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(54) **PORTABLE REMOTE CONTROL DEVICE, PREFERABLY FOR USE IN THE HOME**

(57) Remote control device (10), of the portable and wireless type, configured to command one or more electric actuation devices (43, 45, 47) of an apparatus (12), for example a pergola. The remote control device (10) comprises a microprocessor with which there are associated a magnetometer and an accelerometer to detect the angular position in space of the remote control device (10) and consequently command the electric actuation devices (43, 45, 47) of the apparatus (12).

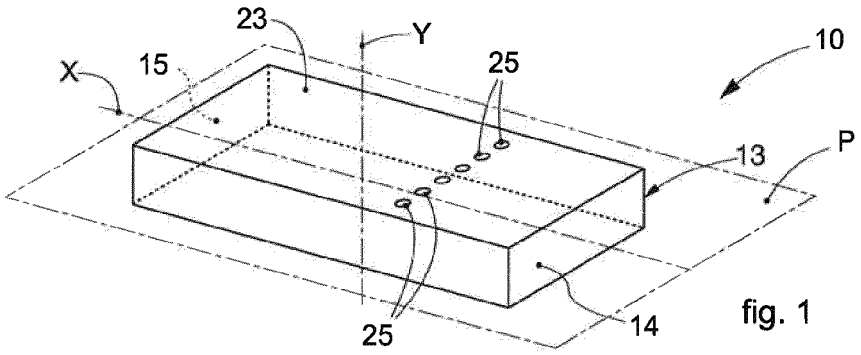


fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a control device of the portable type, for example of the handheld type, which can be used preferably, but not exclusively, in the home, to remotely and wirelessly control the operation of electrical or electronic actuation devices and apparatuses, suitable to command, for example, the movement of mobile parts of fixtures, or blinds, and/or the switching on, switching off, the intensity or color of the light emitted by lighting devices, by moving the control device in space. A particular application of the remote control device according to the present invention is a pergola.

BACKGROUND OF THE INVENTION

[0002] Portable and handheld remote control devices are known, also known by the term "remote controls", or "radio controls", which can be used to remotely and wirelessly control actuation devices and apparatuses such as for example lighting devices, moving parts of fixtures and/or other electrical and electronic devices.

[0003] Among these known devices, infrared remote controls are included, which function through the exchange of signals between a source device, or remote control proper, and a receiving device, normally positioned inside the apparatus to be commanded. This exchange of signals occurs through the propagation of an infrared ray, emitted for example by an LED, located on the source device. However, this exchange of signals requires that the transmitting and receiving sources are aligned with each other, and that there is no obstacle between them.

[0004] Furthermore, possible electromagnetic disturbances during the transmission of the signal could compromise the correct transfer of data between the known remote control and the apparatus receiving the signal, making a new attempt to send the signals necessary.

[0005] Remote controls are also known which use the known Bluetooth standard and which base their operation on the exchange of signals between a source device and a receiving device through short-range radio frequencies which satisfy said technical standard of data transmission. One disadvantage of this type of known control devices is that the devices connected using this technology have to be previously connected to each other.

[0006] Unfortunately, the connection between two devices can be undesirably interrupted for various reasons, including the presence of electromagnetic fields, making a new connection procedure necessary, which, in the case of known devices that use different Bluetooth modules, may also require a long time.

[0007] In the field of portable remote control devices, remote control devices 10 are also known, which base their operation on the exchange of radio signals between transmitting devices and receiving devices.

[0008] Furthermore, all of the known devices described above have the disadvantage of being equipped with many control buttons, or keys, which in the event of a malfunction could prevent the use of determinate functions, or even the devices themselves from being switched on.

[0009] One purpose of the present invention is to provide a remote control device of the portable type, which provides the user with the possibility of sending a plurality of command signals to an apparatus, either solely or mainly, by means of moving and spatially inclining the control device itself.

[0010] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0011] The present invention is set forth and characterized in the independent claims. The dependent claims describe other characteristics of the present invention or variants to the main inventive idea.

[0012] In accordance with the above purposes, a portable remote control device configured to command one or more electric actuation devices for actuating an apparatus, or a compartment of a building or vehicle, having its own means for controlling the one or more electric actuation devices and a receiving unit configured to receive command signals for the one or more electric actuation devices, comprises: a support, having its own longitudinal axis, its own transverse axis, perpendicular to the longitudinal axis, and its own plane lying on the longitudinal axis, and perpendicular to the transverse axis; and at least one microprocessor supported by the support.

[0013] In accordance with one aspect of the present invention, the remote control device also comprises detection means connected to the at least one microprocessor and configured to detect at least one of the following parameters: an angle of orientation of the above mentioned support formed between the longitudinal axis and a straight line connecting the support to a cardinal reference point; an angle of inclination of the support formed between the plane as above and a geographical reference plane; an angle of rotation of the support with respect to the transverse axis, and transmission means connected to the at least one microprocessor and configured to transmit to the receiving unit data indicative of the parameters detected by the detection means, so that the control means activate the one or more electric actuation devices as a function of at least one of either the angle of orientation, the angle of inclination, and the angle of rotation.

[0014] In accordance with another aspect of the present invention, the detection means are configured to detect both the angle of orientation as well as the angle

of inclination, and optionally also the angle of rotation.

[0015] In accordance with another aspect of the present invention, the detection means comprise at least one magnetometer, or an electronic compass.

[0016] In accordance with another aspect of the present invention, the detection means comprise at least one accelerometer, mono or multi-axial, a gyroscope, or a magnetic measuring device of the angle of inclination, and optionally also of the angle of rotation.

[0017] In accordance with another aspect of the present invention, the transmission means are of the wireless type and comprise at least one transmission module for transmitting radio waves or infrared rays.

[0018] In accordance with another aspect of the present invention, the remote control device also comprises one or two buttons, configured to send selectively one or two actuation signals to the at least one microprocessor in order to select one or two functions of the one or more electric actuation devices.

[0019] In accordance with another aspect of the present invention, a method for using the remote control device comprises; at least a first setting step in which, by orienting the support in space, at least one initial angle of orientation is set on the at least one microprocessor, by the above mentioned means of the detection means, as a function of the orientation in space of the apparatus or of the compartment of a building or vehicle; and at least a subsequent first step of use, in which, by orienting the remote control device in space, it is positioned so that its longitudinal axis forms a determinate angle of orientation that can be coincident with the initial angle of orientation or divergent therefrom by a determinate angular amplitude, in order to command corresponding electric actuation devices of the apparatus.

[0020] In accordance with another aspect of the present invention, an apparatus, or a compartment of a building or vehicle, comprises one or more electric actuation devices, control means for the one or more electric actuation devices and a receiving unit. Furthermore, the control means are configured to receive, by means of the receiving unit, command signals emitted by at least one remote control device.

[0021] In accordance with another aspect of the present invention, the apparatus comprises a bearing structure configured to define a pergola.

[0022] In accordance with another aspect of the present invention, a pergola comprises one or more electric actuation devices, control means for the one or more electric actuation devices and a receiving unit. Furthermore, the control means are configured to receive, by means of the receiving unit, command signals emitted by at least one remote control device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] These and other aspects, characteristics and advantages of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a perspective view of a remote control device according to the present invention;
- fig. 2 is a schematic longitudinal section view of the remote control device of fig. 1;
- fig. 3 is a three-dimensional view of a variant of the remote control device of fig. 1;
- fig. 4 is a three-dimensional view of another variant of the remote control device of fig. 1;
- fig. 5 is a perspective view of an apparatus configured to be commanded by the remote control device of fig. 1;
- fig. 6 is a flow diagram relating to the operation of the remote control device of fig. 1;
- fig. 7 is a schematic top view, showing the orientation of the remote control device of fig. 1 with respect to a cardinal reference point;
- fig. 8 is a schematic lateral view, showing the inclination of the remote control device of fig. 1 with respect to a reference plane;
- fig. 9 is a schematic top view, showing the rotation of the remote control device of fig. 1 on the reference plane.

[0024] We must clarify that in the present description and in the claims the terms horizontal, front, rear and upper, with their declinations, have the sole function of better illustrating the present invention with reference to the drawings and must not be in any way used to limit the scope of the invention itself, or the field of protection defined by the claims.

[0025] Furthermore, the person of skill in the art will recognize that certain sizes, or characteristics, may have been enlarged or deformed in the drawings, or shown in an unconventional or non-proportional way in order to provide a version of the present invention that is easier to understand.

[0026] When sizes and/or values are specified in the following description, the sizes and/or values are provided for illustrative purposes only and must not in any way be construed as limiting the scope of protection of the present invention, unless such sizes and/or values are present in the attached claims.

[0027] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can be conveniently combined or incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0028] With reference to fig. 1, a remote control device 10, hereafter also called radio control 10, according to the present invention, preferably, but not limitedly, for home use, is configured to selectively and wirelessly

command the operation of one or more electric actuation devices 11 (fig. 5), installed for example on an automated apparatus 12 or in a compartment of a building, such as for example a home, an office, or a space for commercial, industrial or recreational use, or of a mobile transport mean, or vehicle, such as for example a camper, a caravan, a boat, or other. With the term "compartment" we generally refer to a room or an internal space of a building, or to the cabin of a vehicle.

[0029] In the example provided here, the apparatus 12 is a pergola.

[0030] The radio control 10 (fig. 1) comprises a box-shaped containing body, or support, 13 in which an electronic circuit 16 is disposed (fig. 2), which will be described in detail below.

[0031] The support 13 can have any shape whatsoever, such as for example that of a parallelepiped, shown schematically in fig. 1, and its sizes are such as to make it portable and handheld, that is, so that it can be held in the palm of a hand, for example about 10 x 15 x 2 cm. The support 13 indeed acts as a containing body for substantially all the components of the radio control 10.

[0032] The support 13 has its own longitudinal axis X, disposed along the larger dimension, that is, in the example provided here, made through a front part, or surface, 14 and a rear part, or surface, 15; its own transverse axis Y, perpendicular to the longitudinal axis X and disposed for example in an intermediate zone between the front part 14 and the rear part 15; and its own reference plane P, lying on the longitudinal axis X and perpendicular to the transverse axis Y.

[0033] The electronic circuit 16 (fig. 2) comprises a microprocessor 17, powered by a battery 18, preferably of the rechargeable type, and optionally a recharging device 19, of a known type, connected to the battery 18 in order to recharge it.

[0034] The electronic circuit 16 also comprises a magnetometer 20, of a known type, connected to the microprocessor 17 and configured to detect an angle of orientation α, also defined as azimuth angle, (fig. 7) of the support 13, that is, an angle formed in the space between the longitudinal axis X of the support 13 and a virtual straight line that connects the same support 13, that is, the containing body, to a cardinal reference point N, for example magnetic North.

[0035] In other embodiments, an electronic compass, for example, could be used instead of the magnetometer 20.

[0036] The electronic circuit 16 also comprises an accelerometer 21 (fig. 2), which is known, for example of the type with three axes, connected to the microprocessor 17 and configured to detect both an angle of inclination β (fig. 8) of the support 13, that is, the angle formed in the space between the plane P and a geographical reference plane T, for example horizontal, and also an angle of rotation γ (fig. 9), in a clockwise or counterclockwise sense, of the support 13 with respect to its transverse axis Y.

[0037] In other embodiments, instead of the accelerometer 21 (fig. 2), a magnetic measuring device of an angle of inclination with respect to a geographical reference plane, for example horizontal, or a gyroscope could be used.

[0038] Finally, the electronic circuit 16 also comprises transmission means 22 to transmit, for example, radio waves, comprising for example a transmission module connected to the microprocessor 17 and configured to transmit to the outside signals processed by the latter as a function of the parameters coming from the accelerometer 21, that is, the angle of inclination β and the angle of rotation γ, and from the magnetometer 20, that is, the angle of orientation α, that is, the azimuth angle.

[0039] On an upper surface 23 (fig. 1) of the support 13 there are one or more LED indicators 25, configured to indicate to the user the transmission status of the signals transmitted by the transmission means 22 to the apparatus 12, or other operating conditions thereof.

[0040] For example, the LED indicators 25 could light up once the radio control 10 is paired with determinate electric actuation devices 11 (fig. 5), or the LED indicators 25 (fig. 1) could emit light of different colors to communicate the transmission statuses of the command signals.

[0041] In other embodiments, the LED indicators 25 could be replaced by or integrated in a display screen, of a known type and not shown in the drawings, for example disposed on the upper surface 23 of the support 13.

[0042] According to one variant, shown in fig. 3, the remote control device 10 comprises a first, or single, button or key 26, installed on the upper surface 23 of the support 13 and configured to send a determinate command signal through the transmission means 22, as will be described below.

[0043] According to another variant, shown in fig. 4, the radio control 10 comprises two distinct buttons or keys 27, 28, also installed on the upper surface 23 of the support 13 and configured to send determinate command signals through the transmission means 22, as will be further described.

[0044] For example, the keys 27, 28 comprised in the variant shown in fig. 4 can be disposed aligned along the longitudinal axis X, in such a way as to make the operation of the radio control 10 more intuitive, as will be further described in detail.

[0045] The apparatus 12 (fig. 5), which in the example provided here is precisely a pergola, comprises a bearing structure 30, having four vertical columns, or uprights, 31, 32, 33 and 34, connected to each other by means of horizontal crosspieces 36, 37, 38 and 39, whereby it substantially has the shape of a parallelepiped having, for example and by way of indication, approximately the following sizes: 3 x 5 x 2.5 m.

[0046] The apparatus 12 has its own longitudinal axis X1, parallel to the horizontal crosspieces 37 and 39 and substantially passing through the center line of the horizontal crosspieces 36 and 38.

[0047] The apparatus 12 is configured to be commanded by the radio control 10 and comprises control means, for example an electronic control unit 40, configured to selectively command the different electric actuation devices 11.

[0048] The electronic control unit 40 is installed along the longitudinal axis X1 of the apparatus 12, for example, on the horizontal crosspiece 36, in a position substantially equidistant from the two columns 31 and 32 that support it, and is, for example, facing toward the inside of the bearing structure 30.

[0049] The electronic control unit 40 comprises a receiving unit 41, configured to receive the command signals emitted by the transmission means 22 of the remote control device 10.

[0050] The electric actuation devices 11 can comprise, for example, lighting elements, such as lamps, or luminous spotlights, or suchlike, mobile parts of automated fixtures, and electronic apparatuses or devices such as motors, linear actuators, or suchlike.

[0051] For example, one or more vertically sliding blinds 42 are installed on the horizontal crosspieces 36, 37, 38 and 39, for example of the roll-up type or which can be closed as a pack, each commanded by a corresponding electric motor 43 and configured to allow the selective closure of the lateral walls of the bearing structure 30.

[0052] Furthermore, one or more lamps 45 are disposed on one or more of the horizontal crosspieces 36, 37, 38 and 39, for example LEDs lamps using the well-known RGB color model, which, for example, are facing toward the inside of the bearing structure 30, in order to allow the internal zone of the pergola to be lit.

[0053] The upper part of the bearing structure 30, which acts as a ceiling or selectively closable roof, is provided with a louvered covering 46, of a known type, for example metallic, commanded by a corresponding electric motor 47 which is configured to open and close it.

[0054] The electric motors 43 and 47, and the lamps 45, which in the example provided here constitute the electric actuation devices 11, are therefore configured to be controlled by the electronic control unit 40, which in turn is commanded by the remote control device 10.

[0055] In other words, in the example provided here, the radio control 10 is configured to command, through the control means 40, the switching on and off of the lamps 45, the selective drive of the electric motors 43, to carry out the selective and individual opening or closing of each blind 42, for example by raising and lowering it, and/or of the electric motor 47, to carry out the opening and closing of the louvered covering 46 of the ceiling of the bearing structure 30.

[0056] The operation of the device 10 described heretofore, which also corresponds to the method according to the present invention, schematically shown in fig. 6, is as follows.

[0057] First of all, the remote control device 10 is made available to a user who wants to command the remote controlled actuation of the different electric actuation devices 11.

[0058] Then the user performs a setting step 101, in order to set the parameters necessary for the subsequent correct operation of the radio control 10 and of the apparatus 12, that is, of the pergola in this specific case, as a function of the positioning and orientation of the latter, and in particular of the control means, in particular of the electronic control unit 40, which have been chosen by the installer or by the customer. These parameters are essentially the orientation of the longitudinal axis X1 of the apparatus 12, that is, of the pergola, when this is installed, the inclination of the base of the apparatus 12 with respect to the geographical reference plane T, and the position of the different electric actuation devices 11 in the bearing structure 26.

[0059] For example, suppose that the longitudinal axis X1 of the apparatus 12, that is, of the pergola, when this is installed, forms a determinate initial angle of orientation α_0 (azimuth) with respect to a cardinal reference point N, for example magnetic North, and that this initial angle of orientation α_0 is, for example, 45°.

[0060] In this setting step 101, the user, preferably holding the radio control 10 with one hand, points the front part 14 of the latter toward the control means, in this specific case the electronic control unit 40, preferably remaining inside the apparatus 12, that is, the pergola, or at least disposing the longitudinal axis X of the radio control 10 coincident or parallel to the longitudinal axis X1 of the apparatus 12, even more preferably remaining with the radio control 10 in the center, or in a central zone, of the apparatus 12.

[0061] In this initial setting position, the magnetometer 20 thus identifies the angle of orientation α that the longitudinal axis X of the radio control 10 forms in space, which will be the same as the initial angle of orientation α_0 of the apparatus 12. The microprocessor 17 then stores this angle of orientation α detected by the magnetometer 20 and will then consider it as the initial angle of orientation so that, in the subsequent operation, it will calculate every other angle of orientation α detected by the magnetometer 20 taking into account this initial angle of orientation. In the example provided here, having assumed that the determinate initial angle of orientation α_0 of the apparatus 12 is 45°, the microprocessor 17 will always add 45° to each punctual reading of the magnetometer 20, at least until a new setting.

[0062] A similar initial operation is done using the accelerometer 21 to detect an initial angle of inclination β, if the base of the apparatus 12 is not perfectly horizontal, but possibly inclined by one or more degrees.

[0063] In the setting step 101, one or more angular positions are also defined, both in the sense of the angle of orientation α and also in the sense of the angle of inclination β, which respectively refer to the lateral walls of the apparatus 12 (angle of orientation α), as a function of their number, which in the example provided here is four, and to the number of electric actuation devices 11

to be commanded (angle of inclination β), associated with each wall, for example three.

[0064] Then follows a first step of use 102, in which, in order to activate one or more electric actuation devices 11 of the apparatus 12, the user, keeping the radio control 10 preferably on a substantially horizontal plane, directs the front part 14 of the radio control 10 toward a determinate angular position, with respect to the cardinal reference point N (fig. 7), for example by disposing the longitudinal axis X of the radio control 10 in one of the following positions:

a) coincident with the initial angle of orientation α,
b) at 90°,
c) at 180°, or
d) at 270° with respect to the latter.

[0065] This will mean that the subsequent commands sent by the transmission means 22, under the control of the microprocessor 17, will respectively concern:

a) the wall on which the control means are positioned, that is to say, the wall on which the electronic control unit 40 is positioned (fig. 5), that is, between the columns 31 and 32 (α=0°);
b) the wall immediately to its right, seen from the center of the apparatus 12, that is, between columns 32 and 33 (α=90°);
c) the wall opposite the one on which the electronic control unit 40 is positioned, that is, between columns 33 and 34 (α=180°);
d) the wall immediately to the left of the one on which the electronic control unit 40 is positioned, seen from the center of the apparatus 12, that is, between columns 34 and 31 (α=270°).

[0066] Once the wall of the apparatus 12 affected by the command has been identified, a second step of use 103 follows in which the user, in order to activate a determinate electric actuation device 11 of the apparatus 12, paired with that wall, inclines the front part 14 of the radio control 10 more or less upward, as follows.

[0067] Suppose that three different electric actuation devices 11 are associated with that determinate wall, which has been already identified and selected in the first step of use 102, for example: a first one configured to switch determinate lamps 45 on or off; a second consisting of one of the electric motors 43 to open or close the blind 42 associated with that wall; and a third, paired with all the walls and consisting of the electric motor 47 to open and close the louvered covering 46 of the ceiling of the bearing structure 30.

[0068] The user, in this second step of use 103, in order to activate the first electric actuation device 11, will incline the radio control 10 by a first determinate angle of inclination β (fig.8), for example of 30°; to activate the second electric actuation device 11 the user will incline the radio control 10 by a second determinate angle of inclination β, for example of 60°; and to activate the third electric actuation device 11 the user will incline the radio control 10 by a first determinate angle of inclination β, for example of 90°.

[0069] Then follows a third step of use 104, in which the user, in order to choose the actuation function of each electric actuation device 11, for example switching the lamps 45 on or off, or opening or closing each blind 42 or the louvered covering 46, rotates the radio control 10 with respect to its transverse axis Y by a determinate angle γ (fig. 9), for example of 30°, in a clockwise sense (= on/open), or in a counterclockwise sense (= off/close).

[0070] A determinate period of time t can also be defined, for example indicatively comprised between 1 and 5 seconds, in which the radio control 10 has to be kept stationary in one position, so that each signal emitted by the magnetometer 20 and/or by the accelerometer 21 is interpreted by the microprocessor 17 as a signal of position reached, whereby it can be transmitted to the control means, that is, to the electronic control unit 40, and not as an intermediate and temporary displacement of the radio control 10 in space.

[0071] Alternatively, according to the variant shown in fig. 3, with the button 26 it is possible to send to the microprocessor 17 a signal of confirmation of position reached, without having to wait for the preset time interval mentioned above.

[0072] Furthermore, according to the variant shown in fig. 4, the third step of use 104, instead of the rotation of the radio control 10 around its transverse axis Y, could be carried out using the two buttons 27 and 28 in order to generate corresponding signals to choose the actuation function of each electric actuation device 11; for example the button 27 to switch on/open, and the button 28 to switch off/close.

[0073] In any case and in all the steps as above, the data detected by the magnetometer 20 and by the accelerometer 21 and processed by the microprocessor 17 are then sent by the transmission means 22 to the receiving unit 41, and from this to the control means 40, that is, to the electronic control unit.

[0074] It should be noted that in order for the control means 40 to receive and process the command signals emitted by the remote control device 10, it is not necessary for the user to be inside the apparatus 12.

[0075] In fact, the microprocessor 17 autonomously processes the data relating to the angle of orientation α detected by the magnetometer 20, to the angle of inclination β and possibly to the angle of rotation γ detected by the accelerometer 21 on the basis of the position of the remote control device 10 in space, regardless of the user's position with respect to the apparatus 12.

[0076] The microprocessor 17, through the transmission means 22, directs the command signals to the receiving unit 41, which sends them to the electronic control unit 40, which in turn commands the electric actuation devices 11 of the apparatus 12.

[0077] In accordance with a simplified version, the

functioning method of the radio control 10, for example when the latter is used inside a pergola, comprises a first step in which the radio control 10 is pointed toward a lateral wall of the pergola and is kept inclined downward by an angle of inclination β comprised between - 10° and -30° with respect to the geographical reference plane T, for the determinate period of time t. Consequently, the radio control 10 sends to the control means, that is, to the electronic control unit 40, a command to start lowering the blind 42 of that wall. When the radio control 10 is returned to a position parallel to the geographical reference plane T, the blind 42 stops.

[0078] If the radio control 10 is pointed toward a lateral wall of the pergola and is kept inclined downward by an angle of inclination β comprised between -31° and -45° with respect to the geographical reference plane T, for the determinate period of time t, the radio control 10 sends to the control means 40 a command to start lowering the blind 42 of that wall; however, if the radio control 10 is returned to a position parallel to the geographical reference plane T, the blind 42 closes completely, or stops at a predetermined stopping point.

[0079] If the radio control 10 is pointed toward a lateral wall of the pergola and is kept inclined upward by an angle of inclination β comprised between 10° and 30° with respect to the geographical reference plane T, for the determinate period of time t, the radio control 10 sends to the electronic control unit 40 a command to raise the blind 42 of that wall. When the radio control 10 is returned to a position parallel to the geographical reference plane T, the blind 42 stops.

[0080] If the radio control 10 is pointed toward a lateral wall of the pergola and is kept inclined upward by an angle of inclination β comprised between 31° and 45° with respect to the geographical reference plane T, for the determinate period of time t, the radio control 10 sends to the electronic control unit 40 the command to start raising the blind 42 of that wall; however, if the radio control 10 is returned to a position parallel to the geographical reference plane T, the blind 42 opens completely, or stops at a predetermined stopping point.

[0081] If the radio control 10 is pointed toward the ceiling of the pergola, so that it is inclined upward with an angle of inclination β comprised between 80° and 90°, in one sense or the other, with respect to the geographical reference plane T, and the radio control 10 is rotated in a counterclockwise sense with respect to its transverse axis Y by an angle of rotation γ for example of 30°, and kept in this position for the determinate period of time t, the radio control 10 sends to the electronic control unit 40 a command to close the louvered covering 46. When the radio control 10 is returned to a position parallel to the geographical reference plane T, the louvered covering 46 stops.

[0082] If, on the other hand, the radio control 10 is pointed toward the ceiling of the pergola, so that it is inclined upward with an angle of inclination β comprised between 80° and 90°, in one sense or the other with respect to the geographical reference plane T, and the radio control 10 is rotated in a clockwise sense with respect to its transverse axis Y by an angle of rotation γ for example of 30°, and kept in this position for the determinate period of time t, the radio control 10 sends to the electronic control unit 40 a command to open the louvered covering 46. When the radio control 10 is returned to a position parallel to the geographical reference plane T, the louvered covering 46 stops.

[0083] If the radio control 10 is pointed toward the ceiling of the pergola, but it is inclined upward with an angle of inclination β comprised between 60° and 79°, in one sense or the other with respect to the geographical reference plane T, and the radio control 10 is rotated in a counterclockwise sense with respect to its transverse axis Y by an angle of rotation γ for example of 30°, and kept in this position for the determinate period of time t, the radio control 10 sends to the electronic control unit 40 a command to decrease the brightness of the selected lamps 45. When the radio control 10 is returned to a position parallel to the geographical reference plane T, the command to the lamps 45 stops.

[0084] If, on the other hand, the radio control 10 is pointed toward the ceiling of the pergola, but it is inclined upward with an angle of inclination β comprised between 60° and 79°, in one sense or the other with respect to the geographical reference plane T, and the radio control 10 is rotated in a clockwise sense with respect to its transverse axis Y by an angle of rotation γ for example of 30°, and kept in this position for the determinate period of time t, the radio control 10 sends to the electronic control unit 40 a command to increase the brightness of the selected lamps 45. When the radio control 10 is returned to a position parallel to the geographical reference plane T, the command to the lamps 45 stops.

[0085] Furthermore, each internal corner, that is, each column 31, 32, 33 and 34, of the apparatus 12, that is, of the pergola, can be paired with a determinate color, for example according to the RGB color model and/or to a determinate brightness of the lamps 45, whereby when the radio control 10 is pointed at a determinate column 31, 32, 33 or 34, a corresponding LED indicator 25 lights up on the radio control 10, with the same color as the one to be adjusted; in order to indicate the brightness of the lamps 45, for example, an LED indicator 25 that emits a white light lights up.

[0086] Alternatively, when the radio control 10 is provided with the single button 26 (fig. 3), or with the two buttons 27 and 28 (fig. 4), the opening or closing of the blinds 42, or of the louvered covering 46, or the adjustment of the brightness of the lamps 45 can be started or stopped selectively by pressing one of the buttons once, or a few times.

[0087] For example, when the radio control 10 comprises the two buttons 27 and 28 (fig. 4), one of them can be associated with the "more", "up" or "open" function, while the other can be associated with the "less", "down" or "close" function.

[0088] It is clear that modifications and/or additions of parts or steps may be made to the remote control device 10 and to the corresponding method as described heretofore, without departing from the field and scope of the present invention as defined by the attached claims.

[0089] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of remote control device, all coming within the field and scope of the present invention.

[0090] In the following claims, the sole purpose of the references in brackets is to facilitate reading: they must not be considered as restrictive factors with regard to the field of protection determined by the same claims.

Claims

1. Portable remote control device (10), configured to command one or more electric actuation devices (11) for actuating an apparatus (12), or a compartment of a building or vehicle, having its own control means (40) for said one or more electric actuation devices (11) and a receiving unit (41) configured to receive command signals for said one or more electric actuation devices (11), wherein said remote control device (10) comprises: a support (13), having its own longitudinal axis (X), its own transverse axis (Y), perpendicular to said longitudinal axis (X), and its own plane (P) lying on said longitudinal axis (X), and perpendicular to said transverse axis (Y); and a microprocessor (17) supported by said support (13), **characterized in that** said remote control device (10) also comprises detection means (20, 21), connected to said at least one microprocessor (17) and configured to detect at least one of the following parameters: an angle of orientation (α) of said support (13) formed between said longitudinal axis (X) and a straight line connecting said support (13) to a cardinal reference point (N); an angle of inclination (β) of said support (13) formed between said plane (P) and a geographical reference plane (T); an angle of rotation (γ) of said support (13) with respect to said transverse axis (Y), and transmission means (22) connected to said at least one microprocessor (17) and configured to transmit to said receiving unit (41) data indicative of said parameters detected by said detection means (20, 21), so that said control means (40) activate said one or more electric actuation devices (11) as a function of at least one of either said angle of orientation (α), said angle of inclination (β), or said angle of rotation (γ).

2. Remote control device 10, as in claim 1, **characterized in that** said detection means are configured to detect both said angle of orientation (α) and also said angle of inclination (β), and optionally also said angle of rotation (γ).

3. Remote control device 10, as in claim 1 or 2, **characterized in that** said detection means comprise at least one magnetometer (20) or an electronic compass.

4. Remote control device (10), as in any claim hereinbefore, **characterized in that** said detection means comprise at least one accelerometer (21), mono or multi-axial, a gyroscope, or a magnetic measuring device of said angle of inclination (β), and optionally also of said angle of rotation (γ).

5. Remote control device (10), as in any claim hereinbefore, **characterized in that** said transmission means of the wireless type comprise at least one transmission module (22) for transmitting radio waves, or infrared rays.

6. Remote control device (10), as in any claim hereinbefore, **characterized in that** said remote control device (10) also comprises one or two buttons (26 or 27 and 28) configured to send selectively one or two actuation signals to said at least one microprocessor (17) in order to select one or two functions of said one or more electric actuation devices (11).

7. Method for using a remote control device (10) as in any claim hereinbefore, **characterized in that** it comprises: at least a first setting step (101) in which, by orienting said support (13) in space, at least one initial angle of orientation (α_0) is set on said microprocessor (17), by means of said detection means (20, 21), as a function of the orientation in space of said apparatus (12) or of said compartment of a building or vehicle; and at least a subsequent first step of use (102), in which, by orienting said remote control device (10) in space, it is positioned so that its longitudinal axis (X) forms a determinate angle of orientation (α) that can be coincident with said initial angle of orientation (α_0) or divergent therefrom by a determinate angular amplitude (90°, 180°, 270°) in order to command corresponding electric actuation devices (11) of said apparatus (12) or of said compartment.

8. Apparatus (12), or compartment of a building or vehicle, comprising one or more electric actuation devices (11), control means (40) for said one or more electric actuation devices (11) and a receiving unit (41), **characterized in that** said control means (40) are configured to receive, by means of said receiving unit (41), command signals emitted by at least one remote control device (10) as in any claim from 1 to 6.

9. Apparatus (12), or compartment, as in claim 8, **characterized in that** it comprises a bearing structure

(30) configured to define a pergola.

10. Pergola, comprising one or more electric actuation devices (11), control means (40) for said one or more electric actuation devices (11) and a receiving unit (41), **characterized in that** said control means (40) are configured to receive, by means of said receiving unit (41), command signals emitted by at least one remote control device (10) as in any claim from 1 to 6.

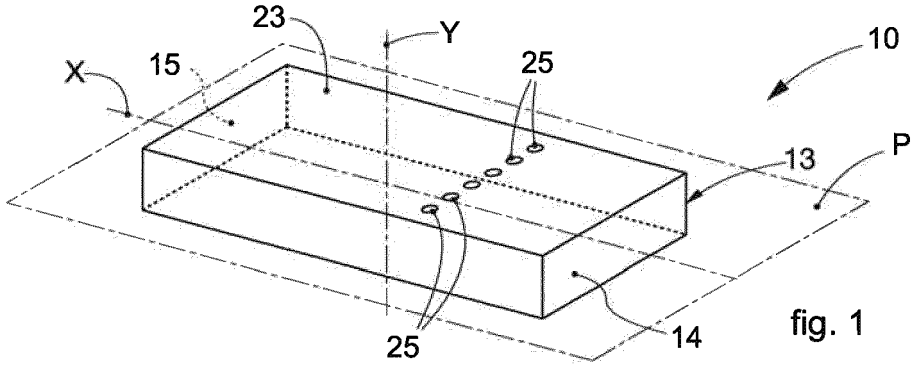


fig. 1

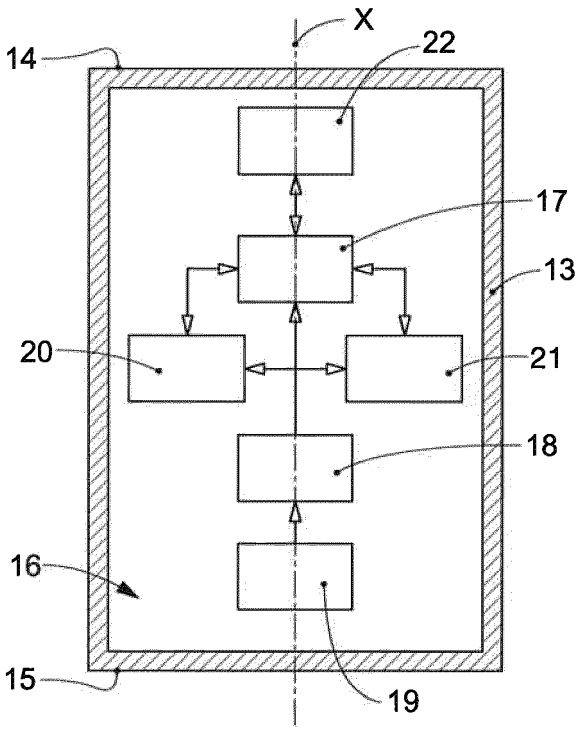


fig. 2

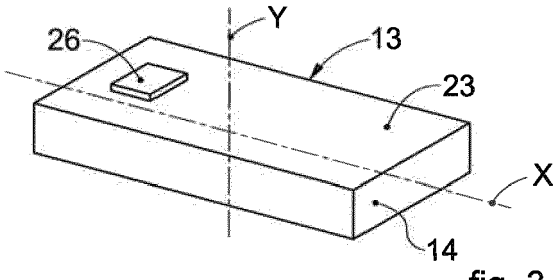


fig. 3

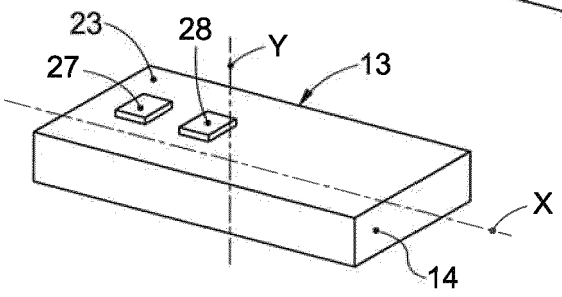


fig. 4

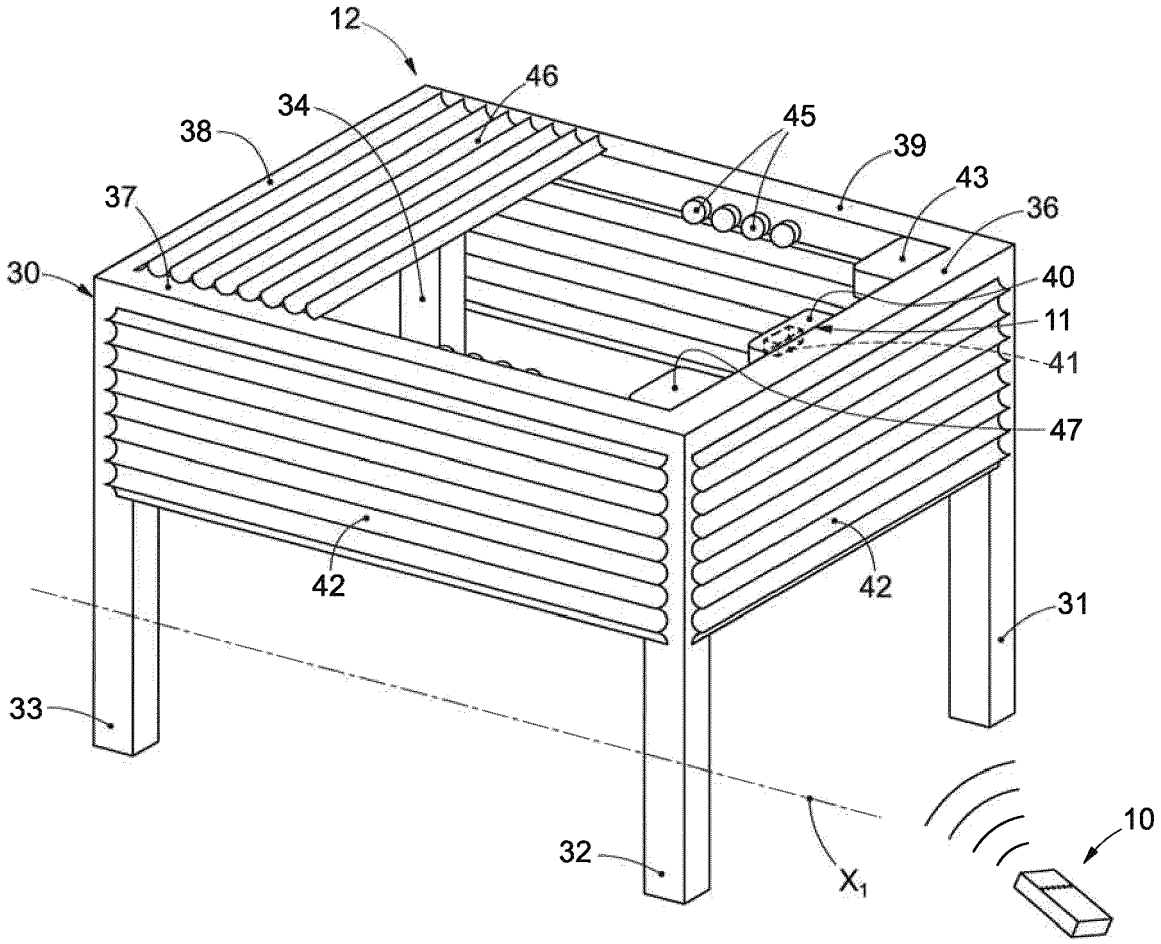

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fig. 5

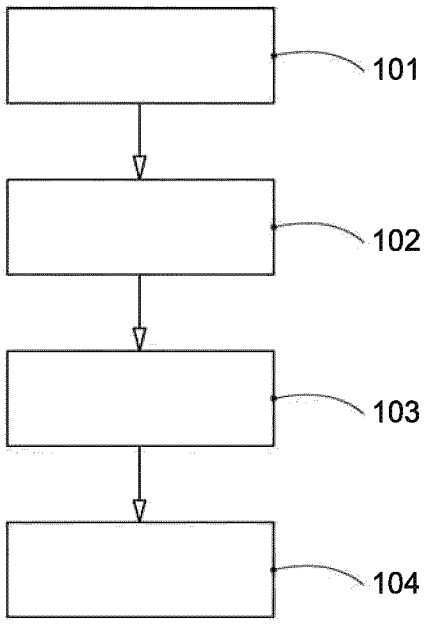

101
102
103
104

fig. 6

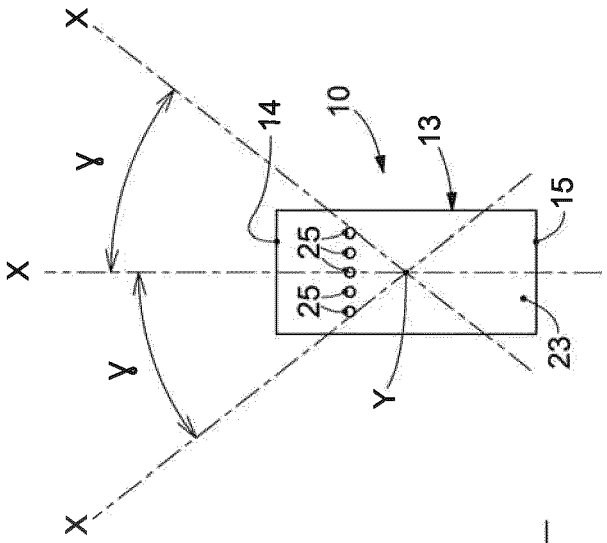


fig. 9

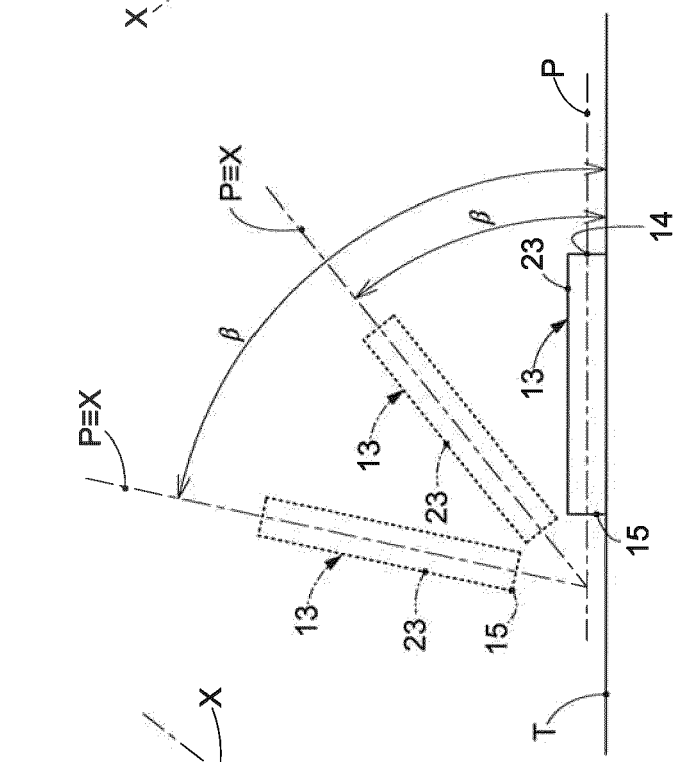


fig. 8

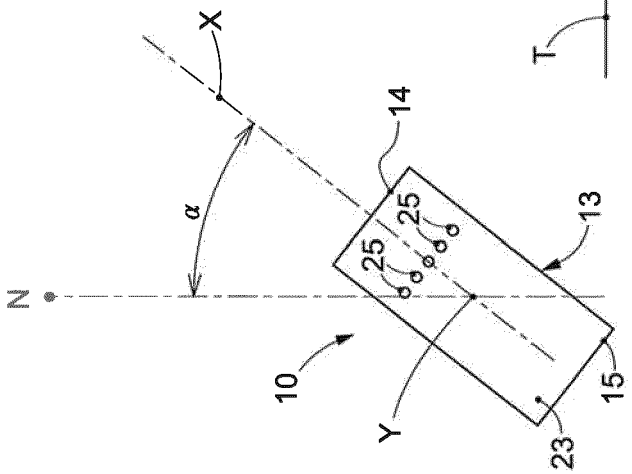


fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 21 20 9138

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2013/147611 A1 (BRENDEL WOLFGANG [DE]) 13 June 2013 (2013-06-13) * paragraph [0001] * * paragraph [0005] - paragraph [0006] * * paragraph [0009] - paragraph [0012] * * paragraph [0022] * * paragraph [0024] * * paragraph [0030] * * paragraph [0041] - paragraph [0044] * * paragraph [0047] * * page 50 * * claim 1 *	1-6,8-10	INV. G08C17/02
A		7	G08C23/04
A	US 2010/060569 A1 (SHAMILIAN JOHN H [US]) 11 March 2010 (2010-03-11) * paragraph [0001] * * paragraph [0004] * * paragraph [0014] * * paragraph [0031] - paragraph [0035] * * claims 1, 2 *	1,7,8,10	

TECHNICAL FIELDS SEARCHED (IPC)

G08C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 April 2022	Barbelanne, Alain

CATEGORY OF CITED DOCUMENTS

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26-04-2022

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82