

[0017] Various devices, such as a keypad, a jog shuttle, a point stick and a touch screen, may be used as the input unit **110**. The input unit **110** is used while the user selects a desired function or inputs information. In the present invention, the user previously inputs an alarm activation function via the input unit **110**.

[0018] The display unit **120** is used to display various information to the user. A Liquid Crystal Display (LCD) is chiefly used as the display unit **120**.

[0019] The memory **130** stores a program and data that are required for the operation of the mobile communication terminal. One of various memory devices, such as Erasable Programmable Read Only Memory (EPROM), Static Random Access Memory (SRAM) and flash memory, may be used as the memory **130**. In the present invention, the memory **130** stores a program that has an algorithm of providing a ring tone and vibrations according to a value obtained by a motion detection unit **160** at the time of receiving a call signal or an alarm activation signal. The memory **130** further stores data used to execute the program, and data used and produced by the program.

[0020] The control unit **140** functions to control the entire operation of the mobile communication terminal. The control unit **140** may be formed of a microprocessor or a Digital Signal Processor (DSP). In the present invention, the control unit **140** performs a function of measuring the motion of the mobile communication terminal and adjusting the volume of a ring tone and the intensity of vibrations based on the measured motion of the mobile communication terminal, a function of automatically switching the mobile communication terminal to a manner mode, and a function of notifying the user of the volume of a ring tone or the intensity of vibrations using the ring tone or vibrations at the time of receiving a call signal or alarm activation signal.

[0021] The wireless circuit unit **150** is a circuit that enables the mobile communication terminal to exchange voice and control information with a base station. The wireless circuit unit **150** functions to receive a call signal, which is transmitted by an external mobile communication terminal, through an antenna and transmit the call signal to the control unit **140**, or to transmit data, which is stored in the memory **130**, to the mobile communication terminal of a transmitter through the antenna.

[0022] The motion detection unit **160** has a function of measuring the motion of the mobile communication terminal. The motion detection unit **160** measures the current posture and motion of the mobile communication terminal and outputs values corresponding to the measured current posture and motion. A gyro sensor may be used as the motion detection unit **160**. The gyro sensor is a device for detecting and indicating the motion, acceleration and inclination of an object, and is applied to the motion control of a robot, a car navigation system, a motion tracking system, etc. The present invention detects the motion of the mobile communication terminal using the function of the gyro sensor.

[0023] The amplifier **170** functions to output a ring tone via a speaker under the control of the control unit **140**.

[0024] The motor drive unit **180** functions to drive a motor under the control of the control unit **140**.

[0025] FIGS. **2a** and **2b** are flowcharts showing processes of measuring the motion of the mobile communication terminal and automatically adjusting the volume of a ring tone or the intensity of vibrations at the time of receiving a call signal or alarm activation signal in accordance with the present invention.

[0026] FIG. **2a** is described first.

[0027] The control unit **140** checks whether a call signal, which has been received through the antenna, exists or whether an alarm activation signal, which has been received through the input unit **110**, exists at step **S210**.

[0028] The control unit **140** reads values, which are output by the motion detection unit **160**, at the time of receiving the call signal or alarm activation signal at step **S220**.

[0029] The control unit **140** adjusts the volume of a ring tone by adjusting the gain of the amplifier **170**, or adjusts the intensity of vibrations by adjusting the output of the motor drive unit **180** at step **S230**.

[0030] In another embodiment, a function of outputting one of various types of ring tones may be added to step **S230**. That is, various types of ring tones corresponding to the values of the motion of the mobile communication terminal are stored in the memory **130** and a corresponding type of ring tone is output according to the value of the motion of the mobile communication terminal. For example, if a noisy ring tone is set to be output when the motion of the mobile communication terminal is large and a quiet ring tone is set to be output when the motion of the mobile communication terminal is small, an effect similar to that, which is obtained when the volume of a ring tone is adjusted depending on the motion of the mobile communication terminal, can be obtained.

[0031] In accordance with the embodiment of FIG. **2a**, the control unit outputs a ring tone of a volume or vibrations of an intensity according to the value of the immediately prior motion of the mobile communication terminal when a call signal or alarm activation signal is received. This may cause the output of a ring tone of a volume or vibrations of an intensity unstable for the circumstances of the user. For example, a large volume ring tone can be output depending on the motion of the user in a quiet conference room. In view of this problem, the embodiment of FIG. **2b** is proposed.

[0032] FIG. **2b** is a flowchart showing a process of taking the average of the values of the motion of the mobile communication terminal for a predetermined period of time.

[0033] The control unit **140** reads values from the motion detection unit **160** and takes the average of the values for a predetermined period of time at step **S240**.

[0034] The control unit **140** checks whether a call signal, which has been received from the antenna, exists or whether an alarm activation signal, which has been input through the input unit **110**, exists at step **S250**.

[0035] When receiving a call signal or an activation signal, the control unit **140** adjusts the volume of a ring tone by adjusting the gain of the amplifier **170** in proportion to a