intended function of the electric device. For purposes of illustration, the printed circuit board **12** includes a dome switch **14** on the surface **16** of the printed wiring board **12** to complete an electrical circuit path when the dome switch **14** is operated as is well known and understood by those skilled in the art. A user interface or keypad generally designated **18** is appropriately located and carried by the electronic device and is made in this example of an elastomer/rigid two-component plastic part wherein the elastomer portion generally designated **20** is deformable and configured to stretch or bulge above the surface **22** such that the surface topology contact area **24** defines keys **26**, **26** when the input device **10** is active or in a first operative state, as illustrated in FIG. **2**.

[0019] An actuator mechanism, such as for example a piezoelectric motor generally designated **30** is appropriately mounted to the printed circuit board **12** and includes a shaft **32** extending axially lengthwise of the piezoelectric motor **30**. A sheet spring steel band generally designated **34** has one end **36** attached to the printed circuit board **12** and its opposite end **38** suitably attached to the shaft **32** of the piezoelectric motor **30**, for example by inserting the end **38** into a complementary shaped and sized slot **40** in the shaft **32**. The sheet spring steel band **34** is somewhat "C" shaped and is located over the dome switch **14**. The sheet spring steel band **34** is in contact with a downward extending foot **42** of the elastomer portion **20** defining the key **24**. When the key **24** is pressed or otherwise pushed downward in a direction toward the surface **16** of the printed circuit board **12**, as indicated by the direction arrow **44**, the bottom **46** of the foot **42** contacts the sheet spring steel band **34** pushing it into contact with the dome switch **14** to operate the switch **14**. When the downward pressure is removed from the key **24**, the sheet spring steel band **34** returns to its "C" shaped configuration pushing the foot **42** upward to make the key **24** available.

[0020] In a situation in which the key **24** is not available, for example when the electric device does not have a given function associated with the key **24** available for the particular mode selected, the surface area topology **26** of the key **24** is flush with the surface **22** of the user interface **18** indicating the key is unavailable. The elastomer portion defining the key **24** is permitted to return to its unstretched state when the shaft **32** of the piezoelectric motor **30** rotates in a clockwise direction as indicated by the rotation arrow **50** such that the end **38** of the sheet spring steel band **34** rotates with the shaft **32**, thereby shortening the length of the sheet spring steel band **34**, causing the band **34** to flatten and approach the surface **16** of the printed circuit board **12**, removing the upward bias on the elastomer foot **42**. As shown in the FIGS. **1** and **2**, the shaft **32** may accommodate a number of sheet spring steel bands **34**, each of which are associated with a key **24**, and the number of keys **24** are determined in accordance with the requirements of the electronic device with which the input device **10** of the present invention is used.

[0021] A piezoelectric motor which may be utilized with the input device of the present invention is available, for example, from New Scale Technologies, Inc. under the trademark name Squiggle Motor to provide the desired actuation and appearance and disappearance of the keys as described above. The operation of such piezoelectric motors is well understood by those skilled in the art and the reader is referred to the manufacturer's literature which is incorporated herein by reference for a more detailed description of the piezoelectric motor and its operation.

[0022] Turning now to FIGS. **3-8**, an electronic device, such as a mobile telephone, embodying the input device of the present invention is illustrated therein and generally designated **100**, wherein only the cover portion generally designated **102** of the electronic device **100** is illustrated for purposes of explanation. The electronic device **100** includes a printed circuit board **104** suitably arranged and carried in the cover **102**. An elastomer/rigid two-component plastic part keypad generally designated **106** is suitably arranged and carried on an outward facing side **108** of the cover **102**. The keypad **106** includes an elastomer portion **112** whose outward facing surface **114** is substantially flush with the surface **110** of the keypad **106**. The input device embodying the present invention is generally designated **120** and is located at one end **116** of the electronic device **100** in the region of the elastomeric portion **112** of the keypad **106**. The elastomeric portion **112** includes a downwardly extending foot **118** of sufficient length to contact a sheet spring steel band **130** having one end **132** connected to the printed circuit board **104** and an opposite end **134** suitably attached to the shaft **136** of a piezoelectric motor or other suitable actuator generally designated **138** mounted on the printed circuit board **104**. The sheet spring steel band **130** is located and arranged over a dome switch **140** carried on the printed circuit board **104** and beneath the foot **118** such that the sheet spring steel band **130** is located between the foot **118** and the dome switch **140**. As illustrated in FIGS. **3-5**, the keys defined by the elastomer portion **112** are not accessible and available for use.

[0023] With reference to FIGS. **6-8**, the electronic device **100** illustrated in FIGS. **3-5** is illustrated therein, wherein the haptic/tactile input device embodying the present invention is activated to make a key or button **150** available for access and use by causing the topography of the contact surface area **152** to bulge or project above the surface topography **114** of the user interface or keypad **106**. In this situation, the shaft **136** of the piezoelectric motor **138** is caused to rotate in a counterclockwise direction as indicated by the direction arrow **154** allowing the sheet spring steel band **130** to increase its length allowing it to return to its "C" shaped state, thereby pushing the foot **118** of the elastomer portion **112** upward in the direction indicated by arrow **156** to cause the key **150** to be formed in the surface **114** of the elastomer portion **112** of the user interface.

[0024] Turning now to FIGS. **9** and **10**, an exploded schematic view of the electronic device **100** illustrated in FIGS. **3-8** is shown therein as viewed from the underside in FIG. **9** and as viewed from the upperside in FIG. **10**, wherein like reference numerals correspond to like parts. As shown, the elastomer portion **112** of the keypad **106** may be molded or shaped to accommodate the requirements of the particular electronic device as defined by the aperture in the cover **102** to align with the sheet spring steel bands **130** and dome switches **140**. It should also be recognized that the dome switches **140** are not necessary, and the electrical contact may be created by the sheet spring steel band **130** to complete the electrical circuit connection that is made by the dome switch.

[0025] It should also be recognized that the keypad **106** may be made as a single molded unit with a rigid portion and