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(54) **SHOWERHEAD AND SHOWER DEVICE**

(57) A showerhead (100) includes a water inlet end (1) for connecting with cold and hot water sources, a water outlet end (2), and a water passage control apparatus (3) connected between the water inlet end (1) and the water outlet end (2). The water outlet end (2) is provided with one or more types of water outlet holes (121), and the water passage control apparatus (3) includes a temperature regulating valve (30) which is arranged to adjust the mixing ratio of cold and hot water entering from the water inlet end (1).

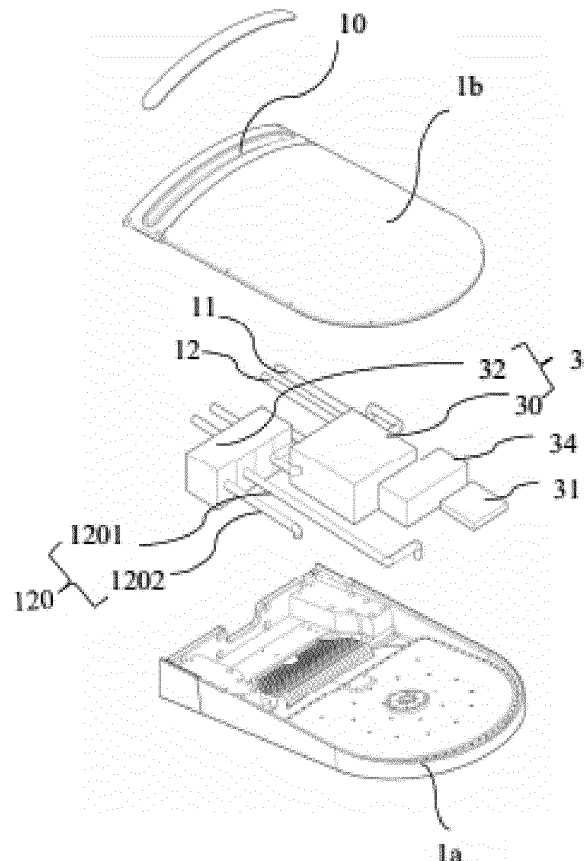


FIG. 3

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## Description

### Technical Field

**[0001]** Embodiments of the present application relate to, but are not limited to, the field of shower device, in particular to a showerhead and a shower device.

### Background

**[0002]** The structure of current shower device is usually provided with a control box in which a thermostatic controller or a mixing valve is provided, and a water passage extending from an outlet end of the control box is communicated with a showerhead. That is, a hot water supply end and a cold water supply end need be connected to the control box first, and then from the control box through the long pipeline to the showerhead. There is a relatively long distance between a water outlet of the showerhead and the control box. Because of the longer pipeline between the showerhead and the control box, there is water left in the pipeline, so that if it is needed to output warm water in the next use, it is usually needed to discharge cold water first, which leads to the problems such as water waste and poor user experience. Besides, due to the relatively long distance between the control box and the showerhead, it is usually needed to arrange corresponding pipeline, which is exposed outside or buried in wall, resulting in the problems such as the waste of materials, unsightliness, need for cleaning and maintenance inconvenience.

### Summary

**[0003]** Embodiments of the present application provide a showerhead and a shower device, which can reduce the section for remaining cold water, save costs and improve user experience.

**[0004]** A showerhead provided by an embodiment of the present application includes a water inlet end which can be correspondingly connected with cold and hot water sources, a water outlet end, and a water passage control apparatus connected between the water inlet end and the water outlet end. The water outlet end is provided with one or more types of water outlet holes. The water passage control apparatus includes a temperature regulating valve connected with the water inlet end. The temperature regulating valve is configured to be capable of adjusting the opening degree so as to adjust the mixing ratio of cold and hot water entering from the water inlet end.

**[0005]** In an exemplary embodiment, the showerhead also includes a controller connected with the temperature regulating valve. The controller is configured to control the temperature regulating valve to adjust the opening degree when receiving the temperature regulating operation, so as to adjust the mixing ratio of cold and hot water entering from the water inlet end.

**[0006]** In an exemplary embodiment, the temperature regulating valve is provided with an adjusting switch which is configured to be capable of adjusting the opening degree of the temperature regulating valve to adjust the mixing ratio of cold and hot water entering from the water inlet end. The adjusting switch is disposed below or on a side of the showerhead.

**[0007]** In an exemplary embodiment, the water passage control apparatus further includes various water outlet channels connected with a water outlet of the temperature regulating valve and arranged corresponding to various water outlet holes of the water outlet end, and a changeover switch arranged at a water inlet of various water outlet channels. The changeover switch is configured to be able to select one or more of various water outlet channels to simultaneously discharge water.

**[0008]** In an exemplary embodiment, the changeover switch is a control valve, and the controller is connected with the control valve and is configured to control the control valve to switch the communication relationship between a water outlet of the control valve and the various water outlet channels when receiving a water outlet mode changeover operation, so as to select one or more of the various water outlet channels to simultaneously discharge water.

**[0009]** In an exemplary embodiment, various water outlet channels are formed by a plurality of water outlet pipes, one end of which is connected with a water outlet of the control valve, and the other end of which is respectively arranged corresponding to the various water outlet holes.

**[0010]** In an exemplary embodiment, the showerhead further includes a control switch connected with the controller in a wired or wireless manner.

**[0011]** In an exemplary embodiment, the showerhead further includes a power supply module connected with the controller for providing power for the water passage control apparatus and the controller.

**[0012]** In an exemplary embodiment, the showerhead includes a lower housing and an upper housing which is matched and engaged with the lower housing. A water outlet panel is formed by a bottom surface of the lower housing, and the various water outlet holes are provided on the water outlet panel. The upper housing is provided with an illuminating lamp. The water passage control apparatus, the controller and the power supply module are all accommodated in an accommodating space formed by the lower housing and the upper housing.

**[0013]** A shower device provided by an embodiment of the present application includes a showerhead which can be connected with cold and hot water sources arranged at an upper part of a wall, and a hand-held shower assembly and/or a lower outlet tap connected with cold and hot water sources arranged at a lower part of a wall.

**[0014]** In the embodiments of the present application, the showerhead can output hot water in a short distance by providing the water passage control apparatus, which avoids the problems such as a long section for remaining

cold water, waste of water, poor user experience caused by a longer pipeline between the showerhead at the upper part and the control box in the prior art. In addition, there is no need to set corresponding pipelines, and the problems such as waste of materials, unsightliness, need for cleaning, and maintenance inconvenience caused by pipelines being exposed outside or buried in the wall are avoided.

**[0015]** Other features and advantages of the embodiments of the present application will be explained in the following description.

#### Brief Description of Drawings

**[0016]** The drawings are used to provide a further understanding of the technical schemes of the present application, and constitute a part of the specification. Together with the embodiments of the present application, the drawings are used to explain the technical schemes of the present application, and do not constitute any limit on the technical schemes of the present application.

FIG. 1 is a perspective view of a showerhead according to an embodiment of the present application from an angle.

FIG. 2 is a perspective view of a showerhead according to an embodiment of the present application from another angle.

FIG. 3 is a perspective exploded view of a showerhead according to an embodiment of the present application.

#### Detailed Description

**[0017]** Embodiments of the present application will be described herein with reference to the accompanying drawings. It should be noted that the embodiments in the present application and the features in the embodiments may be combined with each other randomly if there is no conflict.

**[0018]** As shown in FIGS. 1 to 3, an embodiment of the present application provides a showerhead 100, which includes a water inlet end 1, a water outlet end 2, and a water passage control apparatus 3 connected between the water inlet end 1 and the water outlet end 2. The water inlet end 1 includes a hot water inlet end 11 and a cold water inlet end 12, which may be connected with the interfaces (not shown) of cold and hot water sources on the wall respectively.

**[0019]** As shown in FIGS. 1 to 3, the showerhead 100 includes a lower housing 1a and an upper housing 1b which is matched and engaged with the lower housing 1a. The lower housing 1a serves as a water outlet panel, and is provided with various water outlet holes 121 corresponding to different water drop shapes respectively. The upper housing 1b is provided with an illuminating

lamp 10. The water passage control apparatus 3 is accommodated in an accommodating space formed by the lower housing 1a and the upper housing 1b. The showerhead 100 is semi-elliptical shape as a whole, and has a rear end surface that can be fitted and mounted to the wall. In other embodiments, the showerhead 100 can also be integrally formed or have other shapes, which is not limited here.

**[0020]** As shown in FIG. 3, the water passage control apparatus 3 includes a temperature regulating valve 30 connected to the water inlet end 1. The temperature regulating valve 30 is configured to be capable of adjusting the opening degree to adjust the mixing ratio of cold and hot water entering from the water inlet end 1. The temperature regulating valve 30 may be a thermostatic valve.

**[0021]** In the embodiments of the present application, the showerhead 100 can output hot water in a short distance by providing the water passage control apparatus 3, which avoids the problems such as a long section for remaining cold water, waste of water, poor user experience caused by a longer pipeline between the showerhead in the upper and the control apparatus in the prior art. In addition, there is no need to set corresponding pipelines, and the problems such as waste of materials, unsightliness, need for cleaning, maintenance inconvenience caused by pipelines being exposed outside or buried in the wall are avoided.

**[0022]** As shown in FIG. 3, the temperature regulating valve 30 in this embodiment is an electronic temperature regulating valve, and the showerhead 100 further includes a controller 31 connected with the temperature regulating valve 30. The controller 31 is configured to control the temperature regulating valve 30 to adjust the opening degree so as to adjust the mixing ratio of cold and hot water entering from the water inlet end 1 when a temperature regulating operation is received. Specifically, a control switch (not shown) wired or wirelessly connected with the controller 31 may be provided to realize the temperature adjustment operation of a user. For example, the control switch can be implemented by setting a remote control connected with the controller 31, and the user can adjust the temperature by the remote control. The control switch can also be implemented by setting a control panel connected with the controller 31. The control panel may be installed on the wall surface for the user to operate. The control switch can further be implemented by setting a sensing apparatus connected with the controller 31, and the user can adjust the temperature by changing the gesture.

**[0023]** The opening degree of the temperature regulating valve 30 in this embodiment of the present application refers to the opening degree of the cold water inlet and the hot water inlet of the temperature regulating valve 30.

**[0024]** In an exemplary embodiment, the temperature regulating valve 30 can also be a mechanical temperature regulating valve (not shown), and is provided with an adjusting switch operable by a user. The opening de-

gree of the temperature regulating valve 30 can be adjusted by adjusting the adjusting switch so as to adjust the mixing ratio of cold and hot water entering from the water inlet end. The adjusting switch can be a knob adjusting switch, or a dial adjusting switch, or a button adjusting switch, etc. For example, the temperature regulating valve 30 may include a valve body, a cold water inlet, a hot water inlet and a mixing outlet which are provided on the valve body. A slider, an adjusting spring and the like are provided inside of the valve body. The user can drive the slider to move by rotating the adjusting switch such as a knob adjusting switch provided on the valve body, so as to adjust the opening degree of the cold water inlet and the hot water inlet on the valve body and realize mechanical temperature adjustment. The adjusting switch may be arranged below or on a side of the showerhead 100.

**[0025]** The water passage control apparatus 3 of this embodiment further includes various water outlet channels 120 connected with the water outlet of the temperature regulating valve 30, and a changeover switch 32 arranged at the water inlet of various water outlet channels 120. Various water outlet channels 120 are arranged to correspond to various water outlet holes 121. The changeover switch 32 is configured to be able to select one or more of various water outlet channels 120 to discharge water simultaneously, so as to realize various water outlet modes.

**[0026]** As shown in FIG. 3, in this embodiment, various water outlet channels 120 are formed by a plurality of water outlet pipes arranged in the showerhead. The plurality of water outlet pipes include a first water outlet pipe 1201 and a second water outlet pipe 1202. As shown in FIG. 1, various water outlet holes 121 include first water outlet holes 1211 arranged and distributed along the front of the lower housing 1a of the showerhead, and elongated second water outlet hole(s) 1212 arranged at the rear of the lower housing 1a. One end of the first water outlet pipe 1201 and one end of the second water outlet pipe 1202 are connected with the water outlet of the changeover switch 32, and the other end of the first water outlet pipe 1201 and the other end of the second water outlet pipe 1202 are respectively arranged to correspond to the first water outlet holes 1211 and the second water outlet hole(s) 1212. In other embodiments, various water outlet channels 120 can also be formed by a plurality of grooves arranged in the showerhead 100, which is not limited here.

**[0027]** As shown in FIG. 3, the changeover switch 32 in this embodiment is an electronic control valve, and the control valve 32 is connected with the controller 31. The control valve 32 is configured to switch the communication relationship between the water outlet of the control valve 32 and various water outlet channels 120 when receiving the water outlet mode switching operation, so as to select one or more of various water outlet channels 120 to discharge water simultaneously and realize the switching of water outlet modes. As mentioned above,

the user can control the control valve 32 by providing a remote control, a control panel, or a sensing apparatus and the like connected with the controller 31, so as to realize the switching between the plurality of water outlet modes.

**[0028]** In an exemplary embodiment, the changeover switch 32 is mechanical (not shown) and can be disposed on a side of the showerhead 100 or under the showerhead 100. The user can change the water outlet mode by operating the changeover switch 32.

**[0029]** The showerhead 100 in this embodiment further includes a power supply module 34 connected to the controller 31 for supplying power to the water passage control apparatus 3 and the controller 31. The power supply module 34 is accommodated in an accommodating space formed by the lower housing 1a and the upper housing 1b.

**[0030]** An embodiment of the present application further provides a shower device. The shower device includes a showerhead 100 described in any of the above embodiments which is able to be connected with the cold and hot water sources arranged at the upper part of the wall, and a hand-held shower assembly and/or a lower outlet tap (not shown) which are connected with the cold and hot water sources arranged at the lower part of the wall.

**[0031]** In this embodiment, the showerhead 100 can be directly connected with the interfaces of the cold and hot water sources arranged at the upper part of the wall for discharging water. The hand-held shower assembly is connected with the interfaces of the cold and hot water sources arranged at the lower part of the wall, and can include a control box arranged at the lower part and a hand-held shower connected with the control box. The control box may include a controller, a temperature regulating valve and other components.

**[0032]** In the embodiments of the present application, the showerhead 100 of the shower device can output hot water in a short distance by providing the water passage control apparatus 3, which avoids the problems such as a long section for remaining cold water, waste of water, poor user experience caused by a longer pipeline between the showerhead at the upper part and the control box in the prior art. In addition, there is no need to set corresponding pipelines, and the problems such as waste of materials, unsightliness, need for cleaning, or maintenance inconvenience caused by pipelines being exposed outside or buried in the wall are avoided.

**[0033]** The shower device in the embodiments of the present application can provide the users with a better use experience. The shower device in the embodiments of the present application is not shown, specifics of which may be known with reference to the prior art and are not repeated here.

**[0034]** In the description herein, the term "a plurality of" means two or more. In the description herein, it should be noted that the orientation or position relationships indicated by the terms "upper", "lower", "one side", "the

other side", "one end", "the other end", "side", "relative", "four corners", "periphery", "rectangular structure" and the like are based on the orientation or position relationships shown in the drawings, which are only for an easy description of the embodiments of the present application and simplifying the description, rather than indicating or implying that the structure referred has the specific orientation or is constructed and operated in the specific orientation, and thus cannot be interpreted as a limitation on the embodiments of the present application.

**[0035]** In the description herein, unless otherwise clearly specified and limited, the terms "connection", "direct connection", "indirect connection", "fixed connection", "mounting" and "assembly" should be understood in a broad sense. For example, they may be fixed connection, detachable connection or integrated connection. The terms "mounting", "connection" and "fixed connection" may be direct connection, or indirect connection through an intermediary, or may be an internal communication between two elements. For those of ordinary skills in the art, the specific meanings of the above terms in the present application can be understood according to specific situations.

**[0036]** Although implementations disclosed by the present application are described above, the described contents are only implementations adopted for facilitating understanding of the present application, and are not intended to limit the present application. Any person skilled in the art to which the present application pertains may make any modifications and changes in the form and details of implementation, but the scope of patent protection of the present application shall still be defined by the appended claims.

## Claims

1. A showerhead (100), comprising: a water inlet end (1) which is able to be correspondingly connected with a cold water source and a hot water source, a water outlet end (2), and a water passage control apparatus (3) connected between the water inlet end (1) and the water outlet end (2), wherein the water outlet end (2) is provided with one or more types of water outlet holes (121), and wherein the water passage control apparatus (3) comprises a temperature regulating valve (30) connected with the water inlet end (1) and configured to be capable of adjusting an opening degree to adjust a mixing ratio of cold and hot water entering from the water inlet end (1).
2. The showerhead (100) according to claim 1, wherein the showerhead (100) further comprises a controller (31) connected with the temperature regulating valve (30), wherein the controller (31) is configured to control the temperature regulating valve (30) to adjust the opening degree when receiving a temperature regulating operation, so as to adjust the mixing ratio

of cold and hot water entering from the water inlet end (1).

3. The showerhead (100) according to claim 1, wherein the temperature regulating valve (30) is provided with an adjusting switch which is configured to be capable of adjusting the opening degree of the temperature regulating valve (30) to adjust the mixing ratio of cold and hot water entering from the water inlet end (1), and wherein the adjusting switch is arranged below or on a side of the showerhead (100).
4. The showerhead (100) according to any one of claims 1 to 3, wherein the water passage control apparatus (3) further comprises various water outlet channels (120) connected with a water outlet of the temperature regulating valve (30) and arranged corresponding to various water outlet holes (121) of the water outlet end (2), and a changeover switch (32) arranged at a water inlet of various water outlet channels (120), and wherein the changeover switch (32) is arranged to be able to select one or more of the various water outlet channels (120) to simultaneously discharge water.
5. The showerhead (100) according to claim 4, wherein the changeover switch (32) is a control valve (32), and a controller (31) is also connected with the control valve (32) and is configured to control the control valve (32) to switch communication relationship between a water outlet of the control valve (32) and the various water outlet channels (120) when receiving a water outlet mode switching operation, so as to select one or more of the various water outlet channels (120) to simultaneously discharge water.
6. The showerhead (100) according to claim 5, wherein the various water outlet channels (120) are formed by a plurality of water outlet pipes, one end of which is connected with the water outlet of the control valve (32), and the other end of which is respectively arranged corresponding to the various water outlet holes (121).
7. The showerhead (100) according to claim 5, wherein the showerhead (100) further comprises a control switch wired or wirelessly connected with the controller (31).
8. The showerhead (100) according to claim 7, wherein the showerhead (100) further comprises a power supply module (34) connected with the controller (31) for providing power supply for the water passage control apparatus (3) and the controller (31).
9. The showerhead (100) according to claim 5, wherein the showerhead (100) comprises a lower housing (1a) and an upper housing (1b) which is matched

and engaged with the lower housing (1a), wherein a water outlet panel is formed by a bottom surface of the lower housing (1a), the various water outlet holes (121) are provided on the water outlet panel, the upper housing (1b) is provided with an illuminating lamp (10), and wherein the water passage control apparatus (3), the controller (31) and a power supply module (34) are all accommodated in an accommodating space formed by the lower housing (1a) and the upper housing (1b).

10. A shower device, comprising the showerhead (100) according to any one of claims 1 to 9 which is capable of being connected with a cold water source and a hot water source arranged at an upper part of a wall, and a hand-held shower assembly and/or a lower outlet tap connected with a cold water source and a hot water source arranged at a lower part of the wall.

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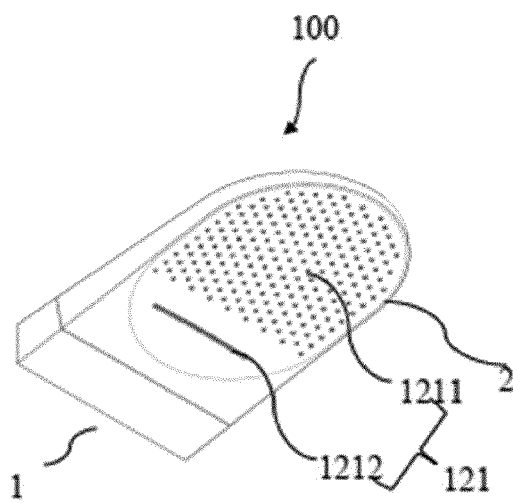


FIG. 1

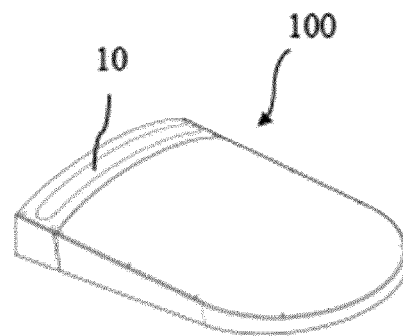


FIG. 2

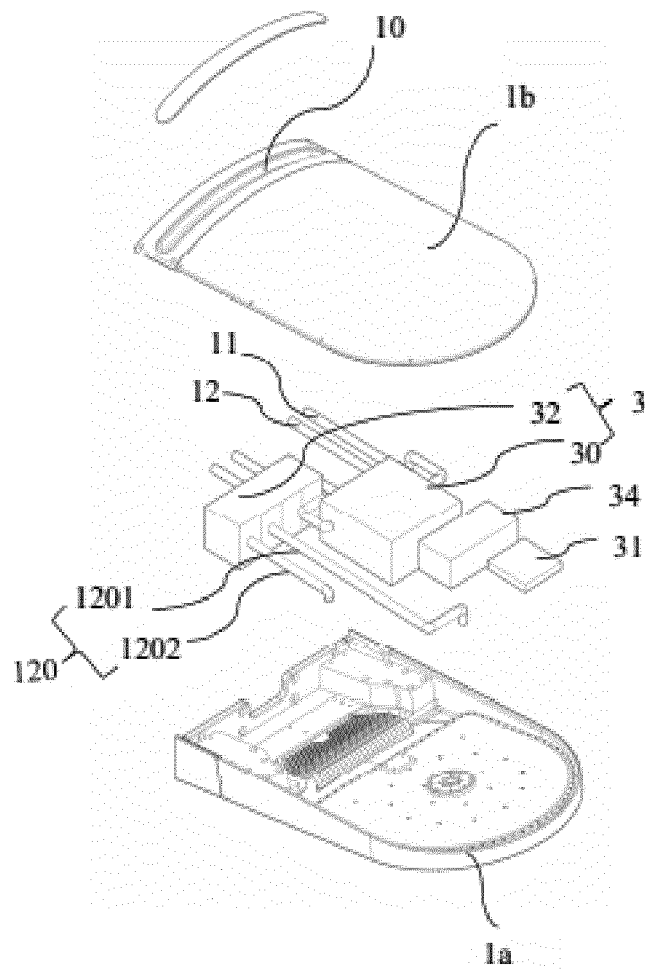


FIG. 3





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Application Number

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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