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(71) Applicant: **Caspro, S.A.**
08759 Vallirana - Barcelona (ES)

(72) Inventor: **TRES CASAS, Daniel**
08759 VALLIRANA (Barcelona) (ES)

(74) Representative: **Ungria López, Javier**
Avda. Ramón y Cajal, 78
28043 Madrid (ES)

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(54) **ELECTRONIC CONTROL SYSTEM FOR A SHOWER FACILITY**

(57) Electronic control system (1) for a shower facility and/or a domestic hot water bathroom that can immediately inform the user, by means of an illuminated colour code on an illuminated control device (8), the temperature range of the water coming out of the system (1), so that the user can intuitively know the water temperature without having to verify the numbers shown on the screen. Nevertheless, the illuminated control device (8)

also displays a numeric code to indicate the exact water temperature. Additionally, when the system (1) is switched on, the default water temperature is set at 38°C, a comfortable water temperature, in order to avoid discomfort for the user with water temperatures that are either too high or too low. It is ideal for children and the elderly.

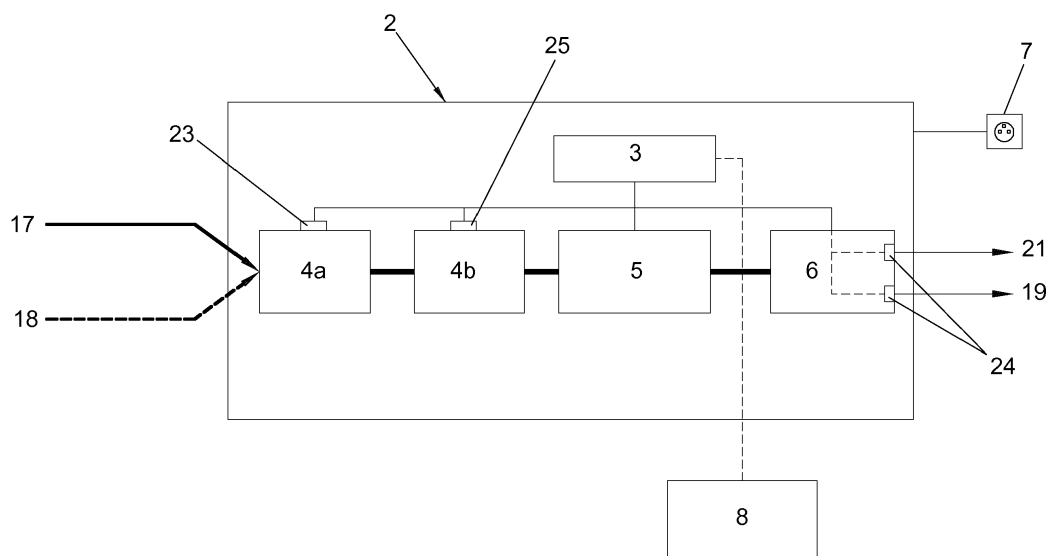


FIG. 2

Description

OBJECT OF THE INVENTION

[0001] The present invention, as detailed in this description, refers to an electronic control system for a shower facility and/or domestic hot water bathroom that allows the user to know at all times, and in an easy and unequivocal way, the temperature range of the water coming out of the system by means of a colour code and a numeric code shown on the screen of an luminous control device, in order to avoid discomfort for the user with water temperatures that are either too high or too low.

[0002] It is of particular use in the thermostatic bath taps industry.

TECHNICAL PROBLEM TO ADDRESS AND BACKGROUND OF THE INVENTION

[0003] In the current state of the art, there are sanitary facilities for showers and/or bathrooms in which water is controlled by means of an electronic module with water inlets for hot and cold water.

[0004] To date, water temperature in this kind of device is regulated by means of an alphanumeric screen or display controlled by the user by pressing buttons and controllers.

[0005] When the user enters the facility he has no immediate knowledge about the temperature of the water coming out of the system; therefore, if the temperature is too high, he could get scalded.

[0006] Therefore, the present invention solves the aforementioned problems of the state of the art by providing a system that allows the user to immediately know, by means of a colour code and a numeric code, the temperature of the water before it even starts flowing, and additionally, when the system is switched on the temperature of the water is set by default at 38 degrees, this temperature being within a comfortable water temperature range, in order to avoid discomfort for the user with water temperatures that are either too high or too low. It is ideal for children and the elderly.

DESCRIPTION OF THE INVENTION

[0007] A first embodiment of the present invention refers to an electronic control system of a shower facility that comprises an electro-hydraulic regulation box connected to a power source, a cold water inlet, a hot water inlet, a shower head and a hand shower, so that the electro-hydraulic regulation box comprises a control circuit connected to: a temperature regulating valve that regulates the temperature of the hot and cold water inlets, a water flow regulating valve that regulates the flow of water and that is located at the outlet of the temperature regulating valve, a temperature sensor located at the outlet of the water flow valve, and a selector valve of the water outlet. The system also comprises an illuminated control

device connected to the control circuit so that said illuminated control device is configured to: activate a plurality of LEDs that show a specific colour depending of the temperature range of the water coming out of the system based on the temperature selected by the user, and also display a numeric code that shows the exact water temperature.

[0008] Both the temperature regulating valve and the water flow regulating valve are connected to engines, which are controlled by the control circuit.

[0009] The illuminated control device comprises: a screen that displays the illuminated colour code, which is indicative of the entire range of water temperatures coming out of the system, and a numeric code, which gives the exact temperature of the water. Additionally, said screen also features indicators of the water flow and water outlet, said water outlet being selected between shower head/hand shower; an On/Off button to start, pause or turn off the system; a control button to increase the water flow; a control button to decrease the water flow; a control button to increase the water temperature; a control button to decrease the water temperature; a button to select the water outlet (shower head / hand shower).

[0010] The control circuit, depending on the temperature selected, is configured so that: between 25 and 33 °C, the screen of the illuminated control device is blue, as this falls in the cold water range; between 34 and 40 °C, the screen of the illuminated control device is fuchsia, as this falls in the comfortable range; and between 41 and 46 °C, the screen of the illuminated control device is red, indicating a danger of getting scalded. Additionally, the control circuit comprises a memory configured to save the level of water flow and temperature when the On/Off button is paused, so that the level of water flow and the temperature remain the same when the system is restarted; and a timer configured to automatically stop the system after a predetermined period of time elapses.

[0011] The selector valve of the water outlet comprises two solenoids, one at the water outlet of the hand shower and the other at the water outlet of the shower head, wherein the control circuit is configured to open/close said solenoids, thus, selecting the water outlet of the hand shower, the shower head or neither of them when the temperature sensor detects temperature levels above a predetermined threshold.

[0012] The electronic control system comprises 5 water flow levels.

[0013] A second embodiment of the present invention refers to an electronic control system of a shower facility that comprises an electro-hydraulic regulation box connected to a power source, a cold water inlet, a hot water inlet, a plurality of water outlets, so that the electro-hydraulic regulation box comprises a control circuit connected to: a temperature regulating valve that regulates the temperature of the hot and cold water inlets, a temperature sensor located at the outlet of the temperature regulating valve, and a selector valve of the water outlets.

The system also comprises an illuminated control device connected to the control circuit, so that said illuminated control device is configured to: activate a plurality of LEDs that show a specific colour depending on the temperature range of the water coming out of the system based on the temperature selected by the user, and display a numeric code that shows the exact water temperature.

[0014] The temperature regulating valve is connected to an engine operated by the control circuit.

[0015] In this second embodiment, the plurality of water outlets comprise a shower head, a cascade shower and a hand shower, whilst in a variant of this second embodiment, the plurality of water outlets also comprises shower jets.

[0016] In this second embodiment, the selector valve of the water outlet is configured to select a water outlet between the shower head, the cascade shower, the hand shower and a combination of the aforementioned. In a more preferred embodiment, the selector valve of the water outlet is configured to select a water outlet between the shower head, the cascade shower, the hand shower, the shower jets and a combination of the aforementioned. Said selector valve of the water outlet comprises a series of solenoids, one for each water outlet, where the control circuit is configured to close said solenoids when the temperature sensor detects temperature levels above a predetermined threshold.

[0017] According to this second embodiment, the illuminated control device comprises a screen that displays an illuminated colour code that indicates the temperature range of the water coming out of the system, and a numeric code that shows the exact temperature of the water; an On/Off button to turn the system on and off; a control button to increase the water temperature; a control button to decrease the water temperature; a button to select the shower head water outlet, a button to select the cascade shower water outlet, and a button to select the hand shower water outlet.

[0018] According to a variant of this second embodiment, the illuminated control device also comprises a button to select the shower jets water outlet.

[0019] The control circuit, depending on the temperature selected, is configured so that: between 25 and 33 degrees, the screen of the illuminated control device is blue, as this falls in the cold water range; between 34 and 40 degrees, the screen of the illuminated control device is fuchsia, as this falls in the comfortable range; and between 41 and 46 degrees, the screen of the illuminated control device is red, indicating a danger of getting scalded.

[0020] The control circuit also comprises a memory configured to save the water temperature when any of the water outlet selector buttons is deselected, so that the level of the water temperature remains the same when the water outlet is selected again; and it also comprises a timer configured to automatically stop the system after a predetermined period of time elapses.

[0021] Additionally, the illuminated control device com-

prises an error detection module configured to diagnose and display on screen any possible anomalies in the system.

5 BRIEF DESCRIPTION OF THE FIGURES

[0022] To complete the description and in order to give a better understanding of the characteristics of the invention, this description is accompanied by a series of drawings that are an integral part thereof, wherein, for illustration purposes and without limitation, the following has been represented:

Figure 1.- Shows a general view of the electronic control system of the shower facility according to a first embodiment where two possible water outlets are shown, which are the shower head and the hand shower. It also shows the illuminated control device.

Figure 2.- Shows a view of the connections of the components of the electro-hydraulic regulation box according to the first embodiment of the invention.

Figures 3a, 3b y 3c.- Show views of the different functioning states of the illuminated control device, according to the first embodiment of the invention.

Figure 4.- Shows a general view of the electronic control system of the shower facility according to a second embodiment where three possible water outlets are shown, which are the shower head, the cascade shower, and the hand shower. It also shows the illuminated control device.

Figure 5.- Shows a view of the connections of the components of the electro-hydraulic regulation box according to the second embodiment of the invention.

Figure 6a.- Shows a view of a functioning state of the illuminated control device, according a second embodiment, where the water temperature is set at 25 degrees. The colour of the screen is blue even though it is not shown in the figure, since it corresponds to the cold water temperature range. The figure also shows the three water outlet selector buttons: the shower head, the cascade shower and the hand shower.

Figure 6b.- Shows the state of the illuminated control device when the system is off, according to the second embodiment. The light of all the buttons is off except for the On/Off button.

Figure 7.- Shows a general view of the electronic control system of the shower facility according to a second embodiment where four possible water outlets are shown, which are the shower head, the cascade shower, the hand shower, and the shower jets.

Figure 8.- Shows a view of the connections of the components of the electro-hydraulic regulation box according to a variation of the second embodiment of the invention, with the four possible water outlets.

Figure 9a.- Shows a view of the illuminated control device when the system is on, according a second

embodiment, where the water temperature is set at 25 degrees. The colour of the screen is blue even though it is not shown in the figure, since it corresponds to the cold water temperature range. The figure also shows the four water outlet selector buttons: the shower head, the cascade shower, the hand shower, and the shower jets.

Figure 9b.- Shows the state of the illuminated control device when the system is off, according to the variant of the second embodiment. The light of all the buttons is off except for the On/Off button.

[0023] A list of the different components that have been represented in the drawings and that comprise the invention is detailed below:

1. Electronic control system for a shower facility.
2. Electro-hydraulic regulation box.
3. Control circuit.
- 4a. Temperature regulating valve.
- 4b. Water flow regulating valve.
5. Temperature sensor.
6. Selector valve of the water outlet.
7. Power supply.
8. Illuminated control device.
9. Screen.
10. On/Off button.
11. Temperature increase control button.
12. Temperature decrease control button.
13. Shower head selector button.
14. Cascade shower selector button.
15. Hand shower selector button.
16. Shower jets selector button.
17. Cold water inlet.
18. Hot water inlet.
19. Shower head.
20. Cascade shower.
21. Hand shower.
22. Shower jets.
23. Engine of the temperature regulating valve.
24. Solenoids.
25. Engine of the water flow regulating valve.
26. Water flow increase control button.
27. Water flow decrease control button.
28. Water outlet selector button (shower head/hand shower).

DETAILED DESCRIPTION

[0024] The present invention refers to an innovative and intuitive electronic control system (1) for a shower facility and/or a domestic hot water bathroom that can inform the user, by means of an illuminated colour code on an illuminated control device (8), the temperature range of the water coming out of the system (1) so that the user can intuitively know the water temperature without having to verify the numbers displayed on the screen. Nevertheless, the illuminated control device (8) also dis-

plays a numeric code to indicate the exact water temperature.

[0025] In a first embodiment, the electronic control system (1) of a shower facility comprises:

- an electro-hydraulic regulation box (2) connected to a power source (7), a cold water inlet (17), a hot water inlet (18), a shower head (19) and a hand shower (21), where said electro-hydraulic regulation box (2) comprises:
 - a control circuit (3) electrically connected to: a temperature regulating valve (4a) for the cold water inlet (17) and the hot water inlet (18), a water flow regulating valve (4b) located at the outlet of the temperature regulating valve (4a), a temperature sensor (5) located at the outlet of the water flow regulating valve (4b), and a selector valve of the water outlets (6).
- an illuminated control device (8), connected to a control circuit (3), that comprises a plurality of LEDs that show a specific colour depending on the temperature range of the water coming out of the system (1).

[0026] The illuminated control device (8) comprises:

- a screen (9) that displays an illuminated colour code, which indicates the temperature range of the water coming out of the system (1) at that moment, and a numeric code that indicates the exact temperature of the water. Said screen also (9) displays the water flow level, as symbolised by water drops, and where the water is coming out from, as symbolised by a shower head/hand shower,
- an On/Off button (10) to start, pause, or turn off the system (1),
- a water flow increase control button (26) that allows the user to increase the water flow (when the water flow is set to the maximum, it can no longer be increased),
- a water flow decrease control button (27) that allows the user to decrease the water flow (when the water flow is set to the minimum, it can no longer be decreased),
- a temperature increase control button (11) that allows the user to increase the temperature (when the temperature is set to the maximum, it can no longer be increased),
- a temperature decrease control button (12) that allows the user to decrease the temperature (when the temperature is set to the minimum, it can no longer be decreased),
- a water outlet selector button (shower head/hand shower) (28).

[0027] The temperature regulating valve (4a), which is

connected to an engine (23) run by the control circuit (3), mixes cold water and hot water in order to achieve the selected temperature. Likewise, the water flow regulating valve (4b), which is connected to another engine (25) also run by the control circuit (3), receives instructions from the control circuit (3) to let through the volume of water needed according to the user's selection.

[0028] The selector valve of the water outlet (6) comprises a series of solenoids (24), one for each of the water outlets, where the control circuit (3) is configured in order to open/close said solenoids (24) in order to select the water outlet of the hand shower (21), the shower head (19), or neither of them.

[0029] The temperature sensor (5) detects the water temperature after it has been mixed and acts as a safety device in case there is an error in the supply of hot or cold water, since if it detects temperatures above 50 degrees, it sends a signal to the control circuit (3), which is in charge of closing the selector valve of the water outlet (6), to close both solenoids (24) at once, thus stopping the water flow in order to prevent the water from scalding the user.

[0030] When the user selects the desired water temperature by pressing the buttons to regulate the temperature (11, 12), the background of the screen (9) of the illuminated control device (8) displays the colour associated to the temperature selected. Simultaneously, the system (1) sends an electric signal to the control circuit (3), and the control circuit (3) also sends instructions to the temperature regulating valve (4a) that mixes hot and cold water. In that moment, the temperature sensor (5) will inform the control circuit (3) that the water temperature is the one selected on screen (9). The control circuit (3), aided by the temperature sensor (5), will also correct the small fluctuations of the water temperature.

[0031] When the On/Off button (10) is pressed and the system (1) is switched on for the first time, the default temperature of the system is set at 38°C, the water flows by default at that temperature and it always comes out of the hand shower (21). In order to change from the hand shower (21) to the shower head (19), the symbol of the shower head must be pressed in the water outlet selector button (28).

[0032] The 38°C temperature is displayed on screen (9) with the background of the screen (9) showing the colour that corresponds to the range of said temperature in the system (1). Until the water coming out of the system (1) reaches said temperature, the numeric code showing the temperature will flicker on screen (9) since while said numbers are flickering, they are informing the user that the temperature in the system is temporary (1). Finally, when the water temperature has reached the temperature selected by the user, the numeric code stops flickering and remains lit, showing that the temperature of the water coming out of the system is at the selected temperature.

[0033] In a preferred embodiment, the screen (9) of the illuminated control device (8) displays the following:

- range 1: between 25 and 33 °C, the screen (9) of the illuminated control device (8) is blue, since it corresponds to the cold water temperature range,
- range 2: between 34 and 40 °C, the screen (9) of the illuminated control device (8) is fuchsia, since it corresponds to the comfortable temperature range,
- range 3: between 41 and 46 °C, the screen (9) of the illuminated control device (8) is red, since there is a danger of getting scalded.

[0034] Nevertheless, the electronic control system can be configured to operate under different ranges.

[0035] The electronic control system (1) comprises 5 water flow levels (volume of water going through the system), as symbolised by small water drops on the screen (9) of the illuminated control device (8).

[0036] The water temperature reaches the highest level when the temperature is set at the maximum level, and likewise reaches the lowest level when the temperature is set at the minimum.

[0037] Preferably, when hot and cold water are mixed together the maximum temperature reached is 46°C.

[0038] If the power supply is interrupted (power failure), the system (1) will switch off.

[0039] The On/Off button (10) has three different statuses: on, paused, and off. The On/Off button (10) buzzes whenever it is pressed. The first time it is pressed (press and hold), the system (1) is switched on and the illuminated control device (8) displays all the available functions. The second time the On/Off button (10) is pressed (press and hold), the system (1) is switched off and the illuminated control device (8) goes out.

[0040] In order to pause the system, the user has to press the On/Off button (10) just once and don't hold it pressed. When the system (1) is paused, it stops sending water through the water outlets but it saves the water flow and temperature levels that were set before the system was paused. This is achieved thanks to the memory of the control circuit (3), which saves said water flow and temperature levels.

[0041] Additionally, the control circuit (3) comprises a timer that allows the system (1) to automatically stop after a set period of time, preferably 15 minutes, preventing the system (1) from remaining switched on indefinitely.

[0042] Figure 3a shows the illuminated control device (8) with the screen (9) and the different buttons (10, 11, 12, 26, 27, 28). The screen (9) displays the background fuchsia colour (not shown in the drawing), which indicates a comfortable temperature range; a numeric code that represents the exact temperature of the water in the system (1) at 38°C; a series of small water drops that indicate the water flow level (volume of water), and an icon of the hand shower water outlet.

[0043] In Figure 3b, the screen (9) displays the background blue colour (not shown in the drawing), which indicates a cold temperature range; a numeric code that represents the exact temperature of the water in the system (1) at 26°C; one small water drop that indicates the

water flow level (volume of water), and an icon of the shower head water outlet.

[0044] In figure 3c, the screen (9) displays the background red colour (not shown in the drawing), which indicates danger of getting scalded by the water; a numeric code that represents the exact temperature of the water in the system (1) at 42°C; 5 small water drops that indicate the water flow level (maximum volume of water), and an icon of the hand shower water outlet.

[0045] In a second embodiment, the electronic control system (1) of a shower facility comprises:

- an electro-hydraulic regulation box (2) connected to a power source (7), a cold water inlet (17), a hot water inlet (18), and a plurality of water outlets that comprise a shower head (19), a cascade shower (20), and a hand shower (21), where said electro-hydraulic regulation box (2) comprises:
 - a control circuit (3) connected to: a temperature regulating valve (4a) for the cold water inlet (17) and the hot water inlet (18), a temperature sensor (5) located at the outlet of the temperature regulating valve (4a), and a selector valve (6) of the water outlets,
- an illuminated control device (8), connected to a control circuit (3), that comprises a plurality of LEDs that show a specific colour depending on the temperature range of the water coming out of the in the system (1).

[0046] According to said first embodiment, the illuminated control device (8) comprises:

- a screen (9) that displays an luminous colour code, which indicates the temperature range of the water coming out of the system (1) at that moment in time, and a numeric code, which indicates the exact temperature of the water,
- an On/Off button (10) to switch the system (1) on and off,
- a temperature increase control button (11) that allows the user to increase the temperature (when the temperature is set to the maximum, it can no longer be increased),
- a temperature decrease control button (12) that allows the user to decrease the temperature (when the temperature is set to the minimum, it can no longer be decreased),
- a water outlet selector button (13) for the shower head (19),
- a water outlet selector button (14) for the cascade shower (20), and
- a water outlet selector button (15) for the hand shower (21).

[0047] In a variant of this second embodiment, the plurality of the water outlets also features a fourth water

outlet of the shower jets (22), so that the illuminated control device (8) also comprises a water outlet selector button (16) for the shower jets (22).

[0048] The selector valve of the water outlet (6) comprises a series of solenoids (24), one for each of the water outlets, where the control circuit (3) is configured in order to open and close said solenoids (24) depending on the water outlet selected. Additionally, the control circuit (3) is configured to close said solenoids (24) when the temperature sensor (5) detects temperature levels above a predetermined threshold.

[0049] According to both embodiments, as well as in the first embodiment, the screen (9) of the illuminated control device (8) displays the following:

- range 1: between 25 and 33 °C, the screen (9) of the illuminated control device (8) is blue, since it corresponds to the cold water temperature range,
- range 2: between 34 and 40 °C, the screen (9) of the illuminated control device (8) is fuchsia, since it corresponds to the comfortable temperature range,
- range 3: between 41 and 46 °C, the screen (9) of the illuminated control device (8) is red, since there is a danger of getting scalded.

[0050] Nevertheless, the electronic control system can be configured to operate under different ranges.

[0051] The water temperature reaches the highest level when the temperature is set at the maximum level, and likewise reaches the lowest level when the temperature is set at the minimum. Preferably, when hot and cold water are mixed together the maximum temperature reached is 46°C.

[0052] The temperature regulating valve (4a), which is connected to an engine (23) run by the control circuit (3), mixes cold water and hot water in order to achieve the selected temperature.

[0053] The temperature sensor (5) detects the water temperature after it has been mixed and sends an electric signal proportional to the temperature to the control circuit (3), which is in charge of comparing and selecting the water outlet according to the user's selection. The temperature sensor (5) acts as a safety device in case there is an error with the water supply of hot or cold water, since if it detects temperatures above 50 degrees, it sends a signal to the control circuit (3), which is in charge of closing the selector valve of the water outlet (6), to close all solenoids (24) at once, thus stopping the water flow in order to prevent the water from scalding the user.

[0054] The control circuit (3), aided by the temperature sensor (5), will correct the small fluctuations of the water temperature.

[0055] The On/Off button (10) has two different statuses: on and off. The On/Off button (10) buzzes whenever it is pressed. The first time it is pressed, the system (1) is switched on and the illuminated control device (8) displays all the available options, showing the default 38°C flickering on screen (9), which indicates that the water is

in the process of warming up since it still hasn't reached 38°C, which is the default temperature set when the system (1) starts. Once the water has reached 38°C, the numeric code displaying 38°C stops flickering and remains lit, showing that the temperature of the water coming out of the system is at 38°C. Until one of the water outlet selector buttons (13, 14, 15, 16) is pressed, water won't start coming out of the system. If the button is pressed again, water stops coming out of the system. Additionally, it is possible to change the default 38°C before the selector buttons (13, 14, 15, 16) are pressed to make the water come out of the system. Evidently, any of the water outlets can be chosen to switch on the system (1). The second time the On/Off button (10) is pressed, the system (1) switches off, the internal default 38°C are restored, any active water outlets are closed, the screen (9) goes off, and the light of all the buttons except for the On/Off button (10) goes off.

[0056] The control circuit (3) comprises a memory that saves the water temperature when any of the water outlet selector buttons (13, 14, 15, 16) is deselected, so that when the water flow is restarted by selecting any of said selector buttons (13, 14, 15, 16), the water temperature remains at the previous level.

[0057] The shower head (19) water outlet selector button (13) and the cascade shower (20) water outlet selector button (14) belong to group 1, whilst the hand shower (21) water outlet selector button (15) and the shower jets (22) water outlet selector button (16) belong to group 2, so that pressing one of the buttons (13, 14, 15, 16) selects the respective water outlet and the light of said button starts flashing once per second. If the other water outlet of the same group is pressed, the previous one is deselected and the new outlet starts flashing. If the active outlet is pressed, the outlet closes and stops flashing. An outlet of group 1 and one of group 2 can be simultaneously activated. Evidently, in the embodiment with three water outlets, the only option in group 2 is the hand shower (21) water outlet.

[0058] Every time the buttons that regulate the temperature (11, 12) are pressed, they buzz and the temperature increases or decreases by 1°C.

[0059] When the shower head (19) water outlet selector button (13) is pressed, it buzzes and activates the shower head water outlet (19). The illuminated button (13) starts flashing to show that water is coming out of the system. When it is pressed again, the button (13) buzzes, water stops coming out and the button stops flashing. The same applies for the rest of the selector buttons (14, 15, 16).

[0060] The real temperature displayed on the screen will continue flashing until the water coming out of the system (1) reaches the temperature selected by the user. Finally, when the water temperature has reached the temperature selected by the user, the numeric code of said temperature remains lit, showing that the temperature of the water coming out of the system is at the selected temperature. Opening and closing the water out-

lets does not affect the preselected temperature.

[0061] If the power supply of the network is interrupted (power cut), the system (1) stops and all the water outlets are closed.

[0062] The control circuit (3) comprises a timer that allows the system (1) to automatically stop after a set period of time, preferably 15 minutes, preventing the system (1) from remaining switched on indefinitely.

[0063] Additionally, the illuminated control device (8) comprises an error detection module configured to diagnose any possible anomalies in the system (1). The cause of any possible anomalies in the system (1) is displayed on the screen (9) of the illuminated control device (8) by means of a 2-digit long alphanumeric code.

[0064] In a preferred embodiment:

- when the code "E1" is displayed on the screen (9) it indicates a possible connection failure between the control device (8) and the electro-hydraulic regulation box (2),
- code "E2" indicates a possible malfunction of the engine of the temperature regulation valve (23),
- code "E3" indicates a connection failure or malfunction of the temperature sensor (5),
- code "E4" indicates a possible isolated malfunction of the engine of the temperature regulation valve (23),
- code "E5" indicates a system (1) security failure, so that the system (1) automatically stops when the temperature sensor (5) detects temperatures above 50 degrees.

[0065] For failure codes "E1", "E2", "E3", or "E5," the technical service will have to be called in order to fix the breakdown, while if the failure code is "E4", since it is a specific malfunction due to an electrical or software problem, disconnecting (unplugging) the system from the power supply will suffice to solve the issue.

[0066] The present invention is not limited by the embodiment disclosed herein. Other embodiments can be made by experts in the art following the present description. In consequence, the scope of the invention is defined by the following claims.

Claims

1. Electronic control system (1) for a shower facility comprising:

- an electro-hydraulic regulation box (2) connected to a power source (7), a cold water inlet (17), a hot water inlet (18), and a plurality of water outlets, **characterized in that:**
- the electro-hydraulic regulation box (2) comprises a control circuit (3) connected to: a temperature regulating valve (4a) for the cold water inlet (17) and the hot water inlet (18), a temper-

- ature sensor (5) located at an outlet of the temperature regulating valve (4a), and a selector valve (6) of the plurality of water outlets,
 - the plurality of water outlets comprise a shower head (19), a cascade shower (20) and a hand shower (21),
 - an illuminated control device (8) connected to a control circuit (3), wherein said illuminated control device (8) is configured for activating a plurality of LEDs that show a specific colour depending on a temperature range of the water coming out of the system (1) based on a temperature selected by a user, and said LEDs also show the exact temperature by means of a numeric code.
2. Electronic control system (1) for a shower facility according to claim 1, **characterized in that** the plurality of water outlets also includes shower jets (22).
3. Electronic control system (1) for a shower facility according to claim 1, **characterized in that** the selector valve of the water outlet (6) is configured to select a water outlet between the shower head (19), the cascade shower (20), the hand shower (21) and a combination of the aforementioned.
4. Electronic control system (1) for a shower facility according to claim 2, **characterized in that** the selector valve of the water outlet (6) is configured to select a water outlet between the shower head (19), the cascade shower (20), the hand shower (21), the shower jets (22), and a combination of the aforementioned.
5. Electronic control system (1) for a shower facility according to claim 3, **characterized in that** the illuminated control device (8) comprises:
- a screen (9) that displays an illuminated colour code, which indicates the temperature range of the water coming out of the system (1) at that moment in time, and a numeric code, which indicates the exact temperature of the water,
 - an On/Off button (10) to switch the system (1) on and off,
 - a temperature increase control button (11) that allows the user to increase the water temperature level,
 - a temperature decrease control button (12) that allows the user to decrease the water temperature level,
 - a water outlet selector button (13) for the shower head (19),
 - a water outlet selector button (14) for the cascade shower (20), and
 - a water outlet selector button (15) for the hand shower (21),
6. Electronic control system (1) for a shower facility according to claims 4 and 5, **characterized in that** the illuminated control device (8) also comprises a selector button (16) for the shower jets (22) water outlet.
7. Electronic control system (1) for a shower facility as claimed in any one of the preceding claims, **characterized in that** the temperature regulating valve (4a) is connected to an engine (23) run by the control circuit (3).
8. Electronic control system (1) for a shower facility as claimed in any one of the preceding claims, **characterized in that** depending on the temperature selected, the control circuit (3) is configured so that:
- between 25 and 33 °C, the screen (9) of the illuminated control device (8) is blue, the blue colour corresponding to a cold water temperature range,
 - between 34 and 40 °C, the screen (9) of the illuminated control device (8) is fuchsia, the fuchsia colour corresponding to a comfortable temperature range,
 - between 41 and 46 °C, the screen (9) of the illuminated control device (8) is red, the red colour indicating a danger of getting scalded.
9. Electronic control system (1) for a shower facility as claimed in any one of the preceding claims, **characterized in that** the control circuit (3) comprises a memory configured to save the water temperature when any of the water outlet selector buttons (13, 14, 15, 16) is deselected, so that the water temperature remains at the previous level when any of the water outlet selector buttons (13, 14, 15, 16) are selected again.
10. Electronic control system (1) for a shower facility as claimed in any one of the preceding claims, **characterized in that** the selector valve (6) of the water outlet comprises one solenoid (24) for each one of the water outlets, wherein the control circuit (3) is configured to close said solenoids (24) when the temperature sensor (5) detects temperature levels above a predetermined threshold.
11. Electronic control system (1) for a shower facility as claimed in any one of the preceding claims, **characterized in that** the control circuit (3) comprises a timer configured to automatically stop the system (1) after a predetermined period of time elapses.
12. Electronic control system (1) for a shower facility as claimed in any one of the preceding claims, **characterized in that** the illuminated control device (8) comprises an error detection module configured to diagnose and display on screen (9) any possible

anomalies in the system (1).

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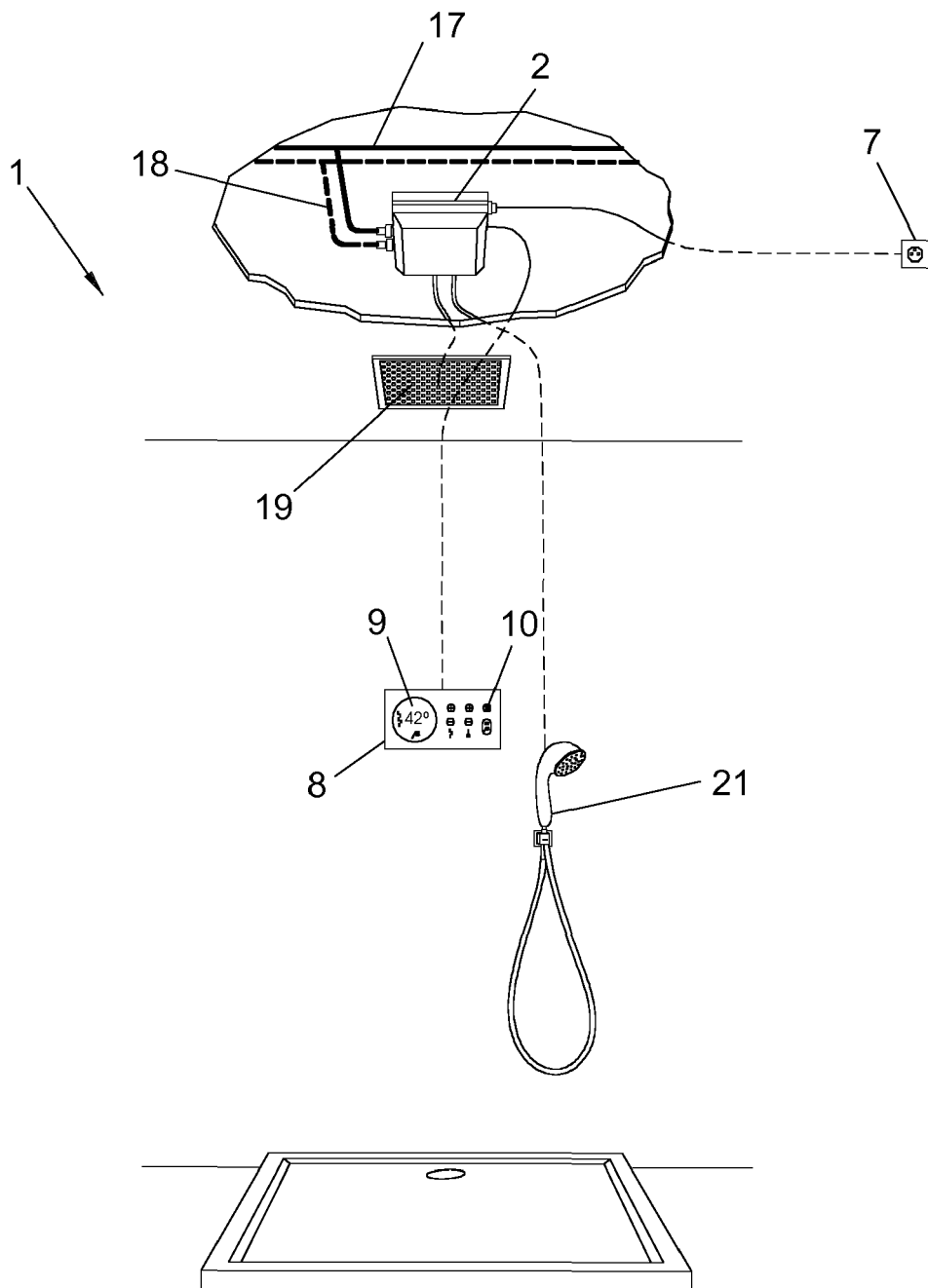


FIG. 1

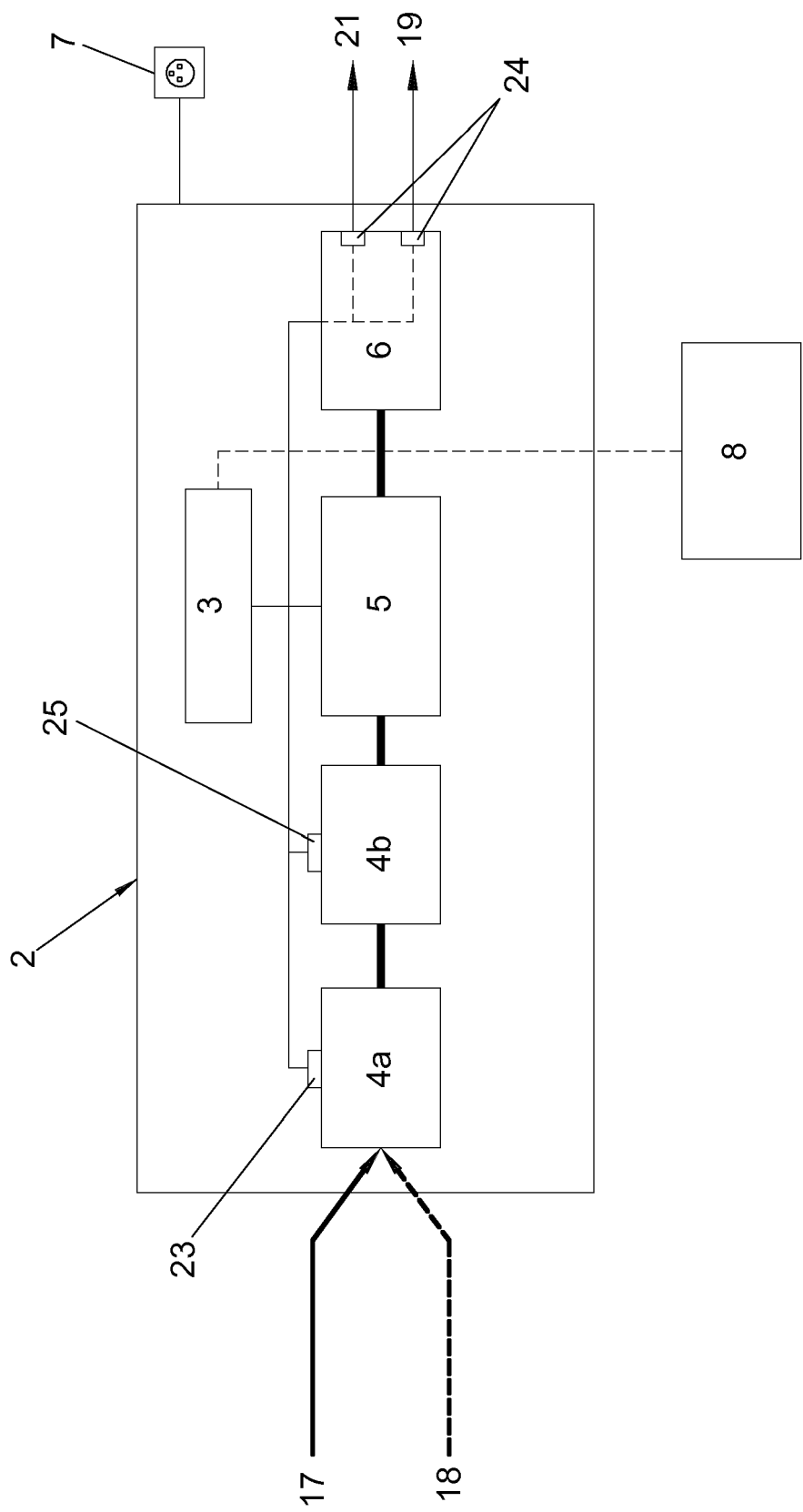
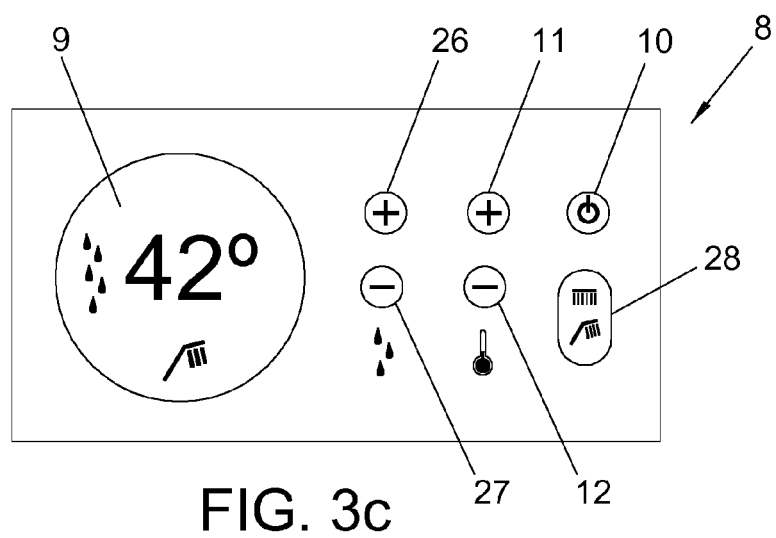
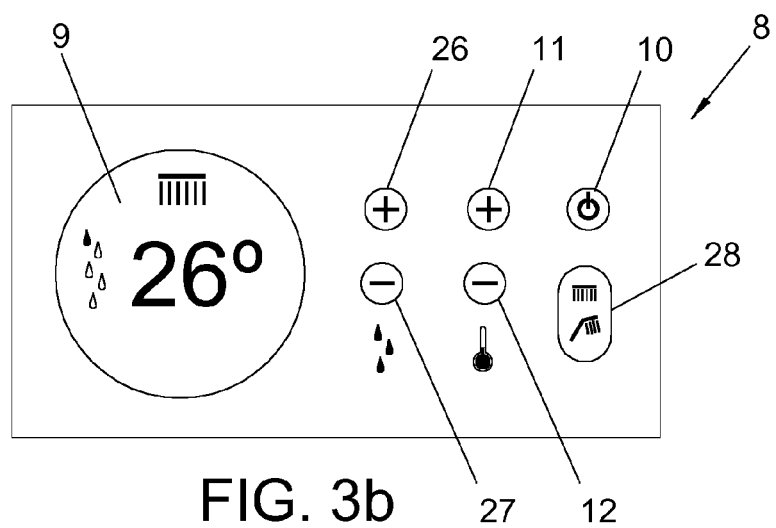
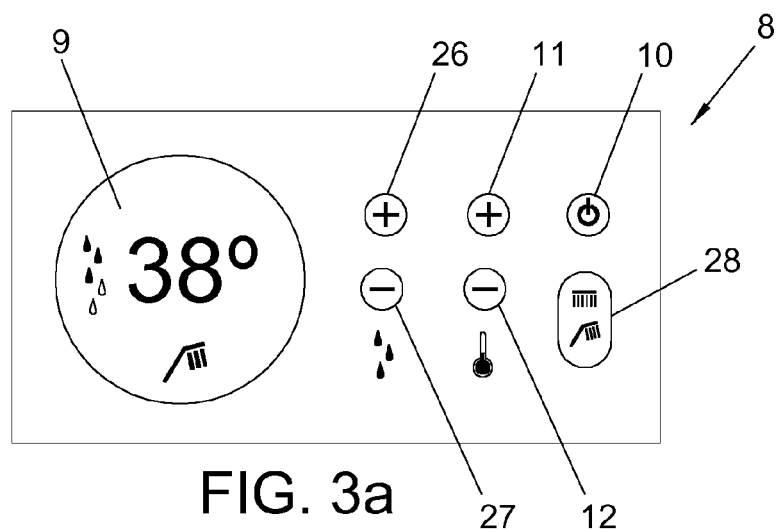


FIG. 2



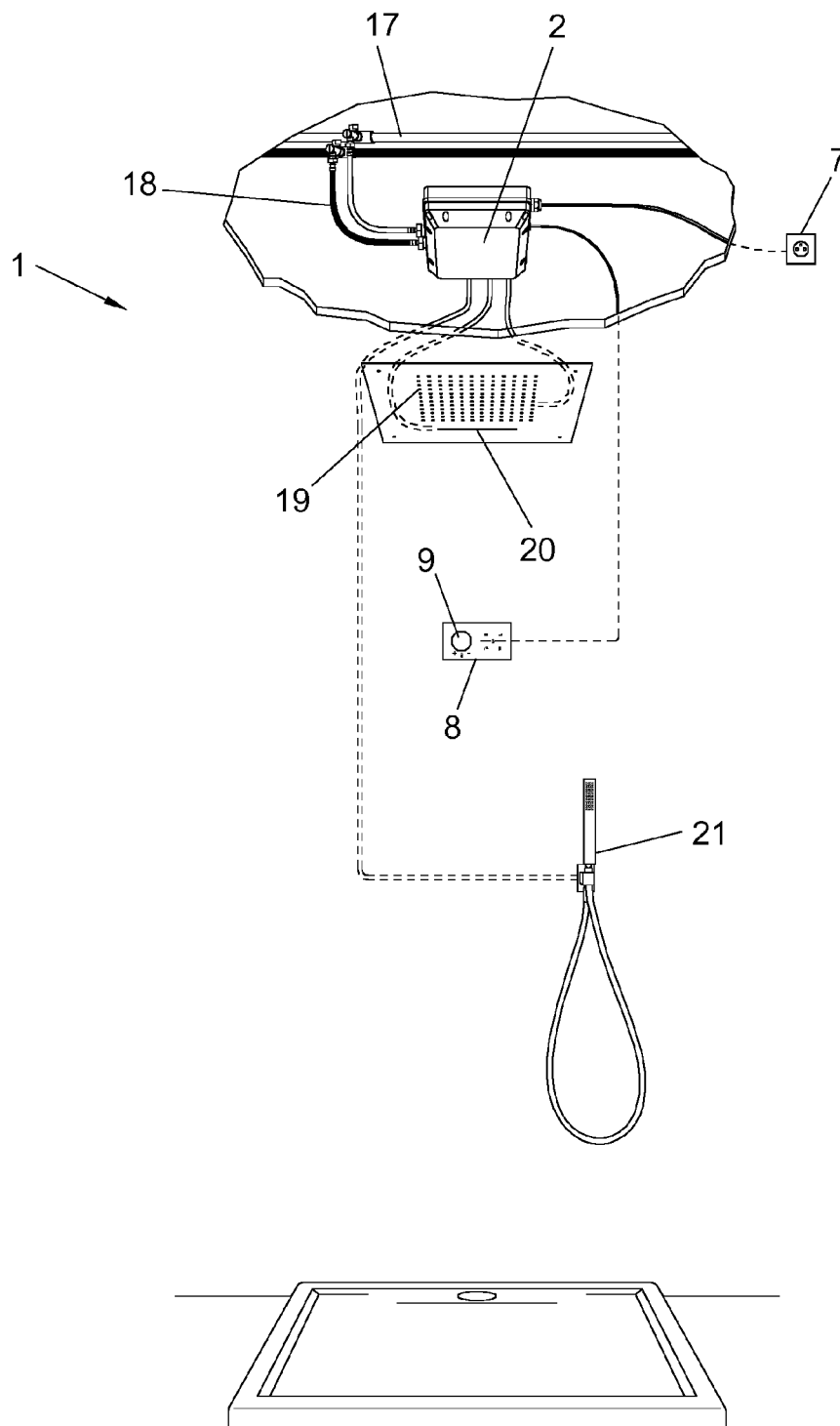


FIG. 4

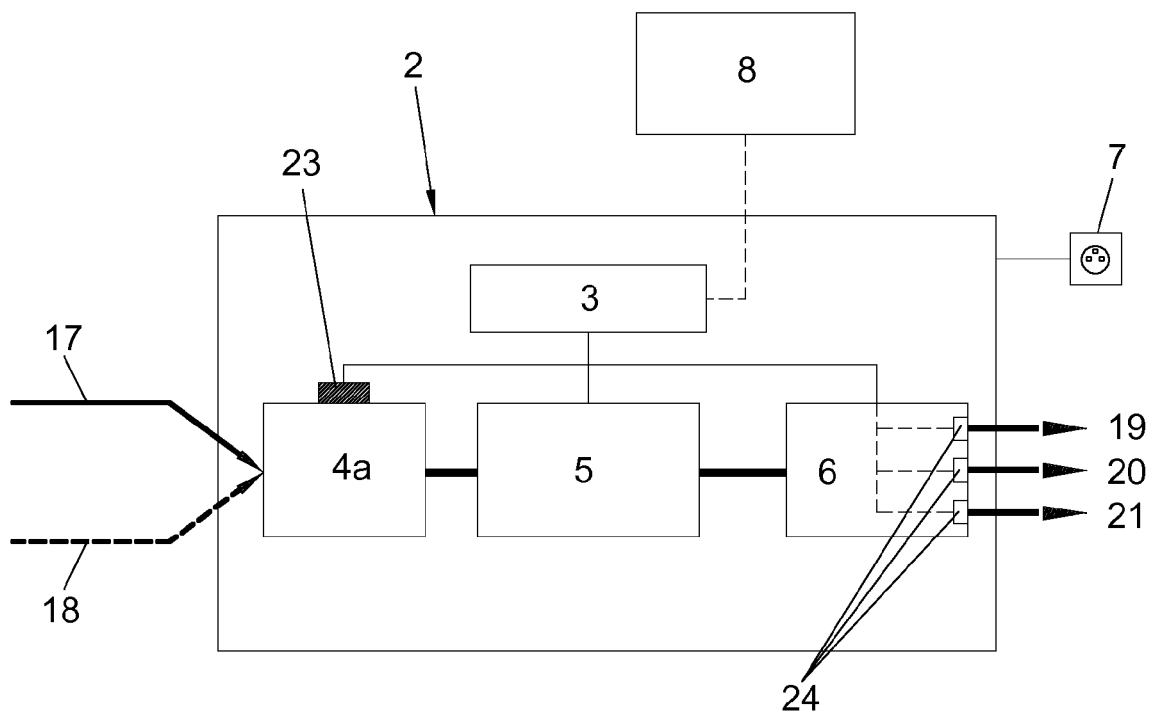
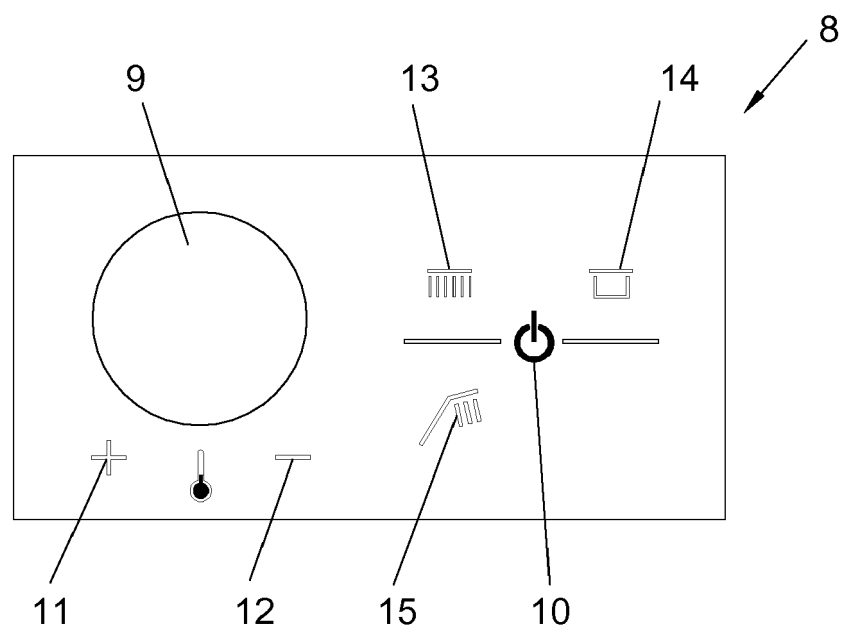
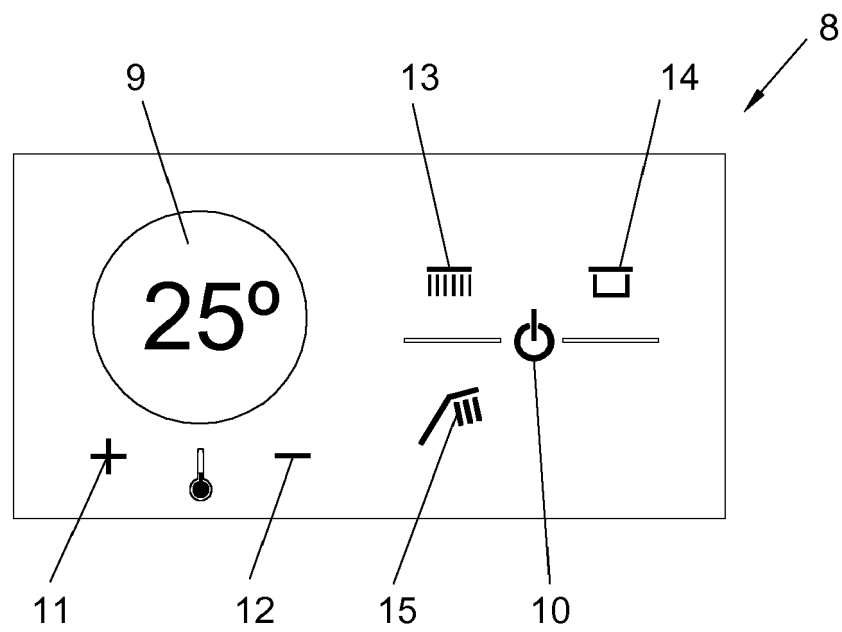


FIG. 5



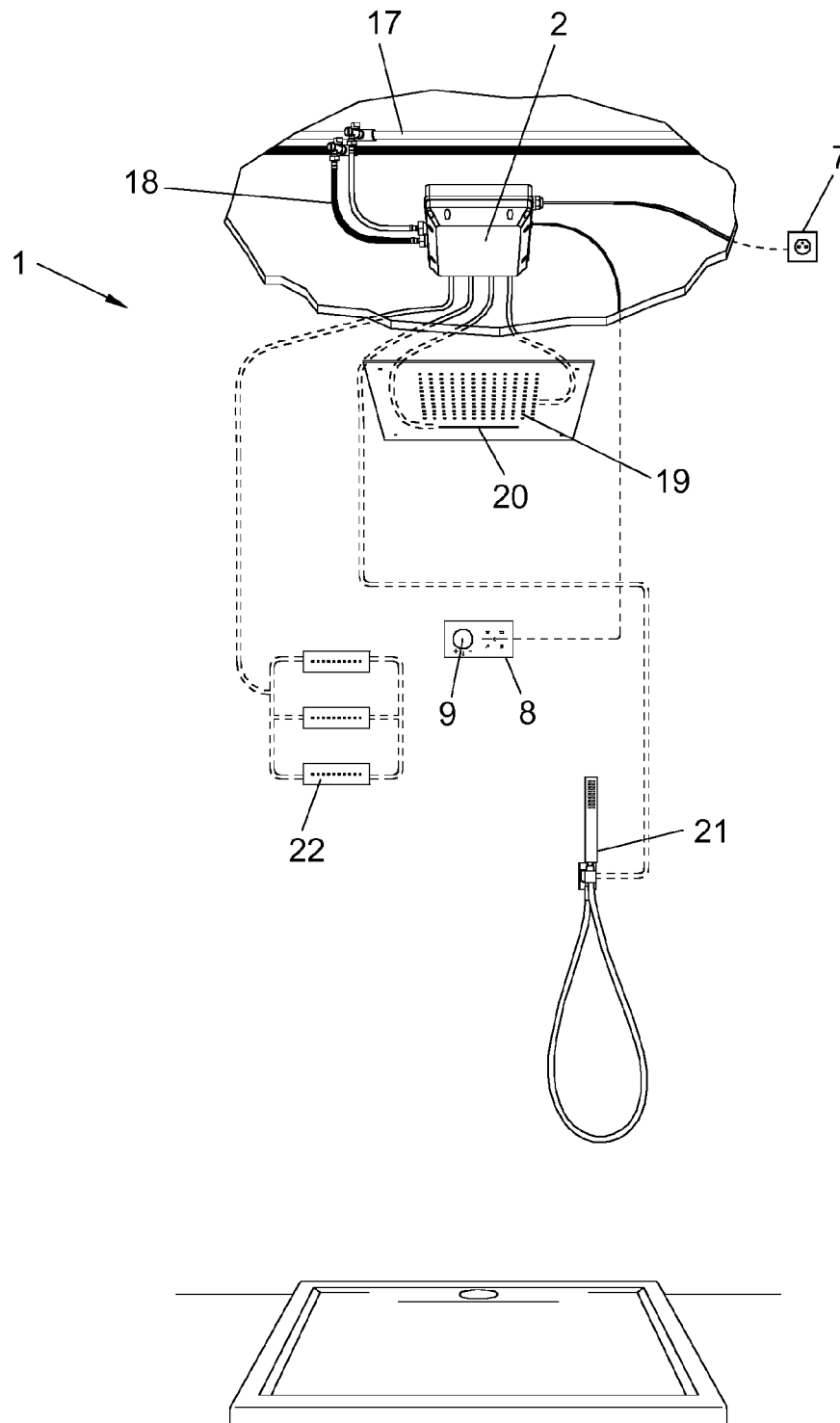


FIG. 7

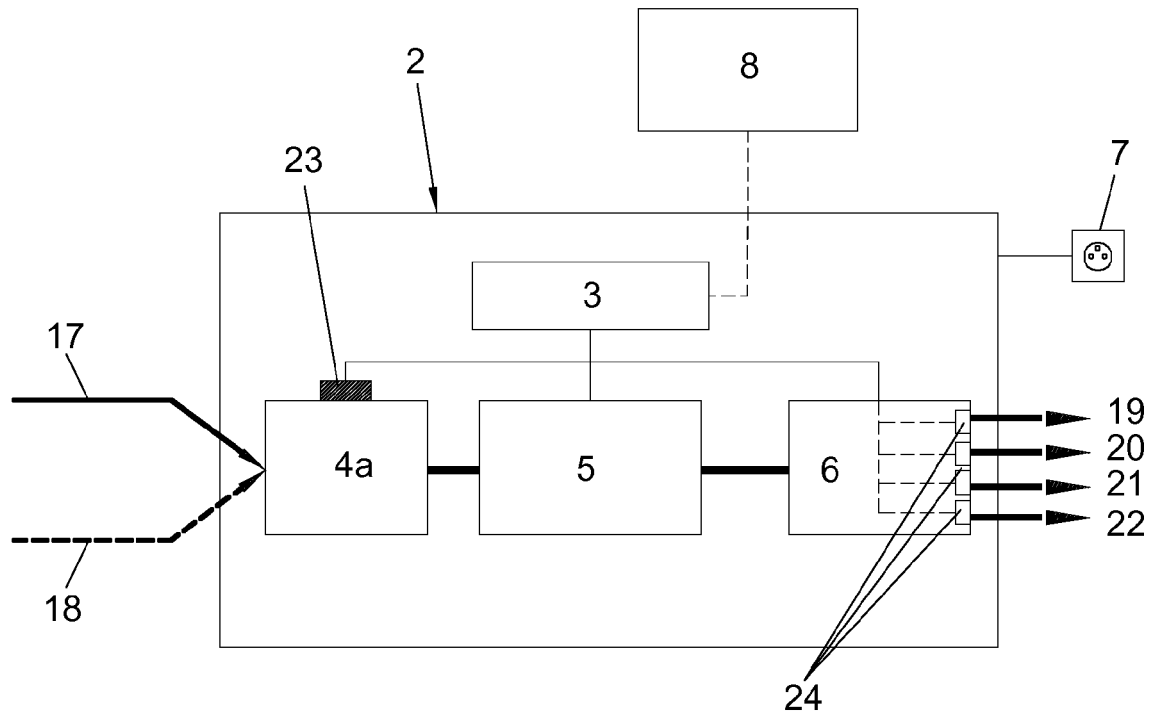
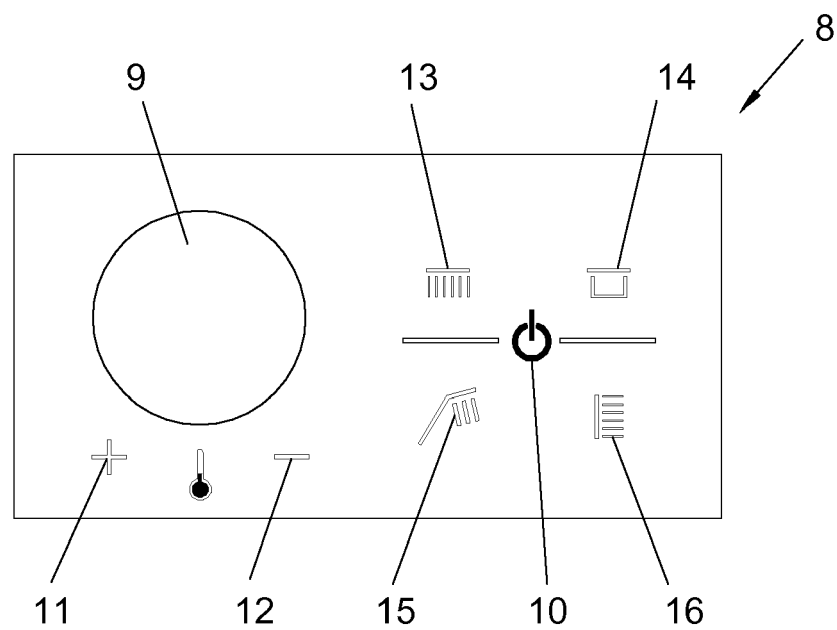
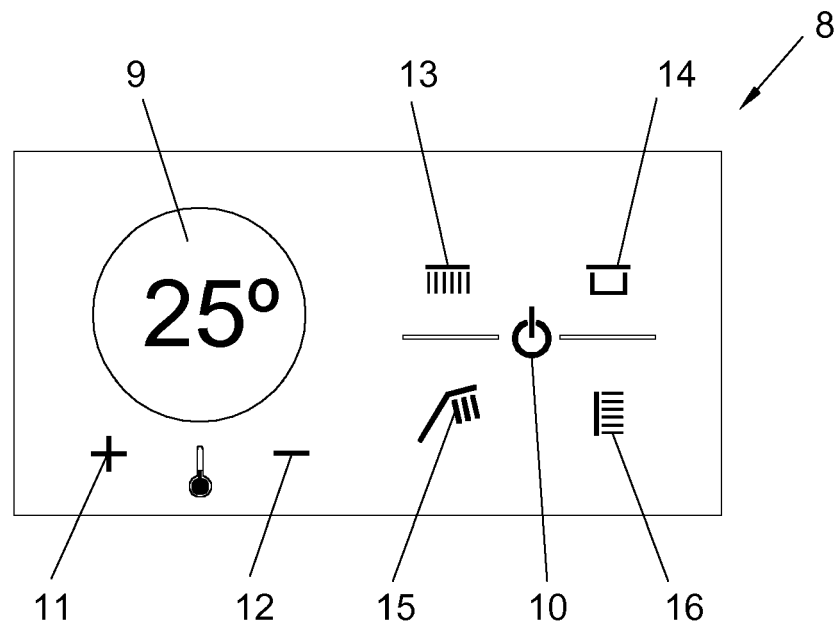


FIG. 8





EUROPEAN SEARCH REPORT

Application Number
EP 15 19 5970

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Place of search Munich		Date of completion of the search 15 April 2016	Examiner Leher, Valentina
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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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-04-2016

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