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(54) **OUTLET DEVICE WITH ELECTRONIC OUTLET AND MECHANICAL OUTLET TWO MODES**

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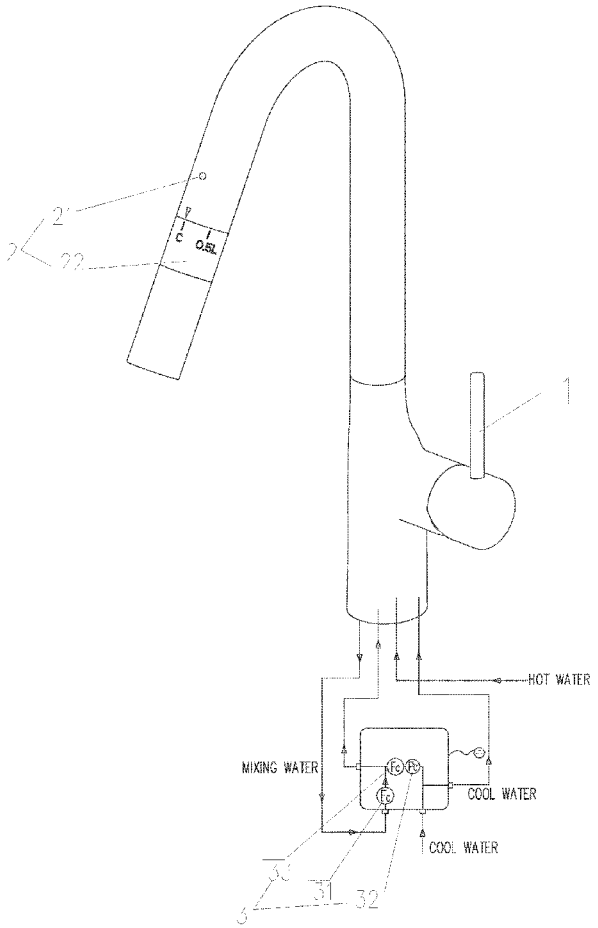
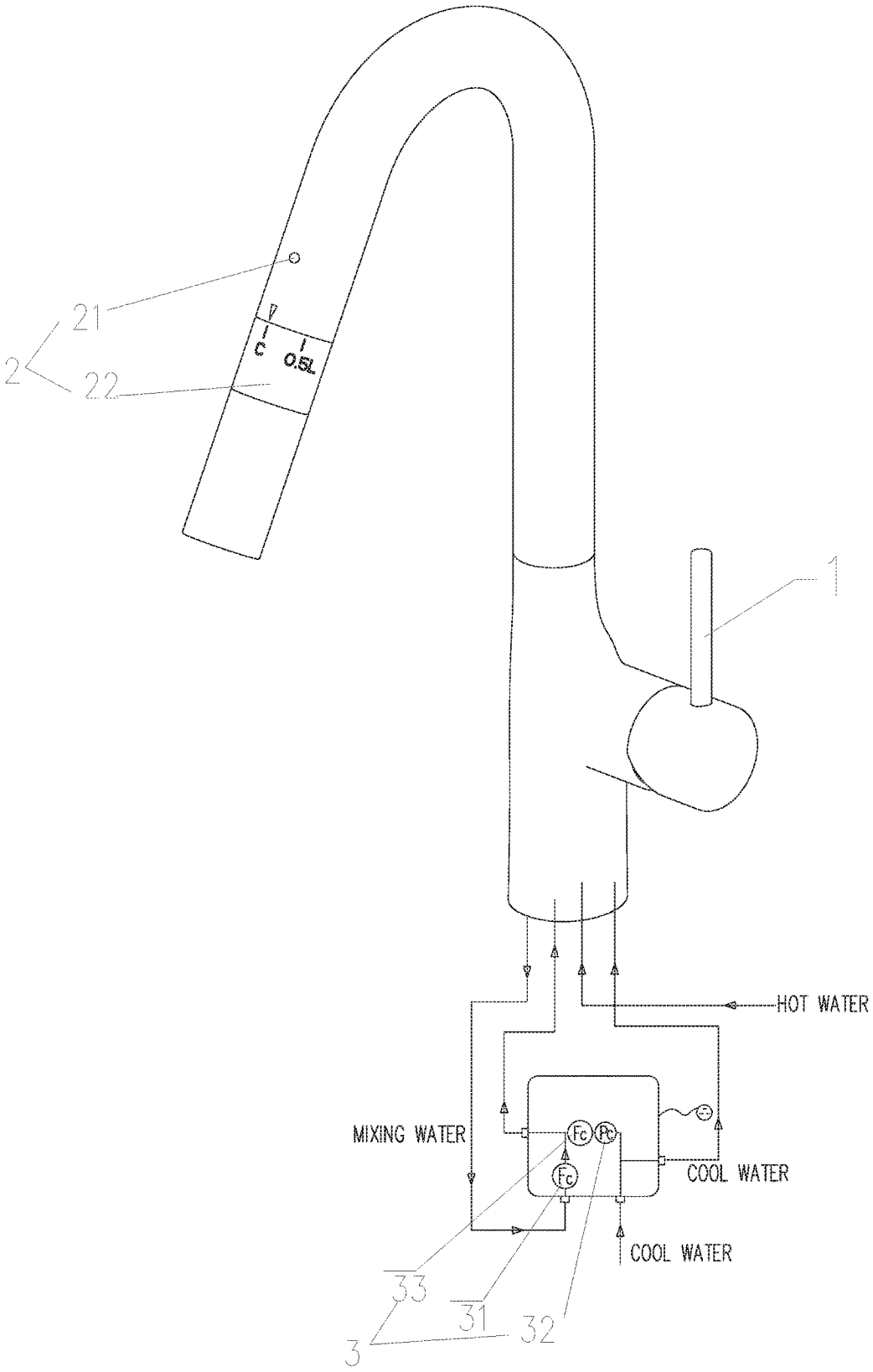
(57) **ABSTRACT**

An outlet device includes an electronic outlet and mechanical outlet two modes. The outlet device has a mechanical outlet control device, an electronic outlet control device and a central control module; the central control module comprises a first outlet passage controlled by the mechanical outlet control device, a second outlet passage controlled by the electronic outlet control device and a central controller; the first outlet passage is disposed with a sensor, the second outlet passage is disposed with an electromagnet valve; when the mechanical outlet control device controls the first outlet passage to open, the sensor detects water flowing in the first outlet passage, whether the electromagnet valve opens or not, the central controller switches the electromagnet valve to normal close state.




21
2
22
C
O.SL
1
HOT WATER
MIXING WATER
Fc
Pc
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COOL WATER
COOL WATER
33
31
32
3

FIG. 1

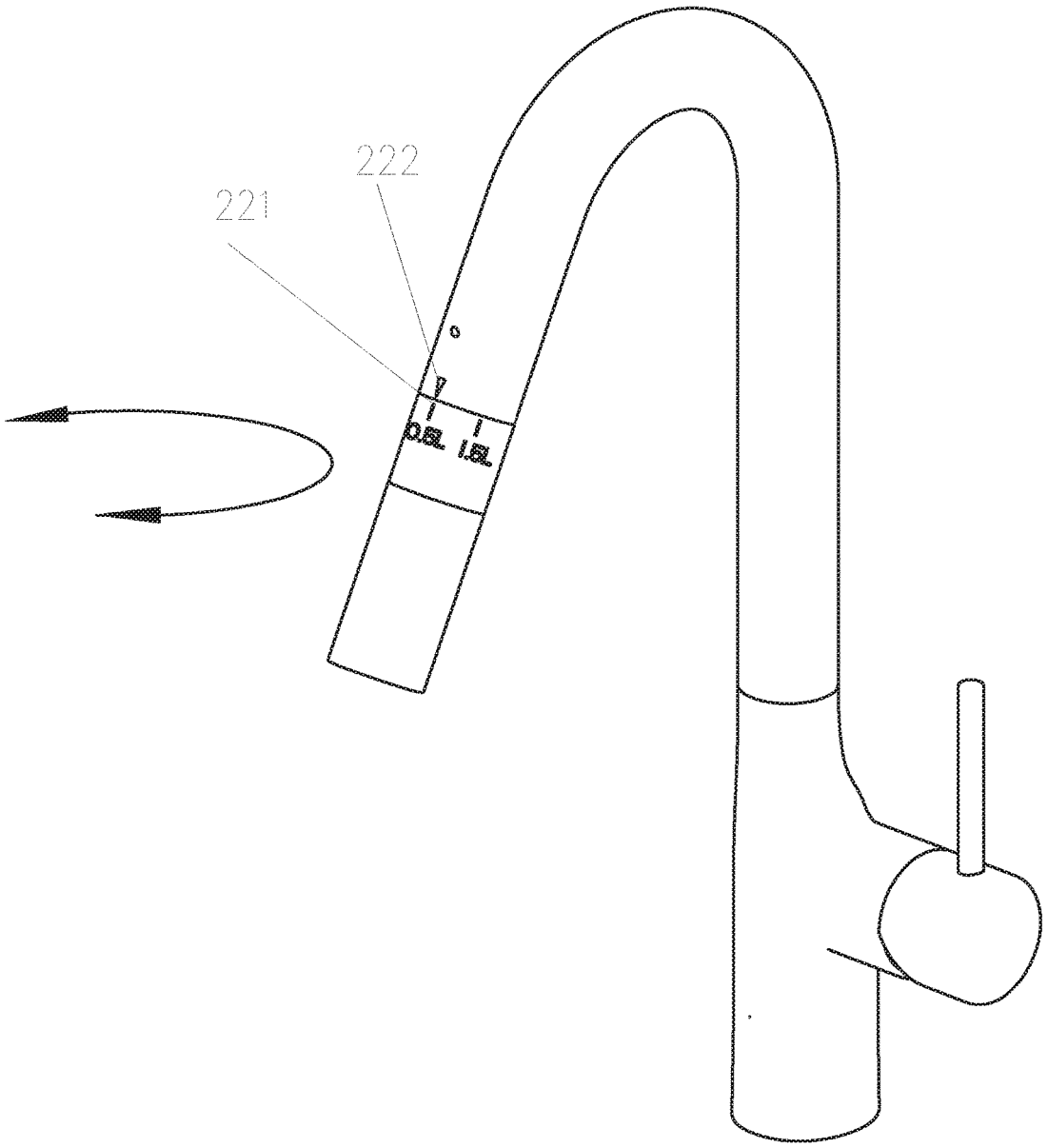

FIG. 2

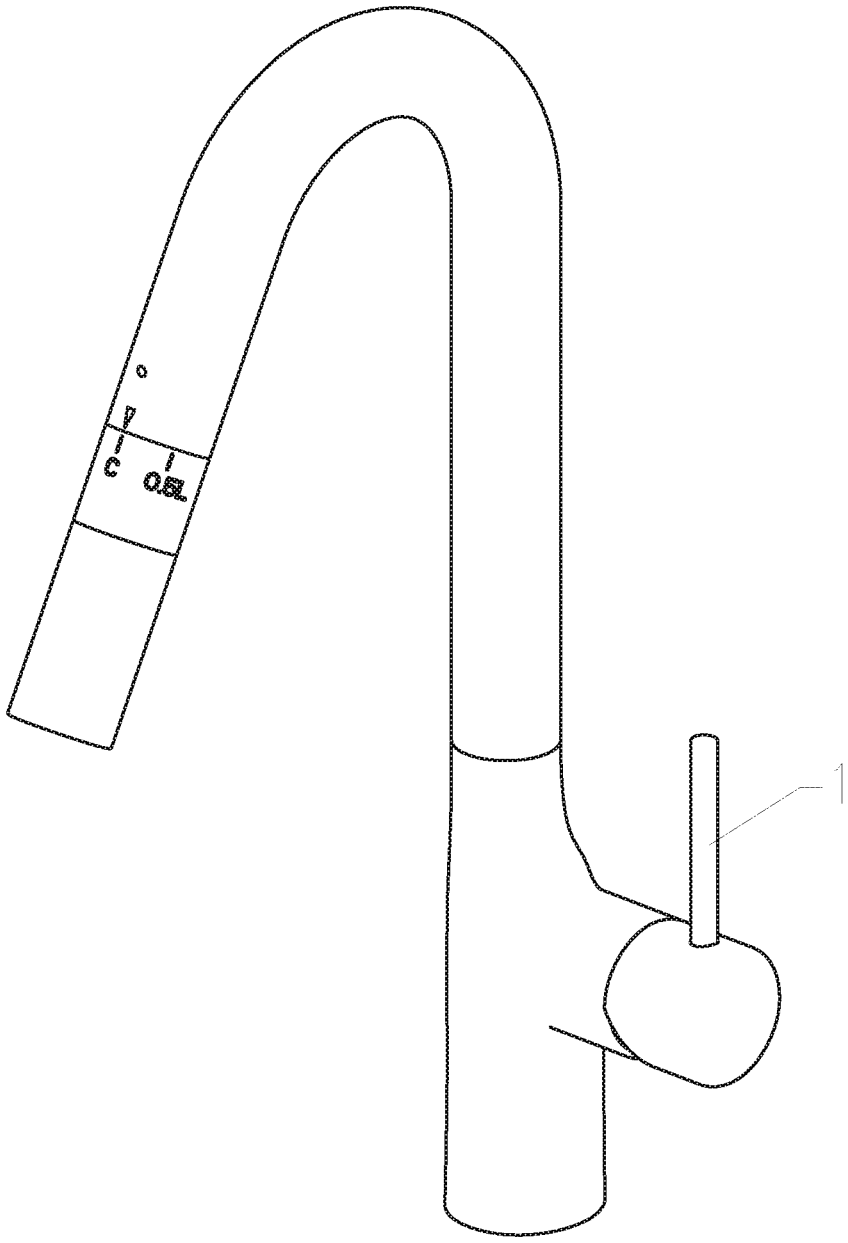

FIG. 3

OUTLET DEVICE WITH ELECTRONIC OUTLET AND MECHANICAL OUTLET TWO MODES

FIELD OF THE INVENTION

[0001] The present invention relates to an outlet device, especially to an outlet device that can be automatically closed when the outlet volume reaches to a certain value.

BACKGROUND OF THE INVENTION

[0002] In the modern society, electronic taps, such as infrared sensing taps, are more and more popular in the public places, user can only put the hand below the tap, water will automatically flow out. Traditional electronic taps have only electronic outlet one mode, once the electronic system fails, the tap can not be used. It can be avoided if the electronic tap is further disposed with a mechanical outlet switch. Moreover, the traditional electronic tap can not be turned off, when washing the wash basin or the tap, the tap will be always turned on because of the infrared sensing, which causes water wasting.

[0003] In addition, people require higher to the life; baking, cooking, making tea or coffee are necessary in the daily life. Especially in the western-style baking, it has strict rules to the ingredients and the flow of water. User usually needs a measuring cup to get the water. It often happens that when you take the measuring cup under the tap to get the water, the measuring cup is filled up in one second when in high flow volume, it far exceeds the needed volume, which may waste the water. When in low flow volume, it gets slowly, during the process, the user needs to take care of the volume in the cup to turn off the tap, it is a waste of time and labor. To solve the problems, a rationed tap exists in the market, this rationed tap can supply rationed flow volume according to the setting, the tap is turned off after the flow volume reaches to the preset value, so that the user needn't to take care of the volume. However, existing rationed tap is usually disposed with a flow adjusting portion, the user adjusts the proper flow volume and the water flows out. But misoperation may happen, the user adjusts the flow volume, but he doesn't get ready to get the water, water still flows out of the tap, it causes inaccurate of the water volume.

SUMMARY OF THE INVENTION

[0004] The present invention is provided with an outlet device with electronic outlet and mechanical outlet two modes to solve the main technical problem, the present invention can be freely switched in electronic outlet and mechanical outlet two modes, when the user uses the mechanical outlet mode, the electronic outlet mode is automatically interrupted so as to ensure that both outlet modes do not interfere.

[0005] Another technical problem of the present invention to solve is that the electronic outlet mode is further designed to be rationed outlet, the rationed volume option and the outlet control are applied with two independent switches, which avoids misoperation.

[0006] To solve above mentioned technical problems, the present invention is provided with an outlet device with electronic outlet and mechanical outlet two modes, wherein the outlet device comprises a mechanical outlet control device, an electronic outlet control device and a central control module;

[0007] the central control module comprises a first outlet passage controlled by the mechanical outlet control device, a second outlet passage controlled by the electronic outlet control device and a central controller; the first outlet passage is disposed with a sensor, the second outlet passage is disposed with an electromagnet valve;

[0008] when the mechanical outlet control device controls the first outlet passage to open, the sensor detects water flowing in the first outlet passage, whether the electromagnet valve opens or not, the central controller switches the electromagnet valve to normal close state.

[0009] The present invention further provides with an outlet device with electronic outlet and mechanical outlet two modes, the outlet device comprises a mechanical outlet control device, an electronic outlet control mode and a central control module;

[0010] the central control module comprises a first outlet passage controlled by the mechanical outlet control device, a second outlet passage controlled by the electronic outlet control device and a central controller; the mechanical outlet control device is disposed with a sensor, the second outlet passage is disposed with an electromagnet valve;

[0011] when the mechanical outlet control device controls the first outlet passage to open, the sensor detects position change of the mechanical outlet control device, whether the electromagnet valve opens or not, the central controller switches the electromagnet valve to normal close state.

[0012] In another preferred embodiment, the electronic outlet control device is disposed with an electronic outlet control switch and a volume option switch; the second outlet passage is further disposed with a flow meter, one end of the second outlet passage is a cool water inlet, the other end is an outlet connected to the outlet device; the volume option switch is linked to an encoder, the encoder is disposed with a unlimited outlet gear and a plurality of rationed outlet gears;

[0013] the electronic outlet control switch and the volume option switch are independently disposed, the volume option switch drives the encoder to set in a proper outlet gear, the electronic outlet control switch is operated to make the central controller turn on the electromagnet valve, the flow meter starts to count.

[0014] In another preferred embodiment, the volume option switch is a rotating ring disposed at one side of the outlet portion of the outlet device, the rotating ring is disposed with a volume dividing ruler, the outlet port of the outlet device is disposed with a marker; the volume dividing ruler is disposed with a scale corresponding to the unlimited outlet gear and a plurality of scales corresponding to the rationed outlet gear; when the rotating ring rotates to make one of the scales align with the marker, the corresponding outlet gear is selected.

[0015] In another preferred embodiment, when the volume option switch rotates to one side, the encoder rotates to the unlimited outlet gear; when the volume option switch rotates to the other side, the encoder rotates to one of the rationed outlet gears.

[0016] In another preferred embodiment, when the encoder rotates to the unlimited outlet gear, the central controller switches the electromagnet valve to normal close state.

[0017] In another preferred embodiment, the electronic outlet control switch comprises a touch switch; when the encoder is disposed in any rationed outlet gear, touching the

touch switch is capable of turning the electromagnet valve on, the volume meter starts to count, when the volume reaches to the setting value of the rationed outlet gear, the central controller controls to close the outlet valve to turn off.

[0018] In another preferred embodiment, the outlet device is a tap or a shower head.

[0019] In another preferred embodiment, the sensor is an angle sensor or a displacement sensor.

[0020] Prepared to existing known technology, the technical proposal of the present invention has advantages as follows:

[0021] 1. The present invention is provided with an outlet device with electronic outlet and mechanical outlet two modes, it is disposed with the electronic outlet control device and the mechanical outlet device, therefore it can realize electronic outlet and mechanical outlet, it ensures that if there is a failure to the electronic outlet, the mechanical outlet mode can still work. Besides, when the user uses the mechanical outlet mode, the electronic outlet mode is automatically invalid, two functions are independent, the outlet stability is guaranteed.

[0022] 2. The present invention is provided with an outlet device with electronic outlet and mechanical outlet two modes, the electronic outlet mode is a rationed outlet mode. The volume option switch is linked to the encoder, the encoder is disposed with the unlimited outlet gear and a plurality of rationed outlet gears. Therefore, when the volume option switch is disposed to the corresponding gear, the user can freely switch it between the rationed outlet mode and the unlimited outlet mode. As the volume switch and the volume control are applied with two independent switches, the user needs to turn on the outlet control switch after he chooses the volume, this two-stage operation efficiently avoids misoperation.

[0023] 3. The present invention is provided with an outlet device with electronic outlet and mechanical outlet two modes, the rationed portion is an electronic only device, the encoder sends the volume the user chooses to the central controller, when the user operates the electronic outlet control switch, the central controller controls to turn on the electromagnetic valve and the volume meter starts to count, when it counts to the target volume of the current gear, the central controller controls to turn off the electromagnetic. This all-electronic control guarantees the accuracy of the volume count.

[0024] Moreover, the temperature adjusting function is added to the mechanical outlet mode, it improves the outlet variety of the outlet device. When the user chooses the unlimited outlet gear, the electronic outlet mode is invalid; when user rotates the handle to achieve mechanical outlet mode, if he continues to rotate the handle, the outlet temperature rises, it satisfies the needs of user using the warm water and enriches the user experience.

[0025] 4. The present invention is provided with an outlet device with electronic outlet and mechanic outlet two modes, the outlet control switch is applied with a touch switch, the sensing area is small, it needs user to accurately touch to trigger outlet, thus avoiding misoperation.

[0026] 5. The present invention is provided with an outlet device with electronic outlet and mechanic outlet two modes, the outlet device can be a tap, a shower head or other normal outlet device, it has wide applicability.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] FIG. **1** illustrates a schematic diagram of the waterway of a preferred embodiment of the present invention.

[0028] FIG. **2** illustrates a schematic diagram of the preferred embodiment of the present invention in rationed outlet.

[0029] FIG. **3** illustrates a schematic diagram of the preferred embodiment of the present invention in close state.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0030] The present invention will be further described with the drawings and the embodiments.

The First Embodiment

[0031] Referring to FIGS. **1-3**, a kitchen tap with electronic outlet and mechanical outlet two modes comprises a mechanical outlet control device **1**, an electronic outlet control device **2** and a central control module **3**;

[0032] The central control module **3** comprises first outlet passage controlled by the mechanical outlet device **1**, a second outlet passage controlled by the electronic outlet control device **2** and a central controller; the first outlet passage is disposed with a sensor **31**, the second outlet passage is disposed with an electromagnetic valve **32**;

[0033] When the mechanical outlet control device controls to turn on the first outlet passage, the sensor detects water flowing in the first outlet passage, whether the electromagnetic valve **32** opens or not, the central controller switches the electromagnetic valve **32** to normal close state immediately. So that the mechanical outlet is prior than the electronic outlet, two outlet modes are independent that they would not interfere to each other. And with the mechanical outlet, even if the electronic outlet fails, the kitchen tap can be still normally used.

[0034] In this embodiment, the electronic outlet control device **2** is provided with rationed outlet function, in detailed, it comprises an electronic outlet control switch **32**, a volume option switch **22**; the second outlet passage is further disposed with a volume meter **33**, one end of the second outlet passage is cool water inlet, the other end is connected to the outlet of the kitchen tap;

[0035] The volume option switch **22** is linked to the encoder, the encoder is disposed with an unlimited outlet gear and a plurality of rationed outlet gears.

[0036] The electronic outlet control switch **21** and the volume option switch are independent, when the volume option switch **22** drives the encoder to a proper outlet gear, operating the electronic outlet control switch **21** can make the central controller turn on the electromagnetic valve **32**, the volume meter **33** starts to count; when the volume meter **33** counts to the target volume set by the encoder, the central controller turns off the electromagnetic valve **32**, thus achieving rationed outlet.

[0037] In this embodiment, the volume option switch is a rotating ring **22** disposed at one side of the outlet portion of the kitchen tap, the rotating ring **22** is disposed with a volume dividing ruler **221**, the outlet portion of the kitchen tap is disposed with a marker **222**. the volume dividing ruler **222** is disposed with a scale C corresponding to the unlimited outlet gear and scales 0.5 L, 1 L, 1.5 L, corresponding to the rationed outlet gears; when the rotating ring **22** rotates

to make the scale of the volume dividing ruler align with the marker, it indicates the present outlet flow volume.

[0038] Furthermore, when the rotating ring **22** rotates to one side, the encoder rotates to the unlimited outlet gear; when the rotating ring **22** rotates to the other side, the encoder rotates to one of the rationed outlet gears. By different rotating directions, the user can choose the unlimited outlet gear or the rationed outlet gear easily, the user experience is better.

[0039] If the mechanical outlet control device **1** is closed and the user turns on the outlet control switch **21** by accident, water will flows out of the kitchen tap, that is to say, when the mechanical outlet control device **1** is closed, the electronic outlet control device **2** is always available, this situation isn't suitable, misoperation easily happens when the user is washing the kitchen tap. To solve the problem, this embodiment is further provided that: when the encoder is rotates to the unlimited outlet gear, the central controller switches the electromagnetic valve **32** to normal close state. Therefore, the user just needs to rotate the rotating ring **22** to the unlimited outlet gear to turn off the electronic outlet mode, so that the kitchen tap will turn to a mechanical traditional tap, the tap would not turned on when washing the tap or the washbasin.

[0040] In this embodiment, the electronic outlet control switch **21** is a touch switch, press switch or infrared switch are available, they are simple substitutions of this embodiment that it would not be further described.

[0041] As a traditional kitchen tap has cool water outlet and hot water outlet two modes, for that in this embodiment, the first outlet passage comprises a cool water inlet, a hot water inlet and a mixing water outlet; the mixing water outlet is connected to the second outlet passage, the sensor **31** is disposed at the end of the mixing water outlet of the first outlet passage.

[0042] Correspondingly, the mechanical outlet control device **1** comprises a handle, when rotating the handle, the first outlet passage is open, when continuously rotating the handle, the proportion of cool water of the first outlet passage decreases and the proportion of hot water increases to make the outlet temperature of the outlet device rise.

[0043] The working process of the kitchen tap is as follows:

[0044] 1. The mechanical outlet control mode: when rotating the handle, the first outlet passage is open, water inside is cool water; when continuously rotating the handle, the flowing area of the cool water inlet is decreased, the flowing area of the hot water inlet is increased, form the mixing water in the first outlet passage. The outlet temperature of the kitchen tap rises with the rotating of the handle. When the sensor **31** detects water flowing in the first outlet passage, the electromagnetic valve **32** is always turned off, however the user adjusts the rotating ring **22** or touches the touch switch, the electronic outlet mode would not be triggered. It guarantees the highest priority of the mechanical outlet mode, the outlet mode is single and stable.

[0045] 2. The electronic outlet control mode: be sure that the handle is in close state, the sensor **31** detects no water flowing in the first outlet passage. when the user rotating the rotating ring **22**, it drives the encoder to the proper outlet gear, touching the touch switch can make the central controller turn on the electromagnetic valve, the volume meter **33** starts to count; when the volume meter **33** counts to the target volume set by the encoder, the central controller turns off the electromagnetic valve **32** to achieve rationed outlet.

[0046] 3. Close mode: when the user rotates the rotating ring **22** to unlimited outlet mode, the electronic outlet control mode is turned off, if the mechanical outlet control device is turned off, no water flows out of the kitchen tap.

[0047] It should be noted that, this embodiment takes rationed tap for example, other electronic-mechanical double-switch taps are available to apply with above control idea, they are within the scope of the present invention.

The Second Embodiment

[0048] This embodiment is different from the first embodiment in that: it is applied in a shower head but not a kitchen tap, the principle and the basic structure are similar, it only needs to design the shower head structure.

The Third Embodiment

[0049] This embodiment is different from the first embodiment in that: the handle is disposed with an angle sensor or a displacement sensor, when the user lifts or rotates the handle, the angle sensor or the displace sensor can detect that the first outlet passage is turned on, so that the central controller controls the electromagnetic valve to be in normal close state, the rest part of this embodiment is similar to the first embodiment.

[0050] Although the present invention has been described with reference to the preferred embodiments thereof for carrying out the patent for invention, it is apparent to those skilled in the art that a variety of modifications and changes may be made without departing from the scope of the patent for invention which is intended to be defined by the appended claims.

1. An outlet device with electronic outlet and mechanical outlet two modes, wherein the outlet device comprises a mechanical outlet control device, an electronic outlet control device and a central control module;

the central control module comprises a first outlet passage controlled by the mechanical outlet control device, a second outlet passage controlled by the electronic outlet control device and a central controller; the first outlet passage is disposed with a sensor, the second outlet passage is disposed with an electromagnet valve;

when the mechanical outlet control device controls the first outlet passage to open, the sensor detects water flowing in the first outlet passage, whether the electromagnet valve opens or not, the central controller switches the electromagnet valve to normal close state.

2. An outlet device with electronic outlet and mechanical outlet two modes, wherein the outlet device comprises a mechanical outlet control device, an electronic outlet control mode and a central control module;

the central control module comprises a first outlet passage controlled by the mechanical outlet control device, a second outlet passage controlled by the electronic outlet control device and a central controller; the mechanical outlet control device is disposed with a sensor, the second outlet passage is disposed with an electromagnet valve;

when the mechanical outlet control device controls the first outlet passage to open, the sensor detects position change of the mechanical outlet control device,

whether the electromagnet valve opens or not, the central controller switches the electromagnet valve to normal close state.

3. The outlet device with electronic outlet and mechanical outlet two modes according to claim **1**, wherein the electronic outlet control device is disposed with an electronic outlet control switch and a volume option switch; the second outlet passage is further disposed with a flow meter, one end of the second outlet passage is a cool water inlet, the other end is an outlet connected to the outlet device;

the volume option switch is linked to an encoder, the encoder is disposed with a unlimited outlet gear and a plurality of rationed outlet gears;

the electronic outlet control switch and the volume option switch are independently disposed, the volume option switch drives the encoder to set in a proper outlet gear, the electronic outlet control switch is operated to make the central controller turn on the electromagnet valve, the flow meter starts to count.

4. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **3**, wherein the volume option switch is a rotating ring disposed at one side of the outlet portion of the outlet device, the rotating ring is disposed with a volume dividing ruler, the outlet port of the outlet device is disposed with a marker; the volume dividing ruler is disposed with a scale corresponding to the unlimited outlet gear and a plurality of scales corresponding to the rationed outlet gear;

when the rotating ring rotates to make one of the scales align with the marker, the corresponding outlet gear is selected.

5. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **4**, wherein when the volume option switch rotates to one side, the encoder rotates to the unlimited outlet gear; when the volume option switch rotates to the other side, the encoder rotates to one of the rationed outlet gears.

6. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **5**, wherein when the encoder rotates to the unlimited outlet gear, the central controller switches the electromagnet valve to normal close state.

7. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **3**, wherein the electronic outlet control switch comprises a touch switch; when the encoder is disposed in any rationed outlet gear, touching the touch switch is capable of turning the electromagnet valve on, the volume meter starts to count, when the volume reaches to the setting value of the rationed outlet gear, the central controller controls to close the outlet valve to turn off.

8. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **7**, wherein the first outlet passage comprises a cool water inlet, a hot water inlet and a mixing water outlet; the mixing water outlet is connected to the second outlet passage, the sensor is disposed at the end of the mixing water outlet of the first outlet passage.

9. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **8**, wherein the mechanical outlet control device comprises a handle; when the handle is rotated, the first outlet passage is open, when continuously rotating the handle, the proportion of cool water of the first outlet passage decreases and the proportion of hot water increases to make the outlet temperature of the outlet device rise.

10. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **1**, wherein the outlet device is a tap or a shower head.

11. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **2**, wherein the sensor is an angle sensor or a displacement sensor.

12. The outlet device with electronic outlet and mechanical outlet two modes according to claim **2**, wherein the electronic outlet control device is disposed with an electronic outlet control switch and a volume option switch; the second outlet passage is further disposed with a flow meter, one end of the second outlet passage is a cool water inlet, the other end is an outlet connected to the outlet device;

the volume option switch is linked to an encoder, the encoder is disposed with a unlimited outlet gear and a plurality of rationed outlet gears;

the electronic outlet control switch and the volume option switch are independently disposed, the volume option switch drives the encoder to set in a proper outlet gear, the electronic outlet control switch is operated to make the central controller turn on the electromagnet valve, the flow meter starts to count.

13. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **12**, wherein the volume option switch is a rotating ring disposed at one side of the outlet portion of the outlet device, the rotating ring is disposed with a volume dividing ruler, the outlet port of the outlet device is disposed with a marker; the volume dividing ruler is disposed with a scale corresponding to the unlimited outlet gear and a plurality of scales corresponding to the rationed outlet gear;

when the rotating ring rotates to make one of the scales align with the marker, the corresponding outlet gear is selected.

14. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **13**, wherein when the volume option switch rotates to one side, the encoder rotates to the unlimited outlet gear; when the volume option switch rotates to the other side, the encoder rotates to one of the rationed outlet gears.

15. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **14**, wherein when the encoder rotates to the unlimited outlet gear, the central controller switches the electromagnet valve to normal close state.

16. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **12**, wherein the electronic outlet control switch comprises a touch switch; when the encoder is disposed in any rationed outlet gear, touching the touch switch is capable of turning the electromagnet valve on, the volume meter starts to count, when the volume reaches to the setting value of the rationed outlet gear, the central controller controls to close the outlet valve to turn off.

17. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **16**, wherein the first outlet passage comprises a cool water inlet, a hot water inlet and a mixing water outlet; the mixing water outlet is connected to the second outlet passage, the sensor is disposed at the end of the mixing water outlet of the first outlet passage.

18. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **17**, wherein the mechanical outlet control device comprises a handle; when the handle is rotated, the first outlet passage is open, when continuously rotating the handle, the proportion of cool water of the first outlet passage decreases and the proportion of hot water increases to make the outlet temperature of the outlet device rise.

19. The outlet device with electronic outlet and mechanical outlet two outlet modes according to claim **2**, wherein the outlet device is a tap or a shower head.

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