Fig. 8

300

301

307

302

303

304

Output of Left-side Character Name

Output of Right-side Character Name (Ghadrif Name)

Output of Numerical

Output of Chinese Character

Left-side Code + Space Bar

Right-side Code + Space Bar

Input of Right-side Code

Output of Chinese Character Corresponding to Right-side Second-side Duplicate Shortcut Code

Output of Chinese Character Corresponding to Left-side Second-side Duplicate Shortcut Code

(54) Title: APPARATUS AND METHOD FOR INPUTTING CHINESE CHARACTERS FOR COMMUNICATION TERMINAL

Abstract: An apparatus and method for inputting Chinese characters for a communication terminal is disclosed, whereby a keypad provided with various kinds of buttons can slide in at least four directions in a main body around the center thereof, and thus Chinese characters or numerals/symbols can be conveniently inputted.
TITLE: APPARATUS AND METHOD FOR INPUTTING CHINESE CHARACTERS FOR COMMUNICATION TERMINAL

TECHNICAL FIELD

The present invention relates to an apparatus and method for inputting Chinese characters. More particularly, the present invention relates to an apparatus and method for inputting Chinese characters for a communication terminal, whereby a keypad provided with various kinds of buttons can slide in at least four directions in a main body around the center thereof, and thus an input of Chinese characters or numerals/symbols through the communication terminal can be conveniently performed.

BACKGROUND ART

Recently, with an abrupt development of communication technology, communication terminals such as a mobile phone, a PDA, a pocket PC, an Internet terminal, and the like, which can make users perform voice and data communications during their movement, have been developed and widely spread.

In particular, owing to the technical development of general personal wireless communication services and the remarkable increase of the number of subscribers, various kinds of additional services have been developed and actively used. Among such additional services, a message transmission service has become the center of special interest of the users due to the peculiarity of the message transmission service in that the message transmission function is performed through voice communication terminals, and through such a message transmission service, mobile communication companies make a great profit.

In order to provide such a message transmission service, there is a need for a method and apparatus for inputting useful characters through a mini keyboard such as an electronic keypad.
Mini keyboard application fields include small-sized computer systems such as cellular phones, ultra mobile personal computers (UMPC), and the like, that should have a small number of key buttons, keyboard systems that are substitutes of keyboard input devices of Internet TVs, digital cameras, PDAs, electronic organizers, and the like, and input systems having constructions and functions similar to those of guide kiosk, electronic locks, automated teller machines (ATMs), and the like.

However, since the number of Chinese characters (汉字) is so large, it is difficult to apply such Chinese characters to a mini keyboard system having a limited number of buttons, and even to a PC QWERTY keyboard having more than 100 buttons. In order to input Chinese characters through a mini keyboard system, it is required to repeat the key button input several times.

At the beginning of 2005, the number of cellular phone users in China was four hundred million, and the use of SMS messages has been explosively increased. In 2004, Chinese sent about 2178 hundred million SMS messages in all, and this amounts to 1/4 of SMS messages sent through all the nations of the world in the same year.

Actually, in sending messages using cellular phones, Chinese mainly use Roman characters and numerals instead of Chinese characters. In particular, there is a growing tendency that young people prefer to send messages using Roman characters as abbreviations without converting pinyin into Chinese characters or using complicated Chinese character input systems. Accordingly, in China, it is actually worried over that the language destruction shall occur to the extent that it hinders the development of the Chinese characters handed down for several thousand years.

Generally, in order to provide a Chinese character transmission service using a mini Chinese character keyboard provided with a limited number of buttons, such as a touch-tone phone type keypad, Hanyu pinyin (HID 音方: which refers to Pronunciations of Chinese characters using Roman characters according to pinyin system, and is hereinafter referred to as "pinyin") may be used. Using the pinyin, Roman consonants/vowels for inputting pinyin are effectively arranged on a touch-tone phone type keypad, or Roman character
codes for outputting pinyin of desired Chinese characters are rapidly combined through a user's function key manipulation.

In order to meet the above-described technical requirements, diverse Chinese character input systems have been developed and used. However, according to the existing pinyin system related to a method of inputting Roman character codes of Chinese characters using a touch-tone phone type keypad, since Roman characters of the corresponding keypad are mixedly arranged and an output of one Roman character requires 3~4 times key input on the keypad, it is inconvenient for a user to be well aware of the keyboard arrangement. Also, when the Roman character combination for one Chinese character is completed and a list of Chinese characters is outputted, it is required to input an end indication key after selecting the corresponding Chinese character.

On the other hand, a conventional Chinese character typing method using a Chinese PC QWERTY keyboard is classified into Yin Ma (ǐǐH) and Zing Ma (形々). In the case of Yin Ma, a pinyin input method has been widely used as a representative. In the case of Zing Ma, a wubizixing (五筆字型) input method, which was devised by Wang Yongmin, has been widely used in most areas in China. It is not easy for a user to become proficient in the wubizixing input method, but wubizixing is extremely fast. Here, the pinyin input method is slow and inconvenient in comparison to the wubizixing input method, but has been widely used in cellular phones. By contrast, although the wubizixing input method is simple and has a much higher character input speed, it is very difficult to apply the wubizixing input method to cellular phones, and thus this method has not yet been actively used in the field of cellular phones.

As described above, the Chinese character input methods using Roman characters using a touch-tone phone type keypad according to the prior art (e.g. pinyin input method using Roman characters) have the problems that they are extremely different from the Roman character input system (that refers to 26 Roman character input environment in a QWERTY keyboard of a PC) provided by a general word processor, and thus deteriorate the user friendship. Particularly, in the case of allocating a plurality of Roman character consonants
and vowels to one button on the keypad, it requires a great effort for a user to be well acquainted with the key arrangement of the keypad and thus it is not easy for the user to become proficient in button manipulation, even if the key arrangement has good regularity, to cause a great obstacle in inputting pinyin.

On the other hand, although the wubizixing has been greatly spread as a Chinese character typing method using the PC QWERTY keyboard, there exists no wubizixing input method using a touch-tone phone type keypad, and thus there is a need for introduction of a fast and convenient wubizixing input method for use in communication terminals.

Also, according to a terminal to be used in a wireless network where users exchange data using the ultrahigh-speed wireless internet, it is more important for the terminal to overcome the limit of a display and an input system in order to function as a multifunctional multimedia device that users seriously desire.

**DISCLOSURE**

**TECHNICAL PROBLEM**

Accordingly, the present invention has been made to solve the above-mentioned problems occurring in the prior art while advantages achieved by the prior art are maintained intact.

One object of the present invention is to provide an apparatus and method for inputting Chinese characters for a communication terminal, whereby a keypad provided with various kinds of buttons can slide in at least four directions in a main body around the center thereof, and thus an input of Chinese characters through the communication terminal can be conveniently performed.

Another object of the present invention is to provide an apparatus and method for inputting Chinese characters for a communication terminal, which enables a user to input four phonemes at maximum by user's once manipulation of the keypad through effective arrangements of Chinese pinyin (which means phonetic symbols of Chinese characters using Roman
characters) and Roman consonants and vowels used to input wubizixing (which means five stroke character models) codes on respective buttons of a keypad and in respective directions of the keypad that can slide in at least four directions, and thus can greatly increase a Chinese character input speed.

TECHNICAL SOLUTION

In order to achieve the above and other objects, there is provided a communication terminal capable of inputting Chinese characters and numerals/symbols for communications with an outside or data storage, according to embodiments of the present invention, which includes a keypad, allocated with keys for a plurality of wubizixing roots, Roman characters for inputting Hanyu pinyin and wubizixing codes, wubizixing zone codes and position codes, numerals/symbols, and special functions, for generating a key signal in accordance with a user's button manipulation or a keypad sliding manipulation in at least four directions in a main body of the communication terminal around the center of the keypad; a character storage unit for storing Chinese character data for used in the communication terminal; a program memory for storing an interior operation program of the communication terminal; a code storage unit for storing Hanyu pinyin and wubizixing code data corresponding to various kinds of buttons arranged on the keypad and a sliding direction of the keypad; a button manipulation recognition unit for detecting a key manipulation state of the respective buttons provided on the keypad; a keypad sliding recognition unit for detecting a key manipulation state according to the keypad sliding manipulation in the at least four directions; a microprocessor for judging which Chinese character code data a user has inputted with reference to the Chinese character data stored in the Chinese character storage unit in accordance with the operation program stored in the program memory if a key manipulation state detection signal is inputted through the button manipulation recognition unit and/or the keypad sliding recognition unit, generating and outputting a display control signal for displaying a Chinese character of a corresponding Chinese character input mode inputted by the user with reference to the code data stored in the Hanyu pinyin and wubizixing code
storage unit; a display drive unit for outputting a drive control signal for
displaying the Chinese character and numeral/symbol corresponding to the
code data selected by the user through the button manipulation or the keypad
sliding manipulation on the keypad in accordance with the display control signal
outputted from the microprocessor; and a display unit for displaying the
Chinese character and numeral/symbol on a display screen in accordance with
the drive control signal outputted from the display drive unit.

In another aspect of the present invention, there is provided a method
for inputting Chinese characters for a communication terminal, which includes
(1) a microprocessor of the communication terminal judging whether a user
selects a Chinese character input mode; (2) the microprocessor of the
communication terminal judging whether the user, who has selected the
Chinese character input mode, selects one input mode of a Hanyu pinyin input
mode and a wubizixing input mode; (3) if the user has selected the Hanyu
pinyin mode, the microprocessor of the communication terminal detecting a key
signal in accordance with a user's manipulation of a plurality of buttons provided
on the keypad or a keypad sliding manipulation in upper, lower, left, right, and
diagonal directions, inputted from a button manipulation recognition unit and/or
a keypad sliding recognition unit, combining a consonant and a vowel of a
corresponding Roman character and a numeral/symbol, and displaying a
corresponding Chinese character and numeral/symbol on a display screen of
the communication terminal; (4) If the user has selected the wubizixing input
mode, the microprocessor of the communication terminal detecting the key
signal in accordance with the user's manipulation of the plurality of buttons
provided on the keypad or the keypad sliding manipulation in the upper, lower,
left, right, and diagonal directions, inputted from the button manipulation
recognition unit and/or the keypad sliding recognition unit, combining the
consonant and the vowel of the corresponding Roman character and
numeral/symbol, and displaying the corresponding Chinese character and
numeral/symbol on the display screen of the communication terminal; (5) if a
Chinese character input work through the one input mode of the Hanyu pinyin
input mode and the wubizixing input mode is completed, the microprocessor of
the communication terminal judging whether the user selects storage of the Chinese character, and storing the Chinese character inputted by the user; and

(6) the microprocessor of the communication terminal judging whether the user terminates the Chinese character input mode, and continuing or removing the Chinese character input mode.

ADVANTAGEOUS EFFECTS
As described above, according to the apparatus and method for inputting Chinese characters for a communication terminal according to the present invention, the Hanyu pinyin and wubizixing codes are arranged on the respective buttons of the keypad provided on the communication terminal and in four or more directions, in which the keypad can slides, so that the user can easily recognize the arrangements, and the user can promptly and conveniently input the Chinese character with a number of inputs which is less than that required in the existing communication terminal to practically contribute to the spread of the Chinese character use.

Also, since the apparatus and method according to the present invention enables users to input Chinese characters more rapidly and conveniently, it can be applied to the implementation of a document work, e-mail, chatting, and internet information search in China, and can contribute to the prevention of the language destruction to the extent that it hinders the development of the Chinese characters handed down for several thousand years.

Also, the apparatus and method according to the present invention can maximize the input speed of the Chinese characters, and thus can reduce the communication cost for mobile Chinese character messenger users.

BRIEF DESCRIPTION OF THE DRAWINGS
The foregoing and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:
FIG. 1 is a view schematically illustrating the structure of a communication terminal according to an embodiment of the present invention;

FIG. 2 is a view explaining the operation state of a keypad of a communication terminal according to an embodiment of the present invention;

FIG. 3 is a block diagram schematically illustrating the inner configuration of an apparatus for inputting Chinese characters for a communication terminal according to an embodiment of the present invention;

FIG. 4 is an exemplary view of a Hanyu pinyin keypad of an apparatus for inputting Chinese characters for a communication terminal according to an embodiment of the present invention;

FIG. 5 is a table showing an example of conversion for implementing a Hanyu pinyin combination using Roman characters, and a Hanyu pinyin code combination using Roman characters in a method for inputting Chinese characters using a Hanyu pinyin keypad according to an embodiment of the present invention;

FIG. 6 illustrates a wubizixing character table, zones, and an identifier (ID) code table that are applied to a conventional PC QWERTY keyboard;

FIG. 7 illustrates wubizixing high-frequency Chinese characters and second-class shortcut-code Chinese character table that are applied to a conventional PC QWERTY keyboard;

FIG. 8 is a view illustrating an example of a wubizixing keypad of an apparatus for inputting Chinese characters for a communication terminal according to an embodiment of the present invention;

FIG. 9 is a view explaining a wubizixing keypad structure of an apparatus for inputting Chinese characters for a communication terminal according to an embodiment of the present invention;

FIG. 10 is a table showing an example of conversion for implementing a wubizixing code combination using Roman characters, and a wubizixing code combination using Roman characters in a method for inputting Chinese characters using a wubizixing keypad according to an embodiment of the present invention;

FIG. 11 is a flowchart illustrating a method for inputting Chinese
characters for a communication terminal according to an embodiment of the
present invention;

FIG. 12 is a flowchart illustrating in detail the Hanyu pinyin input mode of
FIG. 11;

FIGS. 13 and 14 are flowcharts illustrating in detail the left-side
code input and the right-side character input as illustrated in FIG. 9;

FIG. 15 is a flowchart illustrating in detail the wubizixing input mode of
FIG. 11; and

FIGS. 16 and 17 are flowcharts illustrating in detail the left-side
code input and the right-side character input as illustrated in FIG. 15.

BEST MODE
Reference will now be made in detail to the preferred embodiments of
the present invention. It is to be understood that the following examples are
illustrative only and the present invention is not limited thereto.

FIG. 1 is a view schematically illustrating the structure of a
communication terminal according to an embodiment of the present invention,
and FIG. 2 is a view explaining the operation state of a keypad of a
communication terminal according to an embodiment of the present invention.

FIG. 3 is a block diagram schematically illustrating the inner configuration of an
apparatus for inputting Chinese characters for a communication terminal
according to an embodiment of the present invention.

As illustrated in the drawings, a keypad 10 is provided with a plurality of
buttons for inputting a plurality of wubizixing (hereinafter referred to as "wubi")
roots, Roman characters for inputting Hanyu pinyin and wubi codes, wubi zone
codes and position codes, numerals/symbols, and special functions, and in
accordance with a user's manipulation, the entire keypad 10 slides in at least
four directions, e.g. in upper, lower, left, right, and diagonal (upper left, upper
right, lower left, and lower right) directions, in a main body 1 of the
communication terminal. As illustrated in FIG. 1, it is preferable that the
keypad 10 has a sliding structure in which an edge 3 of the keypad 10 is
engaged in a groove 5 in the main body 1, so that the edge 3 is movable in
upper, lower, left, right, and diagonal directions within the groove 5. However, it is also possible to adopt a different engagement between the keypad 10 and the main body 1.

In this case, on the respective buttons of the keypad 10 and in at least four directions, keys for a plurality of wubi roots, Roman characters for inputting Hanyu pinyin and wubi codes, wubi zone codes and position codes, numerals/symbols, and special functions are allocated (See FIGS. 4, 8, and 9), and key signals are generated in accordance with the button manipulation by the user who desires the Chinese character input or the sliding manipulation of the keypad 10 (See FIG. 2) in at least four directions within the main body 1 of the communication terminal around the center of the keypad 10.

In the case where Roman characters for inputting the wubi roots and pinyin and wubi codes are allocated on the respective buttons and in the at least four sliding directions and the keypad 200 is the Hanyu pinyin keypad, one or two kinds of Roman characters for inputting the pinyin codes, numerals/symbols, and special functions are allocated on the respective button of the keypad 10. Also, in the at least four sliding directions, keys for Roman characters of A, O, E, I, U, N, and NG, pinyin input confirmation keys, and function keys for inputting right-side characters are allocated (See FIG. 4). In the case of the wubi keypad 300, one or two kinds of Roman characters for inputting the wubi codes, numerals/symbols, and special functions are allocated on the respective button of the keypad 10. Also, in the at least four sliding directions, wubi Chinese character key names, space-bar function keys for outputting wubi type Chinese characters, and wubi second-class duplicate shortcut-key code Chinese characters are allocated (See FIGS. 6 to 9).

Accordingly, 9 signals can be once inputted through one key, and in the case of a communication terminal allocated with 15 keys, 135 inputs of Roman character codes and numerals/symbols in total can be made through a user’s once manipulation only. Accordingly, the apparatus and method for inputting Chinese characters according to the present invention can be adopted in various kinds of communication terminals that require a keypad 10 provided with a small number of buttons to achieve a Chinese character input speed and
accuracy as high as those obtained through a general computer keyboard (e.g. PC QWERTY keyboard).

For example, in outputting "大" using the pinyin input system, the PC QWERTY keyboard requires inputting of keys three times (L1 + 'Confirm' key), and the keypad of the existing communication terminal requires pressing of keys 7 times in total (including pressing of 5-number key three times, pressing of 4-number key three times, and pressing of 'Confirm' key once). However, according to the present invention, "大" can be outputted by once pressing 'OU' key (See FIG. 4) that is provided on the keypad 10 as manipulating the key in the right direction. On the other hand, in outputting "大" using the wubi system, the existing PC QWERTY keyboard requires pressing of 'S' key four times to input 'SSSS', and the keypad of the existing communication terminal requires pressing of 7-number key 12 times. However, according to the present invention, "大" can be outputted by once manipulating 0-number key (See FIG. 4) that is provided on the keypad 10 in upper left CE_h) direction. Also, in outputting "ll" using the wubi system, the existing PC QWERTY keyboard requires pressing of 'ENT + space bar' four times to input 'SSSS', and the keypad of the existing communication terminal requires pressing of 3-number key twice, pressing of 6-number key twice, pressing of 8-number key once, and pressing of 'Confirm' key that corresponds to a 'space bar' function in the wubi input system. However, according to the present invention, "ll" can be outputted by once manipulating 7-number key on the keypad 10, once manipulating 1-number key in lower (T) direction, and once manipulating 1-number key in left (E) direction. Consequently, using a keypad provided with 15 key buttons, 135 input signals, coming next to the buttons of the PC QWERTY keyboard, can be outputted through a user's once manipulation thereof.

A button manipulation recognition unit 20 detects the key manipulation state of the respective button provided on the keypad 10, and outputs the detected key manipulation state to a microprocessor 70.

A keypad sliding recognition unit 30 detects the key manipulation state
according to the sliding manipulation of the keypad 10 in at least four directions, and outputs the detected key manipulation state to the microprocessor 70.

Although the keypad sliding recognition unit 30 is provided within the groove 5 in the main body 1 of the communication terminal, to which the keypad 10 is coupled, to sense the sliding of the keypad 10, the installation position of the keypad sliding recognition unit 30 may be changed in accordance with the sliding structure of the keypad 10.

A character storage unit 40 stores a plurality of Chinese characters, numerals/symbols, and outputs the Chinese character of the corresponding code under the control of the microprocessor 70.

A program memory 50 stores an operation program of the microprocessor 70.

A code storage unit 60 stores code data corresponding to the various kinds of buttons arranged on the keypad 10 and the sliding directions of the keypad 10.

If a key manipulation state detection signal is inputted through the button manipulation recognition unit 20 and/or the keypad sliding recognition unit 30, the microprocessor 70 judges which Chinese character code a user has inputted with reference to the Chinese character data stored in the Chinese character storage unit 40 in accordance with the operation program stored in the program memory 50, generates and outputs a display control signal for displaying the corresponding Chinese character inputted by the user with reference to the code data stored in the code storage unit 60 to a display drive unit 80.

The display drive unit 80 outputs a drive control signal for displaying the Chinese character and numeral/symbol corresponding to the code data selected by the user through the button manipulation or the keypad sliding manipulation on the keypad 10 in accordance with the display control signal outputted from the microprocessor 70.

A display unit 90 is typically composed of LCD and so on, and displays the Chinese character and numeral/symbol on a display screen in accordance with the drive control signal outputted from the display drive unit 80, so that the
user can confirm the Chinese character inputted by the user.

FIG. 4 is an exemplary view of a Hanyu pinyin keypad 200 of an apparatus for inputting Chinese characters for a communication terminal according to an embodiment of the present invention, and FIG. 5 is a table showing an example of conversion for implementing a Hanyu pinyin combination using Roman characters, and a Hanyu pinyin code combination using Roman characters in a method for inputting Chinese characters using a Hanyu pinyin keypad 200 according to an embodiment of the present invention. FIG. 5 shows examples of all kinds of Hanyu pinyin input methods using a button to which TN’ is allocated.

As illustrated in the drawing, the Hanyu pinyin keypad 200 is provided with a plurality (e.g. 6 rows and 3 columns) of buttons including function keys of call, Chinese character mode, power, and the like. It is preferable that three buttons provided in 1st row are allocated with call, Chinese character mode, and power, respectively, and 26 Roman characters are allocated to 1st to 3rd rows in the remaining 2nd to 6th columns to match the shortcut keypad of the communication terminal with reference to the wubi character table, zones, and ID code table (See FIG. 6) in the PC QWERTY keyboard. The 26 Roman characters are allocated to the respective buttons of the keypad 10 in the order of TN (1st row and 1st column), G(1st row and 2nd column), YH (1st row and 3rd column), RB (2nd row and 1st column), FZ (2nd row and 2nd column), UJ (2nd row and 3rd column), EV (3rd row and 2nd column), D (3rd row and 2nd column), IK (3rd row and 3rd column), WC (4th row and 1st column), S (4th row and 2nd column), OL (4th row and 3rd column), QX (5th row and 1st column), A (5th row and 2nd column), and PM (5th row and 3rd column) (See FIG. 4). Also, Roman vowels that are frequently used to input pinyin are allocated to at least four directions in which the keypad 10 can slide, for example, 7 vowel keys of 'A, O, E, NG, I, N, and U' are allocated to 7 sliding directions (i.e. upper left, upper, upper right, left, right, lower left, and lower right), respectively.

In this case, other vowels, except for the 7 vowels allocated to at least four directions in which the keypad 10 slides, are produced in accordance with the manipulation of the 26 Roman character keys allocated to the
corresponding keypad 10, and the lower direction (T), in which the keypad 10 slides, is used to input the Roman characters allocated to the right sides of the respective buttons each of which is allocated with two Roman characters.

That is, the Roman character arranged on the left side of the respective button on the keypad 10 can be inputted by once pressing the corresponding button, and the Roman character arranged on the right side of the respective button can be inputted by sliding the keypad 10 in lower (T) direction in a state that the corresponding button is pressed.

The input of Roman characters on the Hanyu pinyin keypad 200 as described above will now be described in more detail.

The user can input 'TA' by sliding the keypad 10 in upper left (左 Ji) direction in a state that the button in 2nd row and 1st column is pressed, and can input 'NA' by once pressing the button in 2nd row and 1st column in a state that the keypad 10 is slid in upper left (CZii) direction only by hand's friction with the button in 2nd row and 1st column not pressed.

As described above, 'NA' is inputted by once pressing the button in 2nd row and 1st column in a state that the user slides the keypad 10 in upper left (左 Ji) direction, and this is almost the same as once input of the Roman character.

The rule for the generation of Hanyu pinyin as described above will be summarized as follows.

1. In order to combine the right-side character allocated to the keypad 10 with 'A, O, E, NG, I, N, U' allocated to the respective direction in which the keypad 10 slides, 'A, O, E, NG, I, N, U' is first manipulated, and then the button to which the corresponding right-side character is allocated is manipulated. In this case, if the manipulation signal of 'A, O, E, NG, I, N, U' is first inputted without any button signal, the right-side character of the following button is combined and outputted (e.g. in order to output 'nanone', the manipulation is made in the order of 'a, n, o, n, e, n').

2. In order to combine the left-side character allocated to the keypad 10 with 'A, O, E, NG, I, N, U' allocated to the respective direction in which the keypad 10 slides, the corresponding vowel is manipulated by sliding the keypad 10 in a state that the button to which the left-side character is allocated is
manipulated (e.g. in order to output 'tatote', the manipulation is made in the order of 't, a, t, o, t, e').

- If a vowel is manipulated after the keypad 10 slid in upper, lower, left, right, or diagonal direction is returned to its original position in a state that a button on the keypad 10 is pressed, only the right-side character of the corresponding button is outputted, while if only a vowel is manipulated by siding the keypad 10 in upper, lower, left, right, or diagonal direction in a state that no button is pressed, no character is outputted.

- If the button is not manipulated, it is impossible to output a vowel allocated to the respective sliding direction of the keypad 10.

- A syllable (i.e. a combination of a Roman character allocated to a button with a vowel allocated to the respective sliding direction of the keypad 10) is completed when a signal of the first phoneme is maintained (i.e. is pressed).

- The right-side Roman character on a button is outputted by sliding the keypad 10 in lower (T) direction in a state that the corresponding button is pressed.

- In the case where four contacts are provided on upper (Ъ), lower (T), left (Ъ), and right (Ъ) sides of the four directions in which the keypad 10 slides and 8 key signals are outputted, the output of a vowel allocated in the diagonal direction in which the keypad 10 slides is recognized as a diagonal vowel if switches on both sides of the corresponding diagonal line (e.g. in order to output 'а', both the upper (Ъ) contact and the left (Ъ) contact should be pressed) are pressed together even for 0.01 second.

- In the prior art, the confirm key is pressed after all the corresponding pinyin are completed to output a desired Chinese character, whereas according to the present invention, the input of Hanyu pinyin is recognized as an automatic pressing of the confirm key when the pinyin (i.e., pinyin for one Chinese character and two or more words and sentences) is completed by the input of a vowel through a sliding manipulation.

For example, in the case of 'liang', the vowel refers to 'iang', which does not exist in 'A, O, E, NG, I, N, U' allocated in the sliding directions when the
Hanyu pinyin is inputted, and thus it is completed using vowels included in the 26 Roman characters. According to the input rule, 'liang' can be outputted by the following inputs.

1. Sliding in lower (T) direction in a state that 'OL' button is pressed: L
2. Pressing of 'IK' button: I
3. Sliding in left (E) direction in a state that 'A' button is pressed: ANG + 'Confirm' key
4. Completion of 'liang' pinyin (three times input in total): Arrangement of the corresponding Chinese characters in the order of their frequency on a list window
5. Selection of the corresponding Chinese characters

In this case, even if an input is made by performing "Pressing of 'A' button + Sliding in lower (T) direction + Pressing of 'G' button", instead of inputting as in Number 3, 'liang' is completed. However, since the last vowel is not inputted by sliding the keypad, it is judged that the pinyin (i.e. pinyin for one Chinese character, two or more words and sentences) is not completed, and thus the Chinese characters for the corresponding pinyin are not outputted. This rule is to remove the inconvenience of inputting the last vowel by sliding in order to input the 'Confirm' key whenever the pinyin of each Chinese character is completed when two or more words or sentences are inputted. Accordingly, by once performing the sliding manipulation for the last vowel when the pinyin input for two or more desired words or sentences is completed, Chinese characters in two or more desired words or sentences can be selected.

-. In the case of all list windows (e.g. one Chinese character and two or more words or sentences) outputted after the last vowel is inputted by sliding, Chinese characters are arranged in the order of their frequency.

-. If there is one list outputted for the corresponding pinyin, the corresponding Chinese character is automatically selected.

-. If there are several lists outputted for the corresponding pinyin, a cursor on the display screen is moved onto the corresponding Chinese character through the sliding manipulation of the keypad in a state that no button is pressed, and then the 'Confirm' key (i.e. 'FZ' button in 3rd row and 2nd...
column in FIG. 4) is pressed to select the corresponding Chinese character.

As described above, in the case of inputting the Hanyu pinyin, two Roman characters at maximum can be inputted by a button manipulation only once.

On the other hand, in the case where a user inputs a symbol and so on, which does not exist on the numeral or key buttons, in addition to the Chinese character using the Hanyu pinyin keypad 200, the user first sets a numeral/symbol mode by sliding the keypad 10 in lower (T) direction in a state that 'G' button in 2nd row and 2nd column in FIG. 4 is pressed, and if a corresponding window appears on the display screen, the user inputs a desired numeral/symbol (in the case of inputting a numeral, the user slides the keypad in upper (_h) direction in a state that the user presses the corresponding numeral key button, without setting a separate numeral mode, in a wubi input mode to be described later). In the case of the numeral, the user presses the corresponding key button without setting a separate mode when the character input mode is terminated.

For example, in order to input the numeral T, the user slides the keypad 10 in lower direction in a state that the user presses a 'G' button, and then once presses a button on which T is printed. In order to input the symbol '?' the user slides the keypad 10 to the right (右) side in a state that the user presses a button in 5th row and 2nd column, without the necessity of pressing 'G' button. The numeral/symbol input mode is terminated by pressing the "G" button once again.

Also, in order for the user to control the direction of a cursor displayed on the display unit 90 during inputting of a symbol, the user uses a direction indication button in 3rd row and 2nd column. For example, the cursor displayed on the display unit 90 is moved to the right side in a manner that the user slides the keypad 10 in lower (T) direction in a state that the user presses 'G' button, and then slides the keypad 10 to the right (右) side in a state that the user presses the button in 3rd row and 2nd column. In order to move the cursor to a desired position, the user keeps the manipulation state of the corresponding button until the cursor reaches the desired position.
Here, the symbols are arranged in consideration of their effectiveness in use, and it is preferable that frequently used symbols are allocated to buttons capable of directly inputting the numerals/symbols and the symbols without setting a mode.

FIG. 6 illustrates a wubi character table A, zones A-1, and an ID code table that are applied to a conventional PC QWERTY keyboard, and FIG. 7 illustrates wubi high-frequency Chinese characters A-3 and second-class shortcut-code Chinese character table A-4 that are applied to a conventional PC QWERTY keyboard.

There are about 130 wubi basic roots, and by applying and adding several characters thereto, 245 characters (wubi standard) are provided (See "A" in FIG. 6). In dividing the respective Chinese character into components in a typical method, the components are understood as the meaning of "radicals". In the similar manner, the Chinese characters are analyzed and sub-divided into wubi "roots" in order to divide the Chinese characters on 26 keys provided on a PC QWERTY keyboard. According to wubi, roots are arranged using 5 strokes among 26 essential strokes for national standard Chinese characters, and in accordance with the stroke order of Chinese characters, all Chinese characters are classified into five stroke types. These five stroke type Chinese characters are allocated to match Roman character keys of the PC QWERTY keyboard (See "A-1" in FIG. 6).

As shown as "A-1" in FIG. 6, according to wubi in the conventional PC QWERTY keyboard, Chinese characters are arranged in accordance with the stroke type of the first stroke. That is, as shown as "A-1", the keyboard is divided into five regions, each representing a stroke. Characters of which the first stroke corresponds to 'falling left' are arranged in a third region that is a 'QWERT' key zone, characters of which the first stroke corresponds to 'falling right' are arranged in a fourth region that is a 'YUIOP' key zone, and characters of which the first stroke corresponds to 'horizontal' are arranged in a first region that is a 'ASDFG' key zone. Also, characters of which the first stroke corresponds to 'vertical' are arranged in a second region that is a 'HJKL' key zone, and characters of which the first stroke corresponds to 'hook' are
arranged in a fifth region that is a 'XCVBN' key zone. On the 25 keys, representative characters among 130 roots are respectively arranged along with 25 key numbers (which have the largest size and correspond to representative Chinese characters having very strong capabilities of Chinese character construction. Hereinafter, the representative characters are called "Chinese character key names". In this case, the remaining roots allocated to the respective keys, except for the Chinese character key names, are classified into 'main roots' which are quite frequently used, and 'sub roots' which have root features, but are not frequently used) (See "A-1" in FIG. 6). For example, in the case of a Chinese character key name ‘金’, ‘金’ is a Chinese character key name, a Roman character ‘Q’ is a wubi input code, ’3’ of the numeral ’35’ is a zone number that means the third region, and ’5’ of the numeral ’35’ is a position number that means the fifth position (each of 5 wubi regions has five position numbers given to the Chinese character keys provided in each wubi region, and in the case of the first region, position numbers are given to the Chinese character numbers in the order of 11, 12, 13, 14, and 15 in the left direction based on the 'G' key).

As described above, the 5 regions are classified based on the first strokes of the wubi 245 characters, and the second strokes of the roots are generally constructed to coincide with the position numbers, respectively. That is, in the case of ‘±’, since the first stroke is ‘—’ belonging to the first zone and the second stroke is ’1’ having a sign '2', it is positioned in the position '12F' as illustrated as "A-1" in FIG. 6. However, this rule may not be applied to all the roots.

The number of strokes of a root having a single-stroke or double-stroke is set to coincide with the position number. For example, since the above-described 5 wubi strokes refer to a single-stroke, they are all positioned in the first position. A double-stroke root 'n' composed of two single-strokes is positioned in the second position, and a double-stroke root ‘=.’ composed of three single-strokes is positioned in the third position.

"A-2" in FIG. 6 denotes an identification (ID) code table showing the construction of ID codes that are very important in the wubi input method in the
conventional PC QWERTY keyboard.

Chinese characters, even if they have the same roots, may differ in accordance with their types (Chinese characters can be classified in three types in the order of their occupation ratio in the Chinese character: 1) a right-left type, 2) an upper-lower type, and 3) a combination type, together with their signs indicated by numerals (hereinafter referred to as 'character types')), and thus 'same-code Chinese characters' (which are different Chinese characters having the same code) in wubi may occur. In order to prevent this, ID codes through the above-described three character types are used to discriminate the 'same-code Chinese characters in wubi.

According to the ID code table of "A-2" of FIG. 6, the above-described 5 strokes occupy the respective regions, and in each region, three kinds of character types are allocated to three roman character keys, respectively. For example, in the '—' zone, the right-left type, right-left type, and the combination type are allocated to Roman characters 'G, F, and D', respectively. Also, the three kinds of character types of the ID-code characters are allocated from the center of the PC QWERTY keyboard to both sides in order as indicated by arrows.

Three procedures for confirming the ID codes are as follows.

First, the 'region' is confirmed. For example, the last stroke of '{£.' is '—', and thus it belongs to the '—' region.

Second, the 'character type' is confirmed. For example, the letter of '位' is constructed on both sides, and thus its character type is the right-left type (i.e. sign 2 type).

Third, the 'ID code' is confirmed. For example, the last stroke of '{£' belongs to the '— region', its character type is the right-left type, and its ID code is 'Θ'(G) in accordance with the ID code table.

In the wubi input method in the conventional PC QWERTY keyboard, except for the first-class Chinese characters (which are 25 in total, and may be called frequent Chinese characters. Except for 'Z', each key of 25 Roman characters has one most frequent Chinese character. This first-class Chinese
character can be inputted by entering a corresponding Roman character key and then a space bar of the PC QWERTY keyboard, i.e., by two strokes. See "A-3" in FIG. 7) and the second-class Chinese characters (which are 589 in total, and are high frequent Chinese characters except for the first-class shortcut-code Chinese characters. As shown as "A-4" in FIG. 7, the second-class Chinese character can be inputted by entering a Roman character on a vertical axis, a Roman character on a horizontal axis, and then a space bar of the PC QWERTY keyboard, i.e., by three strokes only), the input of one or more Chinese characters or vocabularies is absolutely based on the key input of four times (i.e., four strokes). In order to output a Chinese character composed of two codes using the conventional wubi input method, three strokes are made by inputting the ID code, and then one stroke is made by entering a space bar of the PC QWERTY keyboard to finally complete the four strokes. In the case of a three-code Chinese character that requires an input of the ID code, the last stroke is made by inputting the ID code to complete the four strokes, while in the case of a three-class shortcut-code Chinese character (there are 4400 third-class shortcut-code Chinese characters) that requires no input of the ID code, the four strokes are completed by entering a space bar of the PC QWERTY keyboard.

Also, in the case of five strokes, a Roman character code corresponding to the respective strokes is inputted twice, and then "L" key is entered twice to complete the four strokes. In the case of inputting the above-described Chinese character key name, a Roman character to which the corresponding Chinese character is allocated is continuously entered four times to complete the four strokes. Also, there are 65 cases that roots themselves can be used as Chinese characters except for the Chinese character key names. In this case, the four strokes are completed by inputting a Roman character code of the corresponding root, dividing the corresponding root into five basic strokes, and then entering the first stroke, the second stroke, and the last stroke. If the entered strokes are insufficient, the four strokes are completed by entering a space bar of the PC QWERTY keyboard in the same manner.

A rule of inputting vocabularies is as follows.
In the case of inputting a two-letter word, the four strokes are completed by constructing codes corresponding to two roots of each character. In the case of inputting a three-letter word, the four strokes are completed by once inputting the codes of the first roots of the two preceding Chinese characters and then inputting the Roman character code of the two preceding roots of the third character. In the case of inputting a four-letter word, the four strokes are completed by once inputting a Roman character code of the first root of each character. In the case of inputting a word composed of more than four letters, the four strokes are finally completed by inputting Roman character codes corresponding to the first roots of the first to third characters and the last character.

As described above, according to the wubi input method in the conventional PC QWERTY keyboard, the input of the first-class shortcut-code (See "A-3" in FIG. 7) Chinese character requires two strokes (including entering of a space bar), and the input of the second-class shortcut-code (See "A-4" in FIG. 7) Chinese character requires three strokes (including entering of a space bar). In other cases, four strokes are absolutely required to complete the vocabulary. Even in the case of inputting a Roman character code that corresponds to three strokes, it is required to once input a space bar in the PC QWERTY keyboard so as to complete the four strokes.

FIG. 8 is a view illustrating an example of a wubi keypad 300 of an apparatus for inputting Chinese characters for a communication terminal according to an embodiment of the present invention, and FIG. 9 is a view explaining a wubi keypad structure 300 of an apparatus for inputting Chinese characters for a communication terminal according to an embodiment of the present invention. FIG. 10 is a table showing an example of conversion for implementing a wubi code combination using Roman characters, and a wubi code combination using Roman characters in a method for inputting Chinese characters using a wubi keypad 300 according to an embodiment of the present invention.

As illustrated in FIG. 8, the wubi keypad 10 or 300 is provided with a plurality (e.g. 6 rows and 3 columns) of buttons including function keys of call,
Chinese character mode, power, and the like. It is preferable that three buttons provided in 1st row are allocated with the call, Chinese character mode, and power, respectively, and Roman characters 313 for wubi inputs are allocated to respective buttons on the keypad 10 or 300. The Roman characters 313 are allocated to the respective buttons of the keypad 10 or 300 in the order of TN (2nd row and 1st column), G(2nd row and 2nd column), YH (2nd row and 3rd column), RB (3rd row and 1st column), FZ (3rd row and 2nd column), UJ (3rd row and 3rd column), EV (4th row and 2nd column), D (4th row and 2nd column), IK (4th row and 3rd column), WC (5th row and 1st column), S (5th row and 2nd column), OL (5th row and 3rd column), QX (6th row and 1st column), A (6th row and 2nd column), and PM (6th row and 3rd column) (See FIG. 9). Also, wubi 'Chinese key names' 312 corresponding to the allocated Roman characters 313, 'zone numbers' 314, and 'position numbers' 314, and 'identification (ID) codes 315 (See "A-2" in FIG. 6) are allocated, and wubi 'main roots' and 'sub roots' corresponding to the allocated 'Chinese key names' 312 are allocated to the keypad 10 or 300. Also, characters corresponding to 'falling left' that refers to a third region of the wubi keypad are allocated to Q, W, E, R, and T keys of the allocated Roman characters 313 (See FIG. 6) (i.e. left-side wubi input codes in each row and 1st column) (See FIG. 9); characters corresponding to 'falling right' that refers to a fourth region of the wubi keypad are allocated to Y, U, I, O, and P keys of the allocated Roman characters 313 (i.e. left-side wubi input codes in each row and 3rd column) (See FIG. 9); characters corresponding to 'horizontal' that refers to a first region of the wubi keypad are allocated to A, S, D, F, and G keys of the allocated Roman characters 313 (i.e. left-side wubi input codes in each row and 2nd column) (See FIG. 9); characters corresponding to 'vertical' that refers to a second region of the wubi keypad are allocated to H, J, K, L, and M keys of the allocated Roman characters 313 (i.e. right-side wubi input codes in each row and 3rd column) (See FIG. 9); and characters corresponding to 'hook' that refers to a fifth region of the wubi keypad are allocated to X, C, V, B, and N keys of the allocated Roman characters 313 (i.e. right-side wubi input codes in each row and 1st column) (See FIG. 9). Also, special functions frequently used for the wubi input are allocate in at least four directions in which
the keypad 10 or 300 can slide (Here, 7 directions (including upper left, upper, upper right, left, right, lower left, and lower right) are exemplified, and 7 special functions of Output of left-side Chinese character key names 301, output of numerals 307, output of right-side Chinese character key names 302, input of left-side code + space bar 303, input of right-side code + space bar 304, output of Chinese characters corresponding to left-side second-class duplicate shortcut codes 305, and output of Chinese characters corresponding right-side second-class duplicate shortcut codes' are allocated in the corresponding 7 sliding directions (See FIG. 8).

In this case, other input methods, except for the 7 special functions allocated to at least four directions in which the keypad 10 or 300 slides, are produced in accordance with the manipulation of the 26 Roman character keys allocated to the corresponding keypad 10 or 300 through a 'four code completion' method that is the basic rule of the conventional wubi input method, and the lower direction (T), in which the keypad 10 slides, is used to input the second Roman characters of two Roman characters allocated to the respective buttons, i.e., to input the Roman characters allocated to the right sides of the respective buttons. That is, the Roman character arranged on the left side of the respective button on the keypad 10 can be inputted by once pressing the corresponding button, and the Roman character arranged on the right side of the respective button can be inputted by sliding the keypad 10 in lower (T) direction in a state that the corresponding button is pressed.

The input of Roman characters on the wubi keypad 200 as described above will now be described in more detail.

The user can input '佗' (which is the name of the left-side Chinese character key) by sliding the keypad 10 in upper left (2r_h) direction in a state that the button in 2nd row and 1st column is pressed, and can input 'S' (which is the name of the right-side Chinese character key) by sliding the keypad 10 in upper right (右_h) direction in a state that the button in 2nd row and 1st column is pressed.

Here, in the case of inputting '佗', which is the first Chinese character
key in the third region (See FIG. 9), and 'S', which is the first Chinese character key in the fifth region, according to the present invention, the user can output the corresponding Chinese character name through only one manipulation for sliding the keypad 10 in a diagonal direction, i.e., to the upper left or upper right side of the keypad, which corresponds to the position of the corresponding Chinese character name 312, in a state that the user presses the corresponding button, and this reduces the number of manipulations for inputting the Chinese character by three manipulations in comparison to the wubi input method in the conventional PC QWERTY keyboard which requires manipulation of the corresponding key four times.

The rule for the generation of Chinese characters in the wubi input method according to the present invention as described above will be summarized as follows.

- The special function keys allocated in the respective sliding directions of the keypad 10 function as follow.

  * Output of the left-side Chinese key name 301: The keypad is slid in upper left ( \( \uparrow \downarrow \_\_L \) ) direction in a state that the corresponding key on the wubi keypad 300 is pressed. This reduces the number of key inputs by three key inputs in comparison to the conventional method.

  * Output of the right-side Chinese key name 302: The keypad is slid in upper right ( \( \_\_\_\_R \) ) direction in a state that the corresponding key on the wubi keypad 300 is pressed. This reduces the number of key inputs by three key inputs in comparison to the conventional method.

  * Left-side code + space bar: In the case where the input of a space bar is required as the last key manipulation in the wubi input method to complete the four key inputs, a space bar is automatically inputted by sliding the keypad 300 to the left ( \( \_\_\_\_L \) ) side in a state that the corresponding key on the wubi keypad 300, which refers to the last (i.e., 3rd) left-side Roman character code, is pressed. This is recognized as the completion of four key inputs, and the corresponding Chinese character is outputted. That is, this further reduces the number of key inputs by one key input in comparison to the conventional method (See FIG. 10).
* Right-side code + space bar: In the case where the input of a space bar is required as the last key manipulation in the wubi input method to complete the four key inputs, a space bar is automatically inputted by sliding the keypad 300 to the right (右) side in a state that the corresponding key on the wubi keypad 300, which refers to the last (i.e., 3rd) right-side Roman character code, is pressed. This is recognized as the completion of four key inputs, and the corresponding Chinese character is outputted. That is, this further reduces the number of key inputs by one key input in comparison to the conventional method (See FIG. 10).

* Output of the Chinese character corresponding to the left-side second-class duplicate shortcut code: In order to output the second-class shortcut-code Chinese character in the case where the code of the left-side Roman character of a specified key is twice repeated on the wubi keypad 300, a space bar is automatically inputted by sliding the keypad 300 to the lower left (£T) side in a state that the corresponding key is pressed, and due to the three key-input completion rule of the second-class duplicate Chinese characters, the corresponding Chinese character is outputted. For example, in the case of '大', the second-class shortcut code is 'Dd' (See "A-4" in FIG. 7), and is outputted by sliding the keypad to the lower left (£T) side in a state that the 8-number key in the 3rd position in the first region on the keypad 10 is pressed. That is, by outputting the Chinese character through one key input, the number of key inputs can be reduced by two key inputs (See FIG. 10).

* Output of the Chinese character corresponding to the right-side second-class duplicate shortcut code: In order to output the second-class shortcut-code Chinese character in the case where the code of the right-side Roman character of a specified key is twice repeated on the wubi keypad 300, a space bar is automatically inputted by sliding the keypad 300 to the lower right (右) side in a state that the corresponding key is pressed, and due to the three key-input completion rule of the second-class duplicate Chinese characters, the corresponding Chinese character is outputted. For example, in the case of '子', the second-class shortcut code is 'Bb' (See "A-4" in FIG. 7), and
is outputted by sliding the keypad to the lower right (右下) side in a state that the 4-number key in the second position in the fifth region on the keypad 10 is pressed. That is, by outputting the Chinese character through one key input, the number of key inputs can be reduced by two key inputs (See FIG. 10).

The combination of a Roman character allocated to a button with a special function allocated to each sliding direction of the keypad 10 is completed only when the signal of the inputted Roman character is maintained (i.e. when the corresponding button is in a pressed state).

The right-side Roman character of the arranged Roman characters is outputted by sliding the keypad 10 in lower (T) direction in a state that the corresponding button is pressed.

In the case where four contacts are provided on upper (±), lower (T), left (←), and right (→) sides of the at least four directions in which the keypad 10 slides and 8 key signals are outputted, the output of a special function allocated in the diagonal direction in which the keypad 10 slides is recognized as a diagonal special function if switches on both sides of the corresponding diagonal line (e.g. in order to output 'left-side Chinese key name', both the upper (_h) contact and the left (£) contact should be pressed) are pressed together even for 0.01 second.

According to the conventional wubi input method, in order to complete the output of the first-class or second-class shortcut-code Chinese character, it is required to press a space bar on the PC QWERTY keyboard. However, according to the wubi input method according to the present invention, the user's input of the space bar can be automatically recognized by a special function key to reduce the number of key inputs.

For example, in the case of outputting "tj" in the wubi method, the existing PC QWERTY keyboard requires input of 'ENT + space bar' four times in total, whereas according to the present invention, key manipulation only three times, which includes input of 7-number key once, manipulation of 1-number key in lower (T) direction, and manipulation of 1-number key in left (左) direction, is required.
The input of an ID code can be made by pressing a key to which the corresponding ID code is allocated on the wubi keypad 300. If it is desired to simultaneously input the ID code and the space bar, the keypad is manipulated in left or right direction in a state that the key, to which the corresponding ID code is allocated, is pressed. In this case, the Chinese character is outputted with reduction of key inputs by one key input in comparison to the conventional method.

On the other hand, in the case where a user inputs a symbol and so on, which does not exist on the numeral or key buttons, in addition to the Chinese character using the wubi keypad 300, the user first sets a symbol mode by sliding the wubi keypad 300 in lower (T) direction in a state that 'G' button in 2nd row and 2nd column in FIG. 4 is pressed, and if a corresponding window appears on the display screen, the user inputs a desired symbol (in the case of inputting a numeral, the user slides the keypad in upper (_h) direction in a state that the user presses the corresponding numeral key button, without setting a separate numeral mode.

For example, in order to input the symbol '?', the user slides the wubi keypad 300 to the right (右) side in a state that the user presses a button in 5th row and 2nd column, without the necessity of pressing a 'G' button. The numeral/symbol input mode is terminated by pressing the "G" button once again.

Also, in order for the user to control the direction of a cursor displayed on the display unit 90 during inputting of a symbol, the user uses a direction indication button in 3rd row and 2nd column. For example, the cursor displayed on the display unit 90 is moved to the right (右) side in a manner that the user slides the wubi keypad 300 in lower (T) direction in a state that the user presses the 'G' button, and then slides the wubi keypad 300 to the right (右) side in a state that the user presses the button in 3rd row and 2nd column. In order to move the cursor to a desired position, the user keeps the manipulation state of the corresponding button until the cursor reaches the desired position.

Here, the symbols are arranged in consideration of their effectiveness in use, and it is preferable that frequently used symbols are allocated to buttons capable of directly inputting the numerals/symbols and the symbols without any
mode setting.

As described above, according to the wubi input method according to the present invention, in the same manner as the Hanyu pinyin input method, the Chinese character can be inputted with a number of inputs which is less than that required in the wubi input method in the conventional PC QWERTY keyboard.

Accordingly, even in the case of the wubi keypad 300, the Chinese character input speed can be greatly improved in comparison to the conventional input method, and a Chinese character input speed that comes next to the wubi input speed of the PC QWERTY keyboard can be implemented even in a portable communication terminal.

Hereinafter, a Chinese character input method for a communication terminal according to an embodiment of the present invention will be described in detail with reference to FIGS. 11 to 17.

FIGS. 11 to 17 are flowcharts illustrating a method for inputting Chinese characters for a communication terminal according to an embodiment of the present invention.

First, the microprocessor 70 of the communication terminal 1 judges whether a user selects a character mode by pressing a character mode key provided on the keypad 10 (step S100). Then, if the user has selected the character mode, the microprocessor 70 judges which mode of a pinyin input mode and a wubi input mode the user selects (step S100).

For example, if it is assumed that a pinyin input mode, an English input mode, a character input mode, and a Chinese character storage mode are set in upper, lower, left, and right directions, respectively, in which the keypad 10 can slide (in the case of a wubi mode, the present mode is changed to the wubi mode if the keypad is slid in upper direction in a state that a key in 5th row and 2nd column among key buttons as illustrated in FIG. 9 is pressed), the microprocessor 70 judges that the pinyin input mode is selected when the user slides the keypad 10 in upper (_,) direction in a state that the user presses the character mode key, judges that the English input mode is selected when the user slides the keypad 10 in lower (T) direction, and judges that the Chinese
character storage mode is selected when the user slides the keypad 10 to the right (右) side.

If the user selects the pinyin input mode as a result of judgment in the step (S100), the microprocessor 70 detects a key signal in accordance with a user's manipulation of a plurality of buttons provided on the keypad 10 or a keypad sliding manipulation in upper, lower, left, right, and diagonal directions, inputted from the button manipulation recognition unit 20 and/or the keypad sliding recognition unit 30, combines a consonant and a vowel of a corresponding Roman character and a numeral/symbol, and displays a corresponding Chinese character and numeral/symbol on a display screen of the display unit 90 (step S200).

More specifically, in accordance with the user's selection of the pinyin input mode, the microprocessor 70 of the communication terminal 1 maintains a pinyin input waiting state by changing the present mode to the pinyin input mode (step S210), and then judges whether the corresponding user selects a menu of 'backspace', 'space', 'shift', or 'enter' by sliding the keypad 10 in upper, lower, left, or right direction after the user presses a menu key (e.g. 'call' key of keypad 10) (step S220).

If the corresponding user has manipulated the menu as a result of judgment, the microprocessor 70 performs the menu of 'backspace', 'space', 'shift', or 'enter' selected by the user, and then repeatedly performs the above-described steps, starting from the step S220 (step S230).

However, if the user has not selected the menu of 'backspace', 'space', 'shift', or 'enter' as a result of judgment in the step S220, the microprocessor 70 judges whether the user inputs a consonant or a vowel of the corresponding pinyin by pressing the button provided on the keypad 10 and/or sliding the keypad 10 in upper, lower, left, right, or diagonal direction (step S240).

If the user inputs a consonant or a vowel of the corresponding pinyin by pressing the button provided on the keypad 10 and/or sliding the keypad 10 in upper, lower, left, right, or diagonal direction as a result of judgment, the microprocessor 70 confirms the input of a left-side character allocated to a button on the keypad 10, the input of a character allocated to a sliding direction...
of the keypad 10, and a Chinese character conversion output based on the key
signal inputted from the button manipulation recognition unit 20 and/or keypad
sliding recognition unit 30 (step S250).

Also, the microprocessor 70 confirms the input of a right-side character
allocated to a button on the keypad 10, the input of a character allocated to a
sliding direction of the keypad 10, and a Chinese character conversion output
based on the key signal inputted from the button manipulation recognition unit
20 and/or keypad sliding recognition unit 30 (step S260).

Then, the microprocessor 70 displays the corresponding pinyin on the
display unit 90 in accordance with the user's input of the left-side character or
the right-side character through the steps S250 and S260, converts the pinyin
into the corresponding Chinese characters in accordance with the user's
selection, outputs the Chinese characters on the display screen, and then
repeatedly performs the above-described steps, starting from the step S220
(step S270).

In this case, the left-side character input process in the step S250 will
now be described in more detail with reference to FIG. 13.

The microprocessor 70 judges whether a specified Roman character
button provided on the keypad 10 is pressed in accordance with a user's
manipulation (step S251), and if the specified button provided on the keypad 10
is pressed, it judges whether a specified Roman character allocated to the
corresponding sliding direction is selected in accordance with the user's keypad
sliding manipulation (step S252).

If the specified Roman character is selected in accordance with the
user's keypad sliding manipulation as a result of judgment, the microprocessor
70 judges whether the button and keypad sliding manipulation state, which is
selected by the user through the steps S251 and S252, is maintained (step
S253).

If the button and keypad sliding manipulation state selected by the user
is maintained as a result of judgment, the microprocessor 70 combines the left-
side Roman character allocated to the corresponding button with the Roman
character allocated to the sliding direction of the keypad 10 (step S254), and
displays the Chinese characters corresponding to the pinyin on the selection window in the order of their frequency (step S255).

At this time, the microprocessor 70 judges whether there is one list of the Chinese characters displayed on the selection window (step S256), and if there is one list of the Chinese characters displayed on the selection window, it outputs the corresponding Chinese characters to perform the above-described step S270 (step S257).

However, if no specified Roman character is selected on the keypad 10 as a result of judgment in the step S251, the microprocessor 70 judges whether another specified Roman character is further selected through a specified button on the keypad 10 in accordance with the user's manipulation (step S259).

Also, if no specified Roman character is selected on the keypad 10 through the user's keypad sliding manipulation as a result of judgment in the step S252, the microprocessor 70 judges whether another specified Roman character is further selected through a specified button on the keypad 10 in accordance with the user's manipulation (step S259).

Then, if the button and keypad sliding manipulation state selected by the user is not maintained as a result of judgment in the step S253, the microprocessor 70 judges whether another specified Roman character is further selected in accordance with the button and keypad sliding manipulation selected by the user (step S259).

Also, if there are two or more lists of Chinese characters displayed on the selection window as a result of judgment in the step S256, the microprocessor 70 judges whether a key manipulation for selecting and outputting the corresponding Chinese character from the lists is performed in accordance with the user's keypad sliding manipulation (step S258). Then, if the key manipulation for outputting the corresponding Chinese character from the lists is performed, the microprocessor outputs the corresponding Chinese character, and performs the above-described step S270 (step S257).

In addition, the right-side character input process in the step S260 will now be described in more detail with reference to FIG. 14.

The microprocessor 70 judges whether the keypad 10 is slid in lower
(T) direction in a state that a specified Roman character button provided on the keypad 10 is pressed in accordance with a user's manipulation (step S261), and if the keypad 10 is slid in lower (T) direction in a state that the specified button provided on the keypad 10 is pressed, it judges whether another specified Roman character is selected (step S269).

However, if the keypad 10 is not slid in lower (T) direction in a state that the specified button provided on the keypad 10 is pressed, the microprocessor 70 judges whether a specified Roman character is selected after the user's keypad sliding manipulation (step S262).

If the specified Roman character is selected after the user's keypad sliding manipulation as a result of judgment, the microprocessor 70 judges whether the button and keypad sliding manipulation state, which is selected by the user through the step S262, is maintained (step S263).

If the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment, the microprocessor 70 combines the right-side Roman character allocated to the corresponding button with the Roman character allocated to the sliding direction of the keypad 10 (step S264), and displays the Chinese characters corresponding to the pinyin on the selection window in the order of their frequency (step S265).

At this time, the microprocessor 70 judges whether there is one list of the Chinese characters displayed on the selection window (step S266), and if there is one list of the Chinese characters displayed on the selection window, it outputs the corresponding Chinese characters to perform the above-described step S270 (step S267).

Also, if no specified Roman character is selected on the keypad 10 through the user's keypad sliding manipulation as a result of judgment in the step S262, the microprocessor 70 judges whether another specified Roman character is further selected through a specified button on the keypad 10 in accordance with the user's manipulation (step S269).

Then, if the button and keypad sliding manipulation state selected by the user is not maintained as a result of judgment in the step S263, the microprocessor 70 judges whether another specified Roman character is further
selected in accordance with the button and keypad sliding manipulation selected by the user (step S269).

Also, if there are two or more lists of Chinese characters displayed on the selection window as a result of judgment in the step S266, the microprocessor 70 judges whether a key manipulation for selecting and outputting the corresponding Chinese character from the lists is performed in accordance with the user's keypad sliding manipulation (step S268). Then, if the key manipulation for outputting the corresponding Chinese character from the lists is performed, the microprocessor outputs the corresponding Chinese character, and performs the above-described step S270 (step S267).

On the other hand, if the user selects the wubi input mode (by sliding the keypad in upper (_h) direction in a state that the user presses a key in 5th row and 2nd column among key buttons as illustrated in FIG. 9) as a result of judgment in the step (S100), the microprocessor 70 detects a key signal in accordance with a user's manipulation of a plurality of buttons provided on the keypad 10 or a keypad sliding manipulation in upper, lower, left, right, and diagonal directions, inputted from the button manipulation recognition unit 20 and/or the keypad sliding recognition unit 30, combines wubi Roman character code and a numeral/symbol, converts the combined codes into a corresponding Chinese character, and displays the corresponding Chinese character on a display screen of the display unit 90 (step S300).

More specifically, in accordance with the user's selection of the wubi input mode, the microprocessor 70 of the communication terminal 1 maintains a wubi input waiting state by changing the present mode to the wubi input mode (step S310), and then judges whether the corresponding user selects a menu of 'backspace', 'space', 'shift', or 'enter' by sliding the keypad 10 in upper, lower, left, or right direction after the user presses a menu key (e.g. 'call' key of keypad 10) (step S320).

If the corresponding user has manipulated the menu as a result of judgment, the microprocessor 70 performs the menu of 'backspace', 'space', 'shift', or 'enter' selected by the user, and then repeatedly performs the above-described steps, starting from the step S320 (step S330).
However, if the user has not selected the menu of 'backspace', 'space', 'shift', or 'enter' as a result of judgment in the step S320, the microprocessor judges whether the user inputs the corresponding wubi Roman character code by pressing the button provided on the keypad in upper, lower, left, right, or diagonal direction (step S340).

If the user inputs less than 3 wubi Roman character codes by pressing the button provided on the keypad and/or sliding the keypad in upper, lower, left, right, or diagonal direction as a result of judgment, the microprocessor judges which direction a left-side character allocated to a button on the keypad lastly inputted by the user slides in based on the key signal inputted from the button manipulation recognition unit and/or the keypad sliding recognition unit, and confirms that the inputted three or less Roman character codes are converted into a Chinese character by a special function in the corresponding direction (step S350).

Also, the microprocessor judges which direction a right-side character allocated to a button on the keypad lastly inputted by the user slides in based on the key signal inputted from the button manipulation recognition unit and/or the keypad sliding recognition unit, and confirms that the inputted three or less Roman character codes are converted into a Chinese character by a special function in the corresponding direction (step S360).

Then, the microprocessor outputs the corresponding Chinese characters to the display unit in accordance with the user's input of the left-side character or the right-side character through the final steps and of inputting the wubi Roman character codes, and then repeatedly performs the above-described steps, starting from the step S320 (step S370).

In this case, the left-side character input process in the step S350 will now be described in more detail with reference to FIG. 16.

The microprocessor judges whether a specified Roman character button provided on the keypad is pressed in accordance with a user's manipulation, who intends to input the wubi Roman character codes (step S351), and if the specified button provided on the keypad is pressed, it
judges whether a specified function key in upper left (£_h) direction allocated to the corresponding sliding direction is selected in accordance with the user's keypad sliding manipulation (step S352).

If the specified function key in the upper left (£_h) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment, the microprocessor 70 judges whether the button and keypad sliding manipulation in the upper left (£_b) direction, which is selected by the user through the steps S351 and S352, is maintained (step S357a).

If the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment, the microprocessor 70 converts the input Roman character codes into a left-side Chinese character key name of the corresponding key through a 'left-side Chinese character key name output' function in the upper left (£_L) direction, and displays the converted left-side Chinese character to perform the above-described step S370 (step S357b).

However, if no specified function key is selected on the keypad 10 as a result of judgment in the step S351, the microprocessor 70 judges whether another specified Roman character is selected through pressing of a specified button on the keypad 10 in accordance with the user's manipulation (step S359).

Also, if no specified function key in the upper left (£_L) direction is selected on the keypad 10 through the user's keypad sliding manipulation as a result of judgment in the step S352, the microprocessor 70 judges whether another specified function key in the left (£E) direction is selected through the user's keypad sliding manipulation (step S353).

Then, if the specified function key in the left (£E) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment, the microprocessor 70 judges whether the button and keypad sliding manipulation in the left (£E) direction, selected by the user through the above-described steps S351 and S353, is maintained (step S358a).

If the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment, the microprocessor 70 converts the input three or less Roman character codes into a corresponding Chinese character
through a 'Chinese character output of the corresponding codes' in left (Si)
direction, and displays the converted Chinese character on the selection
window to perform the above-described step S370 (step S358b).

However, if no specified function key in the left (Ix.) direction is selected
in accordance with the user's keypad sliding manipulation as a result of
judgment in the step S353, the microprocessor 70 judges whether another
specified function key in the lower left (SiT) direction is selected in accordance
with the user's keypad sliding manipulation (step S354).

If the specified function key in the lower left (SiT) direction is selected
in accordance with the user's keypad sliding manipulation as a result of
judgment, the microprocessor 70 judges whether the button and keypad sliding
manipulation in the lower left (SiT) direction, selected by the user through the
above-described steps S351 and S354, is maintained (step S355).

If the button and keypad sliding manipulation state selected by the user
is maintained as a result of judgment, the microprocessor 70 converts the input
Roman character codes into a corresponding Chinese character through a
'corresponding left-side second-class duplicate Chinese character output'
function in the lower left (SiT) direction, and displays the converted Chinese
character on the selection window to perform the above-described step S370
(step S356).

However, if no specified function key in the lower left (SiT) direction is
selected in accordance with the user's keypad sliding manipulation as a result
of judgment in the step S354, the microprocessor 70 judges whether a specified
Roman character is selected by pressing a specified button on the keypad 10 in
accordance with the user's manipulation (step S359).

On the other hand, the right-side character input process in the step
S360 will now be described in more detail with reference to FIG. 17.

The microprocessor 70 judges whether the keypad 10 is slid in lower
(T) direction in a state that a specified Roman character button provided on the
keypad 10 is pressed in accordance with a user's manipulation, who intends to
input the wubi Roman character codes (step S361), and if the keypad 10 is slid
in lower (T) direction in a state that the specified Roman character button provided on the keypad 10 is pressed, it judges whether a specified character is further selected (step S369).

However, if the keypad 10 is not slid in lower (T) direction in a state that the specified Roman character button provided on the keypad 10 is pressed in accordance with the user's manipulation, the microprocessor judges whether a specified function key in upper right (右) direction allocated to the corresponding sliding direction is selected in accordance with the user's keypad sliding manipulation (step S362).

If the specified function key in the upper right (右) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment, the microprocessor 70 judges whether the button and keypad sliding manipulation in the upper right (右) direction, which is selected by the user through the steps S361 and S362, is maintained (step S367a).

If the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment, the microprocessor 70 converts the input Roman character codes into a right-side Chinese character key name of the corresponding key through a 'right-side Chinese character key name output' function in the upper right (右) direction, and displays the converted right-side Chinese character to perform the above-described step S370 (step S367b).

Also, if no specified function key in the upper right (上) direction is selected on the keypad 10 through the user's keypad sliding manipulation as a result of judgment in the step S362, the microprocessor 70 judges whether another specified function key in the right (右) direction is selected through the user's keypad sliding manipulation (step S363).

Then, if the specified function key in the right (右) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment, the microprocessor 70 judges whether the button and keypad sliding manipulation in the right (右) direction, selected by the user through the above-described steps S361 and S363, is maintained (step S368a).

If the button and keypad sliding manipulation state selected by the user
is maintained as a result of judgment, the microprocessor 70 converts the input three or less Roman character codes into a corresponding Chinese character through a 'Chinese character output of the corresponding codes' in the right (右) direction, and displays the converted Chinese character on the selection window to perform the above-described step S370 (step S368b).

However, if no specified function key in the right (右) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step S363, the microprocessor 70 judges whether another specified function key in the lower right (右下) direction is selected in accordance with the user's keypad sliding manipulation (step S364).

If the specified function key in the lower right (右下) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment, the microprocessor 70 judges whether the button and keypad sliding manipulation in the lower right (右下) direction, selected by the user through the above-described steps S361 and S364, is maintained (step S365).

If the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment, the microprocessor 70 converts the input Roman character codes into a corresponding Chinese character through a 'corresponding right-side second-class duplicate Chinese character output' function in the lower right (右下) direction, and displays the converted Chinese character on the selection window to perform the above-described step S370 (step S366).

However, if no specified function key in the lower right (右下) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step S364, the microprocessor 70 judges whether a specified Roman character is selected by pressing a specified button on the keypad 10 in accordance with the user's manipulation (step S369).

If the user terminates the Chinese character input work in any one of the pinyin input mode and the wubi input mode through the above-described steps S200 to S300, the microprocessor 70 of the communication terminal 1 judges whether the user selects a key for storing the Chinese character (step
If the user has selected the storage key for storing the Chinese character, the microprocessor 70 stores the Chinese character inputted by the user (step S500), while if the user has not selected the storage key, the microprocessor judges whether the user terminates the Chinese character mode to continue or remove the Chinese character mode.

While this invention has been described in connection with what is presently considered to be the most practical and preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiment and the drawings. On the contrary, it is intended to cover various modifications and variations within the spirit and scope of the appended claims.
Claims:

1. A communication terminal capable of inputting Chinese characters and numerals/symbols for communications with an outside or data storage, comprising:

   a keypad, allocated with keys for a plurality of wubizixing roots, Roman characters for inputting Hanyu pinyin and wubizixing codes, wubizixing zone codes and position codes, numerals/symbols, and special functions, for generating a key signal in accordance with a user's button manipulation or a keypad sliding manipulation in at least four directions in a main body of the communication terminal around the center of the keypad;
   
   a character storage unit for storing Chinese character data for used in the communication terminal;
   
   a program memory for storing an interior operation program of the communication terminal;
   
   a code storage unit for storing Hanyu pinyin and wubizixing code data corresponding to various kinds of buttons arranged on the keypad and a sliding direction of the keypad;
   
   a button manipulation recognition unit for detecting a key manipulation state of the respective buttons provided on the keypad;
   
   a keypad sliding recognition unit for detecting a key manipulation state according to the keypad sliding manipulation in the at least four directions;
   
   a microprocessor for judging which Chinese character code data a user has inputted with reference to the Chinese character data stored in the Chinese character storage unit in accordance with the operation program stored in the program memory if a key manipulation state detection signal is inputted through the button manipulation recognition unit and/or the keypad sliding recognition unit, generating and outputting a display control signal for displaying a Chinese character of a corresponding Chinese character input mode inputted by the user with reference to the code data stored in the Hanyu pinyin and wubizixing code storage unit;
   
   a display drive unit for outputting a drive control signal for displaying the
Chinese character and numeral/symbol corresponding to the code data selected by the user through the button manipulation or the keypad sliding manipulation on the keypad in accordance with the display control signal outputted from the microprocessor; and

a display unit for displaying the Chinese character and numeral/symbol on a display screen in accordance with the drive control signal outputted from the display drive unit.

2. The communication terminal of claim 1, wherein if the keypad is a Hanyu pinyin keypad, Roman characters for inputting Hanyu pinyin codes are allocated to the respective buttons of the keypad in the order of TN (1st row and 1st column), G(1st row and 2nd column), YH (1st row and 3rd column), RB (2nd row and 1st column), FZ (2nd row and 2nd column), UJ (2nd row and 3rd column), EV (3rd row and 2nd column), D (3rd row and 2nd column), IK (3rd row and 3rd column), WC (4th row and 1st column), S (4th row and 2nd column), OL (4th row and 3rd column), QX (5th row and 1st column), A (5th row and 2nd column), and PM (5th row and 3rd column); the numerals/symbols and special functions keys are allocated to the respective buttons; the Roman characters 'A, O, E, I, U', a right-side Roman character input key, 'N', and 'NG' are allocated to at least four sliding directions including upper left, upper, upper right, right, lower right, lower, lower left, and left directions; and a Hanyu pinyin input completion confirm key is operated immediately when the Hanyu pinyin including Roman characters allocated to the at least four sliding directions is completed.

3. The communication terminal of claim 2, wherein left-side characters on the keypad are outputted by pressing corresponding buttons; in order to combine the left-side characters with 'A, O, E, NG, I, N, U' allocated to the respective directions in which the keypad slides, corresponding vowels are manipulated by sliding the keypad in a state that the buttons to which the left-side characters are manipulated; right-side characters on the keypad are outputted by sliding the keypad in lower (T) direction in a state that the corresponding button is pressed; and if there are initial manipulation signals of
'A, O, E, NG, I, N, U' allocated to the respective directions in which the keypad slides with no button signal on the keypad, the manipulation signals are combined with the right-side characters of the following button to be outputted.

4. The communication terminal of claim 2, wherein if the Hanyu pinyin (of one character and two or more vocabularies) is completed by inputting vowels through the sliding manipulation of the keypad, the corresponding Chinese character is automatically outputted on a selection window with no manipulation of a separate input completion confirm key.

5. The communication terminal of claim 4, wherein if one list of Chinese characters is outputted for the corresponding Hanyu pinyin of the keypad, the corresponding Chinese character is automatically selected, while if two or more lists of Chinese characters are outputted, the corresponding Chinese characters are arranged in the order of their frequency in use.

6. The communication terminal of claim 1, wherein if the keypad is a wubi keypad, Roman characters for wubi input (i.e. wubi input codes) are allocated to the respective buttons of the keypad in the order of TN (1\textsuperscript{st} row and 1\textsuperscript{st} column), G(1\textsuperscript{st} row and 2\textsuperscript{nd} column), YH (1\textsuperscript{st} row and 3\textsuperscript{rd} column), RB (2\textsuperscript{nd} row and 1\textsuperscript{st} column), FZ (2\textsuperscript{nd} row and 2\textsuperscript{nd} column), UJ (2\textsuperscript{nd} row and 3\textsuperscript{rd} column), EV (3\textsuperscript{rd} row and 2\textsuperscript{nd} column), D (3\textsuperscript{rd} row and 2\textsuperscript{nd} column), IK (3\textsuperscript{rd} row and 3\textsuperscript{rd} column), WC (4\textsuperscript{th} row and 1\textsuperscript{st} column), S (4\textsuperscript{th} row and 2\textsuperscript{nd} column), OL (4\textsuperscript{th} row and 3\textsuperscript{rd} column), QX (5\textsuperscript{th} row and 1\textsuperscript{st} column), A (5\textsuperscript{th} row and 2\textsuperscript{nd} column), and PM (5\textsuperscript{th} row and 3\textsuperscript{rd} column);

wubi 'Chinese character key names', 'zone numbers', 'position numbers', and 'ID codes' corresponding to the allocated Roman characters (i.e. the wubi input codes) are allocated to the respective buttons of the keypad;

wubi 'main roots' and 'sub roots' corresponding to the allocated 'Chinese character key names' are allocated;

characters corresponding to 'falling left' that refers to the third region of the wubi keypad are allocated to Q, W, E, R, and T keys (i.e. the left-side wubi
input codes in each row and 1st column) of the allocated Roman characters (i.e. the wubi input codes);

characters corresponding to 'falling right' that refers to the fourth region of the wubi keypad are allocated to Y, U, I, O, and P keys (i.e. the left-side wubi input codes in each row and 3rd column) of the allocated Roman characters (i.e. the wubi input codes);

characters corresponding to 'horizontal' that refers to the first region of the wubi keypad are allocated to A, S, D, F, and G keys (i.e. the left-side wubi input codes in each row and 2nd column) of the allocated Roman characters (i.e. the wubi input codes);

characters corresponding to 'vertical' that refers to the second region of the wubi keypad are allocated to H, J, K, L, and M keys (i.e. the right-side wubi input codes in each row and 3rd column) of the allocated Roman characters (i.e. the wubi input codes);

characters corresponding to 'hook' that refers to the fifth region of the wubi keypad are allocated to X, C, V, B, and N keys (i.e. the right-side wubi input codes in each row and 1st column) of the allocated Roman characters (i.e. the wubi input codes); and

special functions frequently used for the wubi input of 'output of left-side Chinese character key names, output of numerals, output of right-side Chinese character key names, input of a space bar for left-side codes, input of a space bar for right-side codes, output of Chinese characters corresponding to left-side second-class duplicate shortcut codes, and output of Chinese characters corresponding right-side second-class duplicate shortcut codes' are allocated to 8 directions in which the keypad can slide (including upper left, upper, upper right, left, right, lower left, lower, and lower right directions), and a separate manipulation of the space bar (that is used to complete Roman character codes during the wubi input in a conventional PC QWERTY keyboard) is not required.

7. The communication terminal of claim 6, wherein in inputting the Roman characters for completing the Chinese character with four wubi codes without manipulation of the special function keys, the left-side code assigned to
the keypad is outputted by pressing the corresponding button, and the right-side code assigned to the keypad is outputted by sliding the keypad in lower (T) direction in a state that the corresponding button is pressed.

8. A method for inputting Chinese characters for a communication terminal, comprising:

   (1) a microprocessor of the communication terminal judging whether a user selects a Chinese character input mode;

   (2) the microprocessor of the communication terminal judging whether the user, who has selected the Chinese character input mode, selects one input mode of a Hanyu pinyin input mode and a wubizixing input mode;

   (3) if the user has selected the Hanyu pinyin mode, the microprocessor of the communication terminal detecting a key signal in accordance with a user's manipulation of a plurality of buttons provided on the keypad or a keypad sliding manipulation in upper, lower, left, right, and diagonal directions, inputted from a button manipulation recognition unit and/or a keypad sliding recognition unit, combining a consonant and a vowel of a corresponding Roman character and a numeral/symbol, and displaying a corresponding Chinese character and numeral/symbol on a display screen of the communication terminal;

   (4) if the user has selected the wubizixing input mode, the microprocessor of the communication terminal detecting the key signal in accordance with the user's manipulation of the plurality of buttons provided on the keypad or the keypad sliding manipulation in the upper, lower, left, right, and diagonal directions, inputted from the button manipulation recognition unit and/or the keypad sliding recognition unit, combining the consonant and the vowel of the corresponding Roman character and numeral/symbol, and displaying the corresponding Chinese character and numeral/symbol on the display screen of the communication terminal;

   (5) if a Chinese character input work through the one input mode of the Hanyu pinyin input mode and the wubizixing input mode is completed, the microprocessor of the communication terminal judging whether the user selects storage of the Chinese character, and storing the Chinese character inputted by
the user; and

(6) the microprocessor of the communication terminal judging whether
the user terminates the Chinese character input mode, and continuing or
removing the Chinese character input mode.

9. The method of claim 8, wherein the step (3) comprises:

(3-1) the microprocessor of the communication terminal changing the
present mode to the pinyin input mode as the user selects the Hanyu pinyin
input mode;

(3-2) after the present mode is changed to the pinyin input mode, the
microprocessor of the communication terminal judging whether the user
manipulates a menu key;

(3-3) if the user manipulates the menu key, the microprocessor of the
communication terminal performing menus of 'backspace', 'space', 'shift', or
'enter' selected by the user, and then repeatedly performing the above-
described steps, starting from the step (3-2);

(3-4) if the user does not manipulate the menu key, the microprocessor
of the communication terminal judging whether the user inputs a consonant or a
vowel of the corresponding Hanyu pinyin by pressing the button provided on the
keypad and/or sliding the keypad in upper, lower, left, right, or diagonal
direction;

(3-5) if the user inputs the consonant or the vowel of the corresponding
pinyin by pressing the button provided on the keypad and/or sliding the keypad
in upper, lower, left, right, or diagonal direction as a result of judgment, the
microprocessor confirming the input of a left-side character allocated to a button
on the keypad, the input of a character allocated to a sliding direction of the
keypad, and the output of a Chinese character conversion based on the key
signal inputted from the button manipulation recognition unit and/or the keypad
sliding recognition unit;

(3-6) the microprocessor confirming the input of a right-side character
allocated to a button on the keypad, the input of a character allocated to a
sliding direction of the keypad, and the output of a Chinese character
conversion based on the key signal inputted from the button manipulation recognition unit and/or the keypad sliding recognition unit; and

(3-7) the microprocessor displaying the corresponding pinyin on the display unit in accordance with the user's input of the left-side character or the right-side character through the steps (3-5) and (3-6), converting the pinyin into the corresponding Chinese characters in accordance with the user's selection, outputting the Chinese characters on the display screen, and then repeatedly performing the above-described steps, starting from the step (3-2).

10. The method of claim 9, wherein the step (3-5) comprises:

(3-5-1) the microprocessor of the communication terminal judging whether a specified Roman character button provided on the keypad is pressed in accordance with a user's manipulation;

(3-5-2) if the specified button provided on the keypad is pressed, the microprocessor judging whether a specified Roman character allocated to the corresponding sliding direction is selected in accordance with the user's keypad sliding manipulation;

(3-5-3) if the specified Roman character is selected in accordance with the user's keypad sliding manipulation, the microprocessor judging whether the button and keypad sliding manipulation state, which is selected by the user through the steps (3-5-1) and (3-5-2), is maintained;

(3-5-4) if the button and keypad sliding manipulation state selected by the user is maintained, the microprocessor combining the left-side Roman character allocated to the corresponding button with the Roman character allocated to the sliding direction of the keypad, and displaying the Chinese characters corresponding to the pinyin on a selection window in the order of their frequency;

(3-5-5) the microprocessor judging whether there is one list of the Chinese characters displayed on the selection window, and if there is one list of the Chinese characters displayed on the selection window, outputting the corresponding Chinese characters to perform the above-described step (3-7);

(3-5-6) if no specified Roman character is selected on the keypad, the
microprocessor judging whether another specified Roman character is further selected through a specified button on the keypad in accordance with the user's manipulation;

(3-5-7) if no specified Roman character is selected through the user's keypad sliding manipulation, the microprocessor judging whether another specified Roman character is further selected through a specified button on the keypad in accordance with the user's manipulation;

(3-5-8) if the button and keypad sliding manipulation state selected by the user is not maintained as a result of judgment in the steps (3-5-3), the microprocessor judging whether another specified Roman character is further selected in accordance with the button and keypad sliding manipulation selected by the user;

(3-5-9) if there are two or more lists of Chinese characters displayed on the selection window as a result of judgment in the step (3-5-5), the microprocessor judging whether a key manipulation for selecting and outputting the corresponding Chinese character from the lists is performed in accordance with the user's keypad sliding manipulation; and

(3-5-10) if the key manipulation for outputting the corresponding Chinese character from the lists is performed, the microprocessor outputting the corresponding Chinese character and performing the above-described step (3-7).

11. The method of claim 9, wherein the step (3-6) comprises:

(3-6-1) the microprocessor judging whether the keypad is slid in lower (T) direction in a state that a specified Roman character button provided on the keypad is pressed in accordance with a user's manipulation;

(3-6-2) if the keypad is slid in lower (T) direction in a state that the specified button provided on the keypad is pressed, the microprocessor judging whether another specified Roman character is selected;

(3-6-3) if the keypad is not slid in lower (T) direction in a state that the specified button provided on the keypad is pressed, the microprocessor judging whether a specified Roman character is selected after the user's keypad sliding
manipulation;

(3-6-4) if the specified Roman character is selected after the user's keypad sliding manipulation as a result of judgment in the step (3-6-3), the microprocessor judging whether the button and keypad sliding manipulation state, which is selected by the user through the step (3-6-3), is maintained;

(3-6-5) if the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment in the step (3-6-4), the microprocessor combining the right-side Roman character allocated to the corresponding button with the Roman character allocated to the sliding direction of the keypad, and displaying the Chinese characters corresponding to the pinyin on the selection window in the order of their frequency;

(3-6-6) the microprocessor judging whether there is one list of the Chinese characters displayed on the selection window, and if there is one list of the Chinese characters displayed on the selection window, outputting the corresponding Chinese characters to perform the above-described step (3-7);

(3-6-7) if no specified Roman character is selected on the keypad through the user's keypad sliding manipulation as a result of judgment in the step (3-6-3), the microprocessor judging whether another specified Roman character is further selected through a specified button on the keypad in accordance with the user's manipulation;

(3-6-8) if the button and keypad sliding manipulation state selected by the user is not maintained as a result of judgment in the step (3-6-4), the microprocessor judging whether another specified Roman character is further selected in accordance with the button and keypad sliding manipulation selected by the user;

(3-6-9) if there are two or more lists of Chinese characters displayed on the selection window as a result of judgment in the step (3-6-6), the microprocessor judging whether a key manipulation for selecting and outputting the corresponding Chinese character from the lists is performed in accordance with the user's keypad sliding manipulation; and

(3-6-10) if the key manipulation for outputting the corresponding Chinese character from the lists is performed as a result of judgment in the step
(3-6-9), the microprocessor outputting the corresponding Chinese character, and performing the above-described step (3-7).

12. The method of claim 8, wherein the step (4) comprises:
   (4-1) in accordance with the user's selection of the wubi input mode, the microprocessor of the communication terminal changing the present mode to the wubi input mode;
   (4-2) after the present mode is changed to the wubi input mode, the microprocessor of the communication terminal judging whether the corresponding user manipulates a menu key;
   (4-3) if the user manipulates the menu key, the microprocessor of the communication terminal performing the menu of 'backspace', 'space', 'shift', or 'enter' selected by the user, and repeating the above-described steps, starting from the step (4-2);
   (4-4) if the user does not select the menu of 'backspace', 'space', 'shift', or 'enter' as a result of judgment in the step (4-2), the microprocessor judging whether the user inputs the corresponding wubi Roman character code by pressing the button provided on the keypad and/or sliding the keypad in upper, lower, left, right, or diagonal direction;
   (4-5) if the user inputs less than 3 wubi Roman character codes by pressing the button provided on the keypad and/or sliding the keypad in upper, lower, left, right, or diagonal direction as a result of judgment in the step (4-4), the microprocessor judging which direction a left-side character allocated to a button on the keypad lastly inputted by the user slides in based on the key signal inputted from the button manipulation recognition unit and/or the keypad sliding recognition unit, and confirming that the inputted three or less Roman character codes are converted into a Chinese character by a special function in the corresponding direction;
   (4-6) the microprocessor 70 judging which direction a right-side character allocated to a button on the keypad lastly inputted by the user slides in based on the key signal inputted from the button manipulation recognition unit and/or the keypad sliding recognition unit, and confirming that the inputted three
or less Roman character codes are converted into a Chinese character by a special function in the corresponding direction; and

(4-7) the microprocessor outputting the corresponding Chinese characters to the display unit in accordance with the user's input of the left-side character or the right-side character through the above-described steps (4-5) and (4-6) of inputting the wubi Roman character codes, and then repeatedly performing the above-described steps, starting from the step (4-2).

13. The method of claim 12, wherein the step (4-5) comprises:

(4-5-1) the microprocessor judging whether a specified Roman character button provided on the keypad is pressed in accordance with a user's manipulation, who intends to input the wubi Roman character codes;

(4-5-2) if the specified button provided on the keypad is pressed, the microprocessor judging whether a specified function key in upper left (£_b) direction allocated to the corresponding sliding direction is selected in accordance with the user's keypad sliding manipulation;

(4-5-3) if the specified function key in the upper left (£Jh) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-5-2), the microprocessor judging whether the button and keypad sliding manipulation in the upper left (£_h) direction, which is selected by the user through the steps (4-5-1) and (4-5-2), is maintained;

(4-5-4) if the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment in the step (4-5-3), the microprocessor converting the input Roman character codes into a left-side Chinese character key name of the corresponding key through a 'left-side Chinese character key name output' function in the upper left (£±.) direction, and displaying the converted left-side Chinese character to perform the above-described step (4-7);

(4-5-5) if no specified function key is selected on the keypad as a result of judgment in the step (4-5-1), the microprocessor judging whether another specified Roman character is selected through pressing of a specified button on the keypad in accordance with the user's manipulation;
(4-5-6) if no specified function key in the upper left (&-t) direction is selected on the keypad through the user's keypad sliding manipulation as a result of judgment in the step (4-5-2), the microprocessor judging whether another specified function key in the left (左) direction is selected through the user's keypad sliding manipulation;

(4-5-7) if the specified function key in the left (SL) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-5-6), the microprocessor judging whether the button and keypad sliding manipulation in the left (左) direction, selected by the user through the above-described steps (4-5-1) and (4-5-6), is maintained;

(4-5-8) if the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment in the step (4-5-7), the microprocessor converting the input three or less Roman character codes into a corresponding Chinese character through a 'Chinese character output of the corresponding codes' in left (左) direction, and displaying the converted Chinese character on the selection window to perform the above-described step (4-7);

(4-5-9) if no specified function key in the left (左) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-5-6), the microprocessor judging whether another specified function key in the lower left (ЦT) direction is selected in accordance with the user's keypad sliding manipulation;

(4-5-10) if the specified function key in the lower left (&.T) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-5-9), the microprocessor judging whether the button and keypad sliding manipulation in the lower left (ЦT) direction, selected by the user through the above-described steps (4-5-1) and (4-5-9), is maintained;

(4-5-11) if the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment in the step (4-5-10), the microprocessor converting the input Roman character codes into a corresponding Chinese character through a 'corresponding left-side second-class duplicate Chinese character output' function in the lower left (ЦТ)
direction, and displaying the converted Chinese character on the selection window to perform the above-described step (4-7); and

(4-5-12) if no specified function key in the lower left CZhT) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-5-9), the microprocessor judging whether a specified Roman character is selected by pressing a specified button on the keypad in accordance with the user's manipulation.

14. The method of claim 12, wherein the step (4-6) comprises:

(4-6-1) the microprocessor judging whether the keypad is slid in lower (T) direction in a state that a specified Roman character button provided on the keypad is pressed in accordance with a user's manipulation, who intends to input the wubi Roman character codes;

(4-6-2) if the keypad is slid in lower (T) direction in a state that the specified Roman character button provided on the keypad is pressed, the microprocessor judging whether a specified character is further selected;

(4-6-3) if the keypad is not slid in lower (T) direction in a state that the specified Roman character button provided on the keypad is pressed in accordance with the user's manipulation as a result of judgment in the step (4-6-1), the microprocessor judging whether a specified function key in upper right (右上) direction allocated to the corresponding sliding direction is selected in accordance with the user's keypad sliding manipulation;

(4-6-4) if the specified function key in the upper right (右上) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-6-3), the microprocessor judging whether the button and keypad sliding manipulation in the upper right CZh_T) direction, which is selected by the user through the steps (4-6-10 and (4-6-3), is maintained;

(4-6-5) if the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment in the step (4-6-4), the microprocessor converting the input Roman character codes into a right-side Chinese character key name of the corresponding key through a 'right-side
Chinese character key name output' function in the upper right (右 b) direction, and displaying the converted right-side Chinese character to perform the above-described step (4-7);

(4-6-6) if no specified function key in the upper right (右 h) direction is selected on the keypad through the user's keypad sliding manipulation as a result of judgment in the step (4-6-3), the microprocessor judging whether another specified function key in the right (右) direction is selected through the user's keypad sliding manipulation;

(4-6-7) if the specified function key in the right (右) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-6-6), the microprocessor judging whether the button and keypad sliding manipulation in the right (右) direction, selected by the user through the above-described steps (4-6-1) and (4-6-6), is maintained;

(4-6-8) if the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment, the microprocessor converting the input three or less Roman character codes into a corresponding Chinese character through a 'Chinese character output of the corresponding codes' in the right (右) direction, and displaying the converted Chinese character on the selection window to perform the above-described step (4-7);

(4-6-9) if no specified function key in the right (右) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-6-6), the microprocessor judging whether another specified function key in the lower right (右 T) direction is selected in accordance with the user's keypad sliding manipulation;

(4-6-10) if the specified function key in the lower right (右 T) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-6-9), the microprocessor judging whether the button and keypad sliding manipulation in the lower right (右 T) direction, selected by the user through the above-described steps (4-6-1) and (4-6-9), is maintained;

(4-6-11) if the button and keypad sliding manipulation state selected by the user is maintained as a result of judgment in the step (4-6-10), the
microprocessor converting the input Roman character codes into a corresponding Chinese character through a 'corresponding right-side second-class duplicate Chinese character output' function in the lower right (右 T ) direction, and displaying the converted Chinese character on the selection window to perform the above-described step (4-7); and

(4-6-12) if no specified function key in the lower right (右 T ) direction is selected in accordance with the user's keypad sliding manipulation as a result of judgment in the step (4-6-9), the microprocessor judging whether a specified Roman character is selected by pressing a specified button on the keypad in accordance with the user's manipulation.
Fig. 1
Fig. 2

Upper 10

Lower 10

Left 10

Right 10

Upper Left 10

Upper Right 10

Lower Left 10

Lower Right 10
Input of Right-side Character
### Fig. 5

**< Example "TN" >**

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Fig. 10

<< Example "TN" >>

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Fig. 11

1. Start
2. S100: Character mode selected?
   - No
   - Yes: A
3. S200: Pinyin input mode routine
4. S300: Wubi input mode routine
5. S400: Storage key signal inputted?
   - No
   - Yes: S500: Store character inputted by user
6. S600: Character mode ended?
   - No: A
   - Yes: End
Fig. 12

Pinyin input mode → Change to pinyin input mode → S210

Yes: Function key selected?

No: Consonant and/or vowel selected according to button manipulation or keypad sliding?

Yes: Left-side character input processing routine

No: Return → S250

Yes: Perform 'backspace', 'space', 'symbol input', or 'English input' function in accordance with selected function key → S230

B

B

Right-side character input processing routine → S260

Display Chinese character on screen → S270
Fig. 13

Left-side character input processing routine

S251
Specified character selected? No

S252
Specified character selected according to keypad sliding? No

S253
All keys pressed? No

Yes

Combine corresponding left-side Roman character with Roman character arranged in keypad sliding direction

S254
Display corresponding Chinese characters on selection window in the order of their frequency

S255

Yes

S256
one list selected? No

S257
Output Chinese characters of displayed list

Return

Yes

S258
Specified list selected according to keypad sliding? No

C

Yes

C
Fig. 14

Right-side character input processing routine

Specified character selected by lower-direction sliding? Yes S261

Yes

Specified character further selected? No S269

Combine corresponding right-side Roman character with Roman character arranged in keypad sliding direction S264

Display corresponding Chinese characters on selection window in the order of their frequency S265

S266

one list selected? No

Yes

Specified list selected according to keypad sliding? No S268

Yes

Output Chinese characters of displayed list

Return
Fig. 15

Wubi input mode

Change to wubi input mode

S310

Function key selected?

Yes

S320

Perform 'backspace', 'space', 'symbol input', or 'English input' function in accordance with selected function key

S330

Consonant and/or vowel selected according to button manipulation or keypad sliding?

No

E

Return

S350

Yes

Left-side character input processing routine

Right-side character input processing routine

Display Chinese character on screen

S370

E