is not touching the position of an image or icon representing an element such as a switch or slider, then the electrical signal is terminated. By means of such processing, the user performing operations with respect to the operable element **200** made up of images/icons is able to experience user interface feedback similar to that experienced when operating the mechanical operable element of an actual switch or slider.

[0101] The configuration illustrated in FIG. **7** will now be described as an exemplary embodiment of a two-dimensional (2D) user interface feedback apparatus. FIG. **7** illustrates a two-dimensional (2D) user interface feedback apparatus configured for use as a touch pad in a device such as a PC. FIG. **7** illustrates only the operable element **270**. The operable element **270** is configured as the touch pad of a PC. In this configuration, the operable element **270** does not include display functions.

[0102] The operable element **270** has a structure made up of an electrode sheet **271** and an insulator **272**. The electrode sheet **271** and the insulator **272** in the configuration shown in FIG. **7** correspond to the electrode sheet **111** and the insulator **112** in the configuration shown in FIG. **2**. Although FIG. **7** shows only the operable element **270**, processing modules similar to those of FIG. **2** are connected to the operable element **280**. Such processing modules may be realized by the PC, for example.

[0103] Factors such as the position and pressure of the user's finger **280** are detected by sensors. A voltage and frequency are then determined in accordance with the information detected by the sensors, or in accordance with motion information derived from the information detected by the sensors. An electrical signal is then fed to the electrode sheet **271**. When the user's finger **280** is moved over the insulator **272**, friction is felt whose magnitude varies according to the electrical signal fed into the electrode sheet **271**. The user experiences this friction as user interface feedback in response to the user's operation of the operable element **270** by the user's finger **280**, for example.

[0104] The configuration illustrated in FIG. **8** will now be described as another exemplary embodiment of a two-dimensional (2D) user interface feedback apparatus. FIG. **8** illustrates a configuration wherein an image is displayed on a screen **301** by a projector **302**, and wherein a user **300** performs interface operations with respect to the image displayed on the screen **301**.

[0105] In this case, the screen **201** functions as the operable element. In other words, the screen **301** has a laminar structure as shown in FIG. **9**, wherein a transparent electrode sheet **311** and a transparent insulator **312** have been stacked on top of a transparent sheet **320** made of a material such as glass or plastic.

[0106] The transparent electrode sheet **311** and the transparent insulator **312** in the configuration shown in FIG. **9** correspond to the electrode sheet **111** and the insulator **112** in the configuration shown in FIG. **2**. The information processing apparatus (PC) **303** connected to the screen **301** acting as the operable element and shown in FIG. **8** includes processing modules similar to those shown in FIG. **2**.

[0107] Factors such as the position and pressure of the finger of the user **300** are detected by sensors **304**, with the information detected by the sensors being acquired by the information processing apparatus (PC) **303**. The information processing apparatus (PC) **303** determines a voltage and frequency in accordance with the acquired sensor information, and then outputs an electrical signal to the transparent electrode sheet **311** of the screen **301**. For example, the information processing apparatus (PC) **303** may derive the motion of the user's finger from the information detected by the sensors, determine a voltage and frequency in accordance with the results, and then output the resulting electrical signal to the transparent electrode sheet **311** of the screen **301**.

[0108] When the finger **305** of the user **300** is moved over the transparent insulator **312**, friction is felt whose magnitude varies according to the electrical signal fed into the transparent electrode sheet **311**. For example, when the user **300** uses his or her finger **305** to perform operations with respect to various objects displayed on the screen **301**, the user may experience user interface feedback uniquely corresponding to particular displayed objects in the form of unique frictions set by the electrical signals.

[0109] Similarly to the configuration described earlier, the voltage and frequency of the electrical signal output from the information processing apparatus (PC) **303** to the transparent electrode sheet **311** of the screen **301** may be set to arbitrary values in accordance with factors such as the position, motion, and pressure of the finger of the user **300**. Thus, if the user **300** is touching the position of one of various object images displayed on the screen **301**, an electrical signal having predetermined voltage and frequency values set for that object can be input. In so doing, the user can experience a different frictional force for each displayed object.

[0110] It is also possible to execute processing to terminate the electrical signal when the user is not touching the position of a displayed object. By means of such processing, various object images can be displayed on the screen **301**, and user interface feedback corresponding to each object can be provided to the user.

[0111] As described earlier, it is preferable to configure the apparatus so as to prevent charge accumulation with respect to the user **300**. In the present embodiment, the user may be grounded by the floor **306**.

(2-2) One-Dimensional (1D) User Interface Feedback Apparatus

[0112] Next, a one-dimensional (1D) user interface feedback apparatus will be described with reference to FIGS. **10**A and **10**B. A one-dimensional user interface feedback apparatus includes an operable element running along a single line. FIG. **10**A illustrates an exemplary configuration wherein a linear operable element is disposed on a base plate. FIG. **10**B illustrates an exemplary configuration of a string-shaped operable element. The above exemplary configurations will now be described in sequence.

[0113] (a) Exemplary Configuration of a Linear Operable Element Disposed on a Base Plate

[0114] The operable element **410** shown in FIG. **10**A includes: a conducting wire **411** made of a conducting material; an insulating plate **412** made of an insulating material; and a sensor **413**.

[0115] An external electrical signal is applied to the conducting wire **411**. If the user then drags his or her finger over the insulating plate **412** while the external electrical signal is being applied to the conducting wire **411**, a predetermined friction is produced.

[0116] The conducting wire **411** and the insulating plate **412** in the configuration shown in FIG. **10**A correspond to the electrode sheet **111** and the insulator **112** in the configuration shown in FIG. **2**. Although only the operable element **410** is shown in FIG. **10**A, processing modules similar to those