system with keypad area **110** may include housing **101**, glass cover **410**, silicon mat **420**, protrusion **430** and actuator **440**.

[0055] As described above housing **101** may include a hard plastic material used to mount components within terminal **100**. In one embodiment, glass cover **410** may be mounted in housing **101** within keypad area **110**. In other embodiments, an LCD **410** may be mounted in housing **101** within keypad area **110**.

[0056] Glass cover **410** may include a single sheet of glass that may contain back-printed information in order to provide a number of keys **112**. In other embodiments, glass cover **410** may cover an LCD or glass cover **410** may be replaced with an LCD that may be used to display keys **112** to a user. Other materials such as plastic or composite materials may also be used in place of glass for cover **410**. In each case, cover **410** may include a single surface located over keypad area **110** or forming part of keypad area **110**. As described above, position sensing logic **340** may include a transparent film may be placed on glass cover **410** or placed underneath glass cover **410** in order to sense a position of an input. In other embodiments, LCD **410** may be covered with a clear capacitive film that produces an output that is representative of a position of pressure or input, in order to enable position sensing logic **340** to sense a position of input within keypad area **110**.

[0057] Silicon mat **420** may include a flexible silicon material. Silicon mat **420** may contact the bottom surface of glass cover **410** or may be located adjacent to glass cover **410**, without being in direct contact with glass cover **410**. Materials that are relatively easy to compress may be used in place of silicon for mat **420**. Protrusion **430** may include an extension or protrusion of silicon mat **420** that may extend in a downward direction. Protrusion **430** may be used to cause a displacement or deformation of actuator **440** or contact actuator **440** when silicon mat **420** is displaced.

[0058] Actuator **440** may include a flexible material that when displaced, deformed or contacted produces an electrical signal. As shown in FIG. **4**B for example, protrusion **430** may come into contact with actuator **440** as a result of a user pressing on glass cover **410**. Actuator **440** may be included in displacement sensing logic **350**. When actuator **440** is deformed due to pressure from protrusion **430** or contacted via protrusion **430**, an electrical signal may be sent to displacement sensing logic **350** to indicate a key input. The deformation of actuator **440** may also give the user tactile feedback that a key input has been received by terminal **100** as glass cover tilts when pressed (as shown in FIG. **4**B). In this exemplary implementation, actuator is located in the center of keypad area **110**. In other exemplary implementations, multiple actuators may be used. Operation of the key input system shown in FIGS. **4**A-**4**B is described below with reference to FIG. **5**.

[0059] FIG. **5** is a flowchart of exemplary processing consistent with the principles described herein. Terminal **100** may provide a keypad configuration as shown in FIG. **1**, via printed characters on glass cover **410** or in another embodiment may provide a keypad configuration via an LCD **410**. Process **500** may begin when a position of input may be sensed (act **510**). For example, a user's finger may be located over (or contacting) one of keys **112** within keypad area **110**. As described above, the position of the user's finger may be sensed by a capacitive film that sends a signal to position sensing logic **340**.

[0060] When a user presses down with sufficient force on glass cover **410** (or in other embodiments, LCD **410**) as shown in FIG. **4**B, displacement may be sensed (block **520**). For example, a user may press down on glass cover **410** with sufficient force to cause protrusion **430** to come into contact with, and deform, actuator **440**. The deformation of actuator **440** may cause a signal to be sent to displacement sensing logic **350** that may indicate a user's intention to enter associated information with one of keys **112**. Deformation of actuator **440** also produces a tilt or movement of glass cover **410** that provides tactile feedback to a user that a key input is received, and in some embodiments, electrical feedback (indicting key input) may not be required.

[0061] Upon receiving a signal sensing displacement, both the sensed position and sensed displacement signals may be simultaneously processed to determine a key input (block **530**). For example, when displacement sensing logic **350** senses displacement of glass cover **410**, the position of input is also simultaneously determined by position sensing logic **340**. For example if a user's finger is applying pressure over the "2" key **112**B in keypad area **110**, as determined by position sensing logic **340**, when displacement sensing logic **350** senses displacement of glass cover **410**, control logic **310** may determine that the number "2" has been entered.

[0062] In response to determining the key input (block **530**), the associated information with the determined key input may be displayed (block **540**). For example, if control logic **310** determines that key **112**B is actuated, the number "2" may be displayed via display **140**. In this manner, a user may be given tactile feedback relating to entered information and also visual feedback. In further examples, the associated information with a key **112** may not be displayed.

[0063] In further examples, the "2" key (**112**B) may be associated with the letters "a," "b" and "c," in which case, three successive displacements of glass cover **410** (block **520**) may be sensed while the user's finger is determined to be located on key **112**B (block **510**), in order for control logic **310** to determine that a "c" is the desired character to be entered by a user.

[0064] In further embodiments, if control keys **120** are used to display a menu of choices via display **140**, a user may scroll through the menu of choices by moving his/her finger downward over the keypad area **110**. In this embodiment, block **520** may not be enacted, as there may be no displacement of glass cover **410** during scrolling input. For example, moving a finger over the "2" key, the "5" key and the "8" key, may be sensed by position sensing logic **340**, and may be determined by control logic **310** to be scrolling input. In this embodiment, highlighted choices in the displayed menu may be changed based on scrolling input over keypad area **110**.

Conclusion

[0065] Implementations consistent with the principles of the embodiments may provide tactile feedback to a user, via a keypad that includes a single surface or cover.

[0066] The foregoing description of preferred embodiments of the embodiments provides illustration and description, but is not intended to be exhaustive or to limit the embodiments to the precise form disclosed. Modifications and variations are possible in light of the above teachings or may be acquired from practice of the embodiments.

[0067] While a series of acts has been described with regard to FIG. **5**, the order of the acts may be modified in other implementations consistent with the principles of the embodiments. Further, non-dependent acts may be performed in parallel.

[0068] It will be apparent to one of ordinary skill in the art that aspects of the embodiments, as described above, may be implemented in many different forms of software, firmware, and hardware in the implementations illustrated in the figures. The actual software code or specialized control hardware used to implement aspects consistent with the principles of