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(54) Visualization device, particularly for keypads or remote controls

(57) A visualization device, particularly for keypads or remote controls that comprises a box-like frame (2) containing a printed circuit (3) that has, in an upward region, at least one display (4) and at least one luminous indicator (6). The device is constituted by at least one actuator (10) that is arranged below the printed circuit (3). The actuator (10) is adapted to backlight at least one transparent portion of a wall (12) of the box-like frame (2).

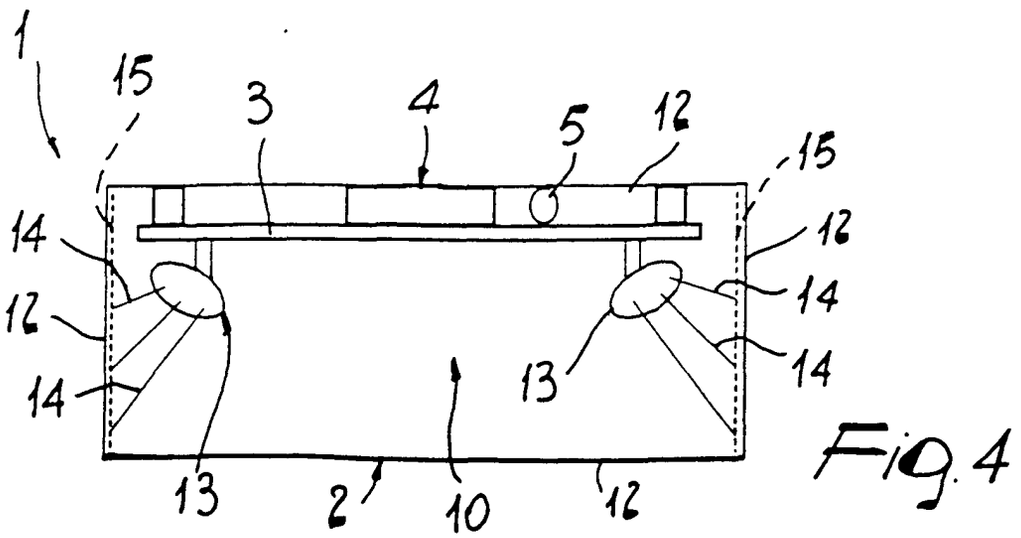

Fig. 4

EP 1 298 686 A1

Description

[0001] The present invention relates to a visualization device, particularly for keypads or remote controls.

[0002] Nowadays it is known to use, particularly in shower cubicles and/or in whirlpool baths, keypads which are usually constituted by a box-like frame that is mounted external to, or embedded in the shower cubicle and/or whirlpool bath and contains a mains-powered printed circuit that has at least one display and a few luminous indicators (LEDs) in addition to a series of buttons.

[0003] By means of the keypad, therefore, the user can set a function chosen among multiple functions that can be indicated on the display, the choice being displayed by way of the luminous indicators.

[0004] However, this known method has drawbacks, since the identification of the chosen function or of the connection to the electrical mains is scarcely visible because it is performed by means of a LED or by means of segments of a display (an apparatus that visualizes numerical or graphical data in output from a system, allowing straightforward reading thereof), which are illuminated but very small and in any case difficult to identify at a glance.

[0005] Specifically when used in a shower cubicle, the use of a simple, direct and localized LED with a small diameter or length of light emission, does not allow the user to determine promptly the status of the chosen function or for example the connection to the electrical mains, this last function being required by a standard currently in force.

[0006] The connection to the electrical mains, for example, is also hardly visible as well as the other chosen functions, because usually a glass closure for the front part of the keypad as a whole is provided, and said glass closure may be curved and usually wet.

[0007] Even worse conditions occur if the shower cubicle is filled with steam because it is used as a shower or as a sauna, and this fact further limits considerably the visibility of the data present on the keypad in addition to the exact location thereof.

[0008] The same remarks apply to keypads used in whirlpool baths.

[0009] The aim of the present invention is therefore to solve the noted technical problems by eliminating the drawbacks of the cited known art and thus providing a visualization device that can be used in keypads or remote controls and allows to visualize, in a manner that is straightforward for the user, the particular chosen function or the state of the connection to the mains of said keypad.

[0010] Within the scope of this aim, an important object is to provide an invention that can be used in keypads or remote controls, for example of shower cubicles or whirlpool baths, allowing, even in the presence of steam, optimum visualization for immediate perception, on the part of the user, of the chosen functions or of the state of the connection to the mains of the keypad.

[0011] Another important object is to provide an invention that allows optimum visualization even if a curved protective glass panel is present.

[0012] Another important object is to provide an invention that is structurally simple and has modest manufacturing costs.

[0013] This aim and these and other objects that will become better apparent hereinafter are achieved by a visualization device, particularly for keypads or remote controls that comprises a box-like frame containing a printed circuit that has, in an upward region, at least one display and at least one luminous indicator, characterized in that it comprises arranged below said printed circuit at least one actuator that is adapted to backlight at least one transparent portion of a wall of said box-like frame.

[0014] Further characteristics and advantages of the invention will become better apparent from the detailed description of a particular but not exclusive embodiment, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a plan view of an example of a keypad with the visualization device inactive;

Figure 2 is a view of the keypad of Figure 1 with the visualization device activated;

Figure 3 is a block diagram;

Figure 4 is a schematic view of the visualization device.

[0015] With reference to the figures cited above, the reference numeral 1 designates a keypad or remote control, of the type that can be used particularly in a shower cubicle or in whirlpool baths.

[0016] Said keypad or remote control is constituted by a box-like frame 2, which internally comprises a printed circuit 3 that has, at one surface, which is referenced here as upper surface, at least one visual display device 4, such as a display, one or more buttons 5, and one or more LEDs 6.

[0017] The keypad or remote control 1 is advantageously connected to a safety transformer 7, which is accommodated for example in an external box and is powered by the electrical mains 8, and is suitable to reduce the mains voltage for example to 5-12 V DC.

[0018] There is also a power board 9, which contains all the electronic components required to operate the display 4 and the LED 6 and a visualization device, designated by the reference numeral 10, which is contained within the keypad or remote control 1.

[0019] Said power board can optionally also comprise the safety transformer 7.

[0020] The connection between the power board 9 and the keypad or remote control 1 can occur, for ex-

ample, by means of a serial-type communication.

[0021] There is also a microprocessor 11, which controls all the normal automations of the operation and visual indication of the LEDs 6, of the display 4 and of the visualization device 10.

[0022] Said visualization device is constituted by at least one actuator, which is arranged at the lower surface of the printed circuit 3 and therefore on the opposite side with respect to the display 4 and the LEDs 6.

[0023] Said actuator is constituted, for example, by an LED or a lamp or by an optical fiber or an electroluminescent sheet, which are all suitable to backlight at least one advantageously transparent portion of a wall 12 of the box-like frame 2.

[0024] In the illustrated solution and in Figures 1 and 2, said wall is the upper wall. Said wall may also be one of the side walls, if they are for example inclined with respect to the upper wall, and the portion affected by the backlighting may also correspond to the entire chosen wall of the box-like frame.

[0025] The reference numeral 13 therefore designates an LED or a low-voltage lamp or an optical fiber or an electroluminescent sheet arranged below the printed circuit 3 and therefore directed away from the display 4 and the LEDs 5; said actuator transmits light directly onto one or more of said walls 12 or by using suitable optical fibers 14 or with an electroluminescent sheet 15.

[0026] Optionally, the solutions chosen for the actuator can be accessorized for example with chromium-plated domes (not shown) for example for changing the lens effect on the wall 12.

[0027] The actuator can of course, during its operation, have a steady or flashing light according to a chosen function preselected by the user or to indicate the mains connection.

[0028] The actuator may also of course emit light as one or more variously colored beams, which according to the intended situation can light up or flash in a dangerous condition or when a chosen type of operation is in progress.

[0029] If the actuator is composed of LEDs or lamps, they can be equipped or not with parabolic reflectors with various angles of reflection of the light in relation to the shape of the wall of the keypad or remote control, in order to transmit light in the best way.

[0030] It has thus been found that the invention has achieved the intended aim and objects, a device having been provided which allows a user of a shower cubicle or whirlpool bath to be better aware of the status of the function preselected by means of the keypads or the remote control and of any danger or malfunction signals.

[0031] Furthermore, the illustrated visualization device allows not only to make it straightforward to detect the type of function chosen as a function of the backlit portion of the wall, but also allows this optimum viewing even if the shower cubicle or the whirlpool bath are filled with steam or there is moisture at the keypad or remote control, since the visualization device can create actual beams of light that actually color the steam or water.

[0032] Therefore, there is an evident improvement, with respect to the known art, of the visibility of the placement and state of operation of the keypad or remote control.

[0033] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0034] The materials and the dimensions that constitute the individual components of the invention may of course also be more pertinent according to the specific requirements.

[0035] The various means for performing certain different functions need not certainly coexist only in relation to the illustrated embodiment, but may be present per se in many embodiments, even embodiments that are not illustrated.

[0036] The disclosures in Italian Patent Application No. TV2001A000135 from which this application claims priority are incorporated herein by reference.

[0037] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A visualization device, particularly for keypads or remote controls that comprises a box-like frame (2) containing a printed circuit (3) that has, in an upward region, at least one display (4) and at least one luminous indicator (6), **characterized in that** it comprises arranged below said printed circuit (3) at least one actuator (10) that is adapted to backlight at least one transparent portion of a wall (12) of said box-like frame (2).

2. A visualization device, particularly for keypads or remote controls that comprises a box-like frame (2) containing a printed circuit (3) that has, in an upward region, at least one display (4) and at least one luminous indicator (6), **characterized in that** it is constituted by an actuator (10) adapted to backlight at least one transparent portion of a wall (12) of said box-like frame (2).

3. The device according to claim 1 or 2, **characterized in that** said actuator (10) is arranged at the lower surface of said printed circuit (11) on the opposite side with respect to said display (4) and said luminous indicator (6).

4. The device according to one or more of the preced-

ing claims, **characterized in that** said actuator (10) transmits light, by way of optical fibers (14), onto one or more of said transparent portions of at least one wall (12) of said box-like frame.

5. The device according to one or more of the preceding claims, **characterized in that** it comprises a chromium-plated dome, adapted to change the lens effect on said wall (12) of said box-like frame, which is associated with said actuator (10).

6. The device according to one or more of the preceding claims, **characterized in that** said at least one actuator (10) emits one or more colored light beams.

7. The device according to one or more of the preceding claims, **characterized in that** it comprises a safety transformer (7), adapted to reduce the mains voltage to 5-12 volts DC.

8. The device according to claim 7, **characterized in that** it comprises a power board (9) that is adapted to comprise and supply said at least one display (4), buttons (5), said luminous indicator (6) and said actuator (10).

9. The device according to claim 8, **characterized in that** it comprises a serial communication between said power board (9) and said keypad or remote control (1).

10. The device according to claim 9, **characterized in that** it comprises a microprocessor (11) that is adapted to control the normal automations of operation and visual indication of said at least one display (4), said luminous indicator (6) and said actuator (10).

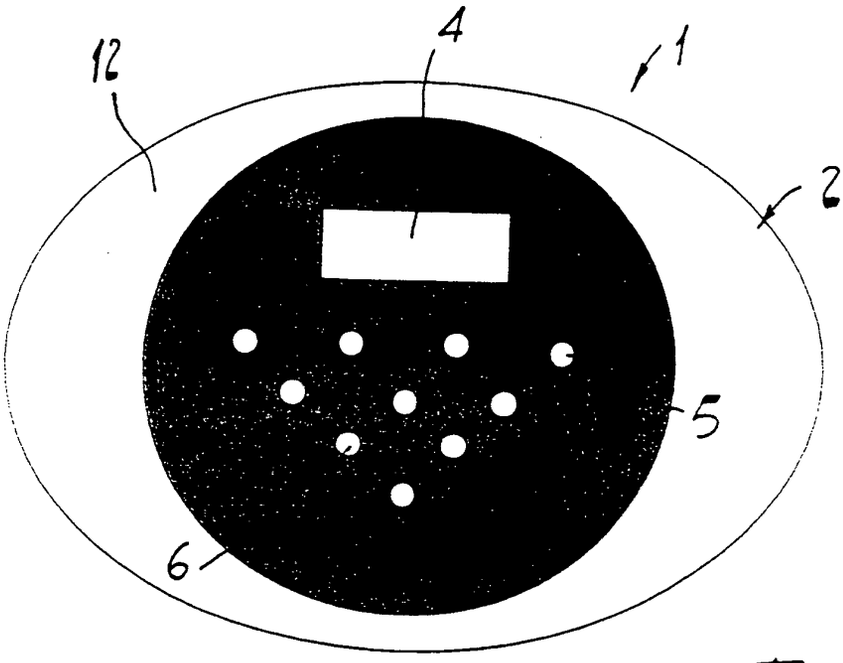

Fig. 1

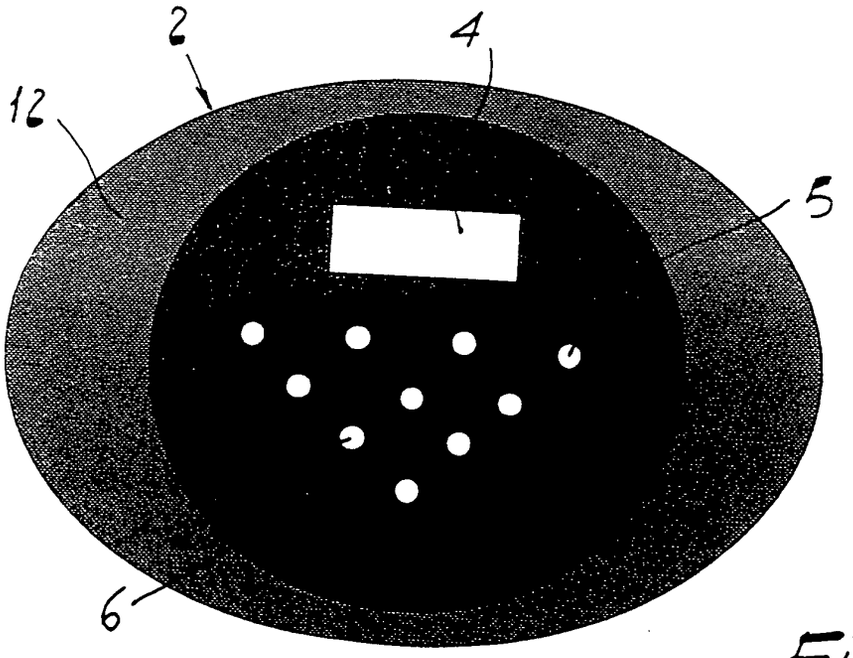

Fig. 2

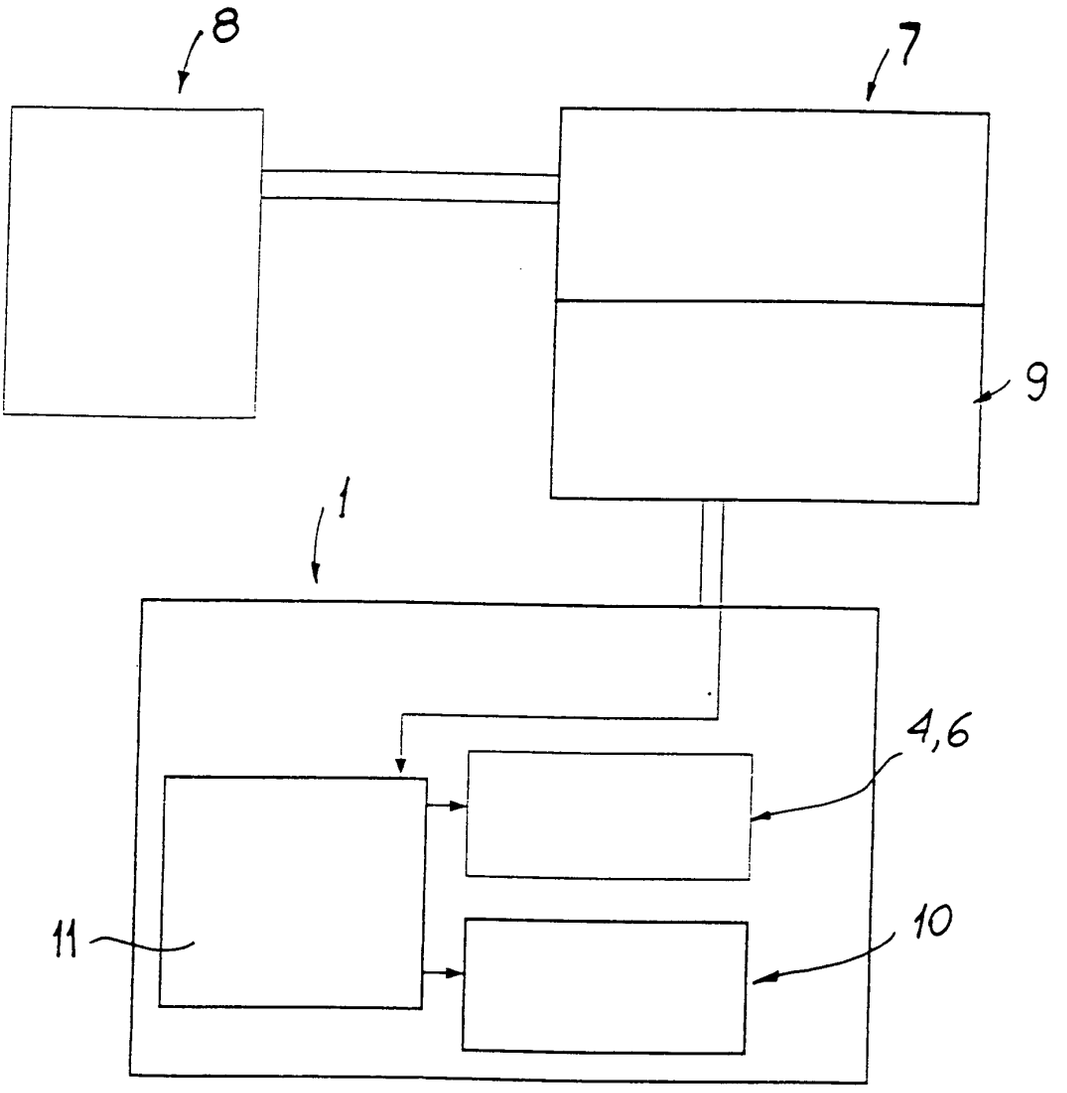

Fig. 3

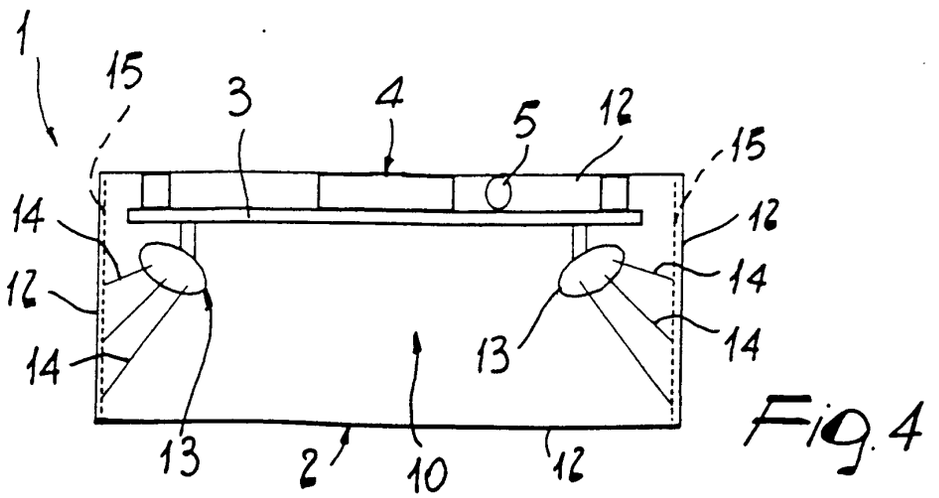

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 02 02 1313

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 109 380 A (NOKIA MOBILE PHONES LTD) 20 June 2001 (2001-06-20) * column 5, line 3 - column 5, line 11; figures 1-4 *	1,2,4,6	H01H9/02 H01H9/16
A	KR 262 394 B (RINNAI KK ;RINNAI KOREA CORP (KR)) 1 August 2000 (2000-08-01) * the whole document *	1-10	
A	JP 10 050163 A (RINNAI CORP) 20 February 1998 (1998-02-20) * the whole document *	1-10	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

H01H
H04M

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	23 January 2003	Simonini, S

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 02 1313

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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23-01-2003

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