using micro touch pad **112**, but due to the relatively small size of touchpad **112**, in some cases it may take several clutches or swipes (e.g., finger lift and retrace across micro touchpad **112**) to move the pointer across a significant portion of the screen distance (e.g., across the entire display screen), according to an example embodiment. Although in other embodiments, micro touchpad **112** may allow a user to move a pointer a significant distance across a screen in one swipe.

[**0021**] Therefore, a larger macro touchpad **114** (e.g., provided across multiple keys) may be provided as well, and may include either touch sensors and/or micro touch pads for each of a plurality of keys (or even all of the keys) to allow, for example, at least large-scale (e.g., relatively longer distance) or gross pointer control by moving a finger or other object across a top surface of touchpads or touch sensors of multiple keys in macro touchpad **114**. According to an example embodiment, a combination of a (e.g., high resolution) micro touchpad on a single key and a macro touchpad spanning across multiple keys may provide a convenient touchpad system that provides both precise or fine pointer control over short distances (e.g., via a single key micro touchpad **212**) and allows gross pointer control or pointer control over longer distances (e.g., via macro touchpad **114**).

[**0022**] The use of a keyboard **100** having an integrated key or (keys) and touchpad(s), such as described above, may be useful for a variety of applications. Such a keyboard with integrated key and touchpad may enable cursor control, typically performed on a mouse. Other example applications for such a keyboard may include vertical and horizontal scrolling, 3D rotation, CAD/CAM application control, document navigation, gaming applications, pressure sensitive input, multi-degree of freedom input. Another application for use with keyboard **100** may include computer control other than cursor control, such as finger-based gesture shortcuts for menu selections, e.g., drawing an "S" across micro touchpad **112** or across multiple keys of macro touchpad **114** to do a "File Save" command or menu pick.

[**0023**] According to another embodiment, the micro touchpad may be the size of a single key. A macro touchpad may include a micro touchpad on each of a plurality of keys, and movement may be detected by motion across the multiple keys or traveling between keys. Interpolation between keys may also be used to detect motion of touch between or across keys. In an example embodiment, a macro touchpad may include a touch sensor or micro touch pad on a set of keys, such as the 6, Y, H and N keys. This may be used for cursor control, scrolling, or for gestures. For example, a tapping on a key in the micro touchpad or macro touchpad may be used for gestures. For example, the user may tap on the Y key to scroll up and tap on the H key to scroll down. In addition, to scrolling and pointer control, the micro touchpad and/or macro touchpad may allow a user to perform other computer control, such as application switching, tabbing to a next prompt in an application, adjusting the volume, etc.

[**0024**] According to other example embodiments, keyboard **100** may also be useful for one or more output applications, or combined input/output applications. For example, an additional touchpad or touch sensor or thin film device may be provided on one or more keys to provide tactile feedback to the user, such as, for example, providing a piezoelectric vibration strip or a thermal strip (to increase or decrease temperature) on one or more keys. For example, these type of tactile sensors may allow the user to receive tactile or physical indication of a certain event or occurrence, such as allowing the user to feel for document or page boundaries, or indicate section boundaries, to notify the user of certain document contents before they appear on the page or screen, or to provide physical or tactile feedback to a blind user of the keyboard, etc.

[**0025**] FIG. **2** is a schematic diagram illustrating a mechanical architecture of a key according to an example embodiment. Key **200** may include a key switch **202** which may move within a silo **212**. Key **200** includes a micro touchpad **204** on an upper surface of the key or key switch **202**. (A touch sensor may be provided in the key switch **202** in the same manner as micro touchpad **204**). A key cover **206** may be provided over touchpad **204**, and may include a snap **208**. An insulative key cover **204** may be provided on an upper surface, a side surface and at least a portion of a lower surface of the key switch **202**. A portion of insulative key cover **204** extending over an edge or lower portion of key switch **202** is shown in FIG. **2** as ESD (electro-static discharge) lip **210**, which may assist in inhibiting electrostatic discharge from the lower edge or lower surface of key switch **202**. One or more (e.g., three) Mylar sheets **224** with conductive traces thereon may be provided. A bottom case **216** is provided beneath Mylar sheets **224**.

[**0026**] The micro touchpad **204** may include a capacitive film, and may be insert molded into the top of the key switch **202**, or assembled on the inside of key switch **202**. By insert molding or top loading, the full top surface of the key (or full top surface of key switch **202**) may be sensitized and available for finger tracking. The touch pad **204**, which may be provided as a capacitive film for example, may be loaded from the top of the key with the touchpad film contacts passing through slots in the outer edge of the key and extending below with the key stem, or through a hole in the keyboard housing **226**. A snap-on key cover **206**, employing snap **208**, may hold the capacitive film (touchpad **204**) in place, or a top molding may be added as an additional operation to seal the key and touchpad. Alternatively, a sensor with a hole to surround the key stem may be assembled like a washer,, which may provide a simpler and less expensive solution and which may provide lower performance. The typical depression force required for key depression may not typically be increased by the addition of the micro touchpad **204**, according to an example embodiment.

[**0027**] In one example embodiment, key switch **202** may be pressed, pushing against and partially collapsing elastomeric dome **214** so that conductive traces in different layers of Mylar sheets **224** are pushed together (shorted) by dome post **220** to provide an indication that key **200** has been pressed (or actuated) to keyboard controller **102** (FIG. **1**). In addition, touch signals from micro touchpad **204** may be routed from touchpad **204** to keyboard controller **102** via a flexible conductor **218** (shown as mechanical flexing feature **218** in FIG. **2**). Flexible conductor **218** may be routed along the outside of key switch **202** from touchpad **204**, through keyboard housing **226** or key stem **212**, to PCB (printed circuit board) or Mylar sheets **224**, as shown in FIG. **2**. Alternatively, the flexible conductor **218** may be routed