

According to this configuration, it is possible to give a greater variation to the mode of vibration used at the time of a report. For example, the vibration time, the magnitude of vibration, and the period of the strength of the vibration may be freely changed.

[0406] Further, the memory 112 stores sample data of the drive signal waveform. The drive signal generation circuit 114 converts the sample data from a digital to analog (D/A) format to generate the drive signal.

[0407] [Modification 2]

[0408] In the above first to third embodiments, a user can designate whether to enable or disable the vibration report mode. In this case, the CPU 113 displays a screen for prompting the user to designate whether to enable or disable the report function by operation input from the user. When enablement or disablement is designated by the operation input from the user, the CPU 113 sets the value of the vibration flag in the memory 112 "0" (disable) or "1" (enable) in accordance with the designated content. Further, the CPU 113, in the case of detecting operation input from the touch panel 102 or the operation keys 104a to 104c, determines whether to report by vibration or not in accordance with the value of the vibration flag.

[0409] [Modification 3]

[0410] For example, the present invention can also be applied to an operation panel 990 installed at a location separate from the body of a lighting facility and for inputting an operation instruction to the body of the facility. The operation panel 990 shown in the figure is installed for example on the wall of a room. The rear surface of the operation panel 990 is provided with a vibration generator 991 such as an oscillatory actuator 115. Further, while not shown, the control device for controlling the main body of the lighting facility controls the report by vibration including driving the vibration generator 991.

[0411] When the user switches an on/off key 992 of the operation panel 990 by his or her fingertip, the control device drives the vibration generator 991 and transmits vibration to the fingertip of the user touching the on/off key 992. Further, in the lighting facility, the amount of the lighting can be continuously changed from bright to dark. If the user operates a slider switch 993 for instructing the amount of the lighting to the control device by his or her fingertip, vibration of a magnitude in accordance with the amount of lighting changed by this operation is transmitted to the fingertip of the user operating the slider switch 993. Note that instead of the slider switch 993, it is also possible to use a dial type switch 994 shown in FIG. 79 or a plus key 995 and a minus key 996 shown in FIG. 80 having the same function as the slider switch 993.

[0412] Further, as shown in FIG. 91, it is of course possible to apply the present invention to an electronic device not having a touch panel or display unit such as a remote controller of a television or video. In the case of such an electronic device, it is sufficient to report to the user that input has been received from an operation key by causing the operation key or housing to vibrate.

[0413] [Modification 4]

[0414] In the first to 12th embodiments, the direction of vibration generated from the vibration generator such as an

oscillatory actuator or vibrator is not limited to a direction perpendicular to the front surface of the touch panel or the direction of pressing the operation keys. Further, the frequency of the drive signal applied to the oscillatory actuator is not limited to the frequency for causing resonance in the housing or touch panel of the electronic device or the liquid crystal display panel provided with the touch panel or the oscillatory actuator itself. Similarly, the drive voltage applied to the vibrator also is not limited to a drive voltage for making the frequency of the DC motor correspond to the natural frequency of the housing or touch panel of the electronic device or the liquid crystal display panel provided with the touch panel or the vibrator itself.

[0415] [Modification 5]

[0416] In the first to twelfth embodiments, the vibrator generator is not limited to a linear oscillatory actuator or a vibrator having an eccentric weight. For example, it is also possible to use a vibration generator using a piezoelectric element.

[0417] Further, in the embodiments other than the second embodiment, the explanation was made of a linear oscillatory actuator using a permanent magnet as a movable weight. Here, the movable weight requires a mechanism for obtaining a suitable mass necessary for causing the generation of vibration and excitation for the movable weight to reciprocate. In the above embodiments, a permanent magnet was used as the mechanism for obtaining the suitable mass and excitation. The movable weight however may be comprised by assembling a permanent magnet into part of the member of the weight. Further, a permanent magnet may be fixed in the case of the linear oscillatory actuator and a coil used as the movable weight. Further, a coil may be fixed in the case and another coil used as the movable weight. Naturally, in this case, when the coil used as the movable weight does not have a sufficient mass, it is sufficient to use the coil as part of the weight having a suitable mass. Further, the linear oscillatory actuator may also be movable iron core type linear oscillatory actuator.

[0418] Further, the oscillatory actuator may also be a so-called electrostatic type oscillatory actuator using electrostatic force. FIG. 82 is a view for explaining an electrostatic type oscillatory actuator according to a first example of this modification. In the figure, an oscillatory actuator 800 has a movable weight (weight) 803 provided with an electrode 802 inside the case 801, an electrode 804 provided at the inside wall of the case 801, and a spring 805. Note that in the figure, the vibratory member is provided at a position facing the electrode 804 across the case 801.

[0419] The movable weight 803 is a columnar weight provided with an annular electrode 802 at its bottom surface. This movable weight 803 is supported by the spring 805 in a state able to linearly reciprocate in the vertical direction in the figure in the space formed inside the case 801. This spring 805, as shown in the figure, has one end connected to the case 801 contacting the vibratory (base member) and has the other end connected to the movable weight 803. Note that the movable weight 803 other than the electrode 802 should be a weight having a suitable mass. Further, the annular electrode 804 is provided at the surface of the inside wall of the case 801 facing the electrode 802.

[0420] This electrode 804 is supplied with a plus or minus constant potential from the outside of the oscillatory actuator