[0035] **FIG. 4**(*b*) is a graph showing scanned potentials.

[0036] **FIG. 4**(*c*) shows an example of data indicated on the display of the cellular phone.

[0037] **FIG. 5**(*a*) shows potentials generated between a contact and a contact pad when the key is depressed at its center.

[0038] **FIG. 5**(*b*) is a graph showing scanned potentials.

[0039] **FIG. 5**(*c*) shows an example of data indicated on the display of the cellular phone.

[0040] **FIG. 6**(*a*) shows potentials between a contact and a contact pad in a first example in which no key depression is detected.

[0041] **FIG. 6**(*b*) is a graph showing scanned potentials.

[0042] **FIG. 7**(*a*) shows potentials between a contact and a contact pad in a second example in which no key depression is detected.

[0043] **FIG. 7**(*b*) is a graph showing scanned potentials.

[0044] **FIG. 8**(*a*) shows potentials between a contact and a contact pad in a third example in which no key depression is detected.

[0045] **FIG. 8**(*b*) is a graph showing scanned potentials.

[0046] **FIG. 9**(*a*) shows potentials between a contact and a contact pad in a fourth example in which no key depression is detected.

[0047] **FIG. 9**(*b*) is a graph showing scanned potentials.

[0048] **FIG. 10**(*a*) is a bottom plan view of a key having three contacts on a rear face.

[0049] **FIG. 10**(*b*) is a bottom plan view of another key having four contacts on a rear face.

[0050] **FIG. 11** is a front elevation of a cellular phone having a data inputting device of the related art.

[0051] **FIG. 12**(*a*) is a front elevation of a contact pad of the cellular phone of **FIG. 11**.

[0052] **FIG. 12**(*b*) is a front elevation of a printed circuit board of the cellular phone of **FIG. 11**.

[0053] **FIG. 13**(*a*) is a side elevation showing the state in which a key is not depressed.

[0054] **FIG. 13**(*b*) is a side elevation showing the state in which the key is depressed.

[0055] **FIG. 14** is a flowchart showing the sequence for inputting characters using the data inputting unit of the related art.

[0056] **FIG. 15**(*a*) shows a potential which is generated each time a contact is touched to or detached from a contact pad on a printed circuit board.

[0057] **FIG. 15**(*b*) is a graph showing the scanned potential.

DETAILED DESCRIPTION OF THE INVENTION

[0058] The invention will be described hereinafter with reference to the drawing figures. It is assumed here that a data inputting device of the disclosed invention is applied to a cellular phone in order to enter characters. The cellular phone is also provided with a data display. However, those skilled in the art will realize that other miniature computing and electronic devices requiring text and data input could benefit from the disclosed device and method herein and such is anticipated.

[0059] The data inputting device comprises a keyboard **1**, contact pads provided on a printed circuit board **2** and corresponding to keys on the keyboard **1**, a key depression detector, and a logic value generator. All the keys are biased away from the contact pads on the printed circuit board **2** using a biasing means such as a spring or having the keys attached to a flexible membrane (not shown). The keys are also tiltable in this biased engagement and this enables the keys to tilt to a number of positions when depressed on the left, right, center, top, or bottom.

[0060] Referring to **FIG. 1**(*a*), the keyboard **1** in the current best mode and to correspond to familiar existing keyboard forms, includes nine keys B1 to B9, each of which corresponds to three characters. Specifically, a total of 27 characters "A" to "Z" and a dot (.) can be entered using these nine keys. The characters corresponding to the individual keys are generally engraved on the keys B1 to B9. For instance, the key B1 carries characters "A", "B" and "C" from left to right engraved on its surface.

[0061] **FIG. 1**(*b*) shows the printed circuit board **2** which is attached to a rear surface of the keyboard **1** and includes a total of 18 contact pads P1-1 to P9-2. Each of the keys B1 to B9 has two contacts C1-1 and C1-2 as shown in **FIG. 2A** on a rear side of the key facing the printed circuit board **2**. The keys and keyboard **1** and the printed circuit board **2** are arranged substantially in parallel with each other and a sufficient distance apart such that they are out of contact with each other when no key is depressed and they are in communication with each other when a key is depressed. The keys are biased away from the printed circuit board **2** by conventional means to bias the keys such as a spring or being attached to a flexible membrane (not shown).

[0062] The key B1 is in the resting state as shown in **FIG. 2**(*a*) when it is not depressed, and is in a contact state as shown FIGS. **2**(*b*) and **2**(*c*) when it is depressed by the user sufficiently to overcome the bias away from the printed circuit board **2**. As shown, the rear face of the key B1 has a plurality of contacts spaced apart and mounted thereon. When the key B1 is depressed at its left side (where the character "A" is present), i.e., a contact C1-1 of the key B1 is touched to the contact pad P1-1 as shown in **FIG. 2**(*b*) and would generate an "A". When the key B1 is depressed at its center, the contacts C1-1 and C1-2 are both touched to the contact pads P1-1 and P1-2 and would generate a different letter, that being "B". Although not shown, when the key B1 is depressed at its right side (where the character "C" is present), only the contact C1-2 is touched to the contact pad P1-2 thereby generating the letter "C".

[0063] In operation, data is inputted to the cellular phone or other connected device by depressing keys as described with respect to the data inputting in the related art shown in **FIG. 14**. The key depression resulting in a left-hand contact of only one contact and one contact pad, or a dual contact of both contacts and both contact pads, or a right-hand contact of only the other contact and other contact pad is detected in order to produce a logic value as follows, which differs from that of the related art.