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(72) Inventor: **Guzzini, Mauro**
62019 Recanati (IT)

(74) Representative: **Jorio, Paolo et al**
STUDIO TORTA S.r.l.
Via Viotti, 9
10121 Torino (IT)

(71) Applicant: **TEUCO GUZZINI S.p.A.**
62010 Montelupone (IT)

(54) **Sanitary fixture**

(57) A sanitary fixture (1) having a hydraulic device (10) for performing a number of hydraulic functions inside the sanitary fixture (1); a number of additional devices (11, 12, 13, 14) for performing a number of additional functions; and an interface device (15) having a number of control knobs (17, 18, 19) (23), each of which

is rotated manually about an axis of rotation (A, B, C) into a number of angular positions, each corresponding to a selection command to select a respective hydraulic or additional function, or to a regulating command to regulate at least one parameter of a previously selected hydraulic or additional function.

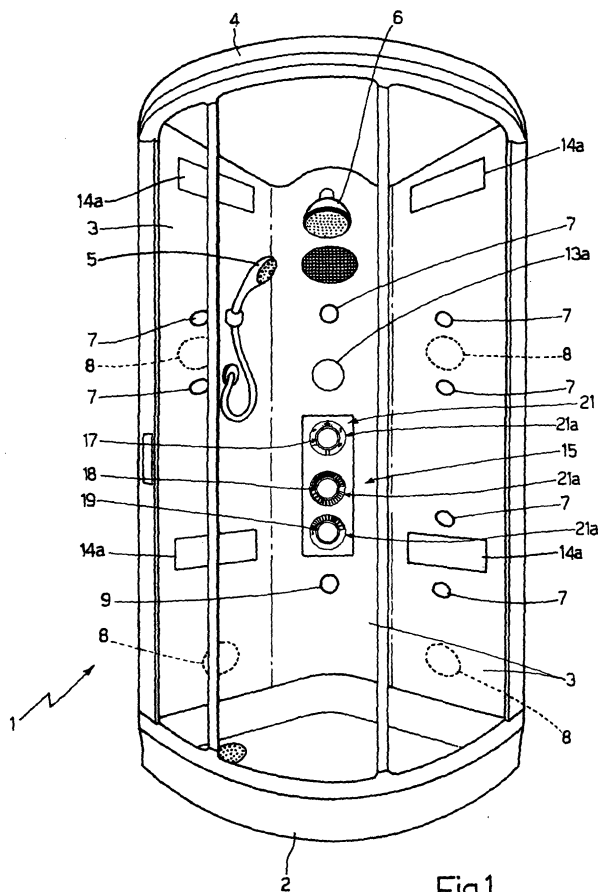


Fig.1

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Description

[0001] The present invention relates to a sanitary fixture.

[0002] As is known, over the past few years, highly advanced sanitary fixtures, particularly shower stalls, have been designed featuring devices which, in addition to conventional main hydraulic functions, e.g. shower and hydromassage, also provide for auxiliary functions, such as sauna, sound broadcasting, chromotherapy and aroma therapy.

[0003] To enable the user to activate each of the above functions manually, currently produced shower stalls are equipped inside with a mixer for controlling shower function parameters, and an interface device housed inside the shower stall, next to the mixer, to activate and control the auxiliary and hydromassage functions.

[0004] The mixer is defined by an ordinary handle for manually activating and regulating water supply flow and temperature, and the interface device comprises a control panel or keyboard comprising a number of keys, each related to a specific command to activate or regulate an auxiliary function. A control panel or keyboard for shower stalls performing auxiliary therapeutic functions is described in American Patent US-5,645,578 filed by Sybaritic, Inc. on 16.11.1994, and in American Patent US-6,623,511 filed by Visibelle Derma Institute, Inc. on 6.11.2000.

[0005] In actual use, the user of the shower stall regulates the shower function, i.e. water flow and temperature, using the handle, and keys in commands on the control keyboard to select and regulate the auxiliary functions and so "configure" the shower stall as required.

[0006] Unfortunately, the handle and interface device occupy large part of the space available inside the shower stall, thus causing a certain amount of discomfort to the user. Moreover, whereas the shower function handle is easy enough to use, the control panel or keyboard has a large number of keys which make keying-in of the commands to activate and regulate the functions awkward and far from intuitive on the part of the user.

[0007] It is an object of the present invention to provide a sanitary fixture comprising an interface device which is compact, and is easy to use to control the functions performed by the sanitary fixture.

[0008] According to the present invention, there is provided a sanitary fixture as claimed in Claim 1 and, preferably, in any one of the following Claims depending directly or indirectly on Claim 1.

[0009] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic front view of a sanitary fixture in accordance with the teachings of the present invention;

Figure 2 shows a circuit block diagram of a group of operating units forming part of the Figure 1 sanitary fixture;

Figures 3 and 4 show an interface device of the sanitary fixture in two different operating conditions; Figure 5 shows, schematically, a first variation of an interface device employed in the Figure 1 sanitary fixture;

Figure 6 shows, schematically, a second variation of an interface device employed in the Figure 1 sanitary fixture.

[0010] Number 1 in Figure 1 indicates as a whole a sanitary fixture comprising a horizontal bottom wall defined by a shower stand 2, from which extend upwards four vertical lateral walls 3 preferably made of plastic material and bounded at the top by a substantially horizontal wall 4.

[0011] Sanitary fixture 1 is fitted inside with a hand-shower 5; a shower head 6; and a number of nozzles, outlets and holes 7 arranged in a predetermined manner on lateral walls 3 to emit respective jets of water of given pressure from various points and in various directions into sanitary fixture 1 to perform a hydromassage function.

[0012] Sanitary fixture 1 also comprises a number of loudspeakers 8 fitted to lateral walls 3 to generate sound signals; and at least one nozzle or outlet 9 fitted to a lateral wall 3 to emit steam and hot air and so produce a sauna effect on the body of the user (not shown).

[0013] With reference to Figure 2, sanitary fixture 1 also comprises a number of control devices for activating and controlling the various functions performed by sanitary fixture 1. More specifically, the control devices comprise a hydraulic device 10 for regulating, on command, water temperature and flow from hand-shower 5 and/or shower head 6 and/or nozzles, outlets and holes 7.

[0014] Sanitary fixture 1 also comprises an additional device 11 for regulating steam and hot water time and/or temperature on command.

[0015] The control devices also comprise an additional audio device 12, which is connected to and supplies loudspeakers 8 with audio signals to permit sound broadcasting inside sanitary fixture 1. More specifically, additional audio device 12 preferably comprises a radio unit (not shown) tuneable to a radio channel to receive radio-frequency signals; and/or a sound reproduction unit (not shown) for reading preferably musical data stored in a known storage device, such as an optical disk (CD, DVD) or any other similar data storage device.

[0016] The control devices also comprise an additional device 13 for emitting aromatic substances from an outlet 13a on a wall 3 of sanitary fixture 1 (Figure 1); and a number of lighting devices 14, each for controlling one or more lighting sources 14a installed in sanitary fixture 1 (Figure 1), e.g. lamps or similar devices for emitting light of given colour and predetermined intensity.

[0017] Hereinafter, the functions performed by hydraulic device 10 described above, i.e. water supply from hand-shower 5 and/or shower head 6 and/or nozzles, outlets and holes 7, will be referred to as "hydraulic functions"; and the functions performed by additional devices 11-14, i.e. sauna, sound broadcasting, aroma emission and lighting, will be referred to as "additional functions".

[0018] Devices 10-14 referred to above are known and therefore not described in detail.

[0019] With reference to Figures 1 and 2, sanitary fixture 1 also comprises an interface device 15 enabling the user to manually select, activate and control the various functions performed by sanitary fixture 1; and a central control unit 16 comprising, for example, a micro-processor, which controls each device 10-14 on the basis of the commands selected and entered by the user by means of interface device 15.

[0020] Unlike the user interface panels of known sanitary fixtures, interface device 15 comprises a number of rotary control knobs, each of which rotates about its axis into a number of angular positions, each corresponding to a command to select and activate one of the functions performed by sanitary fixture 1, and/or to regulate the characteristic parameters of the selected function. In other words, by turning the control knobs of interface device 15, the user can advantageously select, activate and regulate both the hydraulic and additional functions.

[0021] Interface device 15 also comprises a display device 21 which, in use, as the user turns the control knobs, displays the selected and/or selectable function and the values assigned to the characteristic parameters of the function.

[0022] In the Figure 1 and 2 example, interface device 15 comprises three rotary control knobs, which are located on the central wall 3 of sanitary fixture 1, are aligned in a preferably vertical direction and a predetermined distance apart, and rotate about respective parallel axes A, B and C.

[0023] Display device 21 comprises three display rings 21a, each of which extends, on wall 3, about a respective control knob to display and/or indicate the command associated with the angular position assumed, at each instant, by the respective rotary control knob.

[0024] More specifically, interface device 15 comprises a first control knob 17 for selecting and activating each of the functions performable by sanitary fixture 1; and a second and third control knob 18 and 19 for regulating the characteristic parameters of the function selected using control knob 17.

[0025] With reference to the example shown in Figures 1 and 2, rotation of the top control knob 17 provides for selecting and turning on/off one of the hydraulic functions comprising water supply by the hand-shower or shower head or hydromassage, and the additional functions comprising sauna, sound broadcasting, aroma emission, and interior lighting.

[0026] The second and third control knobs 18 and 19 each provide for regulating the characteristic parameters of the above functions. More specifically, when control knob 17 is set to select and activate the hydraulic function of water supply by hand-shower 5, manual rotation of control knobs 18 and 19 to the various angular positions provides for regulating the temperature and flow respectively of water supply by hand-shower 5. Similarly, when the hydraulic function of water supply by shower head 6 is selected, manual rotation of control knobs 18 and 19 provides for regulating the temperature and flow respectively of water supply by shower head 6. When control knob 17 is set to the angular position corresponding to selection of the hydraulic hydromassage function, rotation of control knobs 18 and 19 provides for regulating the temperature and flow respectively of water supply by nozzles, outlets and holes 7.

[0027] When the additional sauna function is selected, rotation of control knobs 18 and 19 provides for regulating the steam temperature parameter and sauna time parameter respectively. When control knob 17 is set to the angular position corresponding to selection of the additional sound function, rotation of control knobs 18 and 19 provides for selecting a piece of music or a radio station and for adjusting volume respectively.

[0028] When the additional aroma emission function is selected and activated, rotation of control knobs 18 and 19 provides for selecting the type of aroma and regulating the strength of the selected aroma respectively. When control knob 17 is set to the angular position corresponding to selection of the additional lighting function, rotation of control knobs 18 and 19 provides for selecting the colour and regulating the brightness of the light respectively.

[0029] In connection with the above, it should be pointed out that rotation of control knob 17 to select and activate a given function preferably produces a corresponding predetermined graphic configuration of display rings 21a surrounding control knobs 18 and 19, so as to provide the user with a display of the values assumed by the parameters of the selected function, as each control knob 18 or 19 is turned.

[0030] More specifically, with reference to the example shown in Figures 3 and 4, rotation of control knob 17 to select and activate a given function automatically activates a respective graphic configuration of display rings 21a of control knobs 18 and 19. More specifically, when control knob 17 is set to select the function, central control unit 16 commands a graphic variation of display rings 21a surrounding control knobs 18 and 19, each of which display rings is defined by a circular or semicircular graduated scale comprising a number of luminous markings which come on/go off sequentially, depending on the angular position of the relative control knob, to indicate at each instant the value assigned to the corresponding parameter. More specifically, each display ring 21a may comprise, for example, a circular or semicircular liquid crystal or LED display, and/or a dial or half-dial

(e.g. a screen-printed dial or half-dial) resting on and covering the luminous face of the display, and which is appropriately backlit by the LEDs as the control knob is turned.

[0031] In addition to rotating about respective axis A, B, C to select functions and/or regulate parameters, each control knob 17, 18, 19 preferably, though not necessarily, also acts as a control button to confirm the selected function and automatically set a predetermined parameter value.

[0032] More specifically, besides rotating about axis A to select a function, control knob 17 can also be pressed temporarily by the user along axis A to confirm and activate a previously selected function. Similarly, besides rotating about respective axis B, C to regulate the relative parameter, each control knob 18, 19 can be pressed temporarily by the user along the respective axis to activate a procedure by which a predetermined value is automatically assigned to the corresponding parameter. For example, when first control knob 17 is set to select and activate the sauna function, temporary pressure on second control knob 18 automatically assigns a predetermined mean time to the sauna time parameter, and temporary pressure on third control knob 19 automatically assigns a predetermined mean temperature to the sauna temperature parameter. The values of the parameters characterizing each of the functions performed by sanitary fixture 1 may obviously also be assigned automatically in exactly the same way.

[0033] With reference to Figure 2, interface device 15 also comprises a command control block 20 connected electrically and mechanically to control knobs 17, 18, 19 in known manner to translate the angular position of, and preferably pressure on, each control knob into an electric control signal S_{COM} coding the above information. In connection with the above, it should be pointed out that command control block 20 may be connected to control knobs 17-19 by a preferably "click-on" mechanical connection system enabling control knob 17-19 to be click-operated to activate the selected function or automatically assign the predetermined parameter value.

[0034] Central control unit 16 is connected to command control block 20 to receive control signal S_{COM} , and, depending on the information in control signal S_{COM} , commands the graphic configuration of the display rings and controls devices 10-14.

[0035] In actual use, when the user touches one of the control knobs, this activates display ring 21a of first control knob 17, which displays the various selectable functions, each represented by a symbol, e.g. a graphic icon. For this purpose, interface device 15 is equipped with contact sensors (not shown) integrated in control knobs 17, 18, 19 to supply an output signal indicating user contact of a control knob.

[0036] Function selection is made by the user turning control knob 17. As control knob 17 is turned, the corresponding display ring 21a indicates instant by instant,

and by an increase in brightness level, the symbol of the function corresponding to the angular position of control knob 17; and, once control knob 17 is set to the angular position corresponding to the selected function, this is activated by the user clicking control knob 17. At this point, command control block 20 supplies signal S_{COM} to central control unit 16, which activates the device corresponding to the selected function, and commands the graphic configuration of display rings 21a of control knobs 18 and 19 according to the parameters of the selected function. Once the device is activated, the symbol corresponding to the activated function lights up to a predetermined brightness.

[0037] At this point, the user can either turn control knobs 18 and 19 to assign desired values to the corresponding parameters, or may click control knobs 18 and 19 to assign the parameter values automatically. At this point too, command control block 20 supplies signal S_{COM} to central control unit 16, which regulates the parameters of the device corresponding to the selected function on the basis of the variation made by the user. After activating the first function, the user may turn first control knob 17 again to activate other functions and regulate the relative parameters by means of control knobs 18 and 19. When selecting multiple functions, display ring 21a of control knob 17 indicates the symbols corresponding to the functions still active. It should be pointed out that a function is deactivated in exactly the same way in which it is activated, i.e. by turning control knob 17 to the angular position corresponding to the function to be deactivated, and then clicking control knob 17.

[0038] Sanitary fixture 1 has various advantages. In particular, user interface device 15 of sanitary fixture 1 is extremely compact as compared with known user interface panels. In fact, by automatically configuring the commands imparted by second and third control knobs 18 and 19, and the respective display rings 21a, on the basis of the function selected by first control knob 17, the external user interface is simplified by using only three control knobs, as opposed to a control keyboard with an extremely large number of keys. Simplifying the user interface in this way obviously has the big advantage of completely eliminating the control keyboard, and enabling the user to select both the hydraulic and additional functions by simply turning the control knobs.

[0039] Clearly, changes may be made to sanitary fixture 1 as described and illustrated herein without, however, departing from the scope of the present invention.

[0040] In particular, in an alternative embodiment, as opposed to three control knobs, user interface device 15 comprises one control knob 23, by which the user imparts the same commands to sanitary fixture 1 as those described above relative to the three knobs 17-19; and one command display ring 23a.

[0041] With reference to the Figure 5 example, control knob 23 is movable axially into three axial positions corresponding to three respective selection planes : a first

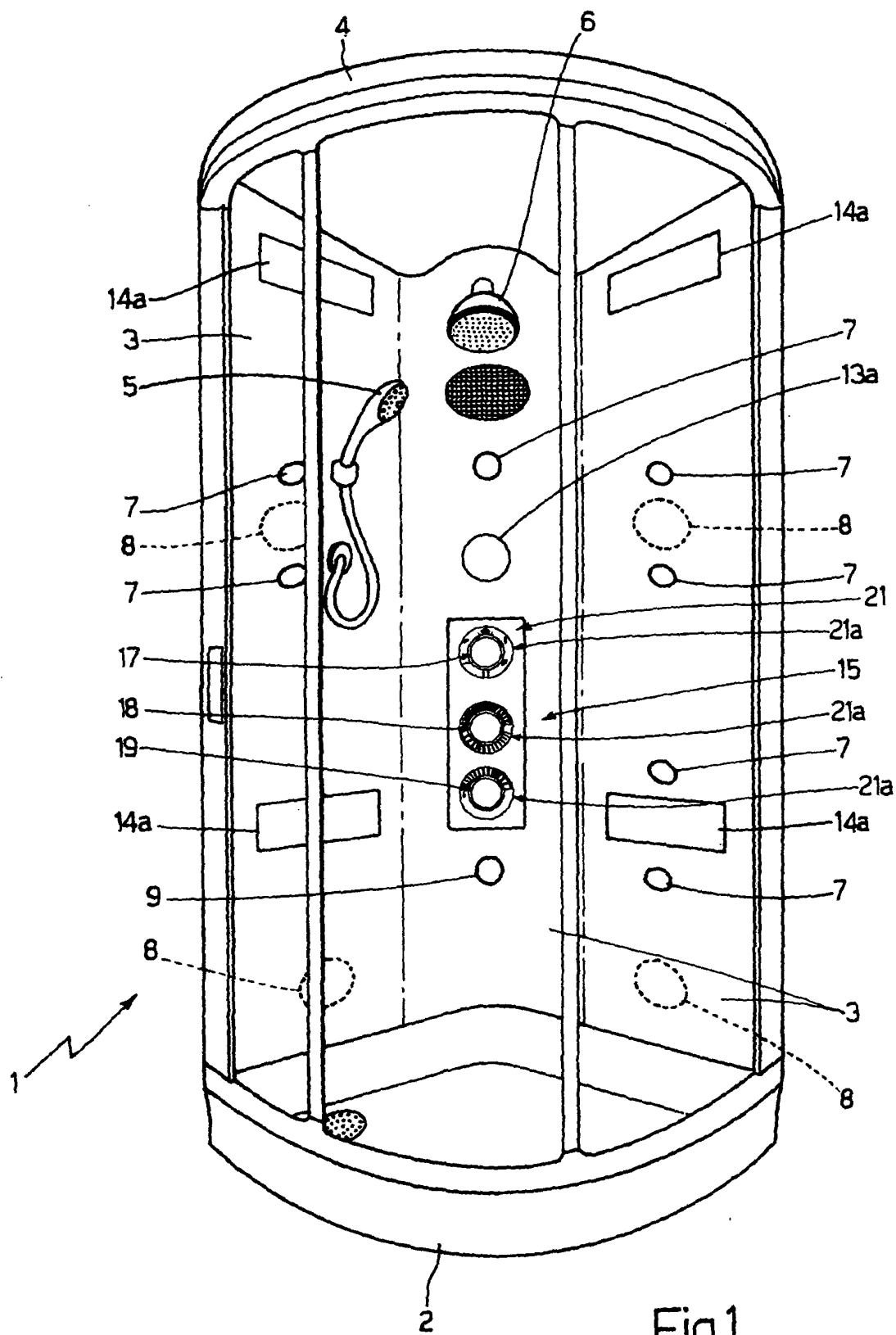
axial position P1 corresponds to a function selection plane, and a second and third axial position P2 and P3 each correspond to a respective selection plane relative to commands to assign values to the characteristic parameters of the selected function.

[0042] In an alternative embodiment shown in Figure 6, display device 21 comprises a preferably, though not necessarily, rectangular display located next to, and for displaying the commands selected by, control knobs 17, 18, 19.

Claims

1. A sanitary fixture (1) comprising hydraulic means (10) for performing a number of hydraulic functions in the space inside said sanitary fixture; additional means (11, 12, 13, 14) for performing a number of additional functions, each comprising a sauna function, or a sound broadcasting function, or a lighting function, or an aroma emission function; and an interface device (15) allowing a user to manually control each said hydraulic or additional function; said sanitary fixture being **characterized in that** said interface device (15) comprises control knob means (17, 18, 19) (23) which are rotated manually about an axis of rotation (A, B, C) into a number of angular positions, each corresponding to a selection command to select a respective hydraulic or additional function, or to a regulating command to regulate at least one parameter of the previously selected said hydraulic or additional function.
2. A sanitary fixture as claimed in Claim 1, **characterized in that** said control knob means (17, 18, 19) comprise a first control knob (17) which rotates about an axis of rotation (A) into a number of angular positions, each corresponding to a selection command to select a respective hydraulic or additional function; and at least one second control knob (18, 19) which rotates about a respective axis of rotation (B, C) to regulate at least one parameter of the hydraulic or additional function previously selected by means of said first control knob (17).
3. A sanitary fixture as claimed in Claim 1, **characterized in that** said control knob means (23) comprise at least one control knob (23) which is movable axially along a relative axis of rotation (A) into at least three axial positions (P1, P2, P3); in one said axial position, each angular position of said control knob (23) corresponding to a selection command to select a respective hydraulic or additional function; and, in each of the other axial positions, rotation of said control knob (23) corresponding to regulation of a respective parameter of the previously selected said function.

4. A sanitary fixture as claimed in any one of the foregoing Claims, **characterized in that** said interface device (15) comprises display means (21, 23a) for displaying the selectable functions and/or the selected function, and the value assigned to the parameter of said selected function.
5. A sanitary fixture as claimed in Claims 1, 2 and 4, **characterized in that** said display means (21, 23a) comprise a first display ring (21a) associated with said first control knob (17) and for displaying the selectable functions and/or the selected function; and at least one second display ring (21a) associated with said at least one second control knob (18, 19) and for displaying the value assigned to the parameter of said selected function.
6. A sanitary fixture as claimed in Claim 5, **characterized by** comprising processing means (16) for varying the graphic configuration of said second display ring (21a) on the basis of the function selected by means of said first control knob (17).
7. A sanitary fixture as claimed in any one of the foregoing Claims, **characterized in that** said hydraulic means (10) comprise a device (10) for controlling water supply by a hand-shower (5) and/or by a shower head (6) and/or by hydromassage outlets or holes (7); and **in that** said additional means (11, 12, 13, 14) comprise a sauna regulating device (11) and/or a sound broadcasting device (12) and/or a lighting regulating device (14) and/or a device for controlling the emission of aromatic substances (13).
8. A sanitary fixture as claimed in any one of the foregoing Claims, **characterized in that** said control knob means (17, 18, 19) (23) comprise means (20) for translating rotation of said control knob means (17, 18, 19) (23) into each said angular position into a relative electric control signal (S_{COM}) coding a selection command to select a function or regulation of a parameter of the selected function.



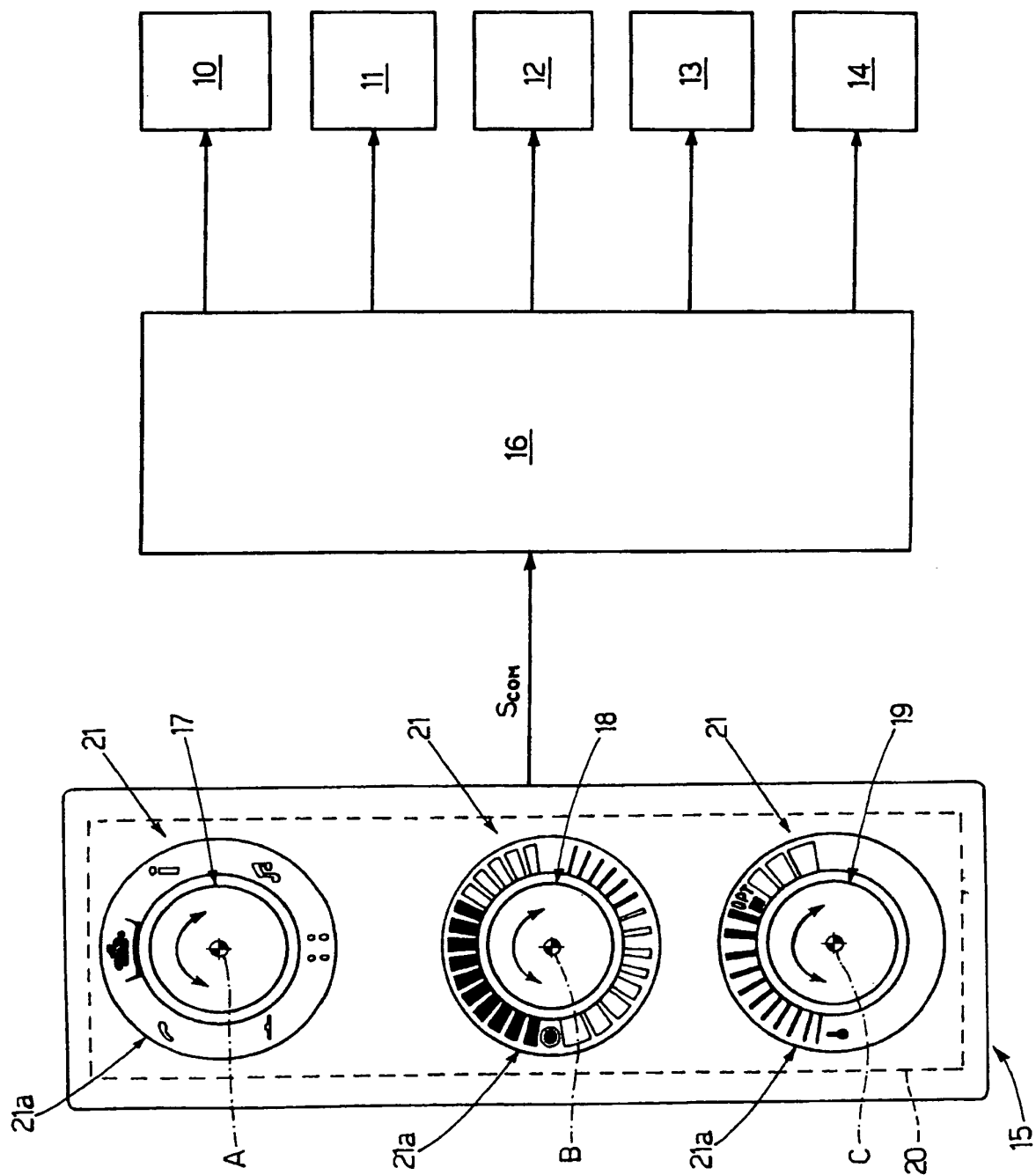
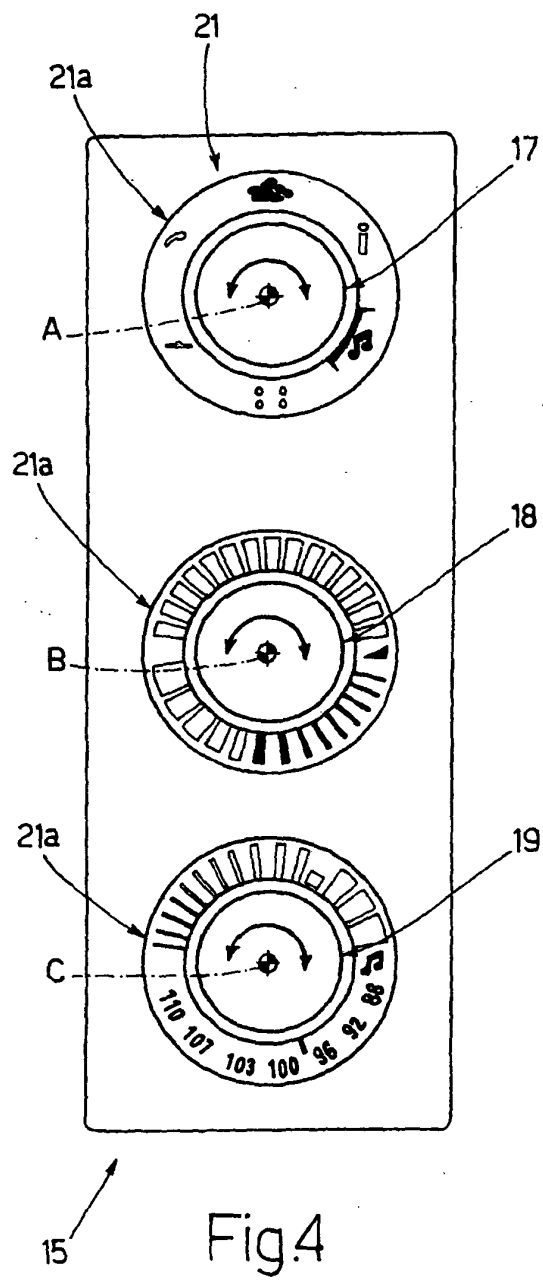
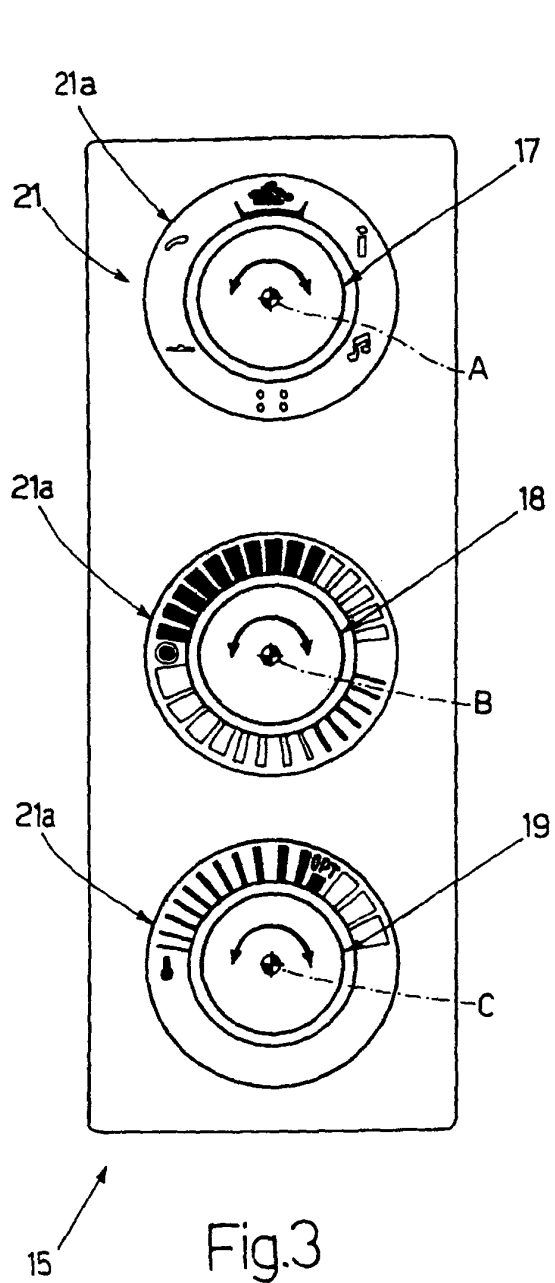


Fig. 2



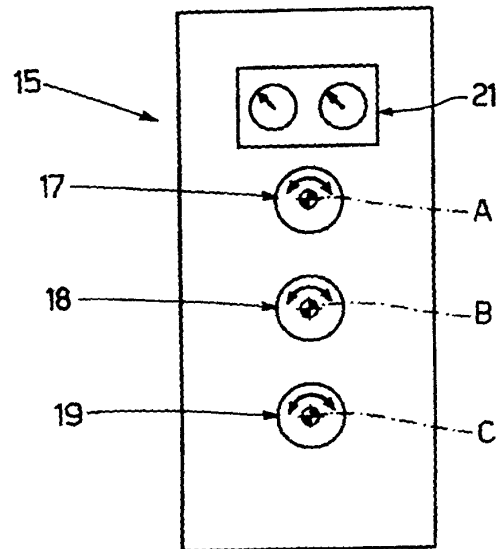


Fig.6

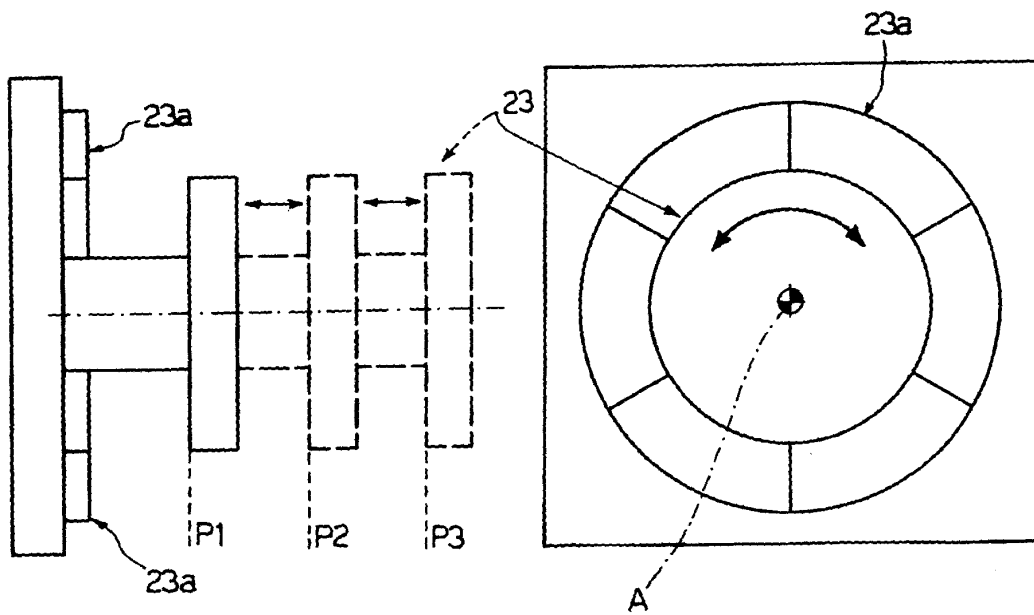


Fig.5



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EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5451

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		13 October 2004	Delzor, F
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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