

signal to be received from a user action. If no signal is received within a time period, then at step **804** the immediately previously received signals are evaluated against known input signal patterns to determine whether an input signal pattern has been detected. If there is a match, then a further action relating to the detected input signal pattern is initiated at step **806**. If there is no match, then the algorithm returns to a wait state **802**.

**[0099]** From step **802**, if a signal is received, this indicates that a finger has contacted the touchpad. As such, it is evaluated to determine what type of contact has been made. At step **808**, the signal is evaluated to see if it matches against a predetermined range (e.g. in pressure, capacitance and/or location) for a partial contact (where the finger is contacting both the nodule **302** and the surface of touchpad **24B** with a possible air gap inbetween) and/or a predetermined range for a full contact with the surface of touchpad **24B** (where the finger is contacting just the surface). It will be appreciated that if a signal is generated when the user is just touching nodule **302**, that may be analyzed as well. Time, location, and/or pressure may form part of the datapoints for the input signal.

**[0100]** For detection of either type of contact, at step **810** an evaluation is made of the received signal having regard to at least its location and time value for the signal against one or more previously received signals, to determine if the just received signal completes a match against a predetermined input signal pattern. The comparison may be conducted against a library of “signatures” for a library of input signal patterns. The library may be stored in the memory **74** of device **10**.

**[0101]** If there is a match of the input pattern against a library pattern, then an input signal pattern has been detected and an action signal is generated that is associated with that user action at step **812**. For example, if the user has selected the “9” key on the keypad, a command is sent to produce a “9” on a display.

**[0102]** If there is a no match, then the algorithm returns to step **802** to wait for the next signal.

**[0103]** It will be appreciated that in steps **810** and **806** a series of input signals may be built to constitute a series of different key activation scenarios, including: a) touching nodule **302** from above then pressing down to touch nodule **302** and the surface of touchpad **24B**; b) scanning the surface of touchpad **24B**, then touching both the surface of touchpad **24B** and nodule **302**, then just touching nodule **302**, then pressing down on nodule **302** and touching both nodule **302** and the surface of touchpad **24B**; c) scanning the surface of touchpad **24B**, then touching both the surface of touchpad **24B** and nodule **302**, then pressing down on nodule **302** and the surface of touchpad **24B**, etc. These input signal patterns may be provided with the above noted user actions of simply simultaneously touching two input regions on a touchpad. As such, using exemplary algorithm **800**, the previously mentioned first, second and third input signals may be evaluated for their location, time and order to determine whether they match an input signal pattern.

**[0104]** It will be appreciated that other algorithms may be provided where the above noted steps are provided in different order and/or in different processes. The algorithm may be represented by a state diagram.

**[0105]** It will be appreciated that the embodiments relating to devices, modules, applications and systems may be implemented in a combination of electronic hardware, firmware

and software. The system may be incorporated into any electronic device, such as a communication device, a portable electronic device, a personal computer, a keyboard, keypad or the like. The firmware and software may be implemented as a series of processes and/or modules that provide the functionalities described herein. Interrupt routines may be used. Data may be stored in volatile and non-volatile devices described herein and be updated by the hardware, firmware and/or software. Some of the processes may be distributed. The physical components providing structural support for the elements described herein (such as the keypad and the underlying internal structural features) may be formed from materials known to those in the art using processes known to those in the art.

**[0106]** As used herein, the wording “and/or” is intended to represent an inclusive-or. That is, “X and/or Y” is intended to mean X or Y or both.

**[0107]** In this disclosure, where a dimension is provided as an approximate value (for example, when the dimension is qualified with the word “about”), a range of values will be understood to be valid for that dimension. For example, for a dimension stated as an approximate value, a range of about 20% larger and 20% smaller than the stated value may be used. Dimensions of features are illustrative of embodiments and are not limiting unless noted.

**[0108]** The present disclosure is defined by the claims appended hereto, with the foregoing description being merely illustrative of an embodiment of the disclosure. Those of ordinary skill may envisage certain modifications to the foregoing embodiments which, although not explicitly discussed herein, do not depart from the scope of the disclosure, as defined by the appended claims.

1. A system for providing tactile feedback to a user of an electronic device, comprising:

- an input device in the electronic device having a first input region for receiving a user action from said user;
- a surface associated with said input device and covering at least a part of said first input region;
- an input signal generator associated with said input device; and
- a physical feature associated with said input region, said physical feature being located on said surface, providing a second input region for receiving said user action and providing a tactile feedback to said user when said user contacts said second region,

wherein

- said input signal generator generates a first input signal when said user action comprises said user touching said first input region while not touching said second input region; and
- said input signal generator generates a second input signal when said user action comprises said user touching simultaneously said first input region and said second input region.

2. The system for providing tactile feedback to a user of an electronic device as claimed in claim **1**, wherein said input signal generator generates a third input signal when said user action comprises said user touching said second input region and simultaneously not touching said first input region.

3. The system for providing tactile feedback to a user of an electronic device as claimed in claim **2**, wherein said input device is a touchpad generating voltage signals for said input signal generator.