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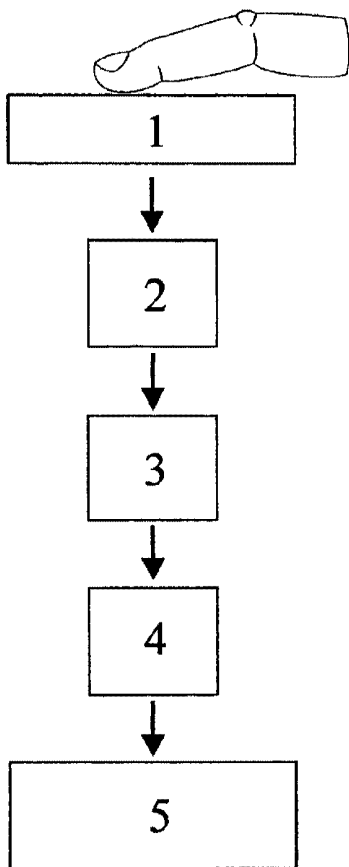
(57) Abstract: Sign generator for information or communication devices comprising at least one touch and/or pressure activated sensor and a display, the sensor being capable of measuring movements in two dimensions, analysing means connected to said sensor for categorising two dimensional movements sensed by the sensor according to a chosen set of categories, translating means including a predetermined table of categories of two dimensional movements corresponding to a chosen set of signs and indicating the chosen sign or signs on the display.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Method and generator for inputting characters

This invention relates to a sign/character generator
represented by a fingerprint sensor with navigation means,
5   for text/sign input for communication and information
devices with displays, such as cellular phones, palmtop PCs,
PDAs, etc.
The compact size of such devices has reduced the
dimensions of their keyboards. Such devices are therefore
10   normally equipped with a keyboard as illustrated in fig. 1
where the number of keys are far less than the standard
letters a user needs to input meaningful text. The solution
for present cellular phones is to let each number key
represent 3 or 4 subsequent letters as per fig. 1. For
15   example the key usually giving number 6 will in the alpha-
numeric mode define one of the letters m, n or o, pending
the number of times the key is pressed. Thus the word
"hello" may be written by pressing key number 4 twice, key
number 3 twice, key number 5 thrice, key number 5 thrice and
20   key number 6 thrice, thus pressing the keys a total of 13
times. The user needs to memorise the positions of these
alphanumeric keys, or look up their positions and shift
finger position from key to key, as per the above example.
This makes text input by reduced keyboards a cumbersome and
25   time-consuming effort.
There is a strong development trend of such handheld
devices to make them increasingly smaller, lighter and yet
cheaper. Yet their functionality continuously increases as
they offer more information and data to the user, and there-
30   fore would benefit from larger displays. However, such
increased displays should preferably not increase the
overall dimensions of the already compact
information/communication devices. Presently the two largest
elements of the front panel of such
35   information/communication devices are the display and the
reduced keyboard, as per fig. 1, where generally the reduced
keyboard still occupies more space than the display. The
only efficient way to increase the display size without

increasing the overall dimensions of the device is to reduce
the keyboard to a minimum size, as indicated in fig. 2
without loosing versatility and convenience of the text
input process.

5   There are several known solutions to make the text
input process based on current keyboard types as per fig. 1.
One manufacturer, Ericsson, provides an external QWERTY
keyboard as a plug-in device to their cellular phones. This
solution has, however, the disadvantages of extra size,
10 weight and costs, being directly contrary to user
requirements for increasingly smaller, lighter, cheaper and
more versatile cell phones.

    Another known solution is the Nokia Naviroller™ in
which a mechanical barrel on the front panel is rolled by
15 the finger, bringing up a vertical column of signs and
characters on the display. Selection of a particular sign or
character is performed by mechanically pressing down the
barrel. In practice this is not a faster solution than
moving the finger from key to key and pressing the selected
20 key one or multiple times. The Naviroller™ solution also
imposes a serious constrain on the cursor movements as it
limits cursor movements to one dimension; <up> and <down>,
except for pressing the barrel for character selection.

    Tegic Communications has developed a system called T9™
25 whereby software logic search for legal letter combinations
of a particular language, thereby minimising the multiple
presses of any key representing multiple characters, as
shown in fig. 1. This is an elegant solution as the number
of finger taps is presumably significantly reduced, but the
30 negative aspect is that it requires a translation program
for each language, and that these must be stored in the
phone memory. Motorola is said to have developed a similar
solution, called iTap™, thus having the same problems.

    Generating text/character input on such reduced
35 keyboards is therefore a slow and cumbersome process, even
for alphabetic languages like the Latin language. However, a
large part of the world's population uses sign-based
languages, such as Chinese, Japanese, Korean, etc. Sign-
based languages may comprise hundreds of thousands of signs,

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aggravating the problem of text input by keyboards
considerably.

A known solution for text input by sign-based languages
is the Zi 8™ provided by ZiCorp, aimed at simplifying
5   character input by Chinese signs through a limited keyboard
as shown in fig. 1. It is based on the fact that Chinese
signs are composed of so-called basic strokes, which
sequence defines a particular sign. These basic strokes are
assigned to the keys, much in a similar way as alphabet
10   letters are assigned to the number keys, as illustrated in
fig. 1. This solution enables input of Chinese characters by
a reduced keyboard as per fig. 1, but does not resolve the
main problems. A keyboard of considerable size is still
required, but due to size limitations it normally contains
15   far less keys than the characters/signs required to compose
a meaningful message. The finger therefore has to be moved
around the keyboard, and each key may need to be pressed
down mechanically multiple times to select a message.

US 5,982,303 describes a joystick to feed characters,
20   numbers and function categories into a processor. The
method according to this publication may be use to write
non-latin signs and to control a cursor. The publication
mentions the use of eight keys for providing the control
signals and represents a large and complicated solution. A
25   similar solution is described in US 4,680,577.

It is an object of this invention to provide a simple
solution for feeding information into a small unit, e.g. a
cellular phone, by using sensors which have already been
provided for other purposes.

30   US 5,088,070 describes the use of several dedicated
switches on a wrist watch. Although it is more compact than
the abovementioned solution it still represents an
unnecessary large structure on the limited available space.

US 6,057,540 describes an optical sensor with
35   navigation utilities. It's dimensions and complexity,
however, makes unsuitable for usse in mobile phones and
similar. Also, as the sensor described here preferably uses
a 16x16 pixel matrix it is not suitable for use as a
fingerprint sensor, since the resolution is unsufficient.

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