vice verse. The terms surface texture and surface relief are used interchangeably herein. The coarse texture or condition, for example, emulates a sensation of a button edge(s) when a user touches a bump on the surface. The coarse texture can also create a sensation of a key, a hole, and the like. The haptic feedback can also provide a click sensation when a button is being pressed. An alternatively embodiment, touch sensitive surface of interface device **106** provides a kinesthetic button, which is capable of actually moving away from user's finger when certain force from the finger is applied to a button-like bump. The surface having a smooth texture indicates that the touch surface is free from irregularities, projections, and/or roughness. It should be noted that the kinesthetic button is also capable of vibrating for input confirmation.

[0032] FIG. **1**B is a block diagram **120** illustrating an interface device having multiple regions for providing relief information in accordance with one embodiment of the present invention. Diagram **120** illustrates a top view of an interface device **116**, which includes ten (10) independent fixed cells or regions **121-130**. It should be noted that each region could be a vibrating ping that vibrates to confirm the press of the finger on the surface. Each region can be independently programmed or controlled to provide relief information. Diagram **132** is a cross-section view of interface device **116**, which illustrates a pattern of locating features that can be programmed. For example, Regions **134-136** are activated while region **138** is deactivated. Since each region can be selectively activated, interface device **116** is capable of changing its surface configurations for different applications. For example, interface device **116** may activate certain regions to configure the touch-sensitive surface as a key pad for a telephone. Alternatively, the touch surface may be configured as a key pad for a PDA. It should be noted that interface device **116** could have more than ten (10) independent controllable regions. For example, interface device **116** may include a 10×10 programmable grid, which may have 100 independent programmable regions.

[0033] FIG. **1**C is a three-dimensional (3-D) block diagram illustrating an interface device **140** having a deformable haptic surface capable of providing the locating features in accordance with one embodiment of the present invention. Interface device **140** includes a touch-sensitive surface **142**, a haptic mechanism **144**, and a display **146**. Display **146** could be a liquid crystal display ("LCD") or a plasma flat panel display. Touch-sensitive surface **142** is capable of receiving inputs via contacting and/or touching on the surface. In one embodiment, touch-sensitive surface **142** includes a touch surface layer and a touch-sensitive screen layer. It should be noted that the underlying concept of the exemplary embodiment of the present invention would not change if one or more blocks (circuits or layers) were added to or removed from device **140**.

[0034] Haptic mechanism **144**, in one embodiment, includes multiple pins **148** and is made of rigid or solid materials such as alloy, metal, plastic, and the like. Touch-sensitive surface **142**, on the other hand, is a relatively soft and flexible surface. Touch-sensitive surface **142** and haptic mechanism **144** are configured in such a way that they can move relative with each other. For instance, haptic mechanism **144** is configured to move along z-axis while touch-sensitive surface **142** is in a fixed position. When haptic mechanism **144** moves up against touch-sensitive surface **142**, pins **148** on haptic mechanism **144** cause portions of touch-sensitive surface **142** to form bumps **102** due to the push from pin **148**. As such, bumps **102** cause touch-sensitive surface **142** to be coarse or rough.

[0035] When haptic mechanism **144** is activated, the surface texture of touch-sensitive surface **142** displays a relief surface that is a series of user contactable bumps or buttons. On the other hand, when haptic mechanism **144** is not activated, the surface texture of touch-sensitive surface **142** becomes smooth. Alternatively, touch-sensitive surface **142** has a coarse texture when haptic mechanism **144** is not activated while touch-sensitive surface **142** has a smooth texture when haptic mechanism **144** is activated. Relief information emulating locating features such as bumps **102** can be generated in accordance with the haptic feedbacks. Alternatively, touch-sensitive surface **142** can be configured to be the moving layer while haptic mechanism **144** is a fixed layer. For example, when haptic mechanism **144** is activated, touch-sensitive surface **142** is configured to move along the z-axis relative to haptic mechanism **144**. The surface texture of touch-sensitive surface **142** changes depending on the location of touch-sensitive surface **142** along the z-axis. In another embodiment, actuator(s) **149** in interface device **140** are used to generate haptic feedbacks or tactile feedbacks for input confirmation as well as haptic relief information.

[0036] FIG. **1**D is another example of 3-D block diagram illustrating an interface device **150** having a deformable haptic surface with multiple independent regions in accordance with one embodiment of the present invention. Interface device **150** includes a touch surface **152**, a haptic mechanism **154**, a touch screen **139**, and a display **156**, wherein display **156** could be a LCD or any other types of flat panel displays. Touch surface **152**, in one embodiment, is a flexible layer for contacting and/or touching. Touch screen **139** or touch-sensitive layer is configured to sense an input(s) via contacting and/or touching on touch surface **152**. For example, touch screen **139** may include various sensors such as capacitance sensors to detect user's contact by sensing the change of capacitance. It should be noted that the underlying concept of this embodiment of the present invention would not change if one or more layers were added to interface device **150**.

[0037] Haptic mechanism **154**, in one embodiment, includes multiple haptic controllable cells or regions **160-170** wherein each region supports a pin **148**. Haptic mechanism **154** is made of rigid materials such as alloy, metal, plastic, and the like. Each region can be independently controlled and activated. Touch surface **152**, on the other hand, is made of relatively flexible materials such as plastics and soft materials. Touch surface **152**, in this embodiment, includes a set of predefined openings or holes **172**, which allow pin or pins **148** to move through holes **172** extending portions of pins **148** above touch surface **152**. When pins **148** reach above touch surface **152**, button-like sensation with sharp edges on top of touch surface **152** are emulated when they are being felt.

[0038] Touch surface **152** and haptic mechanism **154** are configured in such a way that they can move relative with each other for controlling surface texture of touch surface **152**. For instance, haptic mechanism **154** is configured to move in z-axis allowing pins **148** to move above or below touch surface **152** via holes **172** to control surface texture. For example, when the top surfaces of pins **148** level with touch surface **152**, the surface texture of touch surface **152** should feel substantially smooth. Since each region can be independently controlled, different relief information may be generated for different input interfaces. It should be noted that different input interface has different configuration. For example, a