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(54) HAND HELD SHOWER OR HEAD SHOWER COMPRISING A BUTTON JET-CHANGE SYSTEM

(57) A hand held shower or a head shower comprising a jet-change system, said system comprising a conveyor body (30), a diverter drum (100) provided with a main plate (110) provided with a deviation opening (112),

and a gear body (130). The system also comprises a button (12) suitable to directly engage the gear body (130) of the diverter drum (100) to cause its rotation and select a desired dispensing configuration.

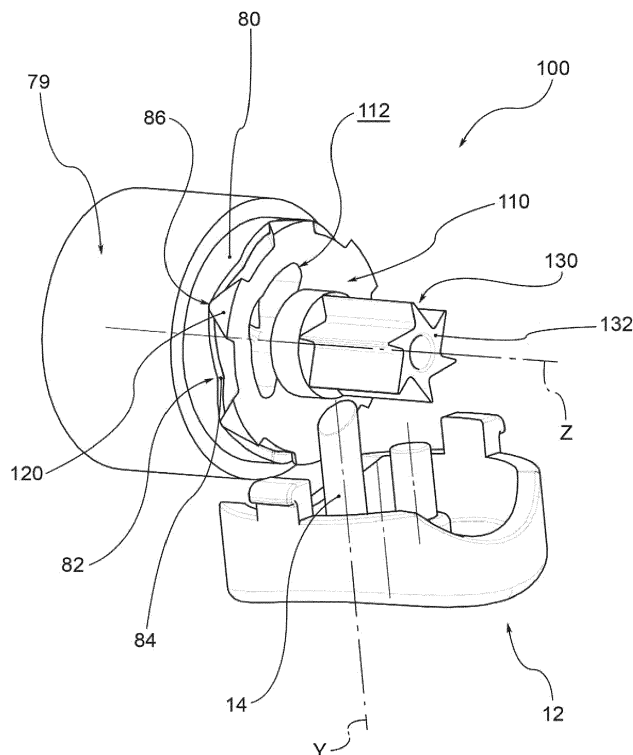


FIG.8

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Description

[0001] This invention relates to a button jet-change system for a shower or a shower head.

[0002] For some time, showers have been known that are provided with a jet-change system that allows changing the jet exiting from the dispensing surface, thus allowing the user to choose, for example, between a rain shower, a pulsing jet, etc.

[0003] Typically, such systems include a control lever at the periphery of the dispensing surface, intended to be rotated to switch from one type of jet to another.

[0004] Button jet-change systems are also known, as described for example in documents DE 102009008196, DE 202009018794, US 4209132 and JP-H07-24363.

[0005] Such systems are certainly more convenient to use with respect to lever systems, since the user can easily reach the button and operate the system, even with the same hand that is gripping the shower.

[0006] However, the button jet-change systems known today are often structurally complex, or provided unreliable mechanisms that tend to jam.

[0007] The purpose of this invention is to provide a button jet-change system for a shower or shower head that overcomes the drawbacks mentioned with reference to the prior art.

[0008] This purpose is achieved by a jet-change system according to claim 1. The dependent claims describe variant embodiments.

[0009] The characteristics and advantages of the button jet-change system according to this invention will be apparent from the following description, given by way of non-limiting example, in accordance with the accompanying figures, in which:

- Figure 1 is a plan view of a shower containing a button jet-change system according to this invention;
- Figure 2 is a side view of the shower of Figure 1;
- Figure 3 is a front view of the shower of Figure 1;
- Figures 4, 5 and 6 are, respectively, a view in longitudinal section of the shower of Figure 2, according to the section planes IV, V and VI in Figure 3;
- Figure 7 illustrates a conveyor body of the shower of Figure 1;
- Figure 8 shows a button jet-change system according to an embodiment of this invention;
- Figures 9a and 9b show the system of Figure 8 in a combined dispensing configuration, with button at rest;
- Figures 10a and 10b illustrate the system of Figure 8 in a first activation step of the button;
- Figures 11a and 11b illustrate the system of Figure 8 in a second activation step of the button;
- Figures 12a and 12b illustrate the system of Figure 8 in a single dispensing configuration;
- Figure 13 shows a shower head comprising a button jet-change system according to this invention; and
- Figure 14 shows a column shower head comprising

a button jet-change system according to this invention.

[0010] For clarity of exposition, hereinafter reference will be made to a shower equipped with a button jet-change system; however, said jet change system is also applicable to a shower head 200, for example of the type illustrated in Figure 13, having distinct dispensing areas A', B', C' or to a column shower head 300, for example of the type shown in Figure 14, having distinct dispensing areas A'', B'', C''.

[0011] With reference to Figures 1 to 12, the number 1 globally indicates a shower provided with a handle 2 that extends along a handle axis X between a free end 4, where a connection for the water is located, and an opposite end, where there is a dispensing head 6 provided with a dispensing surface 8 containing a plurality of nozzles 10 for dispensing the water.

[0012] Preferably, several dispensing areas are recognisable on the dispensing surface 8; for example, there is recognisable: a first central area A provided with first nozzles 10a; a second annular area B, which surrounds the first area A, provided with second nozzles 10b; a third outer annular area C, outside the second area B, provided with third nozzles 10c.

[0013] The shower 1 is provided with a button jet-change system that allows the user to selectively dispense the water from one or more dispensing areas.

[0014] Said jet-change system comprises a button 12, preferably disposed in a transition region between the handle 2 and the dispensing surface 8.

[0015] In the case of the shower head 200 (Figure 13), said shower head 200 includes a fixing portion 202 for the application of the shower head to a wall, and an arm 204 projecting from the fixing portion 202, supporting the dispensing surface 8; the button 12 of the jet-change system is disposed in the fixing portion 202.

[0016] In the case of the column shower head 300 (Figure 14), said column shower head 300 comprises a column 302 with prominent extension in height, for the application of the shower head to a wall, and an arm 304 projecting from the column 302, supporting the dispensing surface 8, provided with the dispensing areas A'' (massage jet), B'' (cascade blade) and C'' (rain jet). The column 302 further carries a shower 306, for example fed by a flexible hose 308, a hot/cold water mixer 310, a diverter 312, for example, two-way, and the button 12.

[0017] By operating on the diverter 312, it is possible to select the shower 306 or the dispensing surface 8; when the dispensing surface 8 is selected, by operating on the jet-change system using the button 12, it is possible to select one of said dispensing areas A'', B'', C'' of said dispensing surface 8 and related combinations A''+B'', B''+C'', A''+C''.

[0018] Furthermore, for example, the shower 306 comprises a further jet-change system according to the present invention, provided with the button 12'.

[0019] According to the invention, by pressing the but-

ton 12, dispensing from one or more of the dispensing areas is selected. Preferably, the jet-change system allows selecting six different modes: dispensing from only the first area A (single dispensing configuration A) or from the first area A and the second area B (combined dispensing configuration A+B), from only the second area B (single dispensing configuration B), from the second area B and the third area C (combined dispensing area B+C), from only the third area C (single dispensing configuration C) or from the third C area and from the first area A (combined dispensing configuration A+C).

[0020] The button 12 cooperates with a return mechanism provided inside the dispensing head 6, so that, by releasing the button 12 after the selection, it returns to the rest position.

[0021] This allows the button 12 to be repeatedly pressed, passing in sequence from one selection to the next.

[0022] The dispensing head 6 has distribution chambers inside, sealingly separated from each other, each corresponding to one of said dispensing areas A,B,C and in communication with its respective nozzles 10a,10b,10c.

[0023] In a preferred embodiment, the dispensing head 6 comprises a lower plate 20, provided with holes for the nozzles of the three dispensing areas, and a conveyor body 30, sealingly coupled to create separate distribution chambers 42,44,46.

[0024] For example, the lower plate 20 comprises two concentric annular walls 52,54, projecting from the inner surface of the plate, and the conveyor body 30 comprises separation walls 62,64, which sealingly couple with the corresponding annular walls 52,54 to form said distribution chambers together to the lower plate 20 and an upper plate 66 of the conveyor body 30.

[0025] For example, the head 6 has inside a first central distribution chamber 42, a second distribution chamber 44, concentric to the first chamber 42, and a third distribution chamber 46, concentric to the second chamber 44.

[0026] The conveyor body 30 also comprises feed ducts 72,74,76, which extend towards the handle 2, connected to a respective distribution chamber 42,44,46.

[0027] In particular, a first feed duct 72 is connected opening on one side in the first distribution chamber 42 (Figure 4) and ends on the other side with a first opening 72a (Figure 7), a second feed duct 74 opens on one side in the second distribution chamber 44 (Figure 5) and ends on the other side with a second opening 74a (Figure 7), and a third feed duct 76 opens on one side in the third distribution chamber 46 (Figure 6) and ends the other side with a third opening 76a (Figure 7).

[0028] Said openings 72a,74a,76a open on a bottom surface 78 with a shank 79 of the conveyor body 30, delimited by an annular wall 80, provided with a circumferentially wavy edge 82.

[0029] In other words, the edge 82 of the annular wall 80 has a succession of ridges 84 and valleys 86, in circumferential succession; preferably, there are six valleys

86, equal to the number of dispensable jet configurations.

[0030] Preferably, moreover, the jet-change system comprises a gasket 90 housed in the compartment delimited by the annular wall 80, provided with appropriate through-ducts.

[0031] The jet-change system also comprises a diverter drum 100, engaged with the shank 79 of the conveyor body 30, rotatable on command about a drum axis Z coaxial with the annular wall 80.

[0032] The diverter drum 100 includes a main plate 110 provided with a deviation opening 112 passing through the thickness of the plate, i.e., in the direction of the rotation axis Z, having a predefined shape and angular amplitude.

[0033] The main plate 110 also comprises at least one engagement projection 120 suitable to slide on the edge 82 of the annular wall 80.

[0034] The diverter drum 100 also comprises a gear body 130 integral in rotation with the main plate 110, and in particular projecting axially from it.

[0035] The gear body 130 is provided with a plurality of teeth 132, and in particular of six teeth, equal to the number of dispensable jet configurations.

[0036] The button 12, which is movable along an actuation axis Y, is also provided with a stem 14, projecting along the actuation axis Y, suitable to engage the diverter drum 100, and in particular one of the teeth 132 of the gear body 130, to impose a rotation around the rotation axis Z on it. In other words, the button 12 is suitable to directly engage the diverter drum 100, and in particular the gear body 130, i.e., without other intermediary levers or mechanisms. In particular, the stem 14 is suitable to directly engage the diverter drum 100, and in particular the gear body 130.

[0037] The deviation opening 112 of the diverter drum 100 is shaped and dimensioned so that, in an angular position in which a single dispensing configuration A,B,C is selected, it is superposed on the respective opening 72a,72b,72c of the shank 79, and in a successive angular position in which a combined dispensing configuration A+B,B+C,A+C is selected, it is superposed on both openings 72a,72b,72c involved.

[0038] The jet-change system also comprises a casing 140, applied to the shank 79 of the conveyor body 30, provided with a tubular casing portion 142, coaxial with the rotation axis Z, inside which is housed the diverter drum 100.

[0039] The water supplied to the shower 1 is fed to the casing 140, for example by means of a handle duct 150 disposed in the handle 2, terminating with the fitting for the water disposed at the free end 4.

[0040] The main plate 110 of the diverter drum 100, and thus the deviation opening 112, is thus hit by a flow of water along a direction parallel to the rotation axis Z, i.e., perpendicular to the actuation axis Y of the button 12.

[0041] In normal operation, the shower 1 is, for example, in combined dispensing configuration A+C and the button 12 is in a rest configuration (Figures 9a, 9b).

[0042] In the combined dispensing configuration A+C, the deviation opening 112 is superposed on the third opening 76a, which feeds the third dispensing area C through the third feed duct 76 of the conveyor body 30, and the first opening 72a, which feeds the first dispensing area A through the first feed duct 72 of the conveyor body 30. In practice, the jet of water exits from the dispensing surface 8 of the circular central area A and from the outer crown C.

[0043] In addition, the engagement projections 120 of the main plate 110 are stably located in the valleys 86 of the edge 82 of the annular wall 80, preventing the free rotation of the diverter drum 100.

[0044] In a first actuation step of the jet-change system (Figures 10a, 10b), when the button 12 is pressed, the stem 14 engages one of the teeth 132 of the gear body 130, causing a rotation of the diverter drum 100 about the rotation axis Z.

[0045] In this step, the engagement projections 120 are carried on the ridges 84 of the edge 82, in an unstable position.

[0046] At the same time, the diverter drum 100 undergoes a translation along the rotation axis Z, backing up with respect to the position assumed in the rest configuration, i.e., moving away from the bottom surface 78 of the shank 79.

[0047] In a second actuation step of the jet-change system (Figures 11a, 11b), by continuing to press the button 12 until the end of its course, the diverter drum 100 continues rotating and the engagement projections 120 pass over the ridges 84.

[0048] The diverter drum 100 then reverses the direction of translation, advancing again towards the bottom surface 78 of the shank 79.

[0049] Finally, in a third actuation step of the jet-change system (Figures 12a, 12b), while releasing the button 12, the diverter drum 100 continues in the rotation (and in the approach translation), since the main plate 110 is pushed axially by the flow of water, thus causing the sliding of the engagement projections 120 along the edge 82, until they are located in the valleys 86.

[0050] In this way a single dispensing configuration A is reached, in which the deviation opening 112 is superposed only on the first opening 72a, for which the jet of water exits from the dispensing surface 8 only from the circular central area A.

[0051] When the button 12 is successively pressed and released, it passes to the successive dispensing configurations A+B, B, B+C, C.

[0052] Innovatively, the jet-change system according to this invention overcomes the drawbacks of the known art, because the mechanism is particularly simple and reliable.

[0053] In addition, advantageously, the jet-change system gives the user great ease of use, especially with the short stroke of the button necessary for the jet change.

[0054] This is due to the fact that the final part of the

rotation of the diverter drum is completed, even though the button is released, thanks to the thrust of the water flow.

[0055] Moreover, advantageously, the jet-change system according to this invention gives the user the possibility of choosing between a very large number of jet dispensing combinations, even though the mechanism is small. This also benefits the aesthetics of the shower or shower head.

[0056] It is clear that one skilled in the art may make changes to the jet-change system described above, all contained within the scope of protection defined by the following claims.

Claims

1. Shower (1) or shower head (200,300) provided with a dispensing surface (8) having distinct dispensing areas (A,B,C), comprising a jet-change system for the selective supply of water to one or more of said dispensing areas, wherein said system comprises:

- a conveyor body (30) provided with an opening (72a,72b,72c) for each dispensing area (A,B,C), hydraulically connected to the respective dispensing area (A,B,C);

- a diverter drum (100) rotatable on command about a rotation axis (Z), provided with a main plate (110) provided with deviation opening (112), suitable to be aligned, by the rotation of the diverter drum (100), to one or more of said openings (72a,72b,72c) of the conveyor body (30), and a gear body (130) rotatable together with the main plate (110);

- a button (12) actuatable along an actuation axis (Y) incident to the rotation axis (Z), suitable to directly engage the gear body (130) of the diverter drum (100) to cause its rotation and select a desired dispensing configuration.

2. Shower or shower head according to claim 1, wherein the jet-change system comprises an annular wall (80) that delimits a bottom surface (78) on which said openings (72a,72b,72c) open, said annular wall (80) being provided with a waved edge (82) on which the diverter drum (100) is engaged, so that, due to the actuation of the button, the diverter drum (100) undergoes a rotation and a simultaneous axial translation.

3. Shower or shower head according to claim 2, wherein the diverter drum (100) is provided with at least one engagement projection (120) suitable to slide on the edge (82) of the annular wall (80) to give the diverter drum an alternating axial translation.

4. Shower or shower head according to claim 3, where-

in the corrugated edge (82) comprises a succession of circumferential ridges (84) and valleys (86), said valleys being equal to the number of selectable dispensing configurations.

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5. Shower or shower head according to any of the preceding claims, wherein the jet-change system comprises a casing (140) provided with a casing portion (142) in which is housed the diverter drum (100), so that the deviation opening (112) is invested by a flow of water in a direction parallel to the rotation axis (Z). 10
6. Shower or shower head according to any of the preceding claims, in which the deviation opening (112) is shaped and dimensioned so that, in an angular position in which water is fed to a single dispensing area (A,B,C), said deviation opening (112) is at least partially overlapped to only one of the openings (72a,72b,72c), and, in a successive angular position in which two dispensing areas (A+B,B+C,A+C) are fed together, said deviation opening (112) is at least partially overlapped to both respective openings (72a,72b,72c). 15 20
7. Shower (1) according to any of the preceding claims, comprising a handle (2) for gripping the shower with one hand, and a dispensing head (6) carrying the dispensing surface (8) and projecting from the handle (2), wherein the button (12) of the jet-change system is disposed in a region between the dispensing surface (8) and the handle (2). 25 30
8. Shower head (200,300) according to any of claims 1 to 6, comprising a fixing portion (202) or a column (302) for the application of the shower head to a wall, and an arm (204,304) projecting from the fixing portion or from the column and carrying the dispensing surface (8), wherein the button (12) of the jet-change system is disposed in the fixing portion (202) or on the column (302). 35 40

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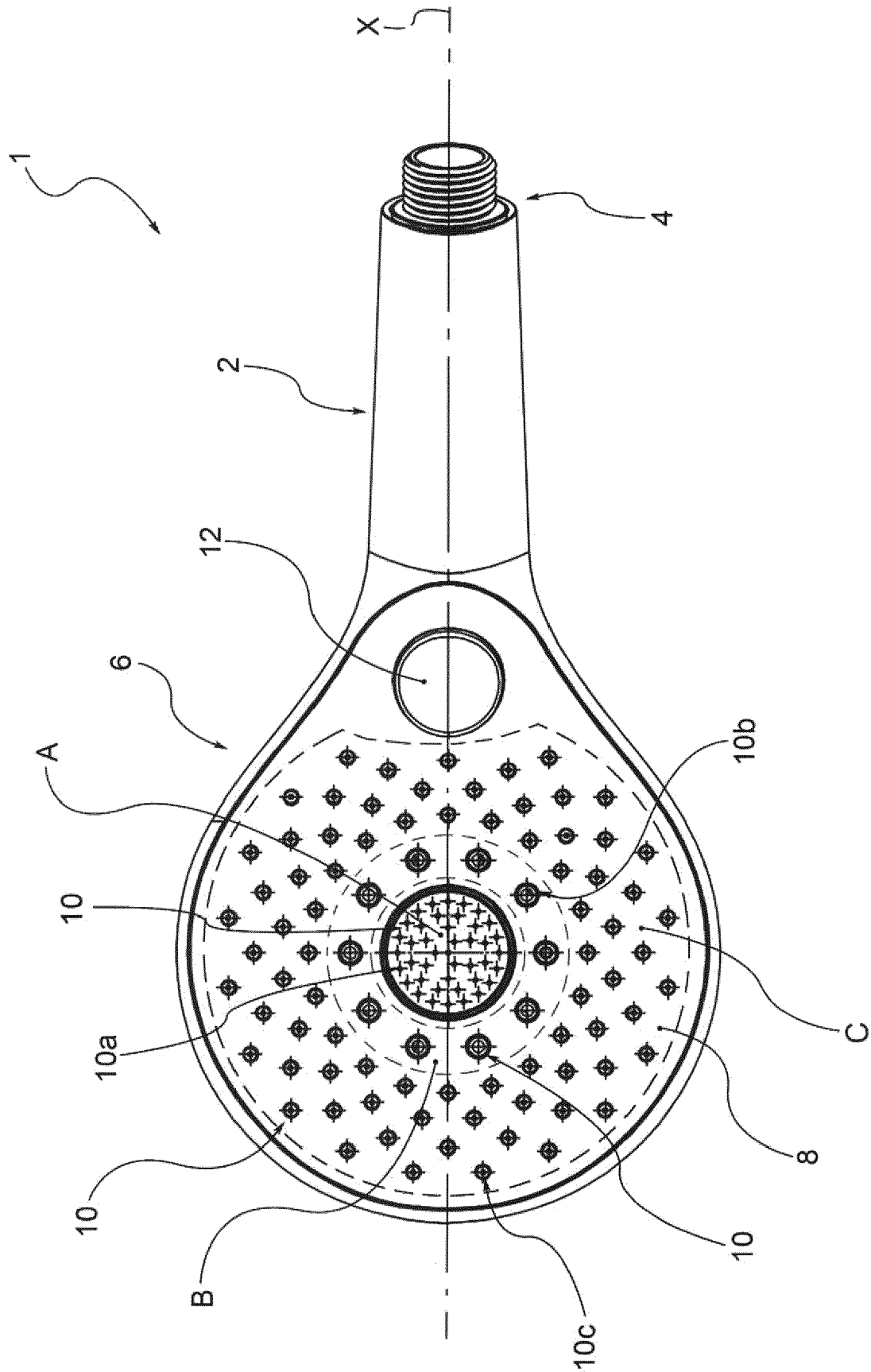
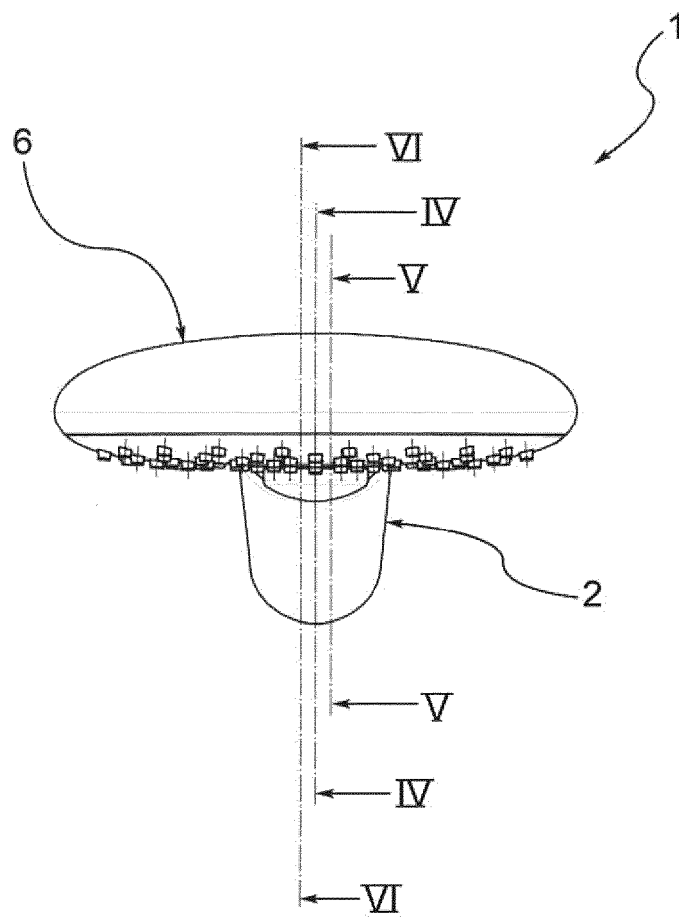
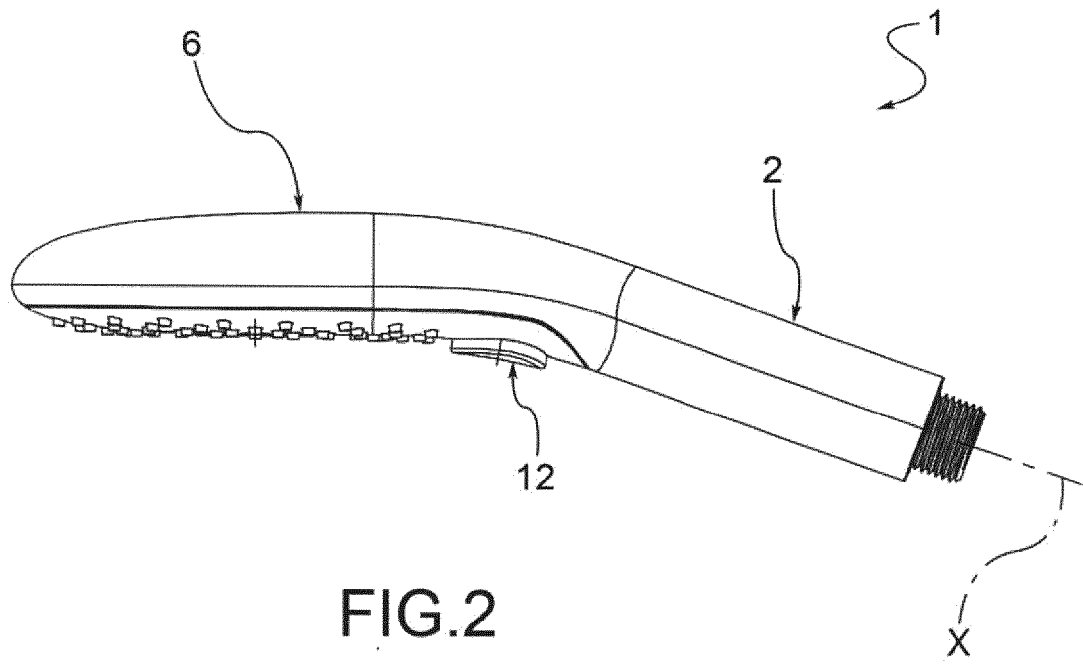


FIG.1



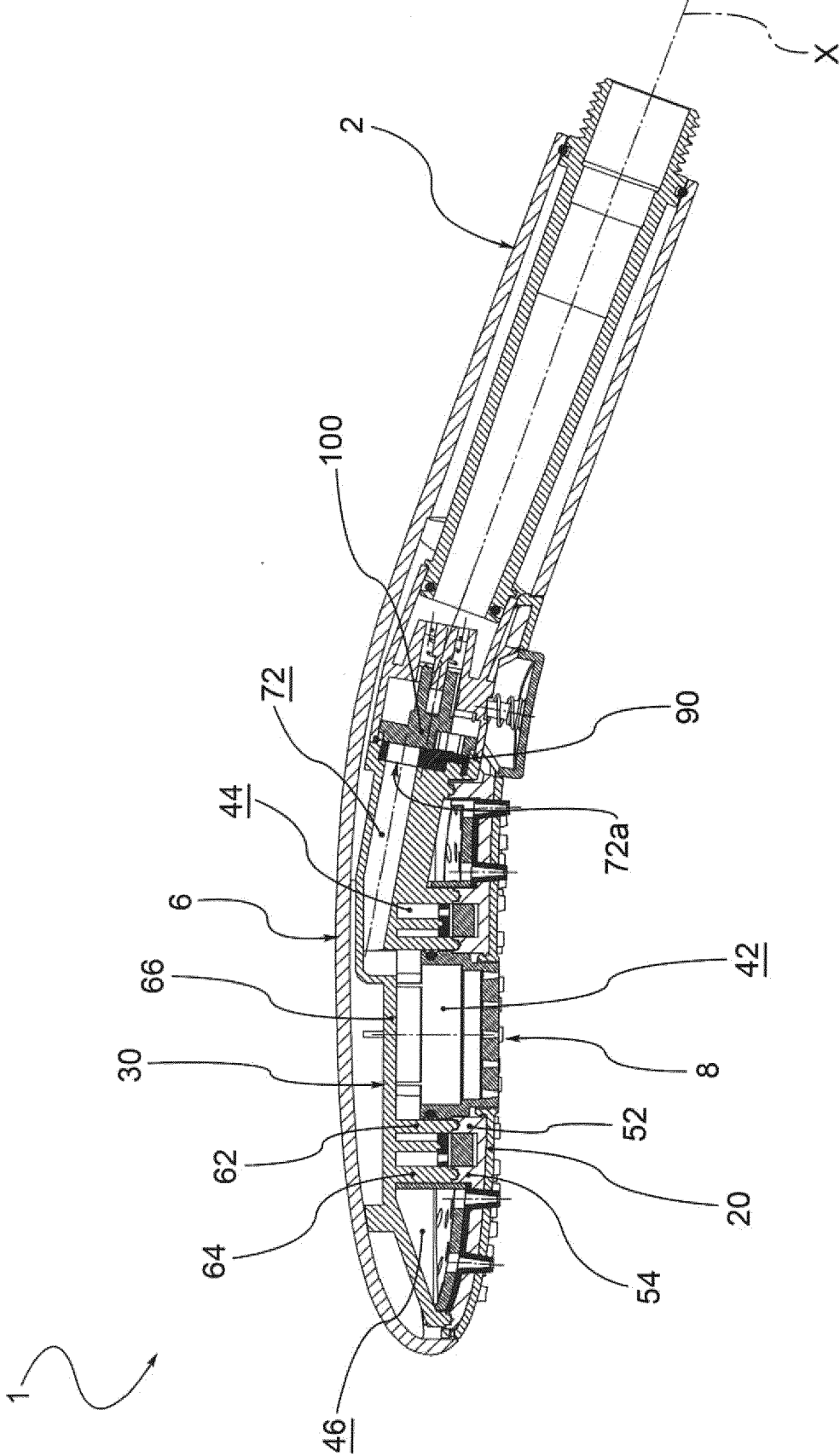


FIG. 4

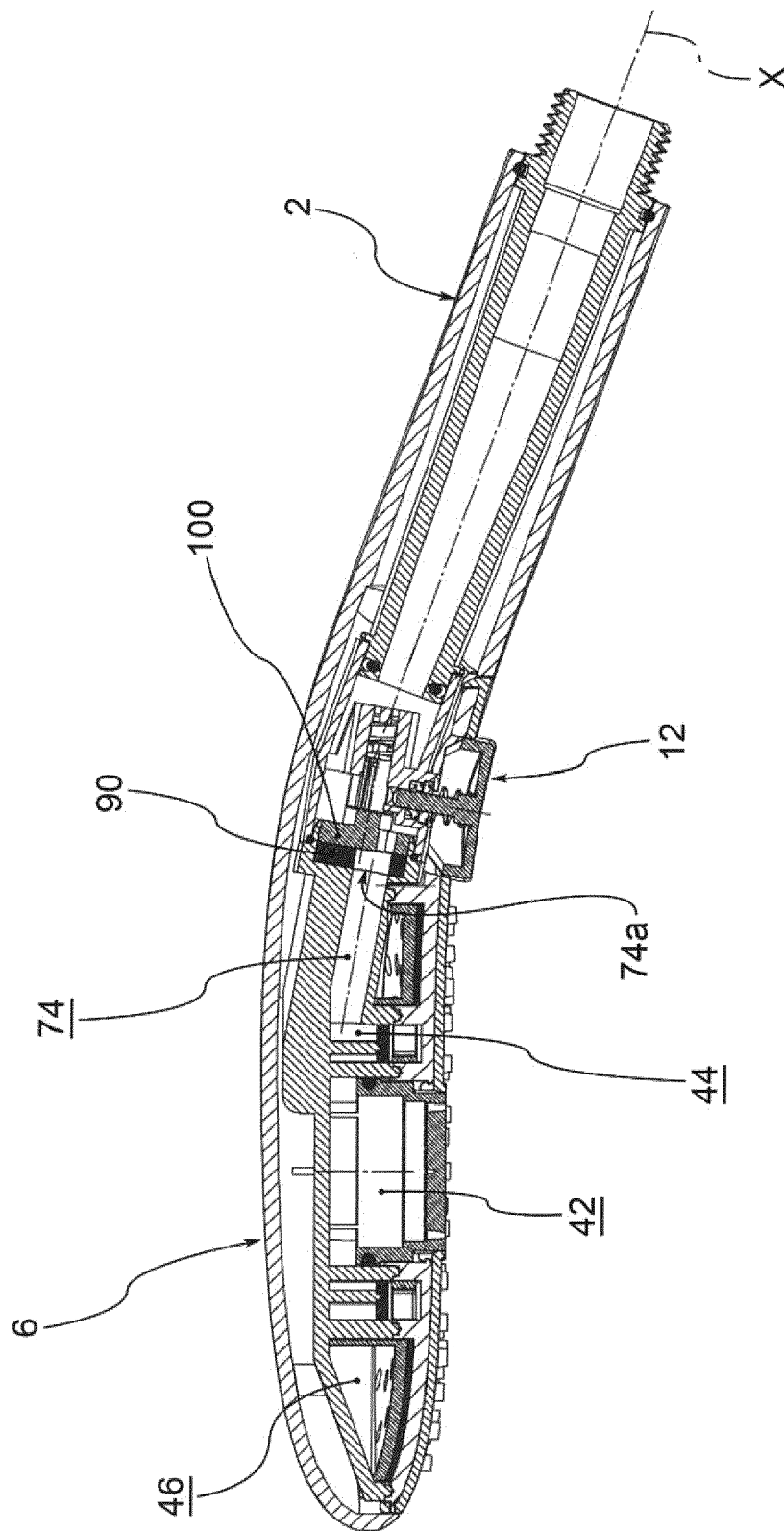


FIG.5

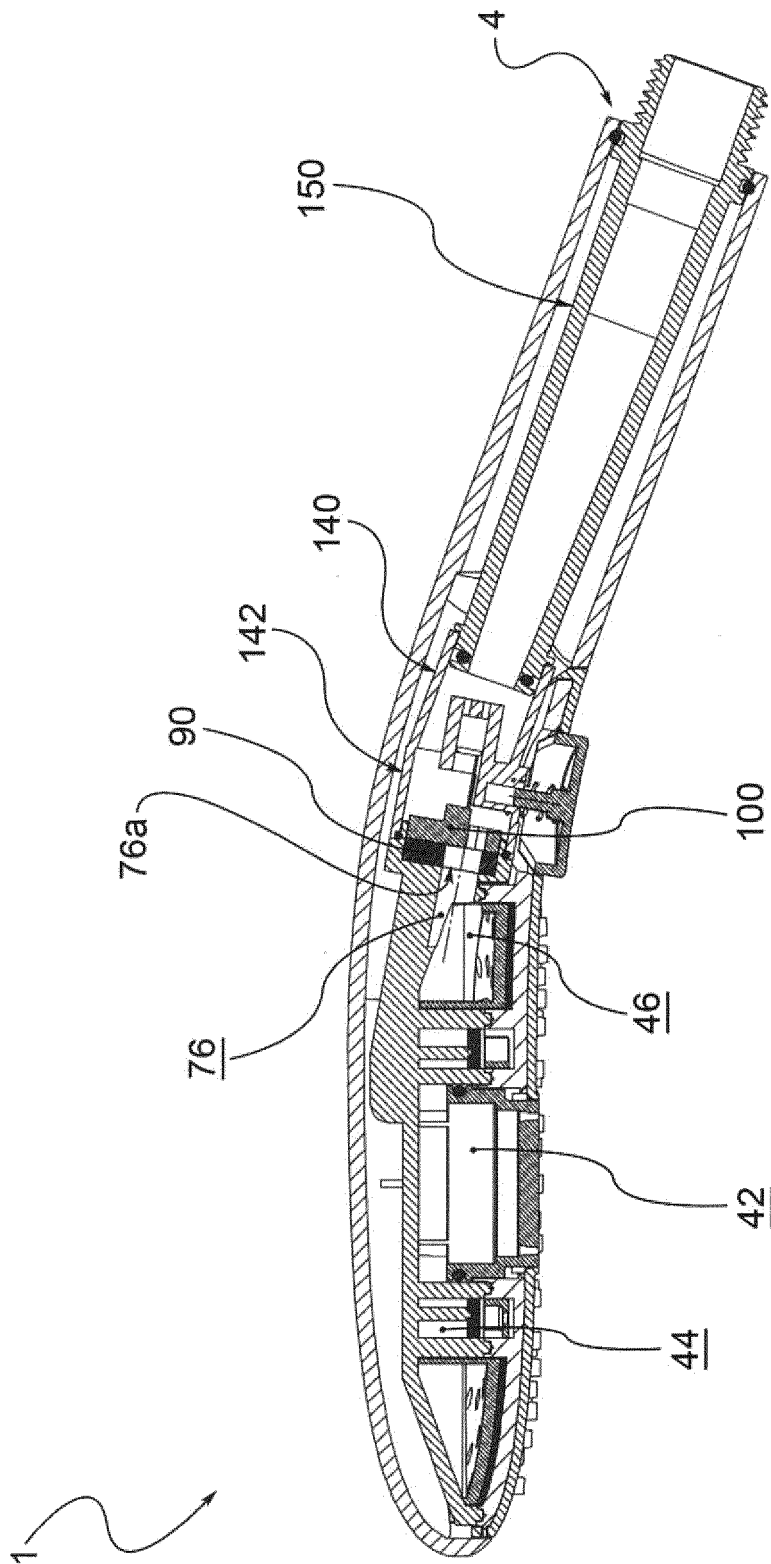


FIG.6

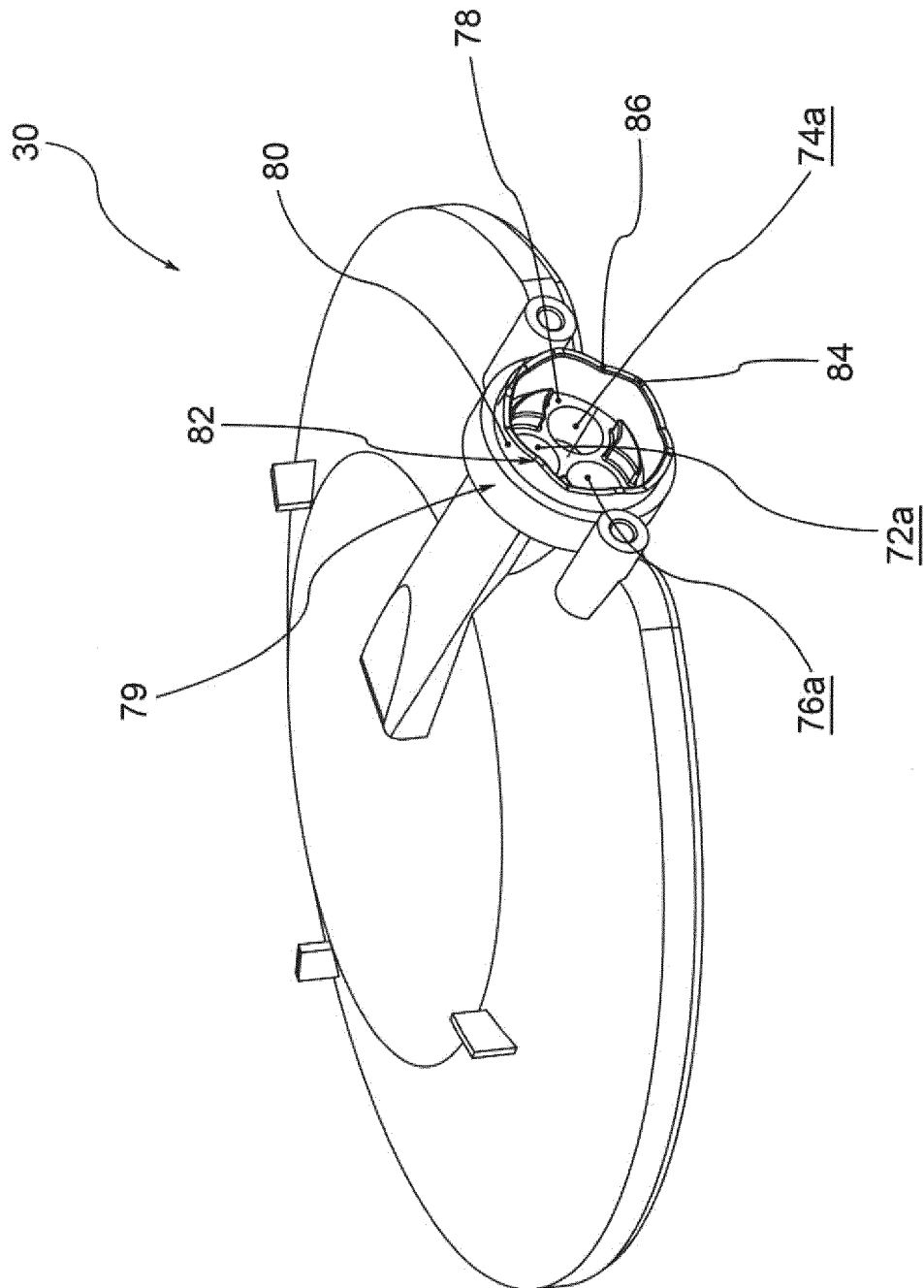


FIG. 7

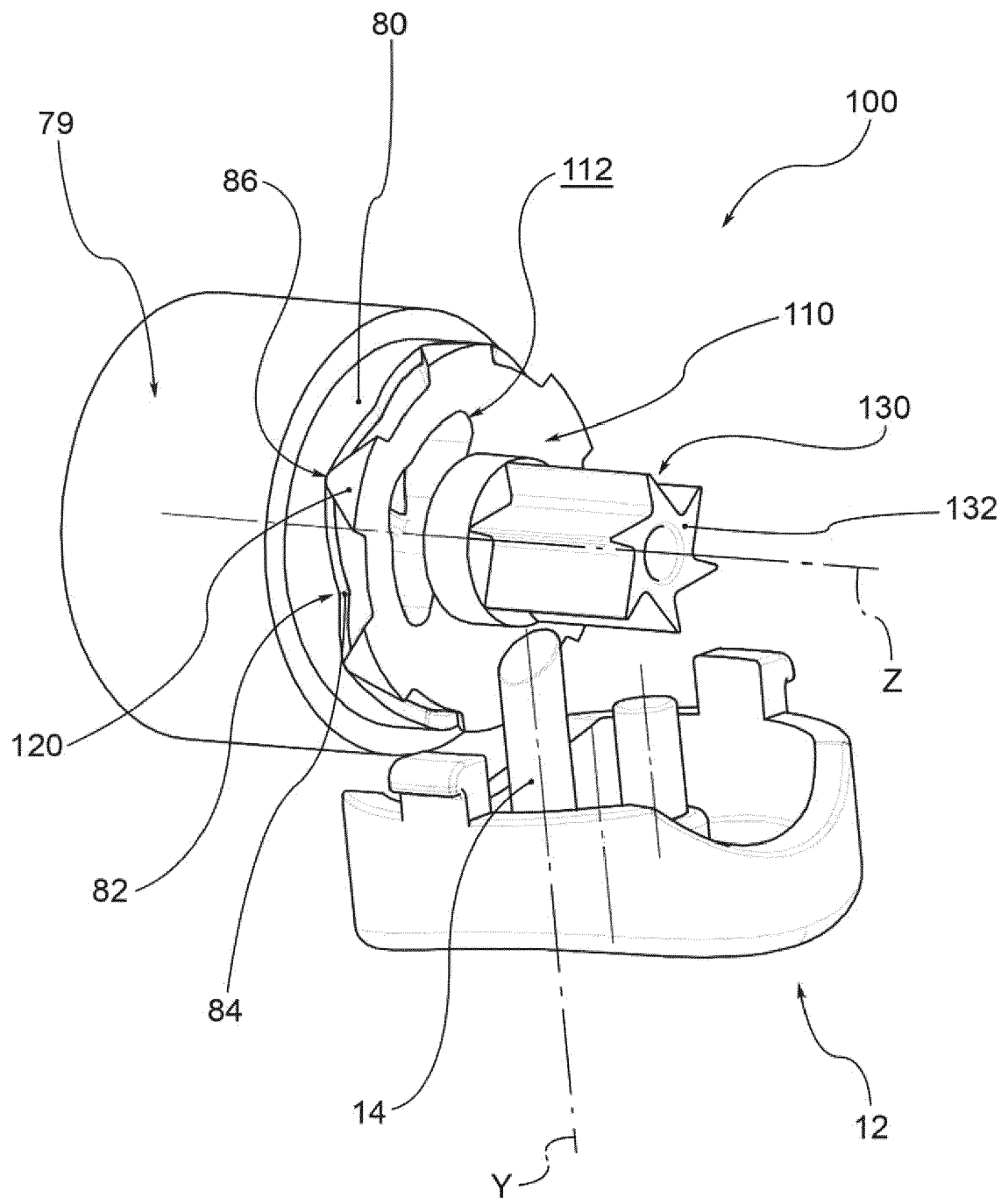


FIG. 8

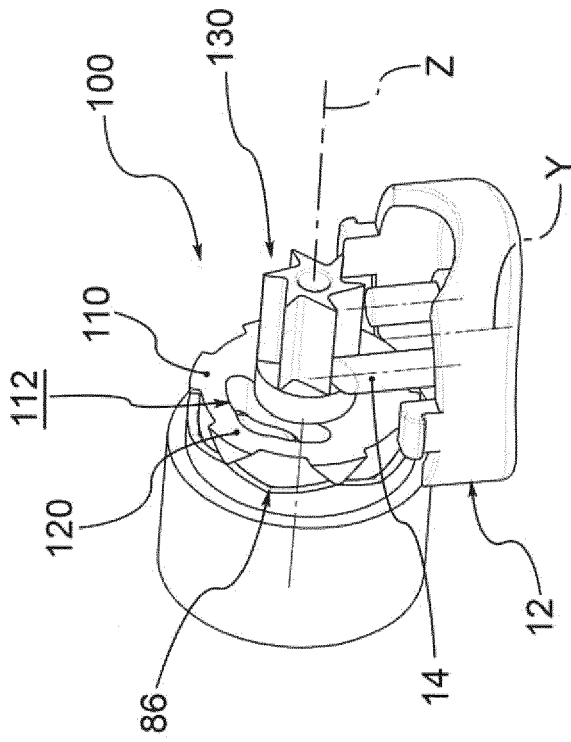


FIG. 10a

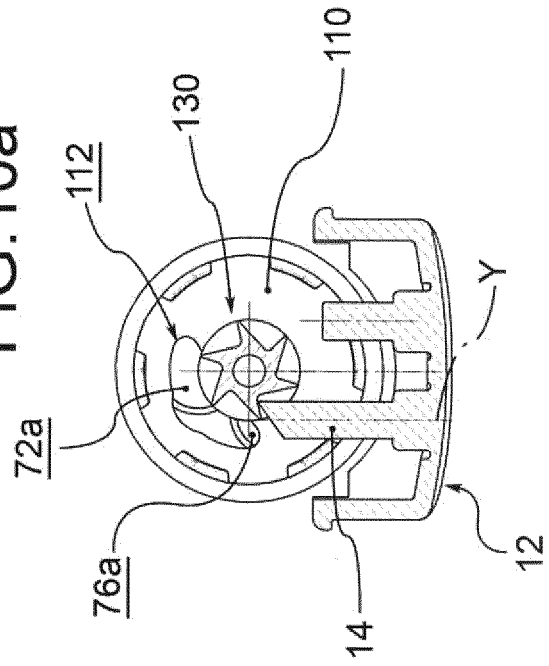


FIG. 10b

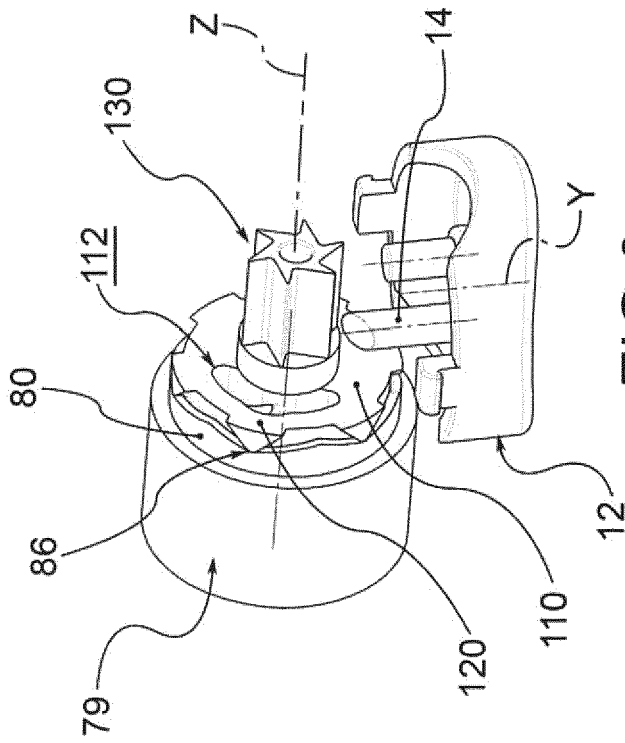


FIG. 9a

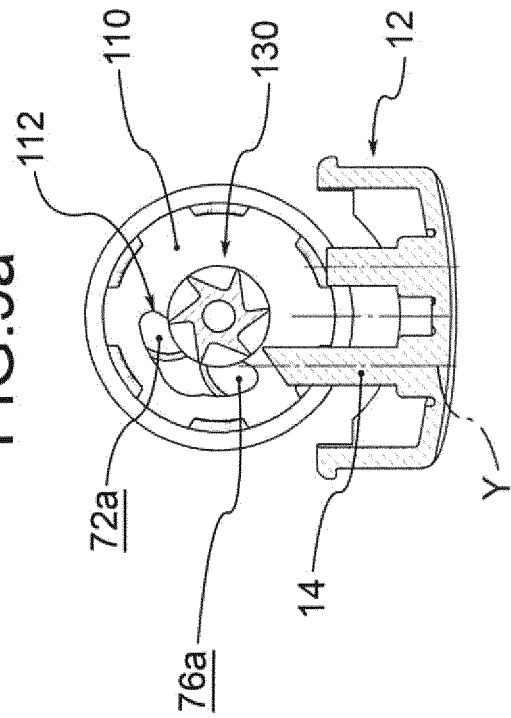


FIG. 9b

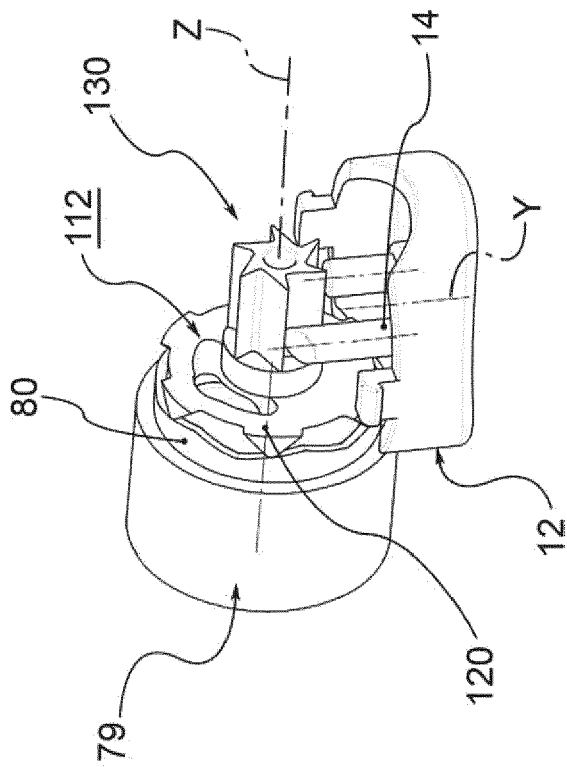


FIG. 10a

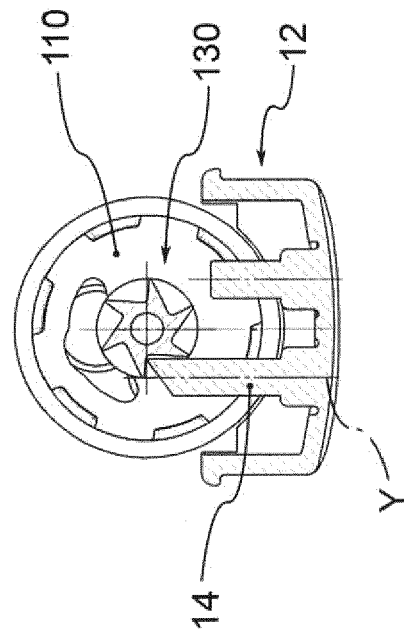


FIG. 10b

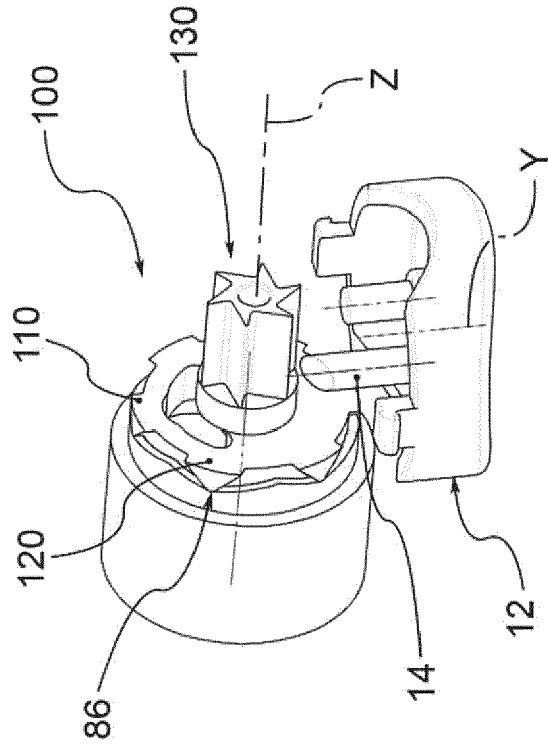


FIG. 12a

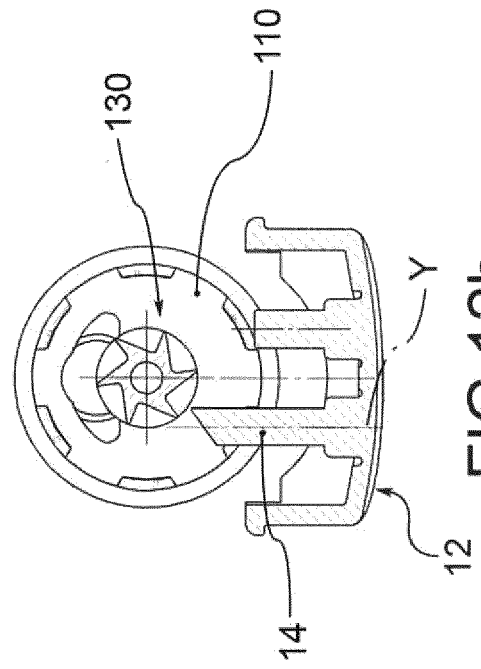


FIG. 12b

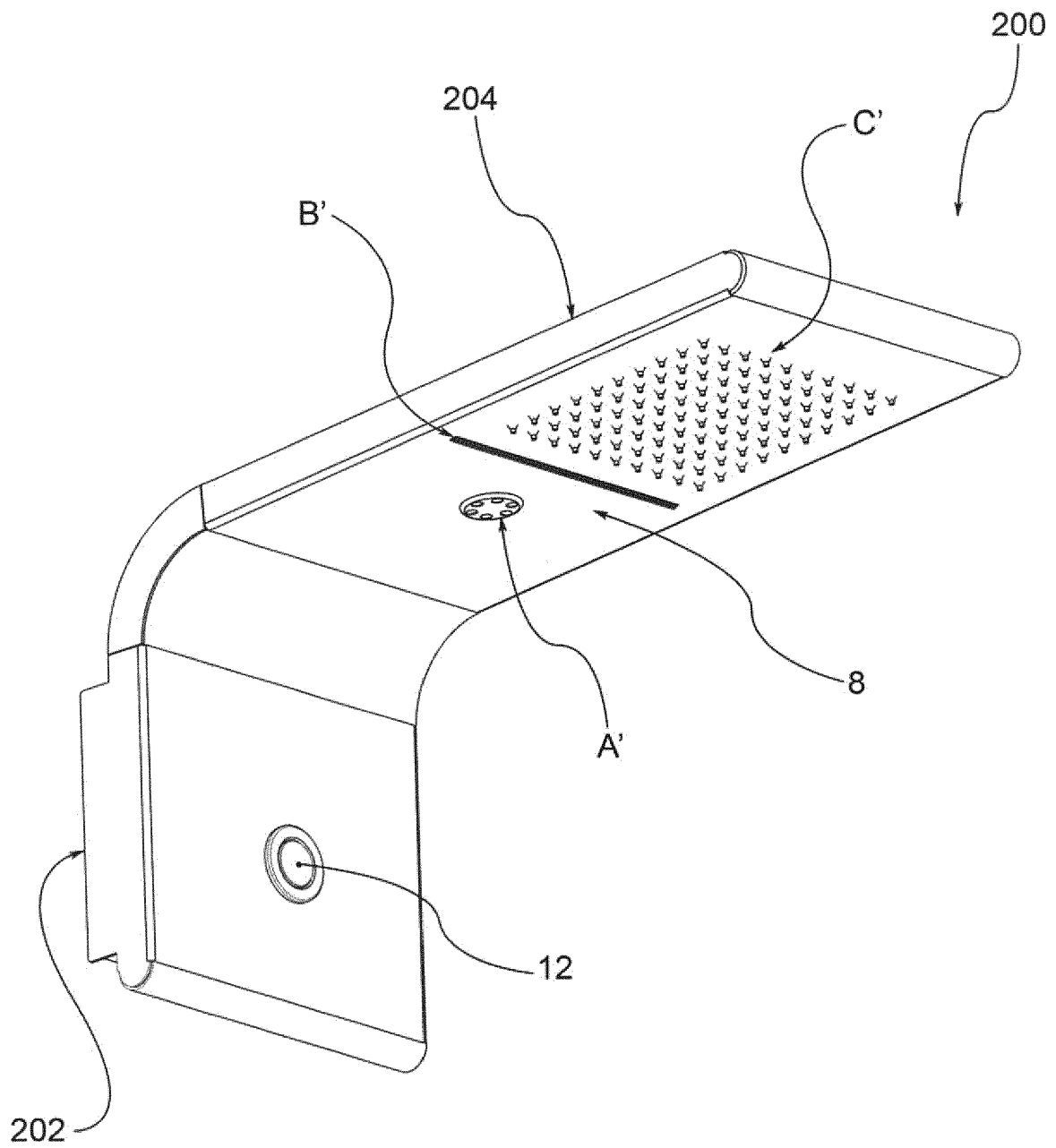


FIG.13

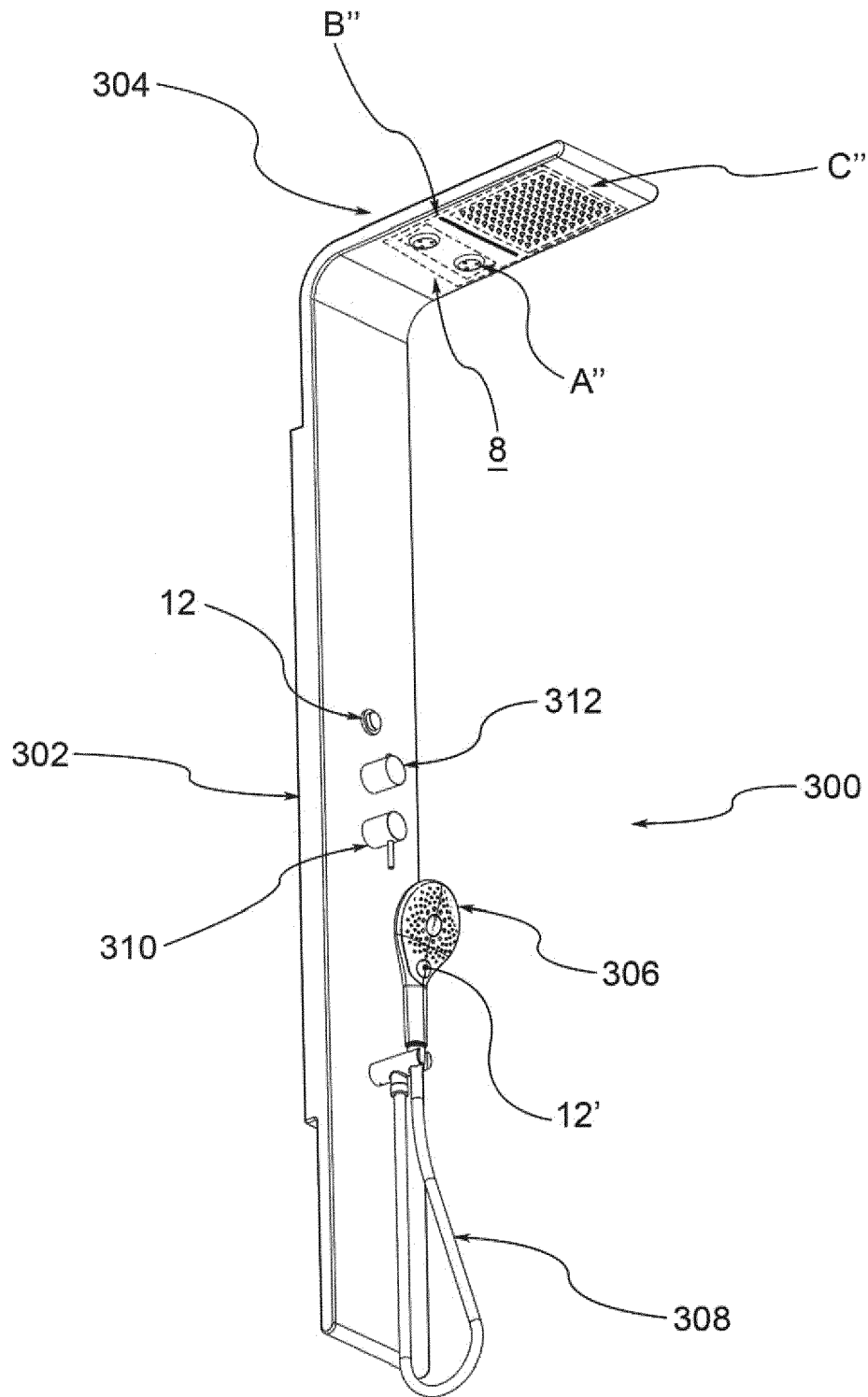


FIG. 14



EUROPEAN SEARCH REPORT

Application Number
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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 2013/161549 A1 (ZHOU HUASONG [CN] ET AL) 27 June 2013 (2013-06-27) * figures 1,2,6,7 *	1,7	
			TECHNICAL FIELDS SEARCHED (IPC)
			B05B E03C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 April 2017	Examiner Isailovski, Marko
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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13-04-2017

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