therefore the liquid storage bottle and the external snapping head are fixed with each other.

[0028] In other embodiments of the present application, as shown in Figs. 10-12, the assembly structure of the hand wash liquid soap dispenser further includes a bottle cap 4 covered onto the outer periphery of the external snapping head for sealing, and a rubber plug 5 disposed in the positioning recess 33 for sealing the recessed hole and the air aperture. Two protruded rotation stoppers 41 for corresponding flexible snaps to screw in are symmetrically provided on an inner side of the bottle cap 4, and a receiving groove 42 for receiving the flexible snap is provided laterally in the rotation stoppers 41. One side of the receiving groove 42 is an opening through which the flexible snap is screwed in, and a protruded arc-shaped limiter 43 is provided at the opening. The arc-shaped limiter can limit the position of the flexible snap after it enters the receiving groove of the rotation stopper, as certain amount of force is required for the flexible snap to be screwed in and out, thereby preventing the bottle cap from being easily unscrewed in the reverse direction. A lower end of the rotation stopper 41 on a side corresponding to the opening is provided with an outwardly inclining guiding inclined edge 44 which guides the flexible snap to be accurately screwed into the receiving groove. The other side of the receiving groove 42 has a rib 45 for stopping the flexible snap to avoid an excess amount of rotation during the process of screwing in and achieve tight fitting. A supporting post 46 extending downwardly into the positioning recess is also provided at the center of the inner side of the bottle cap. A lower end of the rubber plug 5 is provided with two plug pillars 51 which are inserted into the recessed hole and the air aperture respectively. In the above, the bottle cap and the rubber plug are provided such that during the transportation or storage of the liquid storage bottle alone, in order to ensure the sealing of the liquid storage bottle, the recessed hole and the air aperture are first plugged through the rubber plug then the bottle cap is closed, and the bottle cap and the rubber plug can be removed when the main body casing is to be mounted on the liquid storage bottle.

[0029] In other embodiments of the present application, a complete hand wash liquid soap generator can be obtained by arranging corresponding nozzles, foam generating devices, liquid pumps, and gas pumps as driving mechanisms in the main body casing. Specifically, the nozzle is arranged on an upper part of the main body casing, and facing toward the outside of the main body casing to spray the foam. The foam generating device is arranged inside the main body casing, and includes: a gas-liquid mixing chamber in communication with the nozzle, a liquid pump in communication with the suction nozzle at the lower end of the main body casing through a tube and used for sucking the hand wash liquid soap from the suction nozzle and pump it into the gas-liquid mixing chamber, a gas pump for sucking air and pump it into the gas-liquid mixing chamber, a driving mechanism for driving the liquid pump and the gas pump, and a sensing device arranged on the main body casing and electrically connected to the driving mechanism. The sensing device is used to detect the approaching human body, and generate a starting signal that controls the driving mechanism to drive the liquid pump and the gas pump after an approaching human body is detected, so that the air pumped into the gas-liquid mixing chamber is mixed with the hand wash liquid soap in the gas-liquid mixing chamber to generate foam, and the foam generated is sprayed through the nozzle.

Embodiment 2

[0030] As shown in Figs. 4-12, a liquid storage bottle of the present embodiment includes a bottle body 20, an external snapping head 3 snapped to a bottle mouth 21 of the bottle body 20, and a bottle cap 4 covered onto an outer periphery of the external snapping head 3. An outer periphery of an upper end of the external snapping head 3 is provided with two flexible snaps 31 that are protruded and symmetrically arranged, and two protruded rotation stoppers 41 for the two flexible snaps to be correspondingly screwed into are provided on an inner side of the bottle cap 4. A receiving groove 42 for receiving the flexible snap is provided laterally in the rotation stoppers 41. One side of the receiving groove 42 is an opening through which the flexible snap is screwed in, and a protruded arc-shaped limiter 43 is provided at the opening. The arc-shaped limiter can limit the position of the flexible snap after it enters the receiving groove of the rotation stopper, as certain amount of force is required for the flexible snap to be screwed in and out, thereby preventing the bottle cap from being easily unscrewed in the reverse direction. A lower end of the rotation stopper 41 on a side corresponding to the opening is provided with an outwardly inclining guiding inclined edge 44 which guides the flexible snap to be accurately screwed into the receiving groove. The other side of the receiving groove 42 has a rib 45 for stopping the flexible snap to avoid an excess amount of rotation during the process of screwing in and achieve tight fitting. During the transportation or storage of the liquid storage bottle alone, the bottle cap is closed in order to ensure the sealing of the liquid storage bottle, and the bottle cap can be removed and the external snapping head is snap-fitted to the main body casing of the hand wash liquid soap dispenser when the liquid storage bottle is to be mounted on the hand wash liquid soap dispenser.

[0031] Specifically, a recessed hole 32 for a suction nozzle 13 to be inserted in and sealed is provided on the external snapping head 3. A through-hole 321 communicating with an inside of the liquid storage bottle 2 is provided on a bottom part of the recessed hole 32. A positioning recess 33 which is recessed downward into the bottle mouth of the liquid storage bottle is provided in a central part of a top end of the external snapping head 3, and the recessed hole 32 is located on one side of a bottom part of the positioning recess 33. Two vertical guiding columns 331 that are protruded are provided on an inner wall of the positioning recess 33 and are symmetrically located at two sides of the recessed hole 32. An air aperture 34 in communication with the inside of the bottle body 20 is provided on the bottom part of the positioning recess 33. Gas flows into the bottle through the air aperture when drawing liquid out of the bottle. The air aperture 34 is provided at one side of the recessed hole 32. A supporting post 46 extending downwardly into the positioning recess is also provided at the center of the inner side of the bottle cap. A rubber plug 5 is disposed in the positioning recess 33 for sealing the recessed hole and the air aperture, through two plug pillars 51 provided at a lower end of the rubber plug 5 which are inserted into the recessed hole and the air aperture respectively, and the plug pillars are in interference fit with the recessed hole and the air aperture to achieve sealing.

[0032] In the present embodiment, a snapping edge 211 protruding in a radial direction is provided on an outer side of an upper end of the bottle mouth 21 of the bottle body 20. A cap-shaped portion 35 is formed on the outer periphery of the upper end of the external snapping head 3, which is sleeved on an outer periphery of the bottle mouth 21. An inner side of the cap-shaped portion 35 is provided with four protruded second snaps 351 distributed at intervals in an annular array and snap-fitted to a lower end surface of the snapping edge 211 such that the external snapping head is snap-fitted to the bottle mouth. Additionally, the top end of the external snapping head 3 is provided with arc-shaped holes 352 running through in an up and down direction at positions corresponding to the second snaps 351, in order to facilitate the detachment of the external snapping head. When detaching, a matching tool (such as a flat-blade screwdriver, etc.) is inserted downward through the arc-shaped hole 352 to the second snap 351, and then pried outward to separate it from the snapping edge 211.

[0033] Specifically, a positioning protrusion 212 projecting radially outwards from the snapping edge 211 is provided on the outer periphery of the bottle mouth of the liquid storage bottle to prevent the external snapping head from rotating by itself, and the positioning protrusion 212 is located on or below the snapping edge. A lower end of the cap-shaped portion 35 is provided with a U-shaped bayonet 353 for the positioning protrusion 212 to fit in, therefore the bottle body and the external snapping head are fixed with each other.

[0034] The technical proposals provided by the embodiments of the present application have been described in detail above, and specific examples have been applied herein to discuss the principles and implementation modes of the embodiments of the present application. The descriptions of the above embodiments are only applicable to aid in understanding the principles of the embodiments of the present application. Meanwhile, those of ordinary skill in the art, according to embodiments of the present invention, may make modifications in the specific embodiments and application scope, and the content of this specification shall not be construed as limiting the present application.

Claims

1. An assembly structure of a hand wash liquid soap dispenser comprising:

   a main body casing; and
   a liquid storage bottle,

wherein the assembly structure of the hand wash liquid soap dispenser further comprises an external snapping head snap-fitted on a bottle mouth of the liquid storage bottle, a plurality of protruded flexible snaps are provided at intervals on an outer periphery of an upper end of the external snapping head, a recessed groove engaged with the outer periphery of the external snapping head is provided on a bottom part of the main body casing, and a plurality of first snaps or snap grooves corresponding to the flexible snaps are provided on an inner wall of the recessed groove, a suction nozzle extending downward and protruding beyond the recessed groove is disposed on one side of the recessed groove, and a recessed hole for the suction nozzle to be inserted in and sealed is provided on the external snapping head, a through-hole communicating with an inside of the liquid storage bottle is provided on a bottom part of the recessed hole.

2. The assembly structure of a hand wash liquid soap dispenser according to claim 1, wherein a positioning recess is provided in a central part of a top end of the external snapping head, and a boss which extends downward and is to be inserted into the positioning recess is provided in a central part of the recessed groove, and the suction nozzle is disposed on one side of the boss and is protruded downward and beyond a lower end of the boss, the recessed hole is located on one side of a bottom part of the positioning recess.

3. The assembly structure of a hand wash liquid soap dispenser according to claim 2, wherein two vertical guiding columns are provided on an inner wall of the positioning recess and respectively located at two sides of the recessed hole, one side of the boss is recessed and formed with guiding grooves which cooperate with the guiding columns, and the suction nozzle is located in a middle of the guiding grooves.

4. The assembly structure of a hand wash liquid soap dispenser according to claim 3, wherein an air aperture in communication with the inside of the liquid storage bottle is provided at one side of the recessed hole on the bottom part of the positioning recess, outer sides of the two guiding columns are respectively in abutment with both sides of the guiding grooves, an air flow channel connecting external air and the air aperture is provided between the guiding columns and the suction nozzle.

5. The assembly structure of a hand wash liquid soap dispenser according to claim 4, wherein a snapping edge protruding in a radial direction is provided on an outer side of an upper end of the bottle mouth of the liquid storage bottle, a cap-shaped portion sleeved on an outer periphery of the bottle mouth of the liquid storage bottle is formed on the outer periphery of the upper end of the external snapping head, and an inner side of the cap-shaped portion is provided with a plurality of protruded second snaps distributed at intervals in an annular array and snap-fitted to a lower end surface of the snapping edge.

6. The assembly structure of a hand wash liquid soap dispenser according to claim 5, wherein the top end of the external snapping head is provided with arc-shaped holes running through in an up and down direction at positions corresponding to the second snaps.

7. The assembly structure of a hand wash liquid soap dispenser according to claim 6, wherein at least one positioning protrusion projecting radially outwards from the snapping edge is provided on the outer periphery of the bottle mouth of the liquid storage bottle, and a U-shaped bayonet for the positioning protrusion to fit in is provided on a lower end of the cap-shaped portion.

8. The assembly structure of a hand wash liquid soap dispenser according to claim 7, wherein the assembly structure of a hand wash liquid soap dispenser further comprises a bottle cap that is covered on the outer periphery of the external snapping head for sealing; and a rubber plug disposed in the positioning recess for sealing the recessed hole and the air aperture, a plurality of protruded rotation stoppers for screwing the flexible snaps in are provided on an inner side of the bottle cap, and a receiving groove for receiving the flexible snap is provided in the rotation stopper, one side of the receiving groove is an opening into which the flexible snap is screwed, and a protruded arc-shaped limiter is provided at the opening, a lower end of the rotation stopper on a side corresponding to the opening is provided with an outwardly inclining guiding inclined edge, and another side of the receiving groove has a rib for stopping the flexible snap, a lower end of the rubber plug is provided with two plug pillars which are protruded and inserted into the recessed hole and the air aperture respectively.

9. A liquid storage bottle, comprising:

a bottle body;
an external snapping head snapped to a bottle mouth of the bottle body; and
a bottle cap covered onto an outer periphery of the external snapping head,
wherein a plurality of protruded flexible snaps are provided at intervals on an outer periphery of an upper end of the external snapping head,

and a plurality of protruded rotation stoppers for screwing the flexible snaps in are provided on an inner side of the bottle cap, a positioning recess is provided in a central part of a top end of the external snapping head, and one side of the positioning recess is provided with a recessed hole and an air aperture that communicate with an inside and an outside of the bottle body, the positioning recess is also provided with a rubber plug for sealing the recessed hole and the air aperture.

10. The liquid storage bottle according to claim 9, wherein a receiving groove for receiving the flexible snap is provided in the rotation stopper, one side of the receiving groove is an opening into which the flexible snap is screwed, and a protruded arc-shaped limiter is provided at the opening, a lower end of the rotation stopper on a side corresponding to the opening is provided with an outwardly inclining guiding inclined edge, and another side of the receiving groove has a rib for stopping the flexible snap, a lower end of the rubber plug is provided with two plug pillars which are inserted into the recessed hole and the air aperture respectively.

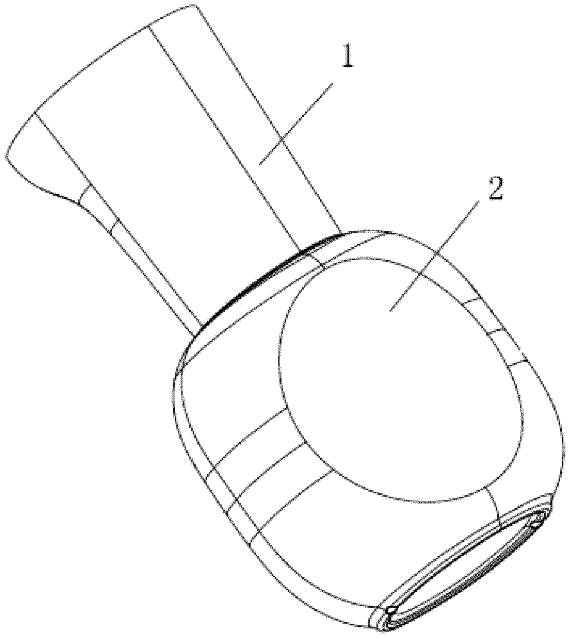

Fig. 1

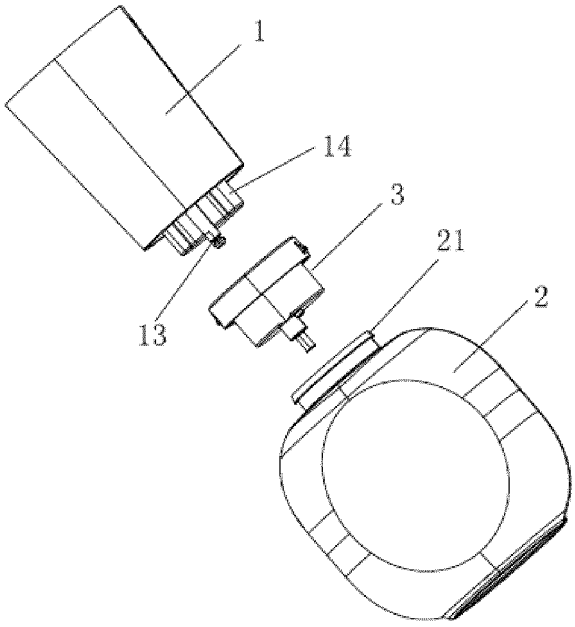

Fig. 2

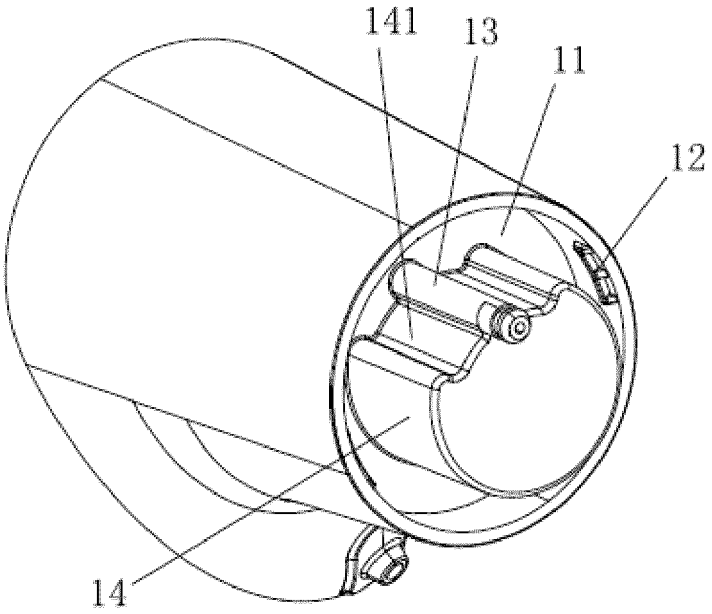

Fig. 3

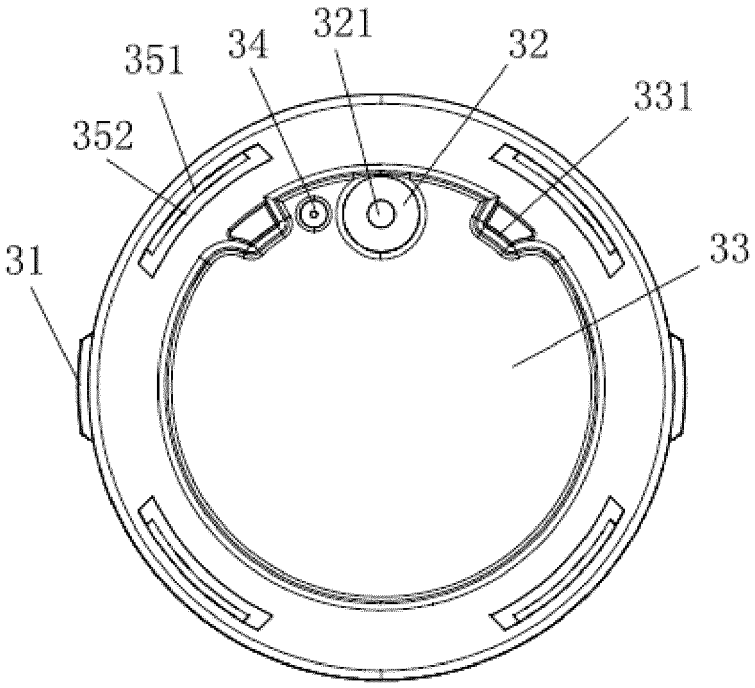

Fig. 4

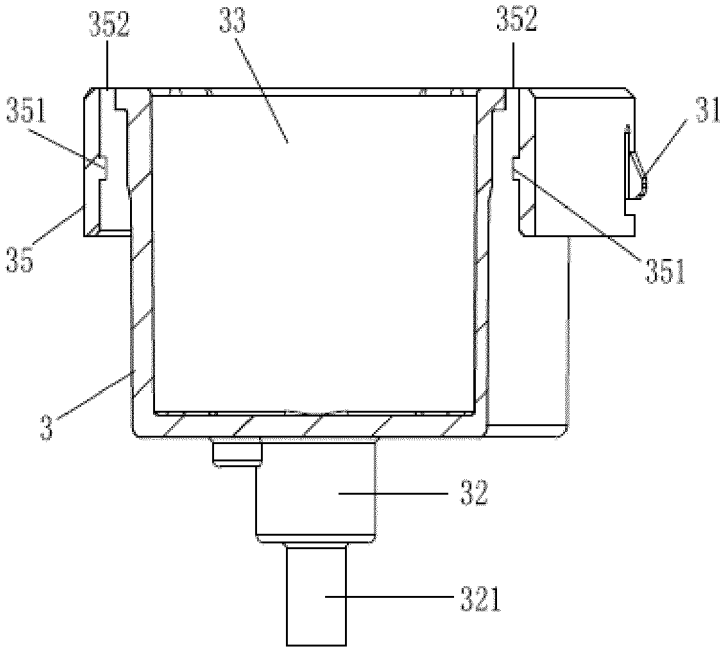

Fig. 5

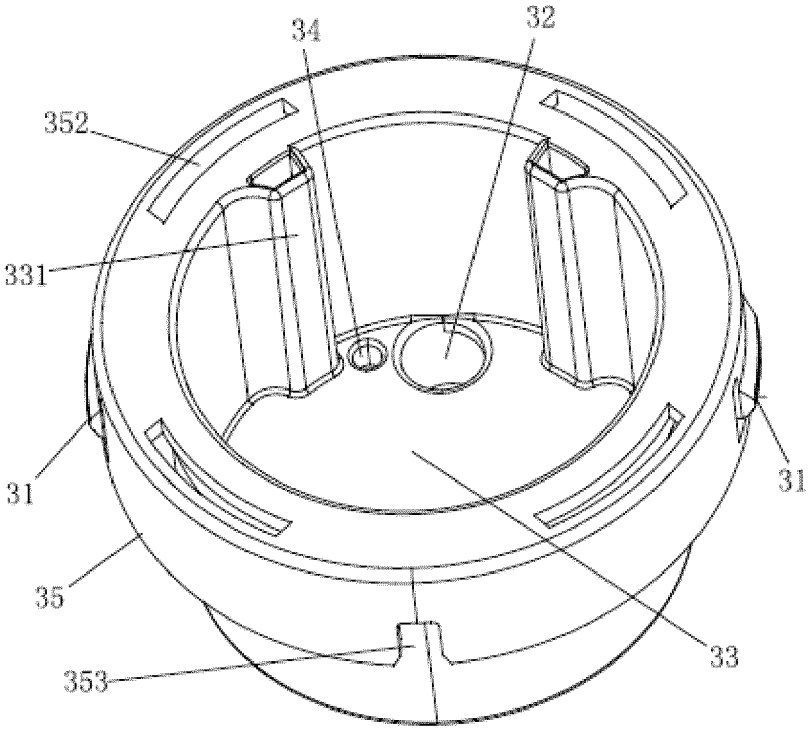

Fig. 6

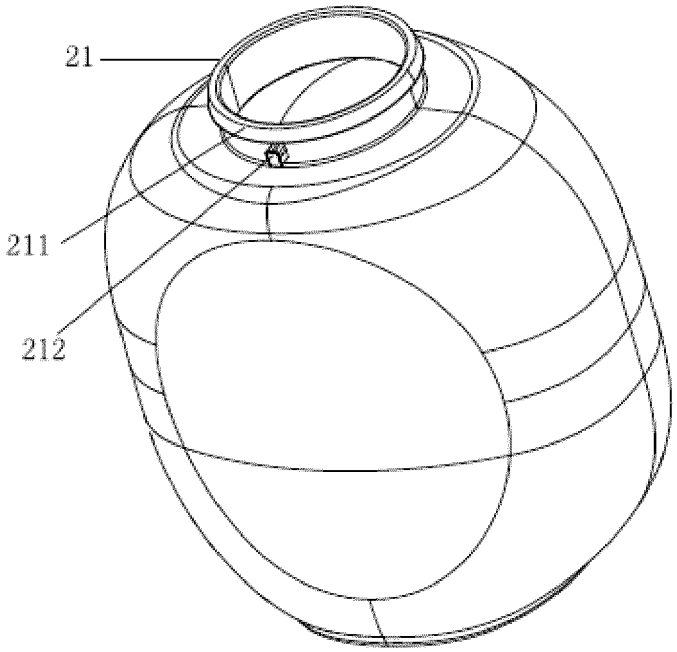

Fig. 7

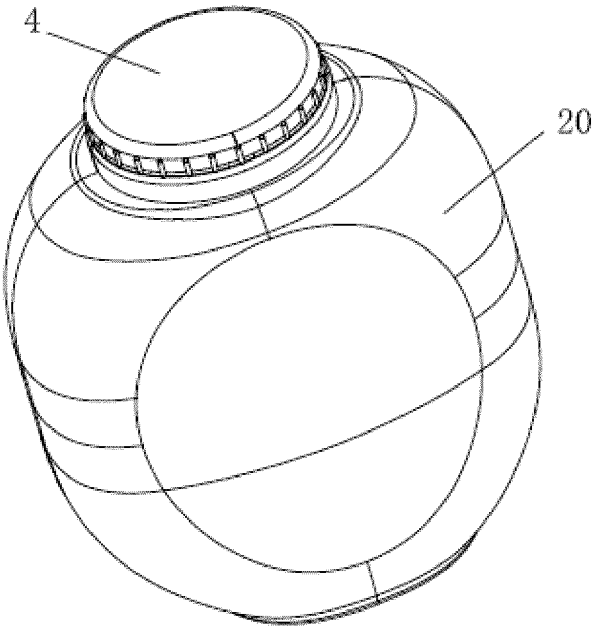

Fig. 8

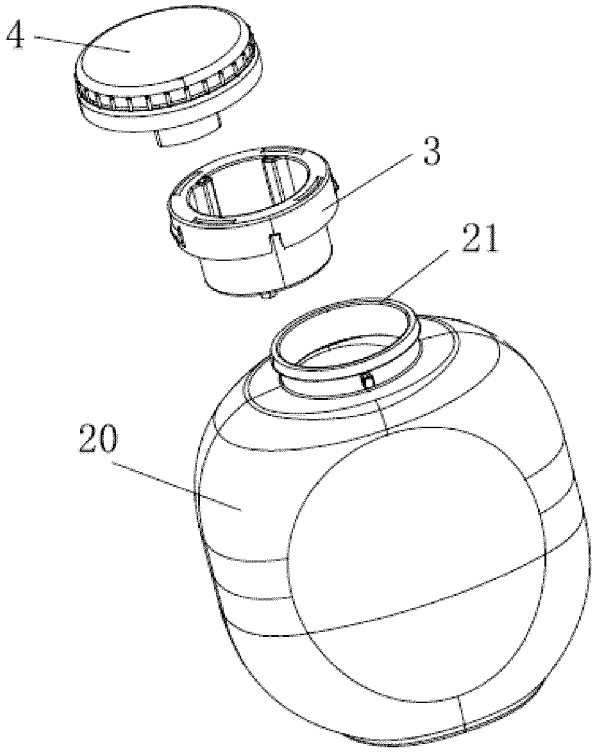

Fig. 9

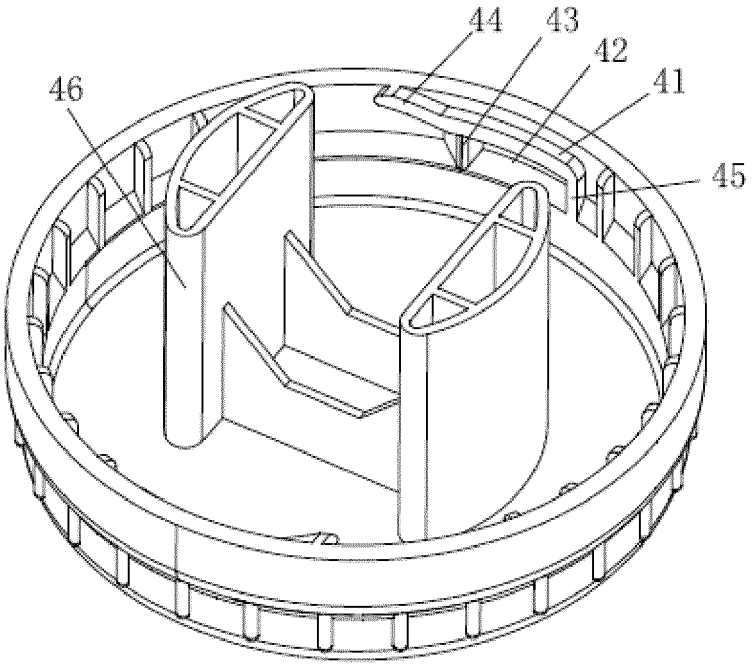

Fig. 10

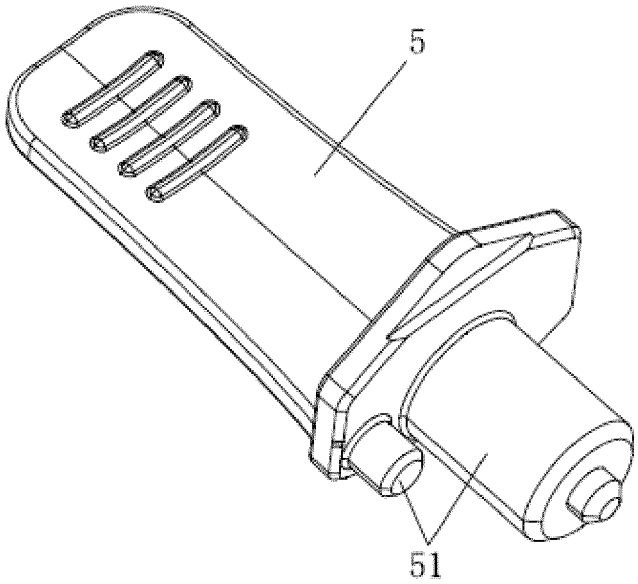

Fig. 11

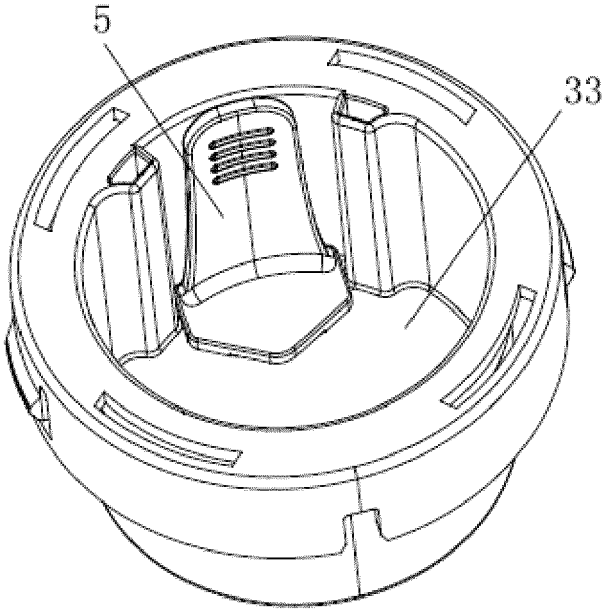

Fig. 12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2020/098509

A. CLASSIFICATION OF SUBJECT MATTER

A47K 5/12(2006.01)i; A47K 5/14(2006.01)i; A45D 34/00(2006.01)i

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)

A47K A45D

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)

CNABS; CNTXT; CNKI; VEN; WOTXT; USTXT; EPTXT: 威莱, 盖, 压头, 泵, 凸, 突, 卡扣, 卡合, 扣合, 瓶口, 容器口, 口部, groove?, concave?, slot?, protrude?, button?, buckle?, cap?, cover

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 109846399 A (XIAMEN OLT CO., LTD.) 07 June 2019 (2019-06-07) description, paragraphs [0029]-[0045], and figures 1-8	1, 2, 9, 10
A	CN 108883429 A (RIEKE PACKAGING SYSTEMS LIMITED) 23 November 2018 (2018-11-23) entire document	1-10
A	CN 202009797 U (FOSHAN INTERA PRECISION METAL PRODUCTS CO., LTD.) 19 October 2011 (2011-10-19) entire document	1-10
A	CN 208677223 U (XIAOWEI (SHANGHAI) BIOTECHNOLOGY CO., LTD.) 02 April 2019 (2019-04-02) entire document	1-10
A	KR 20120058381 A (KU YE SOL) 07 June 2012 (2012-06-07) entire document	1-10

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"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)
"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
"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
"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
"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
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 October 2020	**01 December 2020**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

TRANSLATION

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2020/098509

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 109846399 A	07 June 2019	CN 210277001 U	10 April 2020
CN 108883429 A	23 November 2018	US 2018304291 A1	25 October 2018
		WO 2017089840 A1	01 June 2017
		EP 3380251 A1	03 October 2018
CN 202009797 U	19 October 2011	None	
CN 208677223 U	02 April 2019	None	
KR 20120058381 A	07 June 2012	None	

Form PCT/ISA/210 (patent family annex) (January 2015)