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(71) Applicant: **NOKIA CORPORATION** [FI/FI]; Keilalahdentie 4, FI-02150 Espoo (FI).

(71) Applicant *(for LC only)*: **NOKIA (CHINA) INVESTMENT CO., LTD.** [CN/CN]; Nokia China Campus, No. 5 Donghuan Zhonglu, Beijing Economic and Technological Development Area, Daxing District, Beijing 100176 (CN).

(72) Inventor: **LIN, Jianming**; Nokia Building 2, No.5 Donghuan Zhonglu, Yi Zhuang, Daxing District, Beijing 100176 (CN).

(74) Agent: **KING & WOOD MALLESONS**; 20th Floor, East Tower, World Financial Center, No. 1 Dongsanhuan Zhonglu, Chaoyang District, Beijing 100020 (CN).

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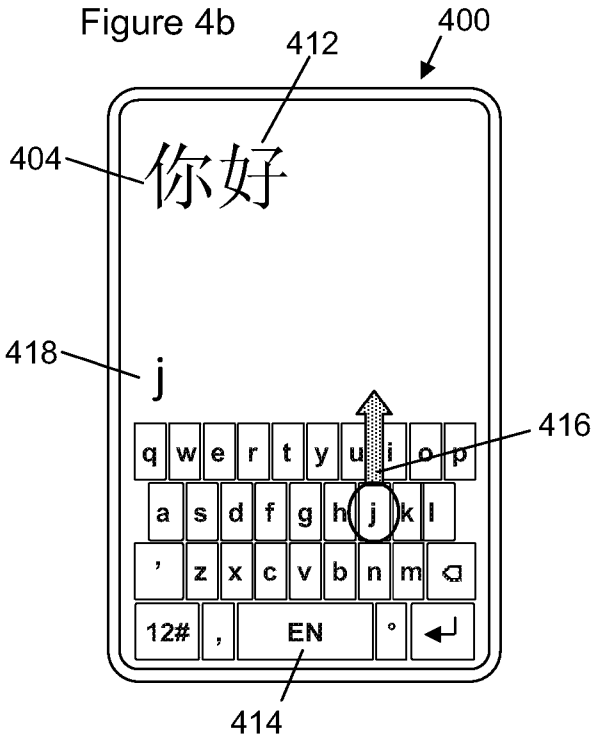
[Continued on next page]

(54) Title: AN APPARATUS AND ASSOCIATED METHODS

Figure 4b



(57) Abstract: An apparatus, the apparatus comprising at least one processor, and at least one memory including computer program code, the at least one memory and the computer program code configured, with the at least one processor, to cause the apparatus to perform at least the following: based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, provide for a corresponding character entry function in a respective first language, the first language different to a second language associated with a different type of user input for the character entry key.

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AN APPARATUS AND ASSOCIATED METHODS

Technical Field

The present disclosure relates to text entry using electronic devices, associated methods, computer programs and apparatus. Certain disclosed embodiments may relate to portable electronic devices, for example so-called hand-portable electronic devices which may be hand-held in use (although they may be placed in a cradle in use). Such hand-portable electronic devices include so-called Personal Digital Assistants (PDAs), mobile telephones, smartphones and other smart devices, and tablet PCs.

The portable electronic devices/apparatus according to one or more disclosed embodiments may provide one or more audio/text/video communication functions (e.g. tele-communication, video-communication, and/or text transmission (Short Message Service (SMS)/Multimedia Message Service (MMS)/e-mailing) functions), interactive/non-interactive viewing functions (e.g. web-browsing, navigation, TV/program viewing functions), music recording/playing functions (e.g. MP3 or other format and/or (FM/AM) radio broadcast recording/playing), downloading/sending of data functions, image capture function (e.g. using a (e.g. in-built) digital camera), and gaming functions.

Background

Many electronic devices allow text input, for example to compose a text-based message or document. Such a document may be composed in one or more languages.

The listing or discussion of a prior-published document or any background in this specification should not necessarily be taken as an acknowledgement that the document or background is part of the state of the art or is common general knowledge. One or more embodiments of the present disclosure may or may not address one or more of the background issues.

Summary

In a first example embodiment there is provided an apparatus comprising at least one processor and at least one memory including computer program code, the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus to perform at least the following: based on a detected first type of

user input of a plurality of different types of input associated with entry of a character using a particular character entry key, provide for a corresponding character entry function in a respective first language, the first language different to a second language associated with a different type of user input for the character entry key.

Thus a user may tap a virtual keyboard character entry key, for example “L”, and based on the type of user input being a tap, a letter “L” may be entered in an English language mode. The first type of user input is the tap, which may be used to enter the character “L”, and the entry of the device into an English language mode (which allows for the character entry of the letter “L” in English) is a corresponding character entry function. The user may also be able to provide a slide user input starting from the “L” key (a second different type of input for the character entry key), and, based on the type of user input being a slide, a letter “L” may be entered as part of a Pinyin representation of a Chinese character, and in some embodiments the language mode of the device may switch to a Chinese language mode. The second different type of user input here is the slide, which may be used to enter the character “L” as part of a Pinyin word, and the entry of the device into a Chinese character language mode (which allows for the Chinese character entry) is a corresponding character entry function.

Thus, a user may be able to use a character entry key to enter characters in a particular language by using different user input types for the character key, each type corresponding to the particular language. This may advantageously allow a user to compose a multi-language document or message without being required to enter a settings menu to, for example, change the language settings of the text editor/application for a particular word or phrase.

The corresponding character entry function may be one or more of:

entry of a corresponding character in the first language;

entry of an accented version of a corresponding character in the first language;

entry of a selectable word comprising a corresponding character in the first language;

predictive text input in the first language using the detected first type of user input;

spell-checking in the first language; and

auto-correction in the first language.

Thus, the entry of a character using a particular user input type corresponding to a particular language may be used to provide character entry functions in that language. If

entering text in Spanish, for example, a user may benefit from text entry assistance in Spanish, such as Spanish spell-checking, predictive text functionality offering a list of likely words based on the user-entered beginning character(s) of a word, and automatic accenting of characters (which may be considered a form of auto-correction). If entering Japanese Katakana characters using Romanised transcription, for example, a user may benefit from predictive functionality offering a list of likely katakana for user selection based on user-entered Roman characters.

The character entry function may be entry of a corresponding character in the first language using the same writing system as that associated with the second language. For example, using a Roman character keyboard (e.g., having the characters “A”, “B”, “C”…), English and French may be input as both use the Roman alphabet/writing system.

The character entry function may be entry of a corresponding character in the first language using a writing system different to that associated with the second language. That is, the writing systems associated with the first type of user input and the different type of input may be different to one another. A Roman character keyboard may be used to enter English letters and Chinese characters, for example using a first type of user input, such as a tap, to enter Roman characters, and using a different type of user input, such as a hold or slide, to enter Chinese characters using the Pinyin system. As another example a Roman character keyboard may be used to enter Cyrillic characters, as each Cyrillic character may be associated with a corresponding Roman character entry key.

The character entry function may comprise entry of a word in the first language which is phonetically associated with a word comprising the entered character but which uses a different writing system to the second language. Thus using user inputs corresponding to Chinese language input, selecting the keys “W”, “O”, “M”, “E” and “N” may enter the phonetically associated two character word “wo men”, meaning “we/us”.

The character entered by the character entry key may comprise one or more of an alphabetical character, a graphical character, a punctuation character and a space character.

The apparatus may be configured to provide for the character entry function following a user confirmation. The user confirmation may be a user selection of a “confirm” option, or may be a timeout, for example.

The apparatus may be configured to provide for the corresponding character entry function in a default language if the first type of user input and/or the different type of user input is detected as being of an uncategorised type of user input associated with the particular character entry key. For example, if a user slides to the left starting from a character entry key, and this “left slide” type of user input is not a recognised type of user input associated with entry of a character, a default character entry function may be provided. Such a default function may be to provide no input, or to provide a character entry in a default language, for example. In this way, if a user slips while making a user input, such a slip would not be interpreted as an input for providing a character entry function which was not required. Also, by providing a default character entry function, the apparatus need not provide an error message which may distract the user from text composition.

The character entry key may be provided using one or more of a virtual keyboard and a physical keyboard. For example, using a physical keyboard, a user may provide different types of user input such as a tap, rapid double tap, or a press for a predetermined amount of time.

The languages for the character entry may comprise two or more characters of: Roman characters (for example in English), accented Roman characters (for example, in French, German, Finnish, Polish or Turkish); Greek characters; Chinese characters (for example, traditional Chinese and simplified Chinese characters/sinograph); Japanese characters (such as Kanji. Hirakana and Katakana); Korean characters; Arabic characters/strokes; Thai characters (and other Brahmic scripts such as Gujarati and Bengali); Cyrillic characters (such as Russian, Bulgarian and Ukrainian); and Hebrew characters. Other writing systems and characters specific to a particular language may also be possible. In other examples it may be that both the first and second languages are in the same language category, such as French and Spanish (as both use accented Roman characters).

The apparatus may be configured to provide for a corresponding character entry function in the respective first language during the composition of one or more of: a text-based document (such as a word processing document or database entry), a text message, an SMS message, an MMS message, an email, a search entry (such as a search entry in a website or file finding application), a microblog post, a social media post, a calendar entry or a web address.

The first type of user input and the different type of user input may comprise two or more of: a tap, a hold, a touch, a press, a slide, a flick, a circle, a shape, a multiple tap, a rub, directional input, and a hover. A tap or press may be provided with a particular pressure to a pressure-sensitive input device, and different pressure inputs may be detected as different types of user input. Similarly, a user may provide a small circle and a double circle as two types of user input. Other shapes may be used as different types of user input. Slides in different directions may be considered different types of user input. In other examples, a slide in any direction may be considered one type of user input. The user may configure which particular input types correspond to particular character entry functions in a preferences/settings menu, for example.

The apparatus may comprise the character entry key. The apparatus may comprise a display to output a corresponding character entry. The apparatus may be configured to output a corresponding character entry on a display.

The apparatus may be configured to detect the types of user input for the character entry key.

The apparatus may be configured to, based on a different type of user input than the detected first type, for the character entry key associated with entry of a character using a particular character entry key, provide for a corresponding character entry function in the second language. Of course, the apparatus may be configured to provide for corresponding character entry functions in three or more languages.

The apparatus may be an electronic device, a portable electronic device, a laptop computer, a mobile phone, a smartphone, a tablet computer, a surface computer, a personal digital assistant, a graphics tablet, a digital camera, a navigation device, a non-portable electronic device, a desktop computer, a monitor/display, a server, or a module/circuitry for one or more of the same.

According to a further example embodiment, there is provided a computer program comprising computer program code, the computer program code being configured to perform at least the following: based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, provide for a corresponding character entry function in a respective first language, the first language different to a second language associated with a different type of user input for the character entry key.

According to a further example embodiment, there is provided a method, the method comprising providing for a corresponding character entry function in a respective first language based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, the first language different to a second language associated with a different type of user input for the character entry key.

According to a further example embodiment there is provided an apparatus comprising: means for providing for a corresponding character entry function in a respective first language based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, the first language different to a second language associated with a different type of user input for the character entry key.

According to a further example embodiment there is provided an apparatus comprising at least one processor and at least one memory including computer program code, the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus to perform at least the following: provide for character key entry in a first language based on detection of a first type of user input associated with a particular character entry key and provide for a character key entry function associated with a second different language based on detection of a second different type of user input associated with the character key.

According to a further example embodiment, there is provided a computer program comprising computer program code, the computer program code being configured to perform at least the following: provide for character key entry in a first language based on detection of a first type of user input associated with a particular character entry key and provide for a character key entry function associated with a second different language based on detection of a second different type of user input associated with the character key.

According to a further example embodiment, there is provided a method, the method comprising providing for character key entry in a first language based on detection of a first type of user input associated with a particular character entry key and provide for a character key entry function associated with a second different language based on detection of a second different type of user input associated with the character key.

According to a further example embodiment there is provided an apparatus comprising: means for providing for character key entry in a first language based on detection of a first type of user input associated with a particular character entry key and provide for a character key entry function associated with a second different language based on detection of a second different type of user input associated with the character key.

The present disclosure includes one or more corresponding aspects, embodiments or features in isolation or in various combinations whether or not specifically stated (including claimed) in that combination or in isolation. Corresponding means and corresponding function units (e.g. a position determined, a relative position determiner, an automatic status updater) for performing one or more of the discussed functions are also within the present disclosure.

A computer program may be stored on a storage media (e.g. on a CD, a DVD, a memory stick or other non-transitory medium). A computer program may be configured to run on a device or apparatus as an application. An application may be run by a device or apparatus via an operating system. A computer program may form part of a computer program product. Corresponding computer programs for implementing one or more of the methods disclosed are also within the present disclosure and encompassed by one or more of the described embodiments.

The above summary is intended to be merely exemplary and non-limiting.

Brief Description of the Figures

A description is now given, by way of example only, with reference to the accompanying drawings, in which:

figure 1 illustrates an example apparatus embodiment comprising a number of electronic components, including memory and a processor, according to one embodiment of the present disclosure;
figure 2 illustrates an example apparatus embodiment comprising a number of electronic components, including memory, a processor and a communication unit, according to another embodiment of the present disclosure;

figure 3 illustrates an example apparatus embodiment comprising a number of electronic components, including memory and a processor, according to another embodiment of the present disclosure;

figures 4a-4d illustrate a portable electronic device used for composing a message in English and Chinese;

figures 5a-5d illustrate a portable electronic device used for composing a message in French and English;

figures 6a-6c illustrate a desktop computer used for composing a message in English and Chinese;

figures 7a-7d illustrate a portable electronic device used for composing a message in multiple languages;

figures 8a-8b each illustrate an apparatus in communication with a remote computing element;

figures 9a-9b illustrate flowcharts according to example methods of the present disclosure; and

figure 10 illustrates schematically a computer readable medium providing a program.

Description of Example Aspects/Embodiments

Many electronic devices allow text input, for example to compose a text-based message or document. Such a document may be composed in one or more languages.

Many users of electronic devices can speak more than one language, and it is not unusual for multi-lingual users to write documents and messages which contain words in two or more different languages. For example, a French user might write a message to a friend to say “J’ai acheté un Christmas pudding”, meaning “I have bought a Christmas pudding”. Christmas pudding is a British peculiarity and does not really have an equivalent name in French. If the user’s text input language is set to French then entering “Christmas pudding” may be difficult, since any text entry assistance such as predictive text, spell-checking or auto-correction will not work for these English words. The English words might even, annoyingly for the user, be corrected to similar French words which the user did not intend to write.

One way to avoid such problems is to swap the language of the device manually by providing a series of user inputs to access and change language settings in a settings menu. However, this can be laborious, particularly when the language needs to be swapped into a new language for just one or two words and then swapped back, and

perhaps swapped repeatedly throughout the message. Not only is it laborious, but it may be very disruptive to the user's train of thought when writing.

Another way to overcome this problem is for the user to define more than one text input language. Text entry assistance may then use words from more than one language dictionary when evaluating the entered text. However, this may pose problems because predicted candidate words for one language become 'polluted' with those of another language, and words from a language which is one of the two or more defined languages but which is not the current desired language, may be entered as auto-corrections or predicted text entries unexpectedly. It may also mean that the number of useful predicted text candidates will be reduced because extra candidates from another language will take the place of candidates from the language which the user intends to write in.

Another way to over come the problem is to automatically detect what language the user is currently using and swap the dictionary to that language. This may work for passages which are written continuously in one language, but it is unsuitable for quickly swapping back and forth in the same passage and the same sentence. In the French-English example above, it is not necessarily the case that "Chris…" would be recognised as an English word, and possibly the text would not be recognised as English until perhaps the word "pudding" has been completed or nearly completed.

Another way to over come the problem is to disable all spelling correction, predictive text, auto-correction and other text entry assistance functions, and allow the user to enter text completely manually in whatever language he/she likes. However, the benefit of all text entry assistance features is lost.

Disclosed herein is an apparatus configured to, based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, provide for a corresponding character entry function in a respective first language, the first language different to a second language associated with a different type of user input for the character entry key. For example, by entering a character by tapping a character entry key (thereby using a first type of user input), text may be entered with text entry assistance operating for the English language (if English is associated with a tap user input). By entering a character using a slide user input for the character entry key, text may be entered in Pinyin for Chinese character recognition. The slide user input is associated with the Chinese language. In certain cases the character entry function associated with the tap user input is to provide text entry

assistance (such as spell-checking on the fly, and auto-correction) in English, and the character entry function associated with the slide user input is to provide Chinese characters matching the characters entered using the Pinyin system to phonetically "describe" a Chinese character in Roman characters. Of course, the character entry function may be simply to allow for appropriate entry without the specific text entry assistance.

Thus an input of one type causes the character associated with that key to be entered in one language, and an input of another type causes the same character to be entered in a different language. The 'easiest'/most intuitive input type (which may be a tap or short press) may be preselected by a user to correspond to the user's primary language, and one or more other more awkward or lengthy (or just different, but not necessarily more awkward/lengthy) input types may be chosen to correspond to one or more secondary languages. For example, a native English speaker who is describing a German city break in an e-mail to a friend using a virtual keyboard on a tablet computer may set a tap user input to correspond to English language text input, and may set a swirl user input to correspond to German language input for entering certain German terms into the English language message. Further, the user may, in certain embodiments, be provided with auto-correction, spell-checking and/or predictive text assistance in English for the English-entered words (using a tap) and with similar assistance in German for the German-entered words (using a swirl user input). Further examples are described below.

Other embodiments depicted in the figures have been provided with reference numerals that correspond to similar features of earlier described embodiments. For example, feature number 100 can also correspond to numbers 200, 300 etc. These numbered features may appear in the figures but may not have been directly referred to within the description of these particular embodiments. These have still been provided in the figures to aid understanding of the further embodiments, particularly in relation to the features of similar earlier described embodiments.

Figure 1 shows an apparatus 100 comprising memory 107, a processor 108, input I and output O. In this embodiment only one processor and one memory are shown but it will be appreciated that other embodiments may utilise more than one processor and/or more than one memory (e.g. same or different processor/memory types).

In this embodiment the apparatus 100 is an Application Specific Integrated Circuit (ASIC) for a portable electronic device with a touch sensitive display. In other embodiments the

apparatus 100 can be a module for such a device, or may be the device itself, wherein the processor 108 is a general purpose CPU of the device and the memory 107 is general purpose memory comprised by the device. The display, in other embodiments, may not be touch sensitive.

The input I allows for receipt of signalling to the apparatus 100 from further components, such as components of a portable electronic device (like a touch-sensitive or hover-sensitive display) or the like. The output O allows for onward provision of signalling from within the apparatus 100 to further components such as a display screen, speaker, or vibration module. In this embodiment the input I and output O are part of a connection bus that allows for connection of the apparatus 100 to further components.

The processor 108 is a general purpose processor dedicated to executing/processing information received via the input I in accordance with instructions stored in the form of computer program code on the memory 107. The output signalling generated by such operations from the processor 108 is provided onwards to further components via the output O.

The memory 107 (not necessarily a single memory unit) is a computer readable medium (solid state memory in this example, but may be other types of memory such as a hard drive, ROM, RAM, Flash or the like) that stores computer program code. This computer program code stores instructions that are executable by the processor 108, when the program code is run on the processor 108. The internal connections between the memory 107 and the processor 108 can be understood to, in one or more example embodiments, provide an active coupling between the processor 108 and the memory 107 to allow the processor 108 to access the computer program code stored on the memory 107.

In this example the input I, output O, processor 108 and memory 107 are all electrically connected to one another internally to allow for electrical communication between the respective components I, O, 107, 108. In this example the components are all located proximate to one another so as to be formed together as an ASIC, in other words, so as to be integrated together as a single chip/circuit that can be installed into an electronic device. In other examples one or more or all of the components may be located separately from one another.

Figure 2 depicts an apparatus 200 of a further example embodiment, such as a mobile phone. In other example embodiments, the apparatus 200 may comprise a module for a mobile phone (or PDA or audio/video player), and may just comprise a suitably configured memory 207 and processor 208.

The example embodiment of figure 2 comprises a display device 204 such as, for example, a liquid crystal display (LCD), e-Ink or touch-screen user interface. The apparatus 200 of figure 2 is configured such that it may receive, include, and/or otherwise access data. For example, this example embodiment 200 comprises a communications unit 203, such as a receiver, transmitter, and/or transceiver, in communication with an antenna 202 for connecting to a wireless network and/or a port (not shown) for accepting a physical connection to a network, such that data may be received via one or more types of networks. This example embodiment comprises a memory 207 that stores data, possibly after being received via antenna 202 or port or after being generated at the user interface 205. The processor 208 may receive data from the user interface 205, from the memory 207, or from the communication unit 203. It will be appreciated that, in certain example embodiments, the display device 204 may incorporate the user interface 205. Regardless of the origin of the data, these data may be outputted to a user of apparatus 200 via the display device 204, and/or any other output devices provided with apparatus. The processor 208 may also store the data for later use in the memory 207. The memory 207 may store computer program code and/or applications which may be used to instruct/enable the processor 208 to perform functions (e.g. read, write, delete, edit or process data).

Figure 3 depicts a further example embodiment of an electronic device 300 comprising the apparatus 100 of figure 1. The apparatus 100 can be provided as a module for device 300, or even as a processor/memory for the device 300 or a processor/memory for a module for such a device 300. The device 300 comprises a processor 308 and a storage medium 307, which are connected (e.g. electrically and/or wirelessly) by a data bus 380. This data bus 380 can provide an active coupling between the processor 308 and the storage medium 307 to allow the processor 308 to access the computer program code. It will be appreciated that the components (e.g. memory, processor) of the device/apparatus may be linked via cloud computing architecture. For example, the storage device may be a remote server accessed via the internet by the processor.

The apparatus 100 in figure 3 is connected (e.g. electrically and/or wirelessly) to an input/output interface 370 that receives the output from the apparatus 100 and transmits

this to the device 300 via data bus 380. Interface 370 can be connected via the data bus 380 to a display 304 (touch-sensitive or otherwise) that provides information from the apparatus 100 to a user. Display 304 can be part of the device 300 or can be separate. The device 300 also comprises a processor 308 configured for general control of the apparatus 100 as well as the device 300 by providing signalling to, and receiving signalling from, other device components to manage their operation.

The storage medium 307 is configured to store computer code configured to perform, control or enable the operation of the apparatus 100. The storage medium 307 may be configured to store settings for the other device components. The processor 308 may access the storage medium 307 to retrieve the component settings in order to manage the operation of the other device components. The storage medium 307 may be a temporary storage medium such as a volatile random access memory. The storage medium 307 may also be a permanent storage medium such as a hard disk drive, a flash memory, a remote server (such as cloud storage) or a non-volatile random access memory. The storage medium 307 could be composed of different combinations of the same or different memory types.

Figures 4a-4d illustrate an example embodiment of an apparatus/device 400 which is a portable electronic device such as a smartphone or tablet computer. The apparatus 400 comprises a touch-sensitive screen and is displaying a virtual keyboard 402. The apparatus is currently running an application allowing text entry, for example a text message application. The user's friend, John, is learning to speak Chinese, so the user is composing a message in Chinese to him.

The apparatus/device 400 in figure 4a is configured to enter Chinese characters using the Pinyin system. The apparatus displays the label "ZH-CN" 406 to show that the text entry will be detected as "Zhongwen - Chinese". In this and later examples, the language label is displayed in the space occupied by the space bar, but it may be displayed in any suitable display space. In this example, tapping a character key once is a first type of user input which provides a corresponding character entry function, namely allowing entered Roman characters to be recognised as part of a Pinyin representation of a Chinese character.

In figure 4a, the user has already entered a character, "ni" 404, by tapping the "N" and the "I" character entry keys. The "ni" character 404 is displayed on the display screen. The user then wishes to enter the character "hao", so he taps the keys "H", "A" and "O"

410. A predictive text character entry function, operating in Chinese due to the user input type of tapping a key being associated with Chinese text input, displays a likely character 408 representing the Pinyin “hao” which the user can select and enter in the text message. In this example, the Chinese language predictive text function is also provided as part of the character entry function, which comprises entry of a word in Chinese which is phonetically associated with a word comprising the entered characters “N”, “I”, “H, “A” and “O”, but which uses a different writing system, namely Chinese script rather than Pinyin. Of course in other examples more candidate characters corresponding to “hao” may be provided.

In figure 4b, the Chinese characters “ni” 404 and “hao” 412 are part of the text message. The user then wishes to enter an English word. The user is able to make a second different type of user input using a character entry key, and the apparatus is configured to provide for a corresponding character entry function in a second language different to the first language of Chinese. The user touches a character entry key “J” 416 and slides his finger up the display screen. This “slide up” type of user input is associated with text entry in English, as indicated on the display by the letters “EN” 414. The letter “J” is displayed 418 at the bottom of the text entry display. Thus, the apparatus will not try and display Chinese characters which begin with the letter “J” in Pinyin, because the apparatus recognises, due to the slide-up user input, that the character input “J” is entered as part of an English word.

In this example the apparatus is also configured to provide predictive text assistance and spell-checking in the particular language associated with the type of user input used to select the character entry keys as corresponding character entry functions. Figure 4c shows the user has continued to enter characters using a “slide up” motion so the apparatus recognises the user is entering an English word. Following the entry of “J”, the user selects “O” and “H” 418 using the “slide up” user input type. The apparatus displays the characters entered so far, “Joh” 420. This is not recognised as an English word buy the English spell-checking facility, so the word in the text message body is zigzag-underlined 424 to indicate that it may be spelled incorrectly. The apparatus displays possible auto-completed words which begin with the characters entered so far. In this example the names “John” and “Johnathan” 422 are provided as potential candidates for the word which the user is trying to enter.

In figure 4d, the user selects the word “John” from the words offered from the predictive text candidates by touching the displayed word 428. The word “John” is entered in the

text message 426. The character entry function comprises accepting a valid entry of a word in English which is phonetically associated with a word comprising the entered character. That is, the user is able to validly enter the word “John” as a correct spelling, which is phonetically associated with the characters “J”, “O”, “H” and “N”. The apparatus in this example is configured to recognise the next entered character as part of a Chinese character, as indicated by the “ZH-CN” label 430. in other examples, the apparatus may not be configured to default to a particular language.

Therefore in this example, the apparatus is configured such that the particular character entry function is provided upon the entry of each character, that is, upon the appropriate selection of each character entry key. So, each character in a Pinyin word is entered by a tap, which is associated with Chinese language entry, and each character in the English word is entered by a “slide-up” stroke, which is associated with English language entry. The apparatus may be further configured, for example, that characters entered using another different user input type are associated with a different language again. For example, entering characters using a “slide-down” input may enter characters in French, with corresponding predictive text candidates including any character accents and any spell-checking performed on the basis of a French dictionary of words.

In other examples (such as that shown in figures 5a-5d) the apparatus may allow switching between different languages at the beginning of entry of a new word, and then allow that language to be maintained regardless of the input type for character keys, until entry of a new word. So, for example, after using a “slide-up” type of user input for the “J” character entry key, English language text entry may continue without requiring the user to “slide-up” on the “O”, “H” and “N” keys until the entry of a new word is detected. A new word may be detected by, for example, selection of a predicted word or by entry of a space delineation (e.g., using a space bar) or other delineation character (e.g., a comma, full stop, quote mark, or other punctuation mark).

The user may find it advantageous to be able to enter a multi-language message, including languages with different writing systems, without being required to manually select a language for the different sections of the message in each language. If a language is a main language of the message (for example, a user is typing in Chinese with a few English terms in the message) then the user input type for Chinese character entry may be an intuitive/easier user input type such as a tap, whereas a user input type for the rarer language in the message may be a more complicated/longer user input type, such as a stroke in a particular direction.

Further advantages may be considered to be that words in the message are not spell-checked against words in a dictionary of another language. It may be frustrating for a user to see all words in a second language marked as spelled incorrectly, when they are actually spelled correctly for the particular language intended for those words. Further still, the predictive text functionality may be considered to work much better by recognising the language which particular words are entered in and offering possible matching completed words in that language.

In certain examples the apparatus/device may be configured to auto-correct entered text, and examples disclosed herein may be considered to provide further advantage in this regard. For example, by entering the characters “Joh” using a user input type corresponding to English language input, the device does not try and auto-correct the word with a Chinese character. In this case there is no Pinyin word “Joh” with a corresponding Chinese character, so an error message may be displayed if the apparatus tried to match the word “Joh” with a Chinese character. This may be more problematic in other examples, such as if a user enters the characters “WOMEN”, since this is both an English word and a Chinese Pinyin word meaning “we/us”. The apparatus is configured to detect that the characters are entered using an input type corresponding to a particular language and auto-correction can be applied in that particular language to the advantage of the user. If the user wished to enter the English word “women” and the word was auto-corrected to the Chinese characters for “wo men” this would be frustrating for the user.

Figures 5a-5d illustrate an example embodiment of an apparatus/device 500 which is a portable electronic device. The apparatus 500 comprises a touch-sensitive screen and is displaying a virtual keyboard 502. The apparatus is currently running an application allowing text entry. In this example a French speaking user has visited a Christmas market on a weekend break to the UK, and is writing an e-mail to her French friends to say what she has bought.

The apparatus/device 500 in figure 5a is configured to enter French language characters and words, and the label “FR” 506 is displayed to indicate this. In this example, tapping a key once is a first type of user input which provides a corresponding character entry function, namely allowing entered Roman characters to be recognised as part of a French word.

In figure 5a, the user has already entered the phrase “J’ai acheté un…” meaning “I have bought a…”. The user then wishes to enter the words “Christmas pudding” in English, since this term has no accurate equivalent in French. If the words “Christmas pudding” were entered while the apparatus is configured to associate entered text with French language words, the words “Christmas” and “pudding” would be marked as mis-spellings although they are correctly written in English (for the purposes of this example neither word is present in the French language dictionary available to the apparatus). Further, a French-language predictive text function would not be able to provide the words “Christmas” and “pudding” as auto-completed words or auto-corrected candidate words (if accidentally mistyped, such as entering “Chritmas” without the “s”).

In figure 5b, the user is able to make a second different type of user input using a character entry key, and the apparatus is configured to provide for a corresponding character entry function in a second language different to the first language of French. The user touches a character entry key “C” 510 and slides his finger down the display screen. This “slide down” type of user input is associated with text entry in English as indicated on the display by the letters “EN” 512. The letter “C” is displayed 514 on screen. In this example, only the first letter of a word needs to be entered using a particular type of user input for the whole word to be associated with the language corresponding to that type of user input.

Figure 5c shows the user has continued to enter further characters in the word using a tap (i.e., without using a “slide-down” type of user input), namely “H”, “R” and “I” 518. Since the first character in the word, “C”, was entered using a “slide down” input associated with English language text input, the apparatus provides for the entry of other characters in the same word in English. The apparatus provides predictive text options to the user in English of “Christ” and “Christmas” 516.

In figure 5d, the user has selected the predictive text option “Christmas” and has moved on to entering the word “pudding”. The first letter in the word, “p”, is entered using the “slide down” input type 520 to indicate to the apparatus that the word will be in the English language, as shown by the displayed “EN” 522. The apparatus is then able to provide text entry assistance in English including predictive text options 524, English spell checking and auto-correction (for example).

In this example, the apparatus is configured such that the character entry function is provided upon the entry of the first character in a word, so that the user only needs to

enter the first character using a special/different type of user input, and the whole following word will be associated with a particular language corresponding to the user input used to enter the initial character. The start of a word may be indicated to the apparatus, for example, by an immediately preceding space, punctuation mark (e.g., a hyphen, asterisk or quote mark), carriage return (enter) or by the character being entered as a capital letter, for example. The end of a word may similarly be indicated, for example, by a space, punctuation mark (e.g., a full stop, comma, exclamation mark or question mark) or carriage return. After the end of the word in indicated, the apparatus may default to associating the next entered characters in a default "home" language. This may be advantageous for the user as only certain particular characters need to be entered using a particular user entry type, and other character entries may be made using a user input type which the user finds most convenient, such as a tap or touch.

The apparatus in this and other examples may provide text assistance for the user, for example by presenting a user with a selectable list of accented characters upon entry of a particular character. In French, for example, a user may input the letter "E" on a Roman keyboard (without special keys for French accented letters) and, because the apparatus is configured to detect the user is entering a word in the French language, the user may be presented with the selectable options of "e", "é", "è" and "ê", for example. As another example, upon entry of the letter "A" in Norwegian on an Roman (English) keyboard, the selectable options "a", "æ" and "å" may be presented for selection.

Figures 6a-6d illustrate an example embodiment of an apparatus/device 600 which is a desktop computer with a physical keyboard 602. The apparatus/device 600 is currently running an application allowing text entry. In this example a Chinese speaker is writing a message to a Chinese speaking American friend called Helen. In this example the apparatus is configured to allow for text entry in a default language (Chinese), and allow for text entry in a different language than the default language (English) if a user input corresponding to the different language English is used. The apparatus is also configured to revert back to associating characters with the default language, Chinese, for new words (which, as discussed above, may be indicated by, for example, a space, punctuation mark or capital letter, for example.) This configuration may be useful for a user composing a message which is predominantly in one language but which includes certain words in a foreign language. This may be the case, for example, in a document including quotations in a different language or a document including foreign language names of people and places.

The apparatus/device 600 in figure 6a is configured to enter Chinese characters, and the label “Default ZH-CN” 608 is displayed on screen. In this example, tapping a key is a first type of user input which provides a corresponding character entry function of allowing Chinese character entry using the Pinyin system. A second different user input, of holding a key for three seconds, provides a corresponding character entry function of allowing text entry in English.

In figure 6a, the user has already entered the two-character word “ni hao” in Chinese. The user then continues to tap the character input keys to enter the name “Helen”. So far the keys “H” and “E” have been selected to write “he” 606. The apparatus is currently configured to operate in Chinese, so several character options 610 corresponding to the Pinyin word “he” 606 are displayed.

At this point the user realises that she doesn’t want the word “Helen” to be recognised as Chinese as it is an English name. Therefore the user enters the third character in the word, “L”, using a second different user input type of holding down the “L” key 614 for three seconds. This different type of user input is associated with character entry in English, so the apparatus displays that it is operating in English language mode for the current word by displaying “EN detected” 612. The different user input of pressing the “L” key for three seconds indicates to the apparatus to allow for text input in a language other than the default Chinese language until a new word is entered, when the apparatus can revert back to detecting words in Chinese. The Chinese character options for “he” 610 are removed from display as the current word is not associated with Chinese but is now associated with English. The user can continue to tap the keys “E” and “N” 616 to complete the word “Helen” 618 which is recognised as an English word due to the long press on the “L” key.

In figure 6c, the user has completed the entry of characters to enter the word “Helen”. An auto-correction functionality of the apparatus has capitalised the “H” of “Helen”, because the apparatus associated the characters in the word “Helen” with an English language word, and therefore recognises that “Helen” is a name requiring an initial capital letter.

Thus the apparatus may advantageously allow a user to indicate, to the apparatus, that a word is intended to be written in a particular language even if the language is only specified part way through the word by using a particular user input type. This may save time for the user as it is not necessary to move back to the start of the word, or re-write the word, with an initial input to indicate what language the word is in.

Figures 7a-7d illustrate an example embodiment of an apparatus/device 700 which is a portable device with a pressure-sensitive touch-sensitive screen and virtual keyboard 702. In this example a user wishes to compose a short message to a group of friends who all speak different languages (namely English, French, Russian and Chinese). In this example the apparatus is configured to allow for text entry in a first language (English) based on a detected first type of user input associated with that language for a character entry key, and allow for text entry in different languages based on detected different types of user input associated with those different languages for the character entry key. A particular user input of a type associated with a particular language is used in this example to switch to allowing character entry in the different particular language using the character entry key.

In figure 7a the user has entered the word “Hello” while the first language is configured as English, as indicated by a displayed “EN” 706. The user has then tapped the “comma” character entry key with a hard tap 708. This particular user input type of a hard (increased pressure) tap corresponds to the character entry function of associating following character entries with French language words.

In figure 7b the user has entered the word “bonjour” 710 while the language is configured as French, as indicated by a displayed “FR” 712. The user has then selected the “comma” character entry key with a slide-down user input 714, which is a user input type corresponding to the character entry function of associating following character entries with Russian language words.

In figure 7c the user has entered the word “привет” (“privet”) 716 while the language is configured as Russian, as indicated by a displayed “ру - RU” 718. The user has then selected the “comma” character entry key with a user input pressing the comma character entry key for two seconds 720, which is a user input type corresponding to the character entry function of associating following character entries with Chinese characters.

In figure 7d the user has entered the word “ni hao” 722 while the language is configured as Chinese, as indicated by a displayed “ZH-CN” 724. The user has then selected the “comma” character entry key with a user input tracing a circle around the character entry key. In this example, tracing around a character entry key is not recognised as being associated with a particular language. In this example, the apparatus remains

associating following character entries with the last language used, in this example Chinese. In other examples, selecting a character using an input which is not associated with a particular language may cause the apparatus to associate following character entries with a default language.

The use of the “comma” character entry key has been used as an example. Other punctuation character entry keys, or even different types of input using the space bar character entry key, may be used to indicate a particular language of text entry during text composition. In certain example embodiments, it may be that punctuation and/or space character entry keys are excluded from being used to change the language mode. It certain examples, it may be that character entry keys which provide for an alphabetic/graphical character entry and not punctuation entry are used to change the language mode.

In certain examples, user interaction with a key which does not cause a character to be entered does not change the language mode/provide language functionality. Thus, for example, user inputs of certain types may be used with virtual character keys to enter a corresponding character (letter, punctuation mark or space) into a message and provide a language function such as those described herein. However, for example, user input made to a “1 2 #” key (which causes a new numerical virtual keyboard to be displayed but which does not cause a character to be entered in a message) can not be used to provide language functionality. In this example only character entry keys which, when touched/selected, cause a character to be entered into a message, may be selected using a particular type of user input and provide language functionality associated with the type of user input used. In this way the user can indicate a particular language to be associated with a character or word without being required to break the flow of message/text composition.

The example of figures 7a-7d illustrates that more than two languages may be associated with particular user input types to allow for multi-lingual text document composition without requiring the user to laboriously change which language a particular portion of text is recognised as by, for example, entering a menu system, which can be time consuming and cause the user to lose his or her train of thought while composing the message.

In the above examples, the current operating language is set by the apparatus based on detecting a particular type of user input associated with a character entry key. In other

examples, the apparatus may provide for a character entry function such as changing the current operating language and providing text entry assistance in a particular language after the user provides a user input of a particular type and the user provides confirmation that he or she wishes to use the character entry function. For example, a user may wish to be prompted before switching which language text entry assistance will be provided in, or receive confirmation before the apparatus, based on the type of user input provided, determined that the user may wish to switch from entering English characters to entering Chinese characters.

The skilled person will recognise that a user may pre-set user preferences relating to features disclosed herein. For example, a user may pre-select a particular user input type to be associated with a particular language. For example, a more intuitive/quick user input may be associated with a most frequently used language. A user may pre-select a default language. A user may pre-select which text assistance functions are provided per language (such as spell-checking, predictive text and auto-correction).

Figure 8a shows an example of an apparatus 800 in communication with a remote server. Figure 8b shows an example of an apparatus 800 in communication with a “cloud” for cloud computing. In figures 8a and 8b, apparatus 800 (which may be apparatus 100, 200 or 300) is also in communication with a further apparatus 802. The apparatus 802 may be a touch screen display, hover screen display, or physical keyboard, for example. In other examples, the apparatus 800 and further apparatus 802 may both be comprised within a device such as a portable communications device or PDA. Communication may be via a communications unit, for example.

Figure 8a shows the remote computing element to be a remote server 804, with which the apparatus 800 may be in wired or wireless communication (e.g. via the internet, Bluetooth, NFC, a USB connection, or any other suitable connection as known to one skilled in the art). In figure 8b, the apparatus 800 is in communication with a remote cloud 810 (which may, for example, be the Internet, or a system of remote computers configured for cloud computing). For example, the apparatus providing text entry assistance may be located at a remote server 804 or cloud 810 and accessible by the first apparatus 800. Language dictionaries may be stored at a remote server 804 or cloud 810 and be accessible by the apparatus 800. In other examples the second apparatus may also be in direct communication with the remote server 804 or cloud 810.

Figure 9a illustrates a method 900 according to an example embodiment of the present disclosure. The method comprises providing for a corresponding character entry function in a respective first language based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, the first language different to a second language associated with a different type of user input for the character entry key 902. Figure 9b illustrates a method 950 according to an example embodiment of the present disclosure. The method comprises providing for character key entry in a first language based on detection of a first type of user input associated with a particular character entry key 952 and providing for a character key entry function associated with a second different language based on detection of a second type of user input associated with the character key 954.

In the above examples, the text entry is made to an application which allows text composition. Such an application may allow for message composition, such as a document editor, a text message editor (such as an SMS or MMS application), an email application, or a social media website allowing a microblog post or a social media post to be composed. In other examples, the application may allow text entry other than for message creation, such as a file application or website allowing a search entry to be made, a calendar application, or an internet browser allowing a web address to be entered. The skilled person will appreciate that the above examples may apply to many examples where text is entered into an electronic device.

In the above examples, the apparatus is shown as a portable electronic device such as a smartphone or tablet computer and as a non-portable desktop computer. In other examples, the apparatus may be a type of electronic device, a laptop computer, a mobile phone, a surface computer, a personal digital assistant, a graphics tablet, a digital camera, a navigation device, another type of non-portable electronic device, a monitor/display, a server, or a module/circuitry for one or more of the same.

In the above examples, the first and second languages used are English, (simplified) Chinese, French and Russian. Other example first and/or second languages may include Roman characters, accented Roman characters; Greek characters; Chinese characters; Japanese characters; Korean characters; Arabic characters; Thai characters or other Brahman script characters; Cyrillic characters; and Hebrew characters. Other characters specific to a particular language may be present in a particular language, for example, the œ character may be considered a character specific to a particular language, as in the French word “cœur” meaning “heart”.

Figure 10 illustrates schematically a computer/processor readable medium 1000 providing a program according to an embodiment. In this example, the computer/ processor readable medium is a disc such as a Digital Versatile Disc (DVD) or a compact disc (CD). In other embodiments, the computer readable medium may be any medium that has been programmed in such a way as to carry out the functionality herein described. The computer program code may be distributed between the multiple memories of the same type, or multiple memories of a different type, such as ROM, RAM, flash, hard disk, solid state, etc.

Any mentioned apparatus/device/server and/or other features of particular mentioned apparatus/device/server may be provided by apparatus arranged such that they become configured to carry out the desired operations only when enabled, e.g. switched on, or the like. In such cases, they may not necessarily have the appropriate software loaded into the active memory in the non-enabled (e.g. switched off state) and only load the appropriate software in the enabled (e.g. on state). The apparatus may comprise hardware circuitry and/or firmware. The apparatus may comprise software loaded onto memory. Such software/computer programs may be recorded on the same memory/processor/functional units and/or on one or more memories/processors/ functional units.

In some embodiments, a particular mentioned apparatus/device/server may be pre-programmed with the appropriate software to carry out desired operations, and wherein the appropriate software can be enabled for use by a user downloading a “key”, for example, to unlock/enable the software and its associated functionality. Advantages associated with such embodiments can include a reduced requirement to download data when further functionality is required for a device, and this can be useful in examples where a device is perceived to have sufficient capacity to store such pre-programmed software for functionality that may not be enabled by a user.

Any mentioned apparatus/circuitry/elements/processor may have other functions in addition to the mentioned functions, and that these functions may be performed by the same apparatus/circuitry/elements/processor. One or more disclosed aspects may encompass the electronic distribution of associated computer programs and computer programs (which may be source/transport encoded) recorded on an appropriate carrier (e.g. memory, signal).

Any “computer” described herein can comprise a collection of one or more individual processors/processing elements that may or may not be located on the same circuit board, or the same region/position of a circuit board or even the same device. In some embodiments one or more of any mentioned processors may be distributed over a plurality of devices. The same or different processor/processing elements may perform one or more functions described herein.

The term “signalling” may refer to one or more signals transmitted as a series of transmitted and/or received electrical/optical signals. The series of signals may comprise one, two, three, four or even more individual signal components or distinct signals to make up said signalling. Some or all of these individual signals may be transmitted/received by wireless or wired communication simultaneously, in sequence, and/or such that they temporally overlap one another.

With reference to any discussion of any mentioned computer and/or processor and memory (e.g. including ROM, CD-ROM etc), these may comprise a computer processor, Application Specific Integrated Circuit (ASIC), field-programmable gate array (FPGA), and/or other hardware components that have been programmed in such a way to carry out the inventive function.

The applicant hereby discloses in isolation each individual feature described herein and any combination of two or more such features, to the extent that such features or combinations are capable of being carried out based on the present specification as a whole, in the light of the common general knowledge of a person skilled in the art, irrespective of whether such features or combinations of features solve any problems disclosed herein, and without limitation to the scope of the claims. The applicant indicates that the disclosed aspects/embodiments may consist of any such individual feature or combination of features. In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the disclosure.

While there have been shown and described and pointed out fundamental novel features as applied to example embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices and methods described may be made by those skilled in the art without departing from the scope of the disclosure. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in

substantially the same way to achieve the same results are within the scope of the disclosure. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiments may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. Furthermore, in the claims means-plus-function clauses are intended to cover the structures described herein as performing the recited function and not only structural equivalents, but also equivalent structures. Thus although a nail and a screw may not be structural equivalents in that a nail employs a cylindrical surface to secure wooden parts together, whereas a screw employs a helical surface, in the environment of fastening wooden parts, a nail and a screw may be equivalent structures.

WHAT IS CLAIMED IS:

1. An apparatus comprising:

at least one processor; and

at least one memory including computer program code,

the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus to perform at least the following:

based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, provide for a corresponding character entry function in a respective first language, the first language different to a second language associated with a different type of user input for the character entry key.

2. The apparatus of claim 1, wherein the corresponding character entry function is one or more of:

entry of a corresponding character in the first language;

entry of an accented version of a corresponding character in the first language;

entry of a selectable word comprising a corresponding character in the first language;

predictive text input in the first language using the detected first type of user input;

spell-checking in the first language; and

auto-correction in the first language.

3. The apparatus of claim 1, wherein the character entry function is one or more of:

entry of a corresponding character in the first language using the same writing system as that associated with the second language; and

entry of a corresponding character in the first language using a writing system different to that associated with the second language.

4. The apparatus of claim 1, wherein the character entry function comprises entry of a word in the first language which is phonetically associated with a word comprising the entered character but which uses a different writing system to the second language.

5. The apparatus of claim 1, wherein the character entered by the character entry key comprises one or more of an alphabetical character, a graphical character, a punctuation character and a space character.

6. The apparatus of claim 1, wherein the apparatus is configured to provide for the character entry function following a user confirmation.

7. The apparatus of claim 1, wherein the apparatus is configured to provide for the corresponding character entry function in a default language if the first type of user input and/or the different type of user input is detected as being of an uncategorised type of user input associated with the particular character entry key.

8. The apparatus of claim 1, wherein the character entry key is provided using one or more of a virtual keyboard and a physical keyboard.

9. The apparatus of claim 1, wherein the languages for the character entry comprise two or more characters of: Roman characters, accented Roman characters; Greek characters; Chinese characters; Japanese characters; Korean characters; Arabic characters; Thai characters; Cyrillic characters; and Hebrew characters.

10. The apparatus of claim 1, wherein the apparatus is configured to provide for a corresponding character entry function in the respective first language during the composition of one or more of a text-based document, a text message, an SMS message, an MMS message, an email, a search entry, a microblog post, a social media post, a calendar entry or a web address.

11. The apparatus of claim 1, wherein the first type of user input and the different type of user input comprise two or more of: a tap, a hold, a touch, a press, a slide, a flick, a circle, a shape, a multiple tap, a rub, directional input, and a hover.

12. The apparatus of claim 1, wherein the apparatus comprises one or more of:
the character entry key;
a display to output a corresponding character entry.

13. The apparatus of claim 1, wherein the apparatus is configured to:
based on a different type of user input than the detected first type for the character entry key associated with entry of a character using a particular character entry key, provide for a corresponding character entry function in the second language.

14. The apparatus of claim 1, wherein the apparatus is an electronic device, portable electronic device, a laptop computer, a mobile phone, a smartphone, a tablet computer,

a surface computer, a personal digital assistant, a graphics tablet, a digital camera, a navigation device, a non-portable electronic device, a desktop computer, a monitor/display, a server, or a module/circuitry for one or more of the same.

15. A computer readable medium comprising computer program code stored thereon, the computer readable medium and computer program code being configured to, when run on at least one processor perform at least the following:

based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, provide for a corresponding character entry function in a respective first language, the first language different to a second language associated with a different type of user input for the character entry key.

16. A method comprising:

providing for a corresponding character entry function in a respective first language based on a detected first type of user input of a plurality of different types of input associated with entry of a character using a particular character entry key, the first language different to a second language associated with a different type of user input for the character entry key.

17. An apparatus comprising:

at least one processor; and

at least one memory including computer program code,

the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus to perform at least the following:

provide for character key entry in a first language based on detection of a first type of user input associated with a particular character entry key and provide for a character key entry function associated with a second different language based on detection of a second different type of user input associated with the character key.

Figure 1

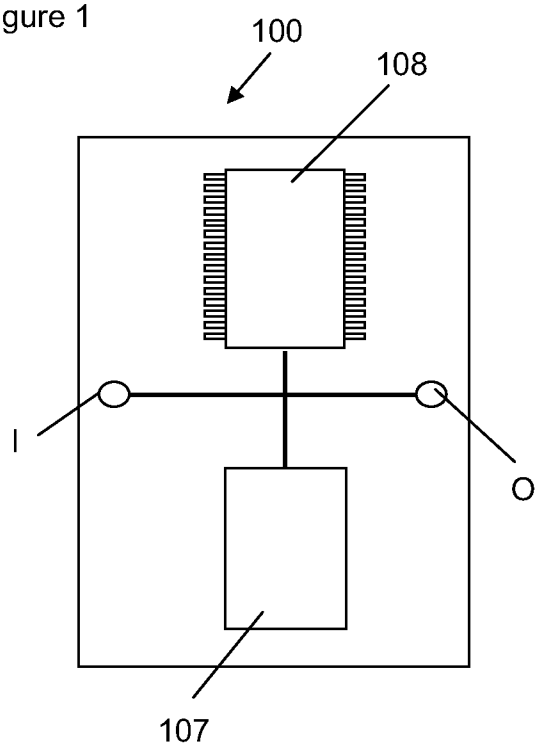


Figure 3

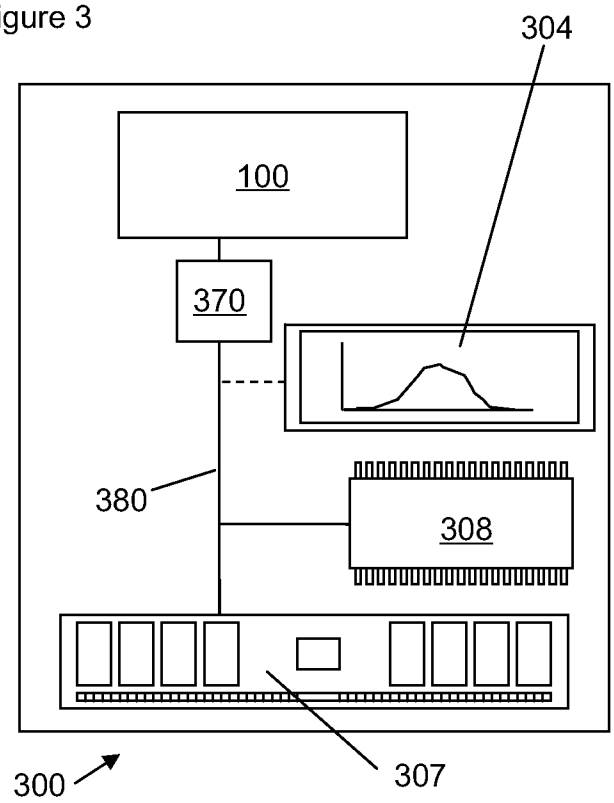


Figure 2

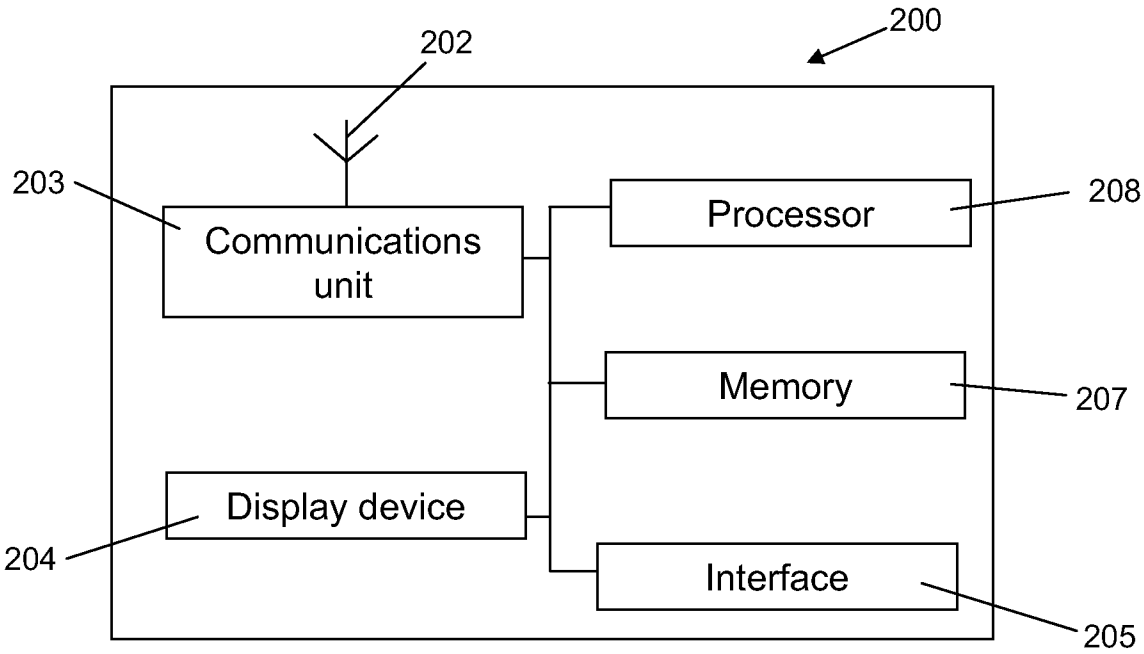


Figure 4a

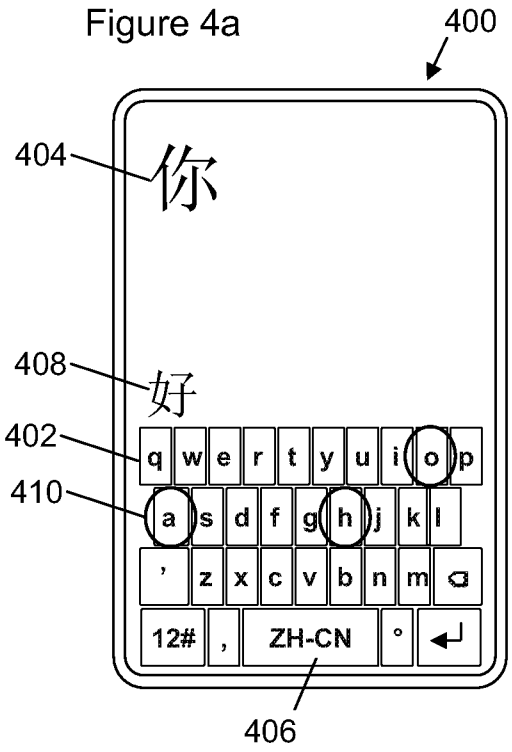


Figure 4b

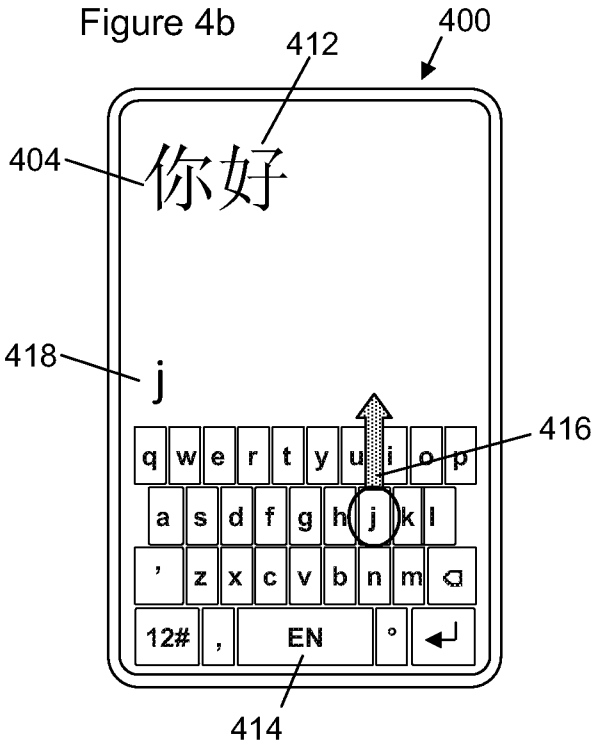


Figure 4c

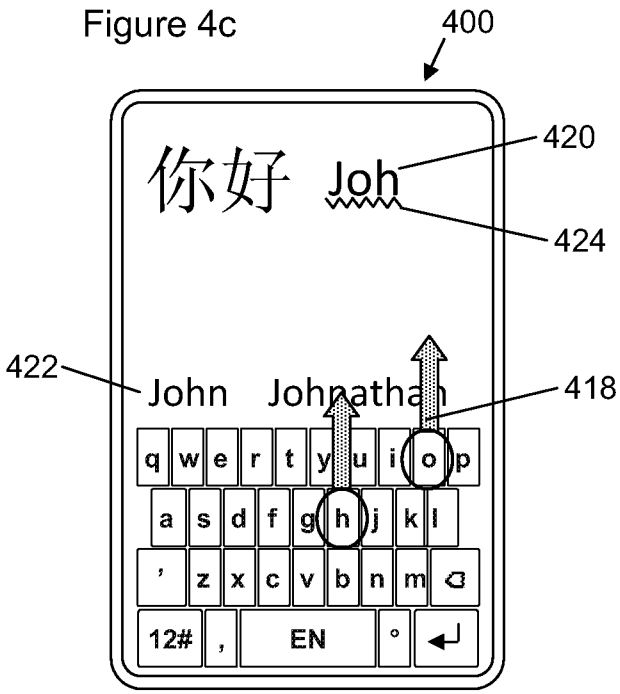


Figure 4d

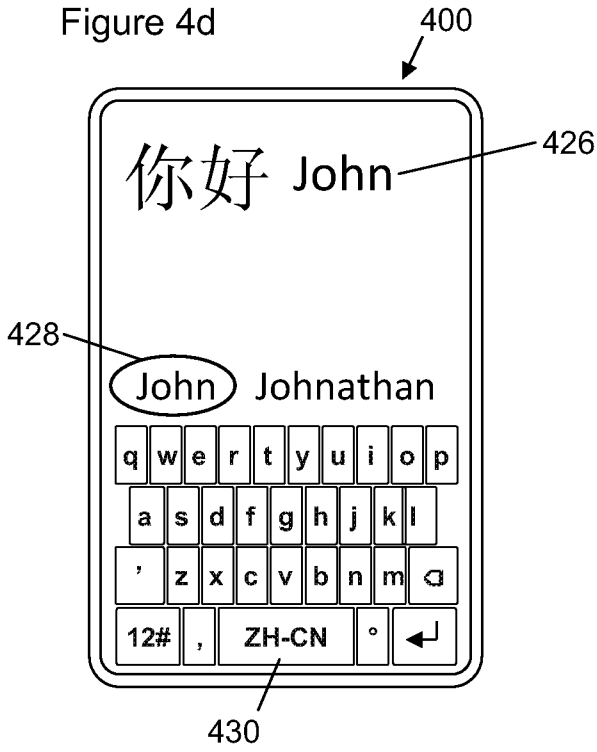


Figure 5a

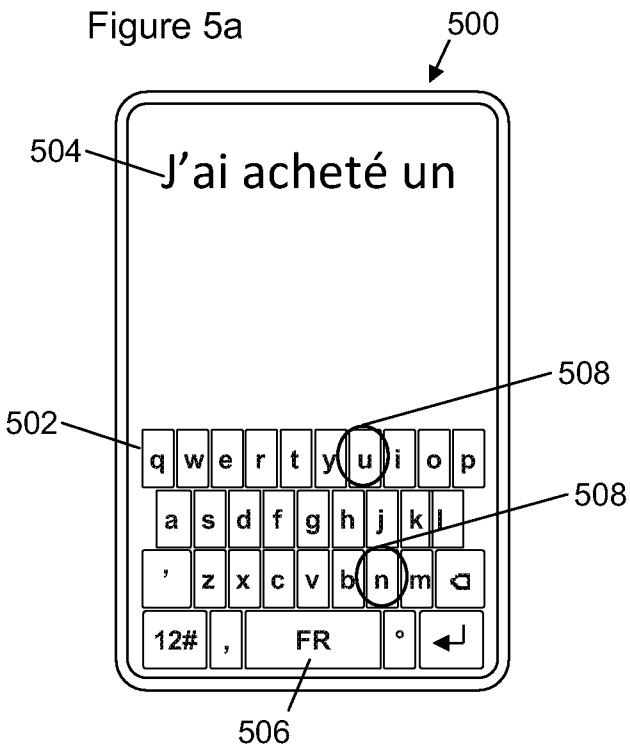


Figure 5b

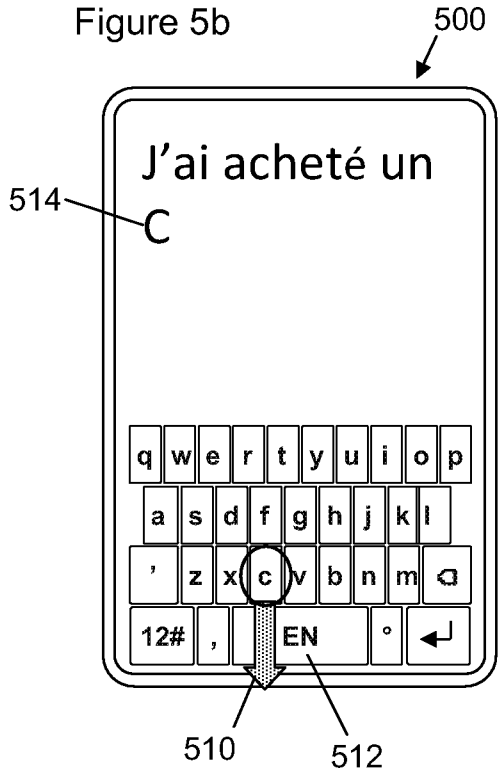


Figure 5c

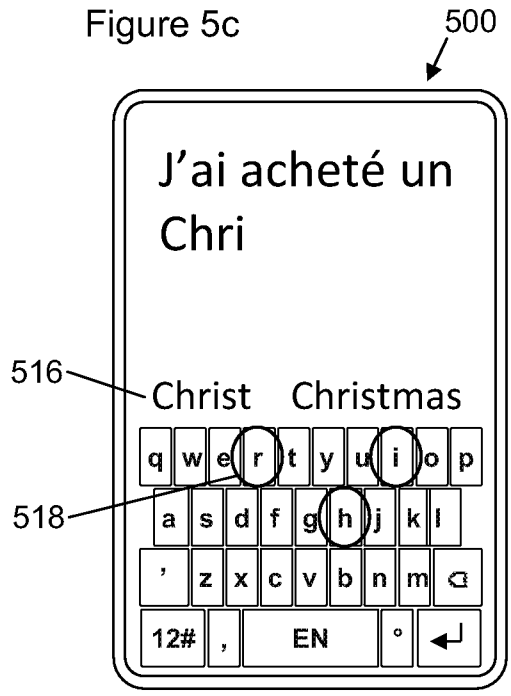
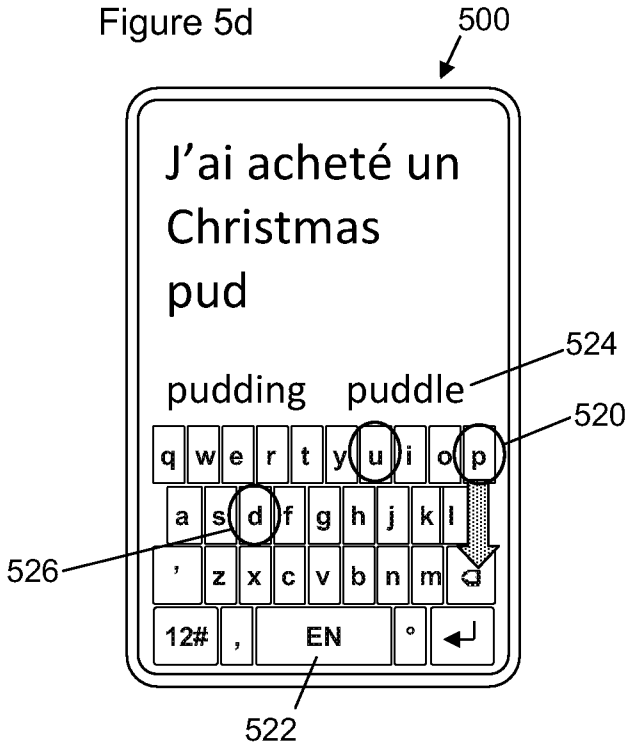


Figure 5d



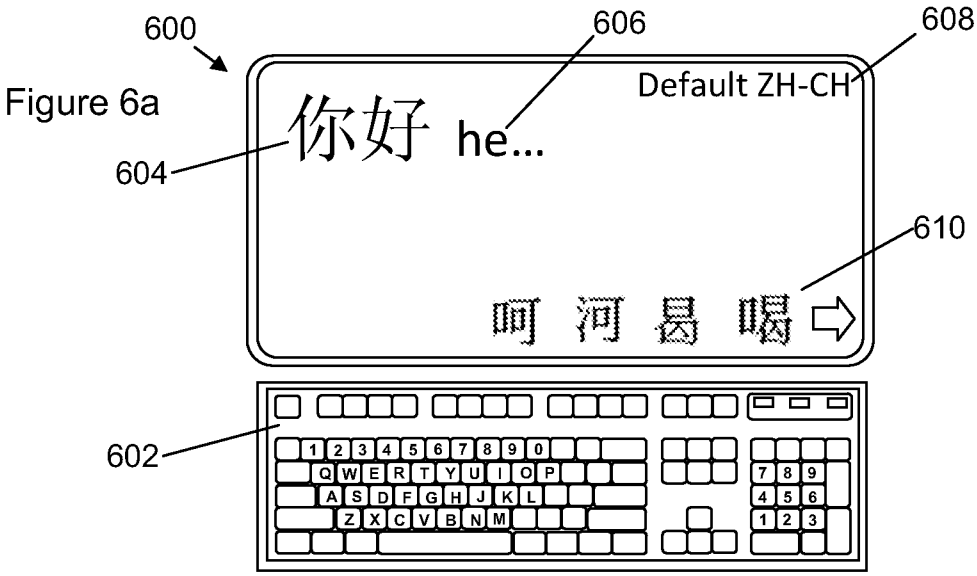


Figure 6a

Figure 6b

Figure 6c

Figure 7a

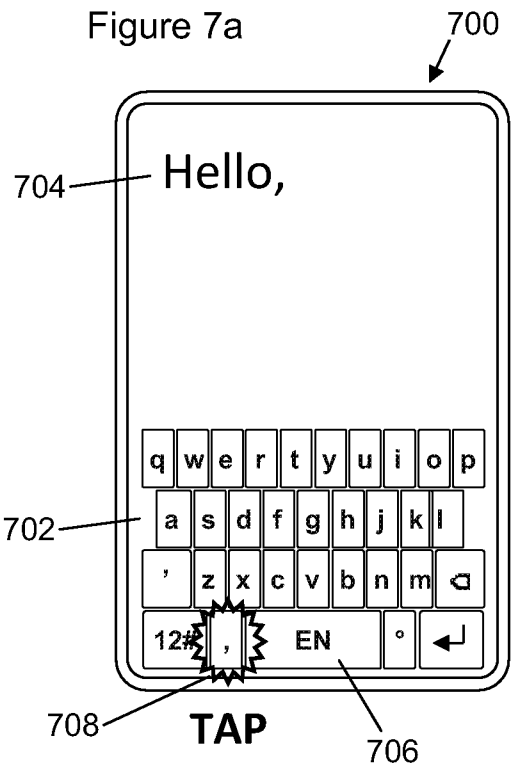


Figure 7b

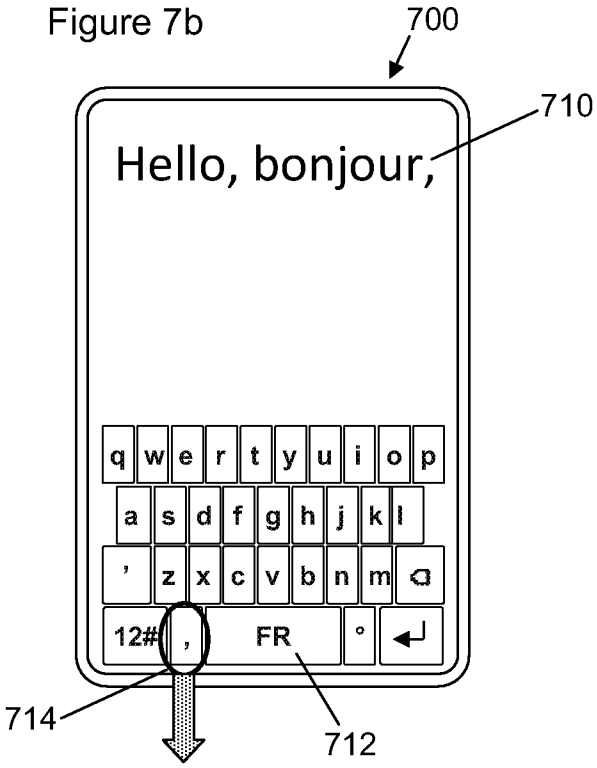


Figure 7c

Figure 7d

Figure 8a

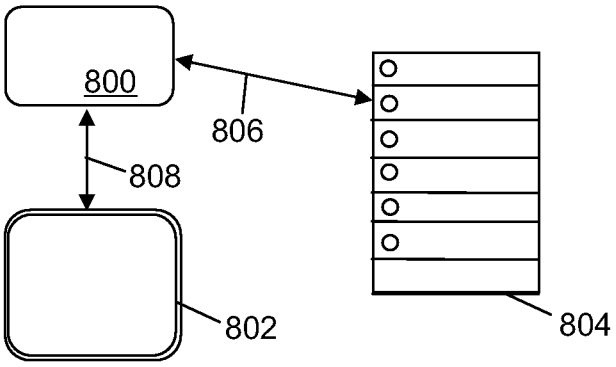


Figure 8b

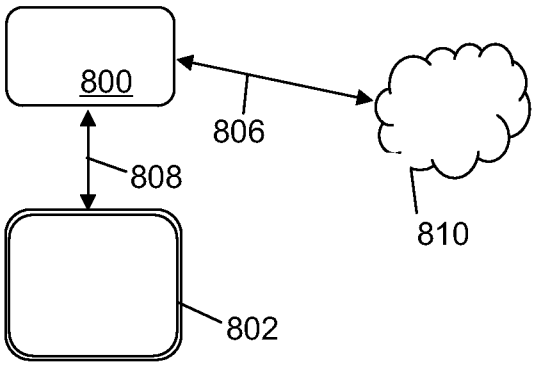


Figure 9a

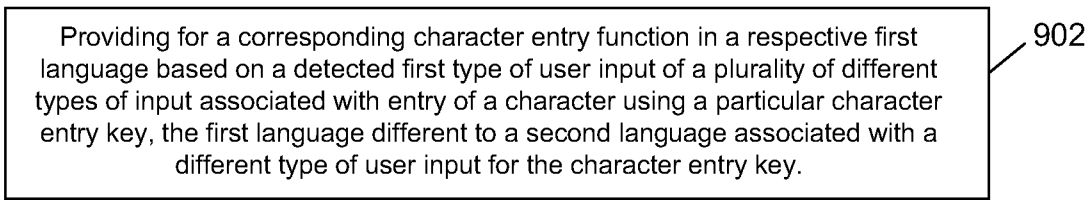


Figure 9b

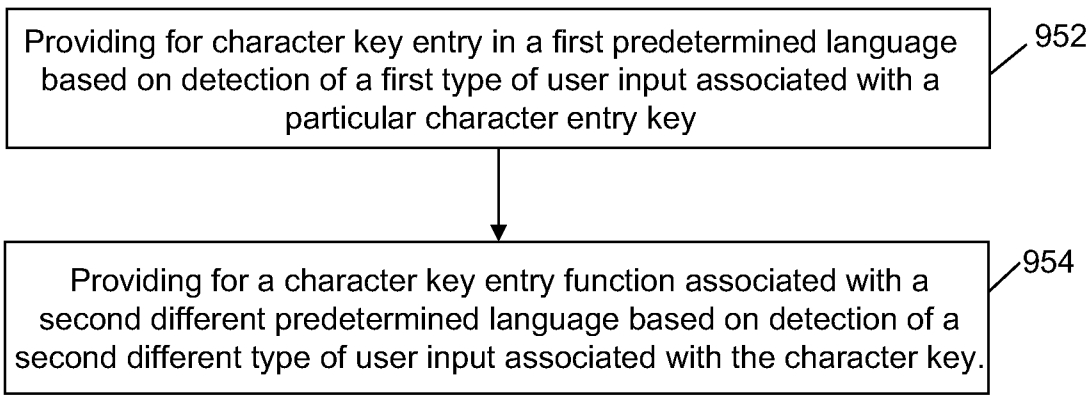
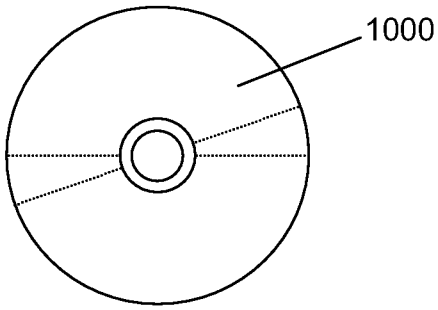


Figure 10



INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2013/072122

A. CLASSIFICATION OF SUBJECT MATTER

G06F 3/023 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, DWPI: INPUT, LANGUAGE, LINGUAL, SWITCH, SWAP, CHANG+, SLIDE, DRAG, GESTURE, MOTION, MOVE,SWIPE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 2431842 A2 (SONY ERICSSON MOBILE COMMUNICATIONS AB) 21 March 2012 (21.03.2012) description, paragraphs 0033-0067 and figures 1, 3, 6, 9-13	1-17
Y	US 8286104 B1 (GOOGLE INC.) 09 October 2012 (09.10.2012) description, column 6, line55 to column 8, line 27 and figures 1C-1D, 2A-2D, 3A-3D	1-17
A	JP 2009169451 A (MATSUSHITA DENKI SANGYO KK.) 30 July 2009 (30.07.2009) the whole document	1-17
A	CN 101882025 A (HANVON CORP.) 10 November 2010 (10.11.2010) the whole document	1-17

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"E" earlier application or patent but published on or after the international filing date

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 November 2013 (07.11.2013)	**12 Dec. 2013 (12.12.2013)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer HE,Minglun Telephone No. (86-10)61648107

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2013/072122

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
EP 2431842 A2	21.03.2012	US 2012068937 A1	22.03.2012
US 8286104 B1	09.10.2012	US 8560974 B1	15.10.2013
JP 2009169451 A	30.07.2009	None	
CN 101882025 A	10.11.2010	None	