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| APPLICATION NUMBER | FILING or 371(c) DATE | GRP ART UNIT | FIL FEE REC'D | ATTY.DOCKET.NO | TOT CLAIMS | IND CLAIMS |
|---|---|---|---|---|---|---|
| 61/827,020 | 05/24/2013 | | 130 | 2104-052-C20-USP | | |

**CONFIRMATION NO. 3886**

**FILING RECEIPT**

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32964
DEKEL PATENT LTD., DAVID KLEIN
BEIT HAROF'IM
18 MENUHA VENAHALA STREET, ROOM 27
REHOVOT, 76209
ISRAEL

Date Mailed: 06/21/2013

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**Inventor(s)**

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**Applicant(s)**

Benjamin Firooz Ghassabian, Jerusalem, ISRAEL;

**Power of Attorney:**
David Klein--41118

**If Required, Foreign Filing License Granted:** 06/18/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/827,020**

**Projected Publication Date:** None, application is not eligible for pre-grant publication

**Non-Publication Request:** No

**Early Publication Request:** No

**** SMALL ENTITY ****

**Title**

DATA ENTRY SYSTEMS

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

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Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (04-07)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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## Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

### Inventor(s)

Inventor 1 — Remove

| Given Name | Middle Name | Family Name | City | State | Country ¡ |
|---|---|---|---|---|---|
| Benjamin | Firooz | Ghassabian | Jerusalem | | IL |

All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. — Add

| | |
|---|---|
| **Title of Invention** | IMPROVED DATA ENTRY SYSTEMS |
| Attorney Docket Number (if applicable) | 2104-052-C20-USP |

### Correspondence Address

Direct all correspondence to (select one):

| | |
|---|---|
| ◉ The address corresponding to Customer Number | ○ Firm or Individual Name |
| Customer Number | 32964 |

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

◉ No.

○ Yes, the name of the U.S. Government agency and the Government contract number are:

PTO/SB/16 (04-07)
Approved for use through 06/30/2010 OMB 0651-0032
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## Entity Status

Applicant claims small entity status under 37 CFR 1.27

- (●) Yes, applicant qualifies for small entity status under 37 CFR 1.27
- ( ) No

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## Signature

Please see 37 CFR 1.4(d) for the form of the signature.

| | | | | | |
|---|---|---|---|---|---|
| Signature | /David Klein/ | | | Date (YYYY-MM-DD) | 2013-05-24 |
| First Name | David | Last Name | Klein | Registration Number (If appropriate) | 41118 |

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

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**Date:** 24/**MAY/2013**

**US Provisional Patent Application**

**Our ref: 052-c20**
**Title:** **IMPROVED DATA ENTRY SYSTEMS**
**Inventor:** **BENJAMIN FIROOZ GHASSABIAN**

This application is part of the previous US Provisional Patent Applications:
The present application claims priority from US patent applications:

- application number 61599000 filed on February-15th, 2012
- application number 61601143 filed on February-21st, 2012;
- application number 61603390 filed on February-26th, 2012;
- application number 61608181 filed on March-8th, 2012;
- application number 61612509 filed on March-19th, 2012;
- application number 61613580 filed on March-21th, 2012;
- application number 61617224 filed on March-29th, 2012;
- application number 61620525 filed on April-5th, 2012 ;
- application number 61637384 filed on April-24th, 2012;
- application number 61641378 filed on May 2nd, 2012;
- application number 61647611 filed on May 16th, 2012;
- application number 61649322 filed on May 20th, 2012;
- application number 61651089 filed on May 24th, 2012;
- application number 61652950 filed on May 30th, 2012;
- application number 61656091 filed on June 06th, 2012;
- application number 61659536 filed on June 14th, 2012;
- application number 61660755 filed on June 17th, 2012;
- application number 61661390 filed on June 19th, 2012;
- application number 61663582 filed on June 24th, 2012;
- application number 61669152 filed on July 09th, 2012;
- application number 61671741 filed on July 15th, 2012;
- application number 61674358 filed on July 22th, 2012;
- application number 61679858 filed on August 06th, 2012;
- application number 61683219 filed on August 15th, 2012;
- application number 61697414 filed on September 6th, 2012;
- application number 61699408 filed on September 11th, 2012;
- application number 61704682 filed on September 24th, 2012;
- application number 61705164 filed on September 25th, 2012;
- application number 61711798 filed on October 10th, 2012;
- application number 61714842 filed on October 17th, 2012;
- application number 61718297 filed on October 25th, 2012;
- application number 61723860 filed on November 08th, 2012;

- application number 61730130 filed on November 27th, 2012 ;
- application number 61730584 filed on November 28th, 2012;
- application number 61737951 filed on December 17th, 2012;
- application number 61746581 filed on December 28th, 2012;
- application number 61749338 filed on January 06th, 2013;
- application number 61754707 filed on January 21th, 2013;
- application number 61760770 filed on February 5th, 2013;
- application number 61761321 filed on February 6th, 2013;
- application number 61764078 filed on February 13th, 2013;
- application number 61765751 filed on February 17th, 2013;
- application number 61766747 filed on February 19th, 2013;
- application number 61769285 filed on February 26th, 2013;
- application number 61772066 filed on March 4th, 2013;
- application number 61774605 filed on March 8th, 2013;
- application number 61777102 filed on March 12th, 2013;
- application number 61778888 filed on March 13th, 2013;
- application number 61802690 filed on March 17th, 2013;
- application number 61803456 filed on March 20th, 2013;
- application number 61804681 filed on March 24th, 2013;
- application number 61810805 filed on April 11th, 2013;
- application number 61811756 filed on April 14th, 2013;
- application number 61813271 filed on April 18th, 2013;
- application number 61814290 filed on April 21st 2013;
- application number 61819598 filed on May 5th 2013;
- application number 61821331 filed on May 9th 2013;
- application number 61822934 filed on May 14th 2013;
- application number 61823971 filed on May 16th 2013; and
- application number 61825049 filed on May 17th 2013.

The drawings and text of the above applications are incorporated herein by reference. The titles used in this application and in the related applications may preferably not be considered as part of the descriptions.

**Glide and hold for selecting a text written in said trajectory**

According to one embodiment, a word or a chain of words may be selected by a predefined type of interaction such as a gliding action including a holding action (e.g. glide and hold, press and hold and glide) on said word (e.g. or chain of words) or preferably near said word (e.g. or chain of words) in the direction/trajectory that said word (e.g. or chain of words) has been entered. In this case, according to one method, a press and holding action on the screen/picture may correspond to another function such as for example a horizontal trajectory for a text to be entered. A selected word may be edited. According to one method, after selecting a word, other candidates corresponding to the input information corresponding to the selected word may be presented to the user.

**Using online graffiti**

**Sharing real time**

**Private fonts, Share fonts, share tools**

The image editing application/functions described herein may permit providing/typing graffiti on a background image / textbox. As such according to one embodiment a social picture sharing application may be created so that user can, edit (e.g. write graffiti preferably simultaneously, an image in in a cloud server.

**Reserved location on an image**

According to one embodiment, the image editing system may be designed such that to not allow (e.g. editing) access in a predefined location on an image, preferably unless a user has an authorization (e.g. through a password). For example, access to the bottom right of an image may be reserved to an editor's signature or an advertisement, etc.

According to one embodiment, mouse function of the system may be used to edit an image. As an example, if the user provides a press-and-holding action (e.g. anywhere or between the keys) on an image/screen, the system may show several mouse functions such as select, select all, copy, cut, past, preferably around his/her finger. The user them may slide the finger towards one of the functions to activate it. As an example:

Select: a portion of an image may be selected by many means. As an example, the menu of the system may have several selection pattern (e.g. square, round, free pattern, etc.) buttons, wherein after interaction with such a button, the use may provide a gliding action on a desired location on the picture, and the system may select a portion of the picture according to the shape of the selected pattern and preferably the length of the gliding action. Optionally, a press-and-holding-and-gliding action at any moment on the screen/image may result in selecting a portion of the image based on a predefined or the last selected pattern.

According to one embodiment, the selected portion may be resized by for example touching a predefined point of it and dragging said point. According to one method, providing a long pressing action combined with gliding action in s predefined direction may resize the selected portion accordingly. According to one method a such gliding action in the middle of the selected portion drags the portion in the corresponding direction on the screen.

Copy: after selecting a portion of picture, a press and holding action combined with a gliding action in the direction of the Copy function/icon may preferably copy the selected portion of the image.

Cut: after selecting or copying a portion of picture, a press and holding action combined with a gliding action in the direction of the Cut function/icon may preferably cut the selected portion from the image.

Paste: after selecting or copying a portion of picture, a press and holding action in a desired location on the screen/picture combined with a gliding action in the direction of the Paste function/icon may preferably paste the copied portion, preferably on in the pressed position, on the image/screen.

Select-All: a press-and-holding-and-gliding action at any moment on the screen/image in the direction of Select-All function may select the whole image.

It must be noted the features and methods of editing an image/picture as described herein are created to permit a simple and quick picture taking/picking, editing, and sharing procedure(s).

Preferably during the modifications/editing (e.g. of the/a word/text) described above, the image/picture on which the editing procedures are being applied is shown to the user so that he can rectify apply and/or rectify his/her modifications accordingly (e.g. according to the image or a portion of the image characteristics).

According to one embodiment of the invention, preferably, an interaction, such as press-and-holding action or a gliding action, corresponding to mouse functions is not provided on a text or on a selected portion of an image (e.g. herein may be referred to as the selected content) to not interfere with other functions such as dragging a selected content . As such according to one example, after selecting a content such as an image or a text (e.g. one or more words. Note that a grabbed word or a word being entered is also considered as a selected text) if a user provides a gliding action including a press and holding action (e.g. at the beginning of the gliding action) at a position/location on the screen wherein said gliding action corresponds to a pasting action, the selected content may be pasted at that position/location. Fig. 438A shows as an example, a picture 438010 being displayed on the screen of an electronic device such as a smartphone or tablet, and wherein a menu 438011 relating to selecting patterns is also shown/poped up. After the user selects one of the patterns 438012, he may provide a gliding action 438013 on a desired location on the screen to select the portion of the image 438014 at that location corresponding to the shape of the pattern and the length of the gliding action. Then, as shown in fig. 438B, by providing a press and holding action (e.g. or a press and holding action combined with a gliding action in a predefined direction) on a desired position on the screen/image and the system may paste the selected portion at that location. Preferably (not shown), after selecting a selecting pattern, the menu is removed from the screen so that to permit the access to the whole image/screen for the pasting action.
Note that, (e.g. after providing a press-and-holding action) the different directions of the gliding actions corresponding to different mouse function may be those described before in related/previous patent applications filed by this inventor (e.g. gliding towerds lower-right direction may correspond to selects all/select the whole picture, towards lower-left may correspond to paste function. Gliding towards upper-left direction may correspond to cut function. Gliding upper-right direction may correspond to copy function, etc.

It must be noted that the functions, interactions, procedures, methods. etc., relating to editing a picture as described throughout this and the related patent applications filed by this inventor may not be restricted to editing a picture. The may be used to provide functions in any other application.

The keyboard used with the picture editing applications/concepts/functions/etc., as described in this and the related patent applications filed by this inventor may be of any type. As an example, said keyboard may be a keypad of the invention having any number of (e.g. letter) keys (e.g. two to eight) wherein at least some (e.g. one) of the keys corresponds to several characters/letters, and use a word prediction software to predict words from a corresponding database. According to one method, the letter keys of such keyboard may be related to all of the letters of a language excluding a/the predefined zone corresponding to non-preferred characters. According to another method, such keyboard may include one or more predefined zones corresponding to non-preferred character. Preferably, the letter keys may be split into two or more groups wherein each group is located on a different side/edge of the (e.g. screen of) the corresponding device, and wherein such a/the zone may be located between said split groups. According to another example such keyboard may be a QWERTY keyboard. According to another example, such keyboard may be a keyboard wherein each of its letter keys corresponds to a precise letter/character/symbol and wherein its keys may be (preferably) arranged on the sides of the screen of the corresponding device.

When a (e.g. an edited) picture is shared with another party, preferably at the similar time the receiving party may receive a means such as for example a link/button preferably next/on the picture such that interacting with said means may permit the user to type on the edited picture preferably instantly and may share it (e.g. back) with the sender and/or others. If the corresponding data entry / input system is not installed in the receiving party device, said system may automatically downloaded (e.g. and installed) into the receiving party's device.

A spelling help feature/method used by the system has been described before in detail. According to one embodiment of the invention, the system may be designed such that a user may enable/disable (e.g. switch on/off) said spelling help feature/method. According to one method, said method/features may be enabled or disabled from a settings menu corresponding to the system. According to one method, when activated, said spelling help method, may be applied from the first character of a word being entered. According to one embodiment of the invention (e.g. when the spelling help is enabled), (e.g. during the entry of a text) preferably, said spelling help may be applied to a word being entered only if the user provides at least a predefined number of (e.g. at least two) key presses (e.g. herein said predefined number may be referred to as "required minimum key presses") from the (e.g. four) letter keys (e.g. from the narrowly ambiguous keys, and/or from the precise letter mode keypad). As an example, by considering the keypad of fig. 436B, if said required key presses number is two and the user provides four consecutive tapping actions on the zone 436107 between the keys (e.g. broadly ambiguous zone), the system does not use the spelling help mode even if it is activated (e.g. from the settings), to for example provide the word "much". In this example, the system relates said tapping actions to the non-preferred characters assigned to

said zone and does not relate any of said tapping actions provided on the said zone to any of the preferred characters (e.g. which are assigned to the (e.g. four) ambiguous letter keys). Accordingly, according to one example, if the user taps on the key 436101, taps two times on the zone 436107, and taps on the keys 436101, the system may ambiguously relate each of the two tapping actions on the zone 436107 to any of all of the characters assigned to said zone (e.g. non-preferred characters) and to the characters assigned to the four letter keys (e.g. preferred characters) (This matter has been described before in detail) and proposes some words including the word that has the highest priority among the corresponding words. It must be noted that the system may also include a word completion means/software such that to, accordingly, propose completed words based on receiving partial input information corresponding to a (e.g. beginning) portion of a word being entered.

According to one embodiment of the invention, if the device/screen is in portrait mode, the word list may preferably be shown vertically and if the device/screen is in landscape mode, the word list may preferably be shown horizontally (e.g. as shown before).

According to one embodiment of the invention, if a word being entered is entered through interacting with the keypad of the system in precise mode, then preferably said word may simultaneously be entered in the text and in the word list (e.g. as the current predicted word). If a word being entered is entered through interacting with the keypad of the system in predictive mode, then preferably said word may be entered in the word list alone (e.g. as the current predicted word).

Methods of swapping words (e.g. in a word list) have been described before. According to one embodiment, if in the word list, in addition to the current predicted word, one or more candidates are also proposed, then a predefined swapping action for example by means of a gliding action simulating another gliding action provided from the current predicted word towards a candidate (e.g. or vice versa), wherein said gliding action is provided on the word list or in the zone between the keys, may replace the current predicted word by the first candidate word next to the current predicted word. Accordingly, an additional such gliding action may replace the current predicted word by another candidate preferably the second word next to the current predicted word, and so on. Note that, one or more such candidates may be shown on each side of the current predicted word. As such one or more gliding actions provided in a similar direction corresponding to each of the sides of the current predicted word may preferably correspond to the first, second, or other corresponding candidates on a corresponding side of the current predicted word.

With continuous description of the current embodiment, after providing a swapping action, preferably when the user appends a letter/character to or deletes a letter/character from the swapped word, the system may preferably consider the characters of the swapped portion as being precise characters (e.g. herein may be referred to as fixing a word/stem). According to one method, if the user desires to fix the current predicted word, he/she may provide a back and forth gliding action in

a predefined direction such as upwards or downwards in preferably the/a predefined zone and/or on the wordlist. Now, a swapping action was applied on the current predicted word, when appending characters to said word or deleting characters from said word, the swapped portion of the new word may be considered as fixed (e.g. precise)

According to one embodiment of the invention, the system may use one or more database of words including 1 to N (e.g. 5) gram entries. When the user enters the input information corresponding to a current predicted word, the system may preferably consider N-1 words prior to the word being entered (e.g. prior to the cursor) in the text (e.g. herein may be referred to "prefixed portion") and combine it with the input information corresponding to the current word being entered (e.g. herein may be referred to combined word information" to predict one or more words from the N gram database. Subsequently, then the system may consider N-2 words prior to the word being entered (prior to the cursor) combined said input information being entered to predict one or more words from N-1 gram database. And so on until (including) N=0 (e.g. until proposing 1-gram words). If the words preceding the current predicted word being entered are n number of words wherein n<N-1, then the system considers said n words combined with the input information corresponding to the current predicted word and begins to search in the entries of n+1 gram database then, then n, then n-1 until the 1 gram database. It must be noted, that after searching for the corresponding words, the corresponding words may be presented to the user (e.g. according to their priorities) until the user selects one of them. Note that in the search procedure as described, if a combined word information matches an entry in the database, then preferably, the system selects the last gram of said entry and proposes it to the user.

In most cases, a 2 gram word database may provide enough information to the word predictive system to accurately predict a word. But in some cases, in an N gram entry, the first beginning gram of the entry may not provide enough information to the system if it if constituted of one of a number of words such as "the", "a", "of", "to", etc. (e.g. herein may be referred to as non-informing words). In this case, an N gram database wherein N>1, may preferably mainly include entries that their first gram exclude a non-informing word. This may permit to have a reduced sized N-gram database (e.g. that also includes 1-gram entries) for an accurate prediction.

The arrangement of an N gram database to be used by a/the word prediction system for accurate and fast prediction have been described in detail in previous patent application filed by this inventor. They may preferably be included in/with this application by reference. As an example, the first gram of gram N gram entries (e.g. N=>0) may preferably include or be constituted of one or more special characters. In this case, for example, a dot character as the first gram of an N-gram entry (e.g. wherein N=2) may provide information to the system that the second word of the entry is a word that is generally entered at the beginning a sentence.

According to one method, different identified character/word (e.g. '~') or a predefined code may be assigned to different categories of entries in a database. For example, in an N-gram (e.g. 2-gram) database, a first type of character (e.g. "~") delimiting grams from each other, wherein the last gram letters are lowercased letters may be used. In a same database, a second type of character (e.g. "^") delimiting grams from each other, wherein the at least one of the last gram letters is an uppercased letter, may be used. According to another example, a third type of character (e.g. "|") delimiting grams from each other, wherein at least one of the characters of the last gram includes a character other than a letter, may be used. And so on. When the user enters a word having a characteristic such as those just described, the system may be designed such that the system searches for the corresponding word/entries within the database having at least one of said characteristics. This method permits a quicker search in the database.

According to a first method of search, when the system is looking for a word based on the input information provided by the user, the system first look in the corresponding N-gram (e.g. 2-gram) entries of the database wherein the input information provided by the user corresponds to all of the characters of the corresponding (e.g. last) gram. If there is no corresponding word found, the system may then proceed to the 1-gram entries wherein the input information provided by the user corresponds to all of the characters of the corresponding gram.

If there is no corresponding word found, the system then looks in the corresponding N-gram (e.g. 2-gram) entries of the database wherein the input information provided by the user corresponds to the beginning characters of the corresponding (e.g. last) gram. If there is no corresponding word found, the system may then proceed to the 1-gram entries wherein the input information provided by the user corresponds to the beginning characters of the corresponding gram.

According to a second method of search, when the system is looking for a word based on the input information provided by the user, the system first look in the corresponding N-gram (e.g. 2-gram) entries of the database wherein the input information provided by the user corresponds to all of the characters of the corresponding (e.g. last) gram. If there is no corresponding word found, the system then looks in the corresponding N-gram (e.g. 2-gram) entries of the database wherein the input information provided by the user corresponds to the beginning characters of the corresponding (e.g. last) gram.

If there is no corresponding word found, the system may then proceed to the 1-gram entries wherein the input information provided by the user corresponds to all of the characters of the corresponding gram. If there is no corresponding word found, the system may then proceed to the 1-gram entries wherein the input information provided by the user corresponds to the beginning characters of the corresponding gram.

According to one embodiment of the invention, the user may type a word or grab/select a word within a text and then he/she may be enabled to delete said word from the dictionary / word-database used by the system. According to one method, the user may long-press on said word (e.g. which is preferably in a word list) to delete it. After providing the long pressing action on the word, the user may be informed of the deletion of said word by, for example, changing the color of the word or the words background to, for example, red. Note that, before deleting a word, the system may ask the user to confirm the deletion action. A words/entry deleted from the/a database may be saved along with its frequency of use such that if the user decides to re-insert it in the database, the system may insert its corresponding frequency. According to one method, delting a word from the dictionary may cause deleting it from all of the entries of an N-gram database. According to another method, said word may be deleted from the 1-gram database only.

As mentioned before, the keyboard used with the picture editing software/feature may be of any type such as for example a QWERTY keyboard. According to one embodiment of the invention, a gliding action or a long-pressing action provided from/on said keyboard may be related by the system to the trajectory of the text being entered over a/the image which preferably is printed on the screen wherein preferably a portion of it is located under said keyboard.

According to one embodiment of the invention, the keys of the keypad/keyboard (e.g. preferably in the ambiguous mode) of the invention used with a/the picture editing software/feature may be transparent/invisible so that to permit to see the content (e.g. a portion of a/the image) under said keypad/keyboard. As such, according to one embodiment, only a/the frame of a key may be shown on the screen. In the visible mode, in addition to the frame, the characters/letters assigned to a key may be printed within said frame but preferably, the rest of the key may be transparent/invisible. According to one aspect, the letters on such a key may be printed in two contrasted colors (e.g. white and black) such that regardless of the color of the content under a/the key, at any moment said characters/letters may be visible to the user. An example of a key of such keyboard/keypad is shown on different background colors (e.g. white, black, and red) in Figs. 437A to 437C.

**Swapping procedure (e.g. by tapping on a word)**

Methods of replacing the current predicted word/stem being entered by another candidate (e.g. another word) relating to the input information provided by the user has been described in detail before. According to one method of the invention, a predefined interaction, such as a tapping action, on any of the words of a list (including the current predicted word) of predicted words (e.g. herein may be referred to as a word list) may preferably set said word as the current predicted word. Preferably, the system also fixes the characters of the selected word (e.g. the system considers all of

the characters of said selected word as precisely entered characters). According to one method, in addition to the word list, the system may preferably show the selected word also in the corresponding text field. Additionally, the system may propose/predict one/more longer-word(s) beginning with the characters of the selected word as a new world list. According to one aspect, at this point in time, on one hand, if the user provides and end-of-word signal such a pressing the Space key, the selected word may preferably be entered into the text and the word list may disappear. On the other hand if the selected word/stem is the beginning of a desired longer-word, at least two scenarios may be considered:

1. The desired word of the user is among the words of the new word list. In this case, the user selects that word (and enters a Space character); and
2. the desired word is not a word of the words in the new word list. In this case the user proceeds to enter/append additional characters at the end of the selected word. By considering the fixed selected portion and the input information corresponding to the additional characters, the system predicts corresponding longer-words (e.g. beginning with the fixed selected portion).

According to one method, after a word is selected, if the user deletes one or more of the selected word, the remaining characters still remain fixed and corresponding longer words may preferably be proposed/predicted (e.g. in a word list of one or more words).

As an example, in order to enter the word "actionable" the user may first tap the keys corresponding to the word/stem "act". The system may propose the word "why" as the current predicted word and several more words which includes the word "act". The user may tap on the word "act" (e.g. in the wordlist) to select it. Preferably, at this time, the word "act" becomes the current (e.g. predicted) word. Now the system may propose longer words that begin with the word/stem "act" including the words "actually", "activity", and "action". At this time the user may select the word "action" by tapping on it. Now the word "action" becomes the current (e.g. predicted) word. At this time the system proposes several longer words beginning with the word/stem "action", including words "actionable", "actions", "action's". The user taps on the word "actionable" to select it. At this time the word "actionable" becomes the current predicted word and the user may press the Space key to enter said word.

Note that after selecting each of said word/stems, in addition or in replacement of within the word list, the system may also show any of the selected word/stems in the text itself.

In the current embodiment, if a provides a predefined interaction, such a tapping action, on the current predicted word (e.g. in the word list) this may result in fixing the current predicted word. As a result, if the user continues to append additional characters to the fixed current predicted word, the fixed portion may remain unchanged and based on the input information, including said fixed portion and additional characters, the system may propose one or more words.

For ease of explanation, predefined interactions such as tapping or sliding actions have been used to describe the principles of the data entry system. Note that this was only used for demonstration purposes and said predefined interactions can be used for the same purpose and can be replaced by any kind of interaction, such as speech commands, interacting with a button, or gestures in the air, etc.

**Organizing a database of words**

Based on the principles just described above, according to one embodiment, a database of words may be organized/created such as to include at least the most commonly used stems (e.g. "pre", "con", "com", "dia", "multi", "multi-"). According to one concept, preferably, the length of said at least most commonly used stems may be limited to a predefined number of characters (e.g. up to 3). According to one method, the user may provide the input information corresponding to a desired stem.

- If the desired stem (e.g. a stem of a long word may, by itself, be a complete word) is in the word list proposed by the system, the user may select that stem and thereafter the system may propose another word list having longer words (e.g. in some cases said a longer word may be the beginning stem of a still longer word) that may include the user's desired word/stem, as described above. And so on. Note that, as describer earlier, at any moment the user may proceed to appended additional characters to the selected stem/word or to delete characters from selected stem/word.

Note that after providing said input information corresponding to the desired stem, if said stem is not in the word list as proposed by the system, the user may provide a predefined interaction so that the system may propose an additional word list corresponding to said input information, and so on.

Note that the N-Gram database including said at least most commonly used stems may be an N-gram database (e.g. N>0) wherein said stems created as such are preferably located/positioned as the last gram of the corresponding entries of the database.

**Word list**

- **Wordlist in order based on length**
    - **Blue on the top**

The predicted/proposed words may be presented in a word list according to different methods. According to a preferred method, the current predicted word may be presented at a predefined location (e.g. on the top, bottom, left side, or right side) in a word list , and the other predicted/presented words may be presented based on their length next to (e.g. under, above, right side, or left side, respectively) the current predicted word. When a proposed word (e.g. among the list) is selected, said word may preferably replace the current predicted word and additional words/candidates may be predected based on the selected word and be presented preferably next to the current predicted word (e.g. below the current predicted word). The order of presentation of said additional predicted word(s) may preferably be based on their length and preferably, based on the alphabetical order in a same length.

**Double/more taps on a same word provides more choices**

According to one aspect, repeating an interaction such as a tapping action on a same predicted/candidate provides additional candidates based on said word/stem.

- **Spelling help starts after selection**

According to one aspect, after a word is selected, the automatic spelling help feature described before in detail, may preferably be activated.

- **3 chars stem list**
    - **On the left**
    - **Based on 300ms pause**
- **Next applies to both sides of to the side where the gesture is provided (e.g. gesture can be applied on the wordlist itself)**

According to one embodiment of the invention, a database of words used by the system, may include may include at least substantially significant number of stems wherein their length preferably is up to three characters.

According to one embodiment of the invention, in addition to or in replacement of some of the words of a list/number of words corresponding to the input information provided by the user during the entry of a desired word as described earlier, additionally, at least some corresponding stems, preferably the beginning stem of corresponding words, may be proposed preferably on a different location. For example, the word list described throughout this application may be presented on the right side of a screen and said additional stems may be proposed on the left side of a screen. According to one method, said additional stems may be printed on the screen if the user

pauses for at least a predefined period of time during the entry of the input information (e.g. key interactions) corresponding to the desired word. According to one method, said stem(s) may be presented to the user, after the user provides the input information corresponding to (e.g. at least) a predefined number of characters (e.g. two) of the desired word preferably regardless of the/a (e.g. at least a) predefined length of a stem to be shown to the user. As a first example, after providing the input information corresponding to the first two characters of a word, in addition to longer words, the system may preferably show/present at least some (e.g. preferably, all) of the corresponding beginning stems (e.g. of words to be proposed corresponding to the input information) having two characters. As a second example (e.g. a preferred method), after providing the input information corresponding to at least (e.g. preferably, the first) four or five characters of a word, (e.g. on or starting from that moment) in addition to the corresponding words, the system may preferably show at least some (e.g. preferably, all) of the corresponding beginning stems having two characters.

With continuous description of the current embodiment, if the user selects one of the proposed stems,the system may present/predict/propose the word(s) corresponding to the input information provided by the user wherein their first (e.g. two) characters begin with the selected stem.

According to another embodiment of the invention, when a user selects a proposed/predicted word (e.g. in the word list), the system may preferably consider a predefined number of its (e.g. beginning) characters and propose other words corresponding to the input information provided by the user and having (e.g. beginning with) said characters.

According to another method, during the entry (e.g. of the input information) of a word, the proposed stems may correspond to any predefined portion of a word being entered.

**Stems**

**Proposing the beginning stems**

**Can have any length**

- **System decides, based on the number of diferent stems**
- **From a predefined number**

**Stems shown in a tree-based order**

  - **Tap several times on the stem**
- **Can include all of the stems such that to not require more key presses**

**Different length in a same list**

According to one embodiment of the invention, during the entry of a word the system may propose the stems corresponding to a portion of a word corresponding to the input information being entered. The length of said stems may be defined differently according to several aspects such as:

a) The (e.g. length of the) stems may be constituted as a predefined number of characters such as, for example, two characters (e.g. herein may be referred to as "fixed length stems"). They may be shown to the user at a predefined moment during the entry of the input information corresponding to the word being entered.
b) The length of the stems and/or the moment to be shown to the user may dynamically be defined by the system based on various parameters. As a first example, different stems corresponding to the input information being provided by the user may be presented to the user when the number of (e.g. different) stems is less than a predefined number. According to one method, the length of the stems being proposed at any instance may be different from each other (e.g. hereafter may be referred to as "free length stems").

Preferably, each of the stems proposed to the user is a different beginning portion of the word(s) corresponding to the input information being entered.

According to one embodiment, the first time (e.g. fixed length) stems are presented to the user is when a user provides the input information corresponding to preferably a predefined number of characters. If the user selects one of said stems, then the system may propose also longer words including/beginning with said stem. Preferably, the system also proposes a number of new stems corresponding to a longer portion of the word(s) corresponding to the input information provided until then (e.g. the key interactions and the selected (e.g. fixed length) stem). The user may select one of the new stems and so on. Note that, preferably, the length of the new stems may vary based on the corresponding words preferably such that to reduce the number of key interactions required for entry of a desired word, preferably also considering that the number of presented stems are considered as not being significant (e.g. not more than seven so as to not occupy a large portion of the screen). According to another aspect, if the number of various stems is significant (e.g. more than a predefined number), the system may first show a/some of them. According to one aspect, the system may propose more stems after the user provides a predefined rejecting/next interaction.

The order of the stems shown/proposed (e.g. in a stem list) may be of any kind such as based on the frequency of use of the corresponding words, alphabetical order, etc.

It is understood that after a list of stems is shown to the user, the user has the option to select a stem or continue typing without selecting one.

Figure 439 shows a flow chart relating to a preferred method of for entering words while using/interacting with stems and/or complete words and/or the keyboard. In step 439001, the user enters the input information (e.g. appending characters by tapping on the keys of the keyboard)

corresponding to a number of characters of a desired word. Said number of characters may be a predefined number of characters or the number may be defined dynamically by the system depending on the number of the corresponding various stems relating to the provided input information. In step 439001, the system shows/proposes the corresponding words corresponding to the provided input information. At step 439003 the system shows/displays, at preferably the same time as step 439002, a number of various stems corresponding to the beginning characters of the words of the database corresponding the provided input information. According to a preferred method, the length of said stems may a fixed and/or limited number of characters such as, preferably, two characters. Note that the number N, in step 439001, may vary depending on the nature of the database. Preferably, the relationship between the said various stems and the input information may be such that the stems may be presented/proposed given that the number of such various stems complies with set criterion/criteria (e.g. predefined number or limit). At the condition 439011, if as show in step 439004, the user selects a proposed stem or a complete word, then as shown in step 439005, the system may propose new word(s), if at all any, wherein their beginning characters start with the selected stem or word of step 439004. Now, as shown in step 439006, the system may propose/show new stems (e.g. longer than the previous stems) preferably beginning with the selected word/stem and corresponding to the input information provided to the user until then. At this point, as shown in condition 439010, if the user provides an end of word (EOW) signal, such as tapping on the Space key, the system may enter the selected word. If not, the system goes to condition 439011.

With the continuous description of the current example, after exiting step 439003 or exiting condition 439010, if at the condition 439011, the user ignores the proposed/presented stems and/or completed words and proceeds to the step 439007 by continuing to input addition input information (e.g. appending characters), the system may show/propose new words and/or stems. Note that if the system enters step 439007 from a path including step 439003, then the length of the proposed stems may preferably be similar to those stems as described in step 439003. Alternatively, if the system enters step 439007 from a path including condition 439010, then the length of the proposed stems may preferably be similar to or longer than the stems proposed/shown in step 439006.

Note that it may happen that the length of the stem and the length of the selected word are equal.

**A character in remaining portion which is rarely used with others**

According to one embodiment of the invention, instead of or in addition to the stems, during the entry of a word the system may show/propose a specific character of a word corresponding to the

input information provided by the user. Preferably, said character may be a character (e.g. z, x, b) that is rarely used in the corresponding words.
In the current embodiment of the invention, providing a predefined interaction corresponding to informing the system that the words in the word list at some location (e.g. on the right side) are rejected so as to cause the system to show more corresponding words, may also cause the system to show more stems at some location, preferably on the left side of a screen.

According to another embodiment of the invention, a first predefined interaction causing the system to show more stems, may be a different predefined interaction from said first predefined interaction such as, for example, sliding on a proposed list of stems.

- **Priority to inverse for stems/ show less priority first**

According to one method, the stems shown to the user corresponding to the input information provided by the user, may be presented according to some criterion/criteria, such as, for example, according to their stem frequency/priority such as, for example, from highest to lowest or, as another example, from lowest to highest.
According to a preferred embodiment, the order of stems being presented to the user based on the corresponding input information entered by the user, may preferably be based on the beginning stems of a word that requires many key presses before being predicted/proposed by the system.

**Precise letters in predictive mode for stems**

Showing precise and/or ambiguous words, simultaneously (e.g. on opposite sides of a screen), based on user interactions with the keys/zones of a keypad has been described in detail herein. According to one embodiment of the invention, in the word list corresponding to ambiguous key presses provided by the user one or more words corresponding to precise characters relating to said key interactions may be proposed to the user. As such, at any moment during the entry of a word, a user may enter a desired stem of a word and then interact (e.g. tap on) with that stem to select it and to later provide longer words, as described herein, where the beginning portion of the longer word corresponds to the selected stem. According to one embodiment, the keys used for such purpose are ambiguous keys of the invention displaying the preferred (e.g. and/or none-preferred characters).

**Precise Characters/Stems**

According to one method of the invention, a stem/portion, preferably the beginning stem/portion of a word, may be entered precisely, letter by letter. The method of entring precise characters using/through ambiguous keys has been described in detail before. As an example, according to

one method, when the system is in ambiguous mode, interacting with a key (e.g. such as a tapping action on a key) may simultaneously be interpreted by the system as ambiguous interactions and precise interactions. As mentioned before, when a user taps on a key, the system may consider the tap as being ambiguously related to any character on said key. Simultaneously, the system may also relate said tapping action on the key to an identified character on which, or on a zone to which, said said character is assigned and wherein said tapping was provided. Other characters on said key may be entered precisely by providing corresponding gliding actions on/from said key. According to one method, preferred characters may also be entered precisely by providing corresponding (e.g. short) gliding actions as described before (e.g. upward, downward, leftward/rightward). As an example, if the user desires to enter the word "organization" the user may first tap precisely on the letters 'o' and 'r' on the corresponding keys, then provide a gliding actions corresponding to the letter 'g'' to enter it precisely. By considering said tapping and gliding actions (e.g. input information), the system may propose two kinds of words. A first type of word is provide/presented as if all the characters relating to the word are considered by the system as being entered precisely. In this case, the word/stem "org" is proposed. Simultaneously, one or more second type of word(s) may be proposed based on ambiguous key interactions (e.g. except the character 'g' that was entered precisely). In this example, the system may propose 'dog', 'dogs', 'organic' and 'roger'. At this time the user may tap on the precise chain of characters to select it, and the system may propose a number of longer words beginning with said precise chain of characters/stem "org" (e.g. the words: 'organic', 'organized', 'organizes', 'organization'). Selecting a stem to provide longer words/stems and methods of entering any of them have been described in detail before.
Note that, after the user provides such key interactions/input information, according to various methods, the system may provide one or more longer words based on or considering said chain of characters as being precisely entered and one or more words (e.g. same sized words or longer words) by (e.g. simultaneously) considering said input information as being ambiguously entered.

- 1 precise word, others ambiguous
    - **Show the after that precise**
    - **Show the list**

After entering such input information and selecting one of the proposed words if the user provides additional input information (e.g. key interactions), according to one method the system may consider said additional input information as being ambiguously entered and/or precisely entered and may provide words correspondingly.

Note that, ambiguous input information preferably refers to input information wherein said information refers to at least one or more ambiguous characters even if said input information also refers to one or more precise characters. Preferably, the word list corresponding to proposed words/stems may include both stem(s)/word(s) that include the characters precisely entered and/or one or more words ambiguously corresponding to the provided input information. As an example, when the user taps on a key, the system may refer said tapping action to two scenarios.

A) According to a first scenario, the system refers said tapping action to an identified character on the key on which the tapping action was provided.

B) According to a second scenario, the system ambiguously refers said tapping action to any of the characters on said key. These matters have already been described before in detail.

- **Include special chars**

Providing short and/or long gliding actions in a predefined direction on/from a key/zone for entering two different characters (e.g. a letter and/or a special character, respectively, or vice versa) has been described before in previous patent applications filed by this inventor. According to a preferred embodiment of the invention, in addition to tapping precisely on the preferred letters on the keys, when the system is in the ambiguous mode, short gliding actions provided on an ambiguous key may correspond to entering precise characters/letters assigned to said key and longer gliding actions on/from said key may preferably correspond to entering special characters assigned to said key. Accordingly, a long pressing action on an ambiguous key may correspond to entering a special character, too. Preferably, after beginning a gliding action and/or providing a long pressing action on/from a key, the system may show the letters and special characters assigned to said key (e.g. including or excluding preferred characters as shown in Figure 440B) so that the user can see them while providing said gliding and/or long pressing actions. Figure 440A shows, as an example, the keypad of the invention in ambiguous mode before providing a gliding and/or long pressing action on/from any of the keys of the keypad. Figure 440B shows the keys of said keypad during providing a gliding action (e.g. short/long) and/or long pressing action, provided on any one of the keys of the keypad. A key of this keypad, in such a case, herein may be referred to as 'expanded key.' According to one method, only the key on which said gliding and/or gliding action is provided is expanded. According to another method, all of the keys may be expanded during providing of a gliding action and/or long pressing action on any key. In the example of the keypad of Figure 440B, the preferred character 'w' can, preferably, be entered by providing a tapping action on it or on a zone assigned to it. On the other hand, as shown in Figure 440B, said preferred character may also be entered precisely by providing a short gliding action 440212 in its direction

(e.g. upward for 'w', downward for 'n', leftward/rightward for 'a'), this matter has already been described in detail before. On the other hand, providing a longer gliding action 440211 may preferably correspond to entering the special '2'. In this example, a long-pressing action on the key 440202, without providing a gliding action, may correspond to entering a center character (e.g. the special character '5' in this example). Alternatively, a back and forth gliding action may correspond to entering a center character.

In such case, according to one method, the expanded keys of the keypad may not be shown to the user, while such interactions are provided. This may permit, may permit the user to type on invisible keys. Preferably the invisible keys, in ambiguous mode, may be presented/displayed only by a frame as described before.

- **Short and long press**
- **Center char long press**
- **Show the keys**
  - **Can include precise preferred letters**

- **additional key presses based on ambiguous or precise**
- **Grabbing a word**

According to one embodiment of the invention, the word already entered may be grabbed (for example, for editing) by providing a double tapping action on said word.

According to one embodiment of the invention, providing a (e.g. short) gliding action, corresponding to a letter, including a holding action may change the case of the letter (e.g. from lower case to upper case, or vice versa).

Preferably, when a user provides a long pressing action or short gliding action, the center of the corresponding expanded key may be located under the touching point under the user's finger.

- **Applies to any kb**
  - **QWERTY**
  - **User can type approximately**

As mentioned before, any of the principles, features, concept, aspects, etc., may be applied to /used with any type keyboard for example a QWERTY keyboard. For example, in the embodiments above, after typing a the beginning of a word, the system may propose some candidate beginning with the beginning portion, and the user may interact with a proposed word so that the system propose additional words beginning with/based on the interacted word. According to one embodiment, after providing a beginning portion of a word, when the user interacts with a key of such keyboard, the system may also ambiguously correspond said interaction with the neighboring keys of the interacted key, and by considering said beginning portion and one or more such key

interactions the system predicts corresponding one or more words. In this embodiment, because the beginning portion is entered precisely, an approximate interaction with the keys corresponding to one or more remaining characters of a corresponding desired word may be enough for predicting said word.

The principles, herein described, of swapping/replacing words/stems being selected and used as a fixed portion (e.g. preferably the beginning portion) of another word/stem (e.g. and if desired/needed) appending or deleting characters from the selected word establishes a new way of inputting (e.g. typing) by mixing interactions of keys/zones of a keyboard (e.g. having ambiguous and/or precise keys) and the presented/predicted/proposed words/stems to predict a (e.g. desired) word.

- **Korean**

The principles of using stems/words mixed with keyboard interactions and word/stem interactions described herein may be applied to any type of (e.g. alphabetic) language such as Roman based languages (e.g. English, Italian), Korean, Hindi, Arabic, Hebrew, etc.

**Chinese/Japanese**

The principles of swapping and/or selecting word(s)/stem(s) and preferably proposing/predicting longer word(s)/stem(s) including (e.g. beginning with) a selected word/stem as described throughout this application may be used for the entry of the phonetic transcription of a word/stem (e.g. hereafter may be referred to as or a phonetic word/stem) for languages such as Chinese or Japanese (e.g. hereafter, may be referred to as a phonetic alphabet). As an example, Chinese language uses Pinyin input method wherein the Chinese characters are represented by the Roman phonetic transcription. A word of a Chinese language may be constituted of one or more characters, each may be represented by a pinyin phonetic transcription (e.g. herein may be referred to as a pinyin representation of a word, or pinyin). According to one embodiment of the invention, a database of pinyin representations of words may be used by the data entry system of the invention. As such, a pinyin representation of a word having more than one syllable may be entered by providing the input information corresponding to said syllable. A word list that may include the corresponding pinyin representations of words may be presented to the user. If the presented word list does not include the desired pinyin, the user may provide a predefined interaction such as a gliding action as described for Roman-based languages (e.g. reject action or next options action), and the system may propose/present a new word list. If needed the user may

repeat this procedure until the system proposes the desired word. The user may select a desired pinyin representation of a word within the/a corresponding word list as described earlier (e.g. by tapping on it). The system may preferably fix the characters of the selected pinyin representation of a word, and preferably, may propose longer pinyin representations of words beginning with the fixed characters, and preferably also show the corresponding hieroglyphic words preferably based on their frequency of use. And so on. According to one method, during proceeding to providing the input information corresponding to the next pinyin representation of the desired word, by considering the selected pinyin representation and said input information, the system may propose one or more corresponding pinyin representations of words wherein their first pinyin representation of a word is the selected one. Now, the user may either select one of the new proposed pinyin representations of words (e.g. as the desired pinyin representation of a word or as a stem of a longer pinyin representations of a words word) or he may continue typing the next one. And so on.

In the current embodiment, according to one method, at any moment (e.g. for each selected pinyin representation of a word) during the entry of a pinyin representation(s) of a word (e.g. after providing information corresponding to the beginning symbols of a word), the user may select its/their corresponding symbol(s) or the user may select all of the symbols of the user's desired word after all of the pinyin(s) of the desired pinyin-based word (e.g. phonetic word) is/are entered.

For the sake of clarity, in the embodiments relating to a hieroglyphic language such as the Chinese or Japanese languages as described herein, a phonetic representation of a word such as a pinyin representation (e.g. as one example for the Chinese language) of a word may be considered as equivalent to a stem of a word and/or a single word in a language with an alphabetic system (e.g. English). As such all principles of the data entry system of the invention may preferably be applied to the entry of input information of a phonetic language for entering phonetic chains of characters (e.g. phonetic words/stems) which may be represented by symbols in the corresponding hieroglyphic language.

  - **Double list**

- **Next applies to both symb/character and pinyin**
  - **Sp applies to symb/character**
  - **Selects a character at any moment**

According to one embodiment, the pinyins corresponding to the input information provided by the user, may be presented on a first predefined location of a screen such as the right side of a screen and the corresponding hieroglyphic symbols may be presented on another predefined location of a screen such the left side of a screen.

According to one embodiment, when the user provides the input information corresponding to a hieroglyphic word, such as a Chinese word, the corresponding predicted phonetic words (e.g. having one or more pinyins in the case of the Chinese language) may be presented in a word list, for example, on the right side of the screen. When a user selects one of said presented phonetic words, by for example tapping on said word, the system may show the corresponding hieroglyphic words at, preferably, another location (e.g. on the left side of the screen). According to a preferred embodiment, a rejecting interaction before selecting a presented phonetic word may result in the system presenting more phonetic words. According to one embodiment, after selecting a phonetic word a same interaction may result in presenting more hieroglyphic words corresponding to the selected phonetic word.

Note that, according to a preferred embodiment, when a user inputs information corresponding to a desired word, the system may preferably show the corresponding phonetic word(s) and preferably show the hieroglyphic words corresponding to the phonetic word having the highest priority in the list. After selecting a phonetic word, the system may propose one or more longer phonetic words beginning with said selected phonetic word. Preferably, after the user selects another phonetic word (e.g. one of the longer phonetic words), the system may show the corresponding hieroglyphic word(s).

The principles of entering phonetic transcription of syllables/words using the data entry system of the invention as described throughout this application, may be applied to any hieroglyphic language such as the Japanese language wherein a phonetic representation of a word is constituted of one or more Kana(s) that may be entered through Roman characters (e.g. using the data entry system of the invention to enter text using the Romaji method).

**Picture editing functions/application**

- **For a current predicted word or after selecting an already entered word (by press and holding on it), then:**

Methods and principles of editing a picture/image/photo/video have been described before in detail. According to a preferred embodiment of the invention, a method of applying functions to a word being entered (e.g. the current (e.g. predicted) word) or to a selected word which has been previously entered (e.g. an already previously entered word may be selected by providing a

predefined interaction such as a long-pressing action on said word) (e.g. hereafter the current word and/or selected word may be referred to as target words) may be considered, such as:

- **A tap on the screen (e.g. outside the selected word, if any) brings the menu, another same tap hides the menu**

- In the case that a word being entered, a predefined action such as a tapping action (e.g. anywhere outside the keypad and/or corresponding broadly ambiguous zone) on the screen, may display a menu.
- In the case that a previous word is selected, a predefined action, such as a tapping action, may be preferably provided not on the selected word.
- In the case of a targeted word, a predefined action such as a tapping action (e.g. anywhere outside the keypad and/or corresponding broadly ambiguous zone) on the screen, may display a menu. Said predefined action may preferably not be provided on the selected word or on a zone assigned to the selected word.
- After the menu is displayed, an interaction with a function of the menu may apply to the targeted word. Preferably, said application of the function may be executed in real time so that the use can see effect of the function on the targeted word. As an example, said function may be change of the color, font, size, font, shadow, style, etc. of the targeted word.

According to one method, functions other than functions relating to a menu may be applied to a targeted word. For example, in the case of a targeted word on a touchscreen, providing a gesture in a direction may cause the system locate the targeted word under the user's fingers in the direction of the gesture. Preferably, a press-and-holding action anywhere on the screen and a slide of a finger in a direction may cause to move the targeted word in said direction (e.g. preferably from the targeted words original location, or optionally under the user's finger) without changing the trajectory of the targeted word itself. Note that said press-and-holding action with gesture may also be provided on the targeted word itself.

With continuous description of the current embodiment, according to one method, a tapping action on a selected word unselects said selected word. Additionally, in case of a targeted word and during the display of a menu on the screen, according to one method, a predefined action (e.g. such as a tapping action anywhere on the screen (e.g. preferably not on the targeted word)) may hide the menu.

According to one method of the invention, a gliding action on the screen may cause the system to display the keyboard on the screen without a menu being displayed on the screen.

According to one method of the invention, when a gliding action is provided on the screen, the trajectory is shown to the user preferably in the form of a line. In the case of a targeted word, according to one method, in addition to said trajectory or in replacement of said trajectory, the targeted word is displayed.

According to one embodiment of the invention, a complex gliding action such as a sequence of continuous gliding actions may be provided on the screen before enter several words. After entering said several words, the system may preferably display said several words according to the trajectory of the complex gliding action on the screen. According to one method, the system may assign each of the gliding action trajectories of said complex gliding action to each word of said several words. Optionally, the system may assign trajectories to said to the whole of said complex gliding action, and adjust the trajectories of each word accordingly.

- **Menu for design**
- **Long-press to release the selected word**
    - **Tap anywhere including on the selected word for menu/keyboard**

According to one embodiment of the invention, a long pressing action on a selected text (e.g. one or more words) may preferably release (e.g. unselect) said text. According to this approach preferably a tapping action anywhere on the screen (e.g. preferably outside the broadly ambiguous zone, if a (e.g. corresponding such) keyboard is poped up one the screen) including on a selected text may correspond to displaying the/a menu and/or a/the keyboard. In this embodiment, a tapping action on the/a selected word may preferably not unselect said word.

**Downwards, upwards, leftwards, rightwards**

**Next, previous, erase word from text (holding erases more words), undo**

**Gesture up/down on the word list**

During the entry of a word, the system proposes/predicts words preferably in a word list. According to one embodiment of the invention, a predefined interaction such as a gliding action in a predefined direction such as downwards on/from a predefined location such as on the word list and/or on the zone between the split keys (e.g. on the broadly ambiguous zone), may result the system to propose additional/new words corresponding to the input information provided by the user. Accordingly, another predefined interaction such as a gliding action in a predefined direction

such as upwards on/from a predefined location such as on the word list and/or on the zone between the split keys (e.g. on the broadly ambiguous zone), may result the system to propose the previous words (or vise versus, e.g. upwards, and downwards, respectively).

According to one embodiment, a predefined interaction such as a gliding action leftward in/from a predefined zone such as the zone between the split keys and/or on/from the (e.g. zone corresponding to the) word list may preferably correspond to deleting the word being entered and/or a word before the cursor in a corresponding text field. In this example, a gliding action including a holding action may result in deleting more words until the user lift his/her finger (e.g. from the touch screen). Accordingly, said interactions in an opposite direction may preferably correspond to an undo function to reviving of one or more deleted words.

According to one method, a predefined interaction such as a gliding action rightwards on/from (e.g. the zone corresponding to) a word in a/the word list may select and preferably enter said word in the text field. Preferably, the system may, automatically, insert a predefined character such as a space character after said entered word (e.g. at the cursor/caret position in the text). According to one method, a press-and-hold-and-dragging action on/from the word list my relocate the word list.

**Multiple words, after fixing one or more words**

- **Is an entry of the database**

As mentioned before, during this application, when an entry of a database may have an N-gram word (e.g. 1-gram, 2-gram, several words, phrase, paragraph, etc.) wherein N is equal and/or greater than 1. As such, after a user fixes a word/stem, the system may propose a (e.g. one or more) word of an entry of the dictionary having N-gram word, wherein they include the fixed stem/word preferably as the beginning characters of them. Additionally, after fixing/selecting a one of the N-gram words, the user may fix/select one of the N-gram words and/or proceed to appending/typing (e.g. and/or deleting) characters to (or from) so that the system may propose one or more longer N-gram word, and so on.

**System decides which stems to propose**

The principles of a data entry system based on a (e.g. semi-predictive) word prediction system have already been described in detail. According to one embodiment, in such a system (e.g. and/or in a fully predictive system), (e.g. preferably at some point) during the entry of a word, the system (e.g. automatically and/or based on user's demand) may present to the user stems (e.g. the beginning portion of a word) corresponding to at least some of the word (e.g. preferably, corresponding to all of the word) corresponding to the input information provided until then. Preferably, the length of the said stems is equal to the length of the characters corresponding to the input information provided until then. Preferably, said stems are shown in a display control (e.g. word list) to the user. Preferably, said stems are shown to the user if their number satisfies a predefined criterion/criteria (e.g. if their number does not exceed a predefined number such as the maximum number of the words allowed in the word list, or if their number equals a predefined number of words). Preferably,

the stems are shown in the same display control (e.g. word list) location/zone that is used for proposing/displaying predicted words during the entry of a word.

With continuous description of the current embodiment, as an example, by considering the keypad of the fig. 447A, during the entry of a word using the semi-predictive system, after the user presses precisely on the letters "d", "e", "l", "i", and then taps one time on the broadly ambiguous zone between the keys so that said tapping action may ambiguously correspond to any of the characters assigned to said zone, the system may not be able to find a word in the database used by the system wherein its length and its characters correspond to the input information provided by the user. At this time, the system may look for the words where their (e.g. beginning) characters correspond to the input information provided by the user, and may preferably propose the (e.g. beginning) chain of characters (e.g. of the word) to the user. In this example, the corresponding chain of characters is preferably limited to a few characters such as

- "deliv" (e.g. beginning stem of the words, "deliver", "deliveryman", "delivers", etc.)
- "delib" (e.g. beginning stem of the words, "deliberate", "deliberately", "deliberation", etc.)
- "delic" (e.g. beginning stem of the words, "delicious", "delicate", "delicacy", etc.)
- "delim" (e.g. beginning stem of the words, "delimit", "delimiting", "delimited", etc.)
- "delig" (e.g. beginning stem of the words, "delight", "delightful", "delightfully", etc.)

The system may propose some (e.g. at least one) of the stems (e.g. in the word list) to the user. If the number of different corresponding stems is more than the maximum number of words permitted in the word list, then the system may show some (e.g. at least one) of the stems, and the system may present more stem(s)/option(s) when/if required. Note that, in a same word list the system may simultaneously, present words and/or stems corresponding to the input information provided until then. According to another method, the complete words and/or stems may be presented in two different display controls such as word lists (e.g. on different zones of a touch screen).

Figs. 447A-447C, show the keypad of the invention in different instances (e.g. respectively, semi-predictive mode, precise combined letter and symbol mode (e.g. activated when providing a gliding action on/from the semi-predictive keys), and precise letter mode) in the semi-precise mode. Preferably, the keypad of the invention in both, semi-predictive and fully predictive, modes have the same appearance. In the fully predictive mode, preferably, the user is allowed to (e.g. may) tap anywhere on the keys to enter ambiguous characters. In semi-predictive mode, preferably, the user is required to tap precisely on the letters of the keys. In any mode (e.g. semi-predictive mode and fully predictive mode), for the entry other characters (e.g. non-preferred characters) the user may tap on a predefined zone (e.g. broadly ambiguous zone) preferably between the keys. Zones assigned to the characters on a key in semi-predictive mode may be defined using various methods of assignment. For example, as shown in fig. 447A, the section/zones assigned to the letters on keys 447001 and 447002 are defined differently, as highlighted by the black lines on said keys.

**Constructing a WALL**

**Id number for A PUZZLE**

**Constitutes a picture**

**Constitutes typing on a picture**

**Piece is missing**

**Writing is missing**

**On our server**

**Linear or non linearcpieces**

**Any other kind of picture**

**Drawing disappears after typing**

**Password**

**Manner of monetizing**

**Coupon**

**Paid by advertiser**

**Coca cola**

**diff size wall diff price**

**same type, mix**

**wall of pictures**

**on facebook, youtube, independent, a single webpage**

According to one embodiment of the invention, the system may enable the user to identify/select one or more portion(s) of an image (e.g. whether edited or not) and share it with one or more party/parties. According to one method, the identified/selected portion(s) of the image, may be the only portion(s) enabled for editing (e.g. entering text/graphic elements, etc.). According to a second method, the identified/selected portion(s) may be the only portions of the image that are not enabled for editing. According to one embodiment, the principles just described may be used in an application (e.g. having the data entry system of the invention and) using a server that may be employed to control the said enablement/disablement of editing an image. According to another method, some portion(s) may be enabled for editing, and some (e.g. one or more) portions (e.g. of the same image) may be disabled for editing. According another method, any of enablement and/or disablement may be alternated/switched. According another method, more portion(s) may be added at any time, and any of exiting portion(s) may be removed.

As an example, Figure 441A shows an image 44100 wherein the portions 441001-441005 are selected by the user for editing purposes. The rest of the image are disable from an editing

action. For selection/identification purposes, a means, preferably in a menu, may be available to the user so that by using said means the user may select said one or more portion(s) of the image. As an example, the user may draw may a shape/form (e.g. a square or other shape) as shown in Figure 441A to identify/select said portions. According to one method, said selection procedure may be provided without interacting with a means in a menu, while according to another method the user may interact with a means in a menu before providing shape/form. Said means in a menu may define enabling/disabling purpose of the selected portions. Preferably, for each of enabling and disabling purposes, a different means in a menu is designated. In the example of Figure 411A, the selected portion(s) are designated to be enabled for editing, and the rest of the image is disabled for editing. In figure 411B, the portions 441103, 441104, and 441105, which are edited, correspond to the selected portions 441003, 441004, and 441005 of Figure 441A, respectively. Other portions are not yet edited.

Figure 442A shows a selected portion 442001 of an image 442000 wherein said portion is disabled for editing. The rest of the image is enabled for editing. In this example, several comments/texts are edited into the image by one or more users. In this example, a split comment, having two portions 4421011 and 4421012, is a single comment that was typed on the image but was (e.g. manually or automatically) split because the portion 442001 prevented it from being printed in a continuous area where portion 442001 was located.

With continuous description of the current embodiment, note that in a preferred method, when a user shares an image having selected portions, said portions are marked by some means, for example, by a line/contour. After editing content in said portion(s), said marking means may disappear. According to a method, in order to have access to a selected portion (e.g. or the rest of the image if the selected portion is disabled for editing) for editing, the editing party (e.g. someone who receives said image) may require an access control means such as a login (e.g. username and/or password) to edit said portion(s)/image. For monetizing purposes, in some cases, the provision of said access control may require payment.

With continuous description of the current embodiment, any portion of an image may be shared separately from the rest of the image with a designated user, and access control may be applied to that portion. Such portion(s), after being edited by the designated user, may be transmitted to a (e.g. remote) server which may assemble the received portions into a (e.g. single) image(s). According to one method, the assembled image may not include the portions that may not yet be edited. While, according to another method, the assembled may also include the non-edited portion. Any of said assemble images, may at any moment be accessed by any user. According to one method, a user may identify themselves as the editor of any portion of an assembled image. Note that, one or more portion(s) of said image may be edited by the user who shares said image. According to one method, each of said portions may be auctioned (e.g. online) and preferably control by some access means. Figure 443A shows an image 443000 that is partitioned (e.g. manually by a user or automatically) into several portions (e.g. 443001, 443002, 443003, and others not numbered in the figure). In Figure 443B, the portions 443001 and 443003 are edited, while the remaining portions are not edited, but users can see the entire image at any moment. In figure 443C, only edited portions are shown to a user(s).

Note that, according to one embodiment, all the principles just described above concerning the selection and/or definition a/any portion of a content, such as an image, for example, for editing purposes, may be applied in such a way the user receiving said content. For example, a user that receives an image from another user (e.g. a sender that controls access), may define and/or request from the sender of the image to define a portion of the image to be edited by him. As mentioned before, for monetizing purposes, in some cases, the provision of said access control to a portion defined by a receiver of content may require payment.

Note that a selected portion of an image may include a part of the image, parts of an image, or the entire image.

**Constructing a WALL**

Virtual walls such as a facebook walls and/or feeds, are very popular today. In such so-called "walls" the content such as text and user identification pictures are provided on different text fields or other corresponding image backgrounds that have no relation with a wall that we are used to image. The image editing principles described in this application may allow typing on images in form of a wall and/or forming a wall. As an example, a user may post a subject (e.g. including text) on an image and said image may be shared with others on a page such as a web-page. Other users may comment/respond to the posted subject on preferably similar image. The similar image may be provided by the user posting the subject by a third party such as a server sharing/providing images such as the server controlling the page. The image of the posted subject and/or the images including comments to the posted subject may be positioned next to each other on the shared page. Preferably, the posted subject and/comments may be positioned in a linear manner, preferably, vertically. In this case, as an example, they may form/construct at least a substantially single image. If each of said images is the image of a wall (e.g. China's, Berlin, or a building wall), the combination of said images on the shared page may form a single wall with many comments making it a pleasant and fun. It also may permit better visualation of the comments. According the one embodiment, any location on the constructed image (e.g. wall) may be accessed freely or by means of permission (e.g. as described before) for posting a comment.

Fig. 444 shows as an example, a "wall" in a current social application such as Facebook using the image editing principles/application as described. In this example, a user 444011 has typed a subject 444007 on an image 444001 such as the image of a wall and shared in his facebook page. In this example, the image of the user himself and/or his corresponding personal information are located outside the image (e.g. because Facebook application requires it). In this example, under said image, posts 444002, 444003, from other user 444012, 444013, responding to the posted subject image 444001, are positioned in a vertical manner. The overall page/wall substantially forms a single image/wall with a single debated subject with a small gap between each image.

In a preferred embodiment, the information corresponding to the poster of the subject and the responding users may be positioned/printed on their corresponding images so that to at least minimize the gap between images. In the example of Fig. 444A, each of the images 444101,

444102, and 444103, include information from its respective poster, 444111, 444112, or 444113. In this example, a very reduced gap separates the images, while in Fig. 444B, no gap is provided between image and they form a single image 444200.

According to one embodiment, the images posted by users may not resemble each other, but preferably may have common characteristic(s). In figure 445, a portion 445002 of the wall 445000 has the image of a wall which may be different from other portions (445001 and 445003) of the wall 445000.

The principles of commenting on a subject while constructing an image such as a wall may be used with/in any type of (e.g. social) application and/or platform/service such as Facebook, YouTube, etc.

**Several (linear/vertical) pieces**

According to one method, a single image may be divided into pieces, preferably linear (e.g. vertical or horizontal) pieces and the pieces may be shared with a number of users. Note that, preferably, each of said pieces may have a different portion of the image which may not necessarily resemble another portion of the image. Because a single image is divided into several portions, the number of portions is generally limited to fixed predefined number. In order to divide an image into several portions, a means such as those described before or some automatic means may be used. As an example, the user may divide the image by drawing lines on the image or the user may instruct the system to automatically divide in to a random number or desired number of portions.

According to one method, an admin user may share any of the portion(s) with other users by the admin user's control of the image, or the admin user may allow other users to select a portion available (e.g. from an entire image and the corresponding portions that may be shown to a user, for example, on a web page) to edit, by preferably sharing the entire image.

According to one method, the portions of a divided image may be available in a linear sequential manner. Preferably, the first portion may be edit by the admin user or another user and the next (e.g. second) available portion is preferably the portion adjacent to the first portion, and the third available portion is preferably the portion adjacent to the second portion, and so on. As mentioned before, according to a preferred method, at least one of said portions may be available to a user by means of access control (e.g. that may be defined and/or granted based on monetary system such as a credit/point/reward system, or payment system). As such, advertisers, celebrities, corporations, consumers may use these principles to monetize and/or market and/or advertise their brands, products, services, etc. through images.

As an example, figure 446 shows an image 446000 divided into five portions by means of drawing lines such as the line 446001. The portion(s) of the image may be available to some users as described before. In this example, the first portion of the image is edited by the admin user. Figure 446A shows a comment/post on the second portion of image provided by a user acquiring control of the second portion. According to one method, the combined edited portions 446100 may be provided on a page, such as a web page, so as to be seen by others, as shown in figure 446A. In Figure 446B, a third comment/post provide by another user and the combined three

portions 446200 are shown. In Figure 446C, the whole edited image 446300 including all of the portions including all the comments/posts provided by several users is shown.

Note that, as shown, the divided portions may have different size.

**Messaging**

- **Email, IM, SMS**

By using the methods/principles of providing information corresponding to the (e.g. related layered) graphical presentation of text (e.g. herein referred to as graphical text) and/or related content and meta data (e.g. such input information may herein be referred to as scene information) to provide text on a content (e.g. a picture/image, video, blank picture/form) described throughout this application, a new protocol/system/method of messaging/communicating (e.g. email, IM, SMS, etc.) may be developed. The advantage of such system is in that the user can express himself/herself (e.g. instantly) through a colorful text, various fonts, text in various directions, corresponding image(s) (e.g. if any) on which the text is to be presented/shown (e.g. anywhere on an image), etc. This preferably eliminates or at least may reduce the need of using text input controls which are mostly related to a restricted text manipulation/processing functionality. According to one method, a (e.g. remote) server may organize/manage/process the scene information relating to a user's activity received from a user (e.g. and other sources related to the user's activity). The server may also transmit/receive such information to/from a destination/source. According to one method, all information (e.g. scene information) such as the history of the messages (e.g. and/or user's activities related to said scene information) may be saved/recorded/stored in a (e.g. remote) server. Said information may be accessible by one or more user(s) upon predefined user interactions and/or (e.g. system) conditions.
According to one embodiment, such information may be transmitted from a user (e.g. fixed/mobile device) to another user (e.g. fixed/mobile device) without the use of a server (e.g. peer to peer).
Note that reference to server herein may refer to a network cluster of severs, whether centralized, distributed or otherwise configured.

The scene information, such as history of messages of a user, may be stored and/or accessed as text and processed (e.g. sorted) accordingly. The procedure of processing may be executed on a server and/or in a user's device.
In the current embodiment, according to one method, the graphical presentation of the scene information may include an attachment such as a picture, a textual document, other types of information, etc. According to a preferred method, the scene information may be printed/presented to a user in the form of a single document/presentation element (e.g. audio and/visual output). Note that the scene information may include one or more image(s). Any portion of a text (e.g. provided as such by a user) may be displayed on one or more of said image(s). Fig. 451 shows as an example of text/graphic messaging as just described above. In this example, on the screen 451000 of a (e.g. mobile) device text is present on/over an image (e.g. several texts are presented on/over several images may also be considered as forming a single image). In this example, the first message "Long time, no see? Where are you? Jack" is presented over an image 451001 that resembles a wall (e.g. note that the image is only an example, and any image may be used, whether from the sender, receiver or another source). The reply to this message is the second message 451002, which contains two sections (451002/1 and 451002/2). The section 451002/1 on which the message is "I'm having great time. See my new house! Tom" is presented on/over an image and attached image 451002/2 is presented, with text written over it, namely "I am here". The reply to this second message 451002 is "Love it! See you soon. Jack" where each part of this third message 451003 is presented at various positions and angles on/over the image of a wall (e.g. this is a exemplary image but it could be

any other image as already described). Note that, in this example, all the messages together may be considered as a history of messages (e.g. a conversation). Also, note that, in this example, the wall/background image of Tom's message is the same as the image of Jack's messages, however, this is only optional, as a user (e.g. Tom, and or Jack) could select any image as a wall/background image for messages at any time.

According to another method, the attachment may be presented on/in a separate document.

The principles of providing scene information by a first party and/or presenting said scene information to a second party, as described throughout this application, may transform network, social, telecommunication protocols and systems such as email, instant messaging (e.g. Whatsapp, ICQ, MSN, AOL Messenger, Instagram, etc.), short message service (SMS), social networks (e.g. such as Facebook, Twitter, LinkedIn, Pinterest, etc.), etc. where a user can express themselves by eliminating/reducing text boxes and using graphical text and/or content, preferably provided on images.

- **Text in pictures may be considered as text information.**
- **Searching and sorting based on text in pictures**
- **<u>Target text to an image remote.</u>**

Preferably, at least a portion of text included in scene information may be treated as text (e.g. not graphical information). As such, functions such as text searching, text sorting, copy, paste, cut, select, etc. may be applied to such text.

According to one embodiment, a scene information (e.g. may exclude an image and) the presentation of at least a portion (e.g. at least a portion of a graphical text) of said scene information on a (e.g. remote) receiving device may be presented on/with a content (e.g. such as an image) on a (e.g. remote) receiving device (e.g. a mobile device, server, desktop, etc.).

According to one embodiment, preferably, the scene information may be contained/found on a (e.g. remote) server wherein at least some of said scene information may be processed (e.g. associated with other information, incorporated into a collage of other scene information, classified according to predefined and/or dynamic parameters and/or classification systems). According to one method, the server may provide at least a portion, preferable at least the last message sent by a user, to a destination. In such case, if the receiving destination desires to have more scene information, more information may be sent to the receiving destination on demand. According to one method, the receiving destination may process at least some of scene information.

**<u>TYPE ON ANY CONTENT</u>**

- **<u>VIDEO</u>**

With continuous description of the current embodiment, rendering information (e.g. transmitted to a destination), may by presented/displayed on and/or over any content such as an image, video, text box, email, etc.

**<u>Wrapping</u>**

According to one embodiment, in the picture editing application/embodiments, the system may include a means (e.g. from a menu) to define a zone of/on an image on which a text may be wrapped when typing a

text. For example, the user may be allowed to define such a zone on the picture by drawing a zone after providing an interacting with a section of an appropriate menu relating to the activation of such function.

**Signature**

- **Starting point**
- **Ending point**
- **Speed of different portions**
- **Timing of different portions relating to each other**

According to one embodiment of the invention, a secured method of identification of the signature of a user may be created. When a user signs on a touch sensitive surface such as on a touch screen, his/her graphical signature may be considered/memorized by a system. When user provides a signature, the gliding action corresponding to the signature on said surface also provides a (e.g. complex) sound. Said graphical signature and said sound may be transmitted to a destination (e.g. another user's device, a server, etc.) for authentication. Said destination may already have stored a correct version both the graphical and sound of the user's signature. By comparing said the combined information with the stored information, the user's signature may be authenticated.

Note that, for the entry of text, no text box is used and/or required. The text provided as such may be presented over any content such as an image, a text box, video, etc. without necessarily being integrated with the content.

According to a preferred embodiment of the invention, the presentation of text on a (e.g. receiving) device may stop after a predefined lapse of time, or by instruction of the a user, or (in the case of a video) after a fixed number of frames. Optionally, said text may be saved (e.g. for several purposes such as reviewing content, for example, related to and/or including said text at a later time) on a remote/local server and/or on a receiving device.

According to one embodiment, a photo sharing/editing application such as the photo editing application of the invention may include a store (e.g. online store such as an Internet based store), where goods/contents such as fonts, photos, smileys, etc. may be presented for sale/rent to users. According to one embodiment, photos owned by a party may be proposed in the store to the users in a manner not be used more than a predefined number of times such as, preferably, one time. For such purpose, after a user selects/purchases a content such a photo, the photo may be presented with and/or amended by a security element such as a watermark (e.g. text and/or signature of some kind, preferably substantially visible). After a user edits a photo and preferably saves or shares the photo, said security element may be removed by the system from the edited and shared/saved photo. Said security element may preferably be inserted/added/put on/appended by the system on the presented and/or purchased photo. Note that in the example above, a content such as a photo was used in the example, it is understood that any other content such a video, music, etc. can be used through the principles just described.

This manner of selling content allows the owner of the content to keep the original version of the content while monetizing said content through the store. In this case the photo is preferably presented/proposed at an inexpensive price.

The revenues of the store may be shared with the suppliers of content and the owner of the photo editing application.

**Any keyboard**

Note that, the principles of editing (such as typing text/comments) and sharing pictures/images as described throughout this application may use any type of keyboard such as the keyboard of the invention having few keys such as four keys (e.g. and zone outside of said keys) or a QWERTY-like keyboard.

Fig. 448A shows another type of configuration/assignment of letters to the keys 448001-448004 of the keypad of the invention. In this example, the letters on two adjacent keys are arranged such that to have at least vertically large distance from each other. To enhance the accuracy, the zones assigned to each letter (e.g. in a same row/column) are defined such that a portion of a zone of a first key (e.g. which is closer to a letter/character assigned to a second key/zone than to a letter which is assigned to a first key) may be assigned to a character of said second key/zone. In this example, the zones 448011, 448012, 448013, and 448014 are respectively assigned to the letters "S", "R", "T", and "N".

As mentioned before, instead of assigning several zones on a key to respectively each of several (e.g. preferred) characters, each of said characters may be assigned to a (e.g. an independent) key/zone on the screen. Fig. 449A shows a type of a keyboard including twelve independent keys/zones corresponding to preferred characters which in this example are split into two portions 449001 and 449002, and a zone 449007 (e.g. broadly ambiguous zone) outside said keys assigned to a (e.g. large) number of characters such as, for example, at least the non-preferred characters as described throughout this application. In this example, the letter keys constitute four columns.

Fig. 449B shows a keypad with similar principles wherein its letter keys form two (e.g. horizontal) rows of keys. In this example, the letter keys are split into two portions and a (e.g. broadly ambiguous) zone 449107 is positioned between the two portions of keys. Note that, as shown in the examples above and demonstrated in fig. 448A, a (e.g. zone assigned to a) letter (e.g. "A") of a first row 448021 adjacent to a second row 448022 may (e.g. also) preferably be arranged (e.g. located) such that to be between two (e.g. zones assigned to two) letters (e.g. "W", and "N") of the second row 448022. As such, preferably for better accuracy, interacting with a portion/zone 448115 of the second row between said two letters wherein said portion is closer to the letter of the first row, may preferably (e.g. also) be assigned/correspond to the letter of the first row. Other types of configuration of letters/characters (e.g. based on the principles described) on keys/zones may be considered by people skilled in the art.

**NEW KEYS**

Figs. 450A-C show other methods of assignment of characters/letters to different zones on the corresponding keys. In this example, the key 450001 is divided in three zones based on dividing an imaginary circle in three (e.g. equal) portions corresponding to the letters T, Y (e.g. portion 451011), and I. In this example, the key 451002 if divided in three portions as described earlier in this application.

Showing a word including a letter when a special character is selected during the entry of a word

According to one embodiment of the invention, when the user provides a gesture in a direction on/from a key wherein to said direction two characters (e.g. a letter and a special character) are assigned depending on the length of the gesture, the system may consider both characters and may present them, separately or within a corresponding word being entered, to the user. This may preferably avoid misentry of a desired precise characters if a user does not provide the gesture with the correspondingly correct length.

**AUTO CORRECT**

- **2 CONSONANTS**

According to one embodiment of the invention, (e.g. in precise and/or semi-predictive mode) the system may include an auto-correction method such that when the user touches a key on a location near the border between (e.g. zones corresponding to two or three) letters/characters, the system may consider all of said letters/characters, and preferably provide/predict different words accordingly.

**Any type of letter arrangement**

It must be noted that the keypad of the invention may have any number of (e.g. letter) keys, each key may have any number of characters/letters, and any other configuration of letters on the keys.

- **Anywhere on/closed to a letter includes the surrounding letters**
  - **One line**
  - **2/3 lines**
  - **On opposite sides on the screen**
    - **All chars**
    - **Include outside zone**
  - **Each zone assigned to spchars**
  - **2 line qwerty on opposite sides**
  - **Narrow qwerty**
- **Chars on the top of the finger**
- **Spchars not on the direction of letters**
- **Tap between the two keys may correspond to at least the neighboring characters of the two keys**

According to a first aspect of the invention, each of a plurality of (e.g. dynamically assigned) zones/keys on the screen may ambiguously represent a number of characters such as letters. When a user interacts (e.g. taps on) with a location between two (e.g. neighboring) zones/keys, at least some of the characters surrounding the location, preferably regardless of key(s)/zone(s) to which characters are/may be assigned, may be considered as an ambiguous input preferably corresponding to a plurality of said characters by the word predictive data entry system of the invention.

According to a second aspect of the invention, when a plurality of zones/keys on the screen each represent a (e.g. single) character such as a letter, when a user interacts (e.g. taps) on/near a zone/key, in addition to the character of the corresponding zone/key, the system may ambiguously consider at least some of the characters (preferably those characters close to the location of the interaction) corresponding to the neighboring keys/zones as input to the data entry system of the invention. Also, preferably, when the user interacts (e.g. taps on) on/near a zone/key which may also be related to an individual identified character such as a letter, the system may also consider said identified character as input to the data entry system of the invention. In both cases, the system may predict/propose words corresponding to a sequence of input signals provided as such, wherein at least one of the input signals ambiguously corresponds to a plurality of characters.

The arrangement/assignment of (e.g. dynamic) zones and/or assignment of one or more characters to a zone may be of any kind. For example, the zones may constitute a single line of zone(s), a double line of zone(s) (e.g. parallel to each other, and/or located on opposite sides of a touch sensitive surface such as a touch screen), etc. The (e.g. dynamic) assignment of one or more characters to a zone may be based on alphabetical order, QWERTY-based order, or based on any of the principles of data entry system of the invention (e.g. preferred character(s) may be assigned to one or more row(s) of zone(s) and non-preferred character(s) may be assigned to one or more zone(s) outside said zone(s), etc.). As an example, the keypad of the invention may be a narrow full QWERTY keyboard (e.g. a QWERTY keyboard layout compressed in either the vertical or horizontal orientation, in a manner to preferably at least substantially maintain its QWERTY appearance but preferably such that said keypad may be useable (where said keypad may be used by the data entry of the invention (e.g. by considering a plurality of characters near an interaction on a zone of said keypad as input to the (e.g. predictive) data entry of the invention) in a manner to maintain the highest possible prediction accuracy). According to one method a (e.g. multiple-) split QWERTY keyboard wherein each of the split portions is narrow, as described, and preferably is located on an opposite side on the screen may be considered and used. In the current embodiment, the keyboard used with the word prediction system may also include one or, preferably, more special characters that may, at least, be included in words of a database, such as "'", "_", "/", "-", ".", "&", etc. Fig. 452 shows such a (e.g. compressed qwerty) keyboard 452200. In this example, characters "&" 452051, and "-", "_" and "'" 452052.

Fig. 452A shows an exemplary (e.g. linear) one line keyboard of the invention in which some (e.g. preferably) preferred characters are arranged on a single row zone 452001. When a user interacts (e.g. taps, slides/glides, double taps, etc.) on a zone on said keypad, the system may consider at least some of the characters (e.g. displayed/located) near the impact of the user's interaction (e.g. tapping action, sliding action, double tapping action, etc.) on the zone. A (e.g. one or more) predefined zone(s) (e.g. 452002) outside the (e.g. single row) zone may correspond to a broadly ambiguous zone(s) as described before. By providing at least a sequence of interactions (e.g. tapping actions) on the said single row zone and/or the broadly ambiguous zone(s), the word predictive system may predict/propose a word. Fig. 452B, shows, for example, another type of arrangement of preferred letters assigned to said first zone is shown. Other letter(s), configuration of letters on a zone, number of corresponding zone(s), arrangement of said zone(s) on a touch sensitive surface, etc., may be considered by people skilled in the art. As an example, fig. 452C shows the two zones 452201, and 452202, including the preferred letters, and a broadly ambiguous zone 452203.

In the event that each zone/key represents a single identified character, providing a predefined interaction such as a long pressing action or a gliding action (e.g. preferably) on a larger zone corresponding a group of such zones/keys may correspond to entering one of another group of characters such one of a group of special characters or one of a group of non-preferred characters assigned to said larger zone (e.g. 452002 of Fig 452A).

According to one embodiment of the invention, providing short gliding action(s) or providing long gliding action(s) from/on a zone/key in a predefined direction may correspond to two different symbols such as two special characters and/or functions, and providing a predefined interaction such as a gliding action with any length in a (e.g. another) predefined direction may preferably correspond to a single character such as, preferably, a non-preferred character/letter.

According to one method, upon providing a predefined interaction such as a gliding action and/or a long pressing action with such a larger zone or with a zone/key of the keypad having at least one plurality of preferred characters, the corresponding other characters may be shown near the user's finger such that, preferably, substantially all of them may be visible to the user.

According to one embodiment, when the user switches to the precise letter mode, the system may show the non-preferred characters in one or more rows, based on any order, preferably, based on an alphabetic order.

According to one embodiment of the invention, preferably in the semi-predictive mode, if a word being entered (e.g. or already entered and then grabbed by a predefined interaction, for example by (e.g. single or double) tapping on it) is not in the dictionary, the user may switch the system into the precise letter mode. In this case, the user may tap on the (e.g. zone(s) corresponding to non-preferred) characters to replace at least some of (e.g. preferably all of) the (e.g. non-preferred) characters of the word. According to one embodiment of the invention, upon providing a predefined interaction such as a gliding action (in a predefined direction or trajectory) or, for example, a long pressing action from/on a (e.g. dynamic) zone anywhere on a (e.g. one line) keyboard and/or on a predefined location such as on/from a character such as a letter, may correspond to (e.g. precisely) enter a predefined character (e.g. a non-preferred or preferred character), (e.g. either alone or from a group of characters presented to the user).

Note that in the embodiments/principles described herein, zone(s) relating to one or more character(s) may preferably be considered by the system as part of a larger zone (e.g. the keypad/letters keys of the invention).

Note that, through this application, although the word 'zone' and/or 'key' is used to describe the relationship (e.g. relative distance) between two or more characters (e.g. preferred characters) to assign one or more characters to a corresponding input signal related to a user interaction with the keypad (e.g. the larger zone) of the invention, it is understood that different other parameter(s)/object(s) of description such as the distance between points/areas/characters/locations may be used to assign one or more characters to an interaction with the larger zone (e.g. including characters) providing an input signal to the system.

Fig 452D show another type of assignment/arrangement of letters to a (e.g. a larger) zone(s). In this example, the letters are arranged in two groups such that to have a (e.g. significant) space/gap 452302 anywhere between the groups. In this example, the space/gap 452302 relates to a broadly ambiguous zone as described herein.

According to one embodiment of the invention, by providing a predefined interaction, the system may enter into the precise character (e.g. letter) mode wherein the non-preferred characters and/or special characters/functions may be shown (e.g. on different zones) to the user, preferably in a straight line. The (e.g. non-preferred) characters may preferably be arranged in alphabetical order. An interaction with a zone corresponding to a character may enter said character precisely.

**INCLUDES SPCHARS in qwerty squeezed**

**key arrangement**

**2 long keys on each side**

**Sp, bs, under/above/between them**

Fig. 453A shows another method of arrangement of keys of the keypad of the invention, in this example, the keypad having the letter keys 453001 to 453004 (e.g. being split in to two groups and located on opposite edges of the display 453009 (e.g. touch sensitive screen of a device)). In this example, the space and backspace keys are grouped with the letters keys of each side (e.g. such as to form a row/column of keys). Note that, in this example, the boarder of the space and backspace keys are not shown. The space and backspace keys may be located above the letter keys, between the letter keys, under the letter keys, or beside the letter keys. In this example, the broadly ambiguous zone is located between the split keys.

**Main method**

Different methods of entering precise characters through the data entry system of the invention have been described before. According to one embodiment of the invention, when user interacts with a zone

assigned to a or related to a preferred character, in addition to entering said/a preferred character, the system may show in a location of the screen the non-preferred character(s) related to said key. As an example, as shown in Fig. 452A, if the user interacts with any zone related to a letter of a key (interacting with a zone relating to a letter of a key may herein be referred to as interacting with a letter on a key) such as the key 453004, the system may show the corresponding non-preferred characters BPQ (e.g. at a location 453011) on the screen 453009 of the device 453000. To each of said non-preferred characters a predefined zone (e.g. on the screen) is defined such that an interaction such as a tapping action on the zone relating to a non-preferred character may preferably enter said character precisely preferably by replacing the entered precise character. Note that, according to one method, the non-preferred characters relating to each key may preferably be printed next to the key, or close/on the key. The current embodiment of entering precise characters may be used/integrated with any of the methods of entering words such as Semi-predicted Mode and/or the Fully-predictive Mode of the invention.

According to one embodiment of the invention, when the user touches anywhere on the key all of the (e.g. preferred and/or non-preferred) characters related to said key may be shown on a location on the screen as described immediately above and interacted with as described immediately above. Fig. 453B shows an example of this embodiment wherein by providing a tapping action anywhere on the key 453004 the system has printed/displayed all the characters related to said key on the location 453111.

According to another embodiment, the system may include a means, for example, such as providing a predefined gliding action on/from a key so that to present/display all of the non-preferred characters (e.g. in a location) on the screen. In this case, interacting with a zone corresponding to a preferred and/or a non-preferred character may enter said character precisely. Fig. 453C shows an example of such an embodiment wherein the non-preferred characters 453301 are display (e.g. on a screen) for a given predefined interaction. Now the user can tap on any of the characters (e.g. letters) on the screen to enter said character(s) precisely.

Note that in the embodiments above, any of the preferred and/or non-preferred characters relating to a keys/zone of the keypad of the invention may include one or more of the commonly used special characters (e.g. such as "'" is included in a word such as "it's").

**[one line dynamic, can be place anywhere, any portion is dynamic]**

As mentioned before, the (e.g. preferred and/or non-preferred) characters (e.g. letters) of the invention may be grouped in various groups and assigned to various zone(s)/key(s) on a touch sensitive surface to for a keypad of the invention or said (e.g. preferred and/or non-preferred) characters may form a continuous sequence of characters on the surface (e.g. preferably a linear sequence) and wherein an interaction with any location of said sequence of characters may dynamically define a key/zone of the keypad of the invention, including the characters close to the touch impact on said sequence of characters. Said group of characters may be considered as an ambiguous key(s)/zone(s) of the invention. By receiving a sequence of one or more such ambiguous dynamic zone or key interactions the data entry system of the invention may predict one or more words accordingly. Accordingly, each of the considered ambiguous characters of such interaction may be printed/displayed on a screen in a separate zone such that an interaction with a zone corresponding to a character enters said character precisely (e.g. as described above).

Fig. 454A shows an example of the keypad of the invention, in this example, the limits of the borders of the Space and Backspace keys are demarked in the figure, but are not shown on the screen and/or keypad of the invention. As described throughout this application, gliding actions in predefined directions on/from the Space and/or Backspace key may be related to symbols such as functions and/or special characters,

letters such as, for example, accented letters, etc. In this example, said gliding actions are preferably provided on/from said key(s) towards preferably a plurality of preferred gestures (e.g. such as gliding actions) departing preferably anywhere on/from said key(s) in a direction such as left, upper-left, up, upper-right, and right.

Another method of entering precise characters may be considered. According to one embodiment of the invention, in order to entry a non-preferred character precisely, by considering the exemplary keypad of Fig. 454A, (e.g. during the entry of a word) when a user interacts with a (e.g. preferred) character (e.g. letter) on a key, said character may be printed/displayed in a corresponding word(s) in the word list proposed by the system. The user may then interact (e.g. tap) with said word and the system may propose/predict a new list of word(s) wherein all of their characters (e.g. zero of more characters) except the last character of the word resemble the corresponding characters of the interacted word and wherein the last character of said word(s) each include one of the non-preferred characters relating to the interacted key. Note that, said word list may also include word(s) other than those described immediately above.

Fig. 455 shows and example of the principles just described above, with a semi-predictive mode of the invention. In this example, in order to enter the word "AZARENKA" letter-by-letter precisely, a user may tap on the letter "A" then tap, for example, on the letter "S" of the key 455005. The system may propose a word list 455201 of a number of words including the word/precise-chain-of-characters "AS" (e.g. hereafter may be referred to as non-definite precise stem) and preferably some other words beginning with the letters "AS". In order to replace the letter "S" by the desired letter "Z", the user may tap on the word/chain-of-characters "AS" in the word list. Consequently, preferably, the system may propose a new word list 455202 including a number of words/chain of characters (e.g. "AC", "AG", "AU", and "AZ") (e.g. that herein may be referred to as "suggested chains of precise characters") each beginning with the letter "A" (e.g. the first letter of the non-desired word "AS") and each ending with a different one of the non-preferred characters corresponding to the key 455003 and wherein said words (e.g. preferably) have the same length as the non-desired word (e.g. such ) (e.g. Note that the system may also propose additional words (e.g. "ASK") beginning with the chain of characters "AS" in said word list). The user now may interact (e.g. tap) on the desired chain of characters (e.g. word) "AZ" to select it, and continue to tap on the characters "A", "R", "E", and "N" so that the system presents at least the chain of characters "AZAREN" in a word list 455203. Now, in order to enter the letter "K", the user taps on a letter such as the letter "N" on the key 455002. The system may propose the word/chain-of-characters "AZARENN" – this is not the desired chain of characters. The user may tap on said word and the system may propose a new word list 455204 including a number of words having the same number of characters as the word "AZARENN" and where in each of said words start with the chain-of-characters "AZAREN" and where in each of said words end with one of the non-preferred characters (e.g. "C", "G", "U", and "Z") corresponding to the key 455003. Now the user selects the word "AZARENK" in the word list 455304 and type on the letter "A" on the key 455002 to complete the desired word (e.g. letter-by-letter precisely).

Fig 456 shows the principles of this embodiment used with the fully predictive mode of the data entry system of the invention. In this example, in order to enter the word "AZARENKA" the user first interacts (e.g. taps) with the letter "A" and then interacts with the letter "L" of the key 454002. The system proposes the ambiguous word "AS" and the precise chain of characters "AL" in a word list 456301 that also includes at least one more word (e.g. "NET") preferably (e.g. ambiguous) related to the interactions with the keys 454002 and 454003. The precise characters "AL" is are not desired by the user. The user interacts with said precise chain of characters "AL". Consequently, preferably, the system may propose a new word list 456302 including a number of words each beginning with the letter "A" (e.g. the first letter of the non-

desired word "AL") and each ending with a different one of the non-preferred characters corresponding to the key 455003 and wherein said words (e.g. preferably) have the same length as the non-desired word (e.g. Note that according to a first method, the system may also propose additional words (e.g. "ALBERT") beginning with the selected chain-of-characters "AL", and that according to a second method, the system may propose additional words by considering the key interactions as ambiguously corresponding to any of the characters of the corresponding keys). The user now selects the chain-of-characters "AZ" and continues to enter the rest of the characters as described in the example of semi-predictive mode.

Note that, according to a preferred method, preferred and non-preferred characters related to the keys of the keypad of the invention having four letter keys are grouped such that letters the key 454001 stand on one point, and letters on the key 454002 stand on two points, and letter on the key 454003 stand on a wide base, and letters on the key 454004 containing substantially a closed circle, as described before and in previous applications filed by this inventor.

Note that, according to one method, the keypad of the invention may preferably have a broadly ambiguous zone as described throughout this application. According to another method, all of the preferred and non-preferred characters related to the keys (e.g. four keys) of the keypad of the invention, as described, may be considered as preferred characters. Such keypad may preferably, not include a broadly ambiguous zone and may be used with the word predictive data entry system and use the methods of entering precise characters as described throughout this and previous applications filed by this inventor. As an example, in the examples of Fig. 453B, each of the keys 453001 – 452004 may be assign to all of the preferred and non-preferred characters related to any of said keys as display on and near each key. All of said ambiguous keys may be used by the word predictive system of the invention. Additionally, for example, according to a preferred method, when the user interacts with the key 453002 all of the characters assigned to said key may be shown in a location on a screen where interacting with any of said characters may enter said character precisely as described before.

According to one embodiment of the invention, each of the preferred letters/characters may correspond to some non-preferred letters/characters. Fig. 457A shows four different types of relationships between the preferred and non-preferred letters/characters (e.g. such as the relationship shown in the line 457301 and its corresponding key configuration as shown in Fig. 457B. In this example, the non-preferred characters "BC" are related to the preferred character "A", the preferred character "D" has no relationship with any non-preferred character, and so on.). Such relationship is shown in the example of Fig. 457B in such a way that, for example, for the group of characters "E,F,G,H" the preferred character "E" is displayed on the key and the last non-preferred character of the group is shown preferably outside the key, near said preferred character "E". In this example, the preferred character "S", "R", "N", "D", have no group relationship. The above principles may be used for entering precise characters.

In the examples of Fig. 454A to 456, when a user interacts with any preferred character, the corresponding non-preferred characters are a similar group of characters, while in the immediate example above, interacting with each of the preferred characters corresponds to a different group (e.g. of one or more) of non-preferred characters, if any. The principle of entry of precise characters related as such may be similar to those described from Fig. 455 through to Fig. 456 with the difference that here the related non-preferred characters used for entering characters precisely are those characters assigned/related to said preferred characters.

The assignment of non-preferred characters to preferred characters, in the current embodiment, may be of any kind such as alphabetical order, QWERTY order (e.g. "Q" assigned/related to "W" and e.g. "M", "V", "B" assigned/related to "N"), shape order (e.g. "K", "H", "X" assigned/related to the preferred character "A"),

etc. Note that in the current embodiment any other type (e.g. arbitrary) assignment/relationship between a preferred and corresponding non-preferred character(s), if any, may be considered by those skilled in the art.

In the embodiments above, for entering characters precisely by using the non-preferred characters assigned to a preferred character, according to one method, when the user interacts with a chain-of-characters corresponding to the non-definite precise stem, the system may replace the last character of the non-definite precise stem by the first related/assign non-preferred character and so on, until the system replaces set character with the desired non-preferred character corresponding to the preferred character. After entering precisely the preferred character "A", if the user interacts with the character "E", the system may show the stem "AE". If the user taps one time on that stem in the word list, the system may propose the stem "EF". If the user interacts (e.g. taps) with the stem "EF" the system may propose the stem "EG". Interacting with the stem "EG" will cause the system to provide "EH" wherein "H" is the last non-preferred character relating to the preferred character "E". As such, any non-preferred character corresponding to a preferred character may be entered using this method of multi-tapping on a proposed stem and may be used for entering characters precisely, letter-by-letter and mentioned before in various embodiments.

Figs. 458A to 459B show various examples of entering characters precisely during the entry of words and the corresponding words proposed by the system.

**applies to fully predictive and semi predictive**

**on the keys show the first and the last char of each key (if alphabetic)**

**LETTERS SHAPES**

**Manually - include spchars as non-preferred choices**

According to one embodiment, the non-preferred may be hidden or shown (displayed) next to the keys based on the uses manual interaction, or automatically according some system criterion/criteria.

**show different possibilities of alpha order**

**tap on precise word 1 time**

**- show candidates**

**- change the precise to the next letter**

**non preferred can be alphabetic**

**qwerty**

**4k**

**include spchar in qwerty**

**gestures for symbol**

**long press to show all symbols**

**any number of keys**

**- with/without zone**

**show/hide non-preferred chars**

**a word is entered**

**10 keys x2 2k x 3 used with fully predictive/semi predictive**

Note that the keypad of the invention may be of any kind configuration of keys/zones and various assignments of characters to said keys/zones. As an example, the keypad of the invention may have 10 keys each having one preferred character related/assigned to one non-preferred character, and 2 more keys each having one preferred character related/assigned to two non-preferred characters, wherein preferably one of the non-preferred characters of said two non-preferred characters is the one that is used less often (e.g. has lowest frequency of use among the letters of a language, e.g. 'Z' and 'X' in a Roman based language).

**kp can include , -**

Note that the non-preferred characters may including special characters too.

**provide a gesture on a key for other letters to be shown**

**choice of letter always anywhere on the screen**

- **First**
- **Current**

According to one correction embodiment, after the user provides interaction with a key, the system may preferably show at least the corresponding non-preferred characters (e.g. the system may show all/any of the non-preferred characters too) on a location of the screen for entering any of the characters precisely, as described before. According to one embodiment of the invention, when the user continues to interact with the key(s), the non-preferred characters shown as such corresponding

to the first key interaction may remain on the screen. As an example, after providing the input information corresponding to a desired word, if the user's word is not in the dictionary, the user may proceed to correct the entered chain-of-characters. For that, if the first character of the desired word is a non-preferred character, the user may tap on a desired letter of the group of non-preferred characters corresponding to the key of the first key interaction which is shown on the screen, if not, the user may, for example, tap on the desired preferred character. Now the system may show the non-preferred characters corresponding to the following key interaction of the user, and so on.

**Tap on a group of non-preferred chars to open them**

**Press-and-hold on a letter key to open the none-preferred chars**

- **Open them in/closed-to the wordlist**

According to one embodiment of the invention, (e.g. each of) a group of non-preferred characters may have its own corresponding zone on a/the touch sensitive surface, and wherein interacting with said zone may enlarge said zone or may result to show the (e.g. enlarged) corresponding characters on a location on the screen as described before (e.g. the zone corresponding to the enlarged non-preferred characters may herein be referred to as the non-preferred characters' enlarged zone). As an example, Fig. 460A, a tapping on (e.g. the zone corresponding to) the non-preferred characters 460021 may result to proposing the enlarged corresponding non-preferred characters in a zone 460022 near the word list 460011 on the screen 460009 of a device 460000.

**Non-preferred chars have Alphabetical order**

Note that the non-preferred characters may be grouped according to any type of arrangement such as for example alphabetical arrangement. In the exemplary Fig. 460B, the non-preferred characters are arranged in four (e.g. separate) groups in 460111-460114 in an alphabetical order.

**Press-and-hold on/gesture from a preferred letter for a non-preferred letter**

According to one embodiment, each (e.g. of the preferred) letters/characters may have at least one related character/letter such as a non-preferred character. By providing a predefined interaction such as a gliding/long-pressing action with a (e.g. zone corresponding to a preferred) character/letter, the system may enter the corresponding (e.g. non-preferred) character (e.g. preferably, precisely). As an example, in Fig. 460C, a long pressing action or a gliding action from/on the (e.g. zone corresponding to the) letter "S" may correspond to entering the letter "Z". Accordingly, a gliding action upward from/on the (e.g. zone corresponding to the) letter "L" may correspond to entering the letter "C", and a gliding action downward from/on the (e.g. zone corresponding to the) letter "L" may correspond to entering the letter "U".

**Each of the None-preferred chars can have its own key**

Note that other types of arrangement of non-preferred characters and other methods of entering a non-preferred character may be considered. As an example, according to another method, each of the non-preferred characters may have its own zone, wherein upon interacting with one of said zones the system may preferably enter the corresponding character precisely.

**2 times tapping on non-preferred chars:**

- **Is not possible, because after the 1st tap they disappear**
- **1 correction + 1 insertion**

- **2 corrections on a same letter position**

**When selecting a first non-preferred char the relating (non-preferred/preferred) char appears (e.g. bh ch ck gh kh ph qu xx zh ex:c-->h for ch)**

According to one embodiment of the invention, according to a first method, after the user selects a non-preferred character in the non-preferred characters' enlarged zone, said non-preferred character replaces the corresponding preferred character and said zone disappears.

According to a second method, after said selection of said non-preferred character, said zone remains displayed on the screen and subsequently selecting another character from said zone, replaces the previously selected non-preferred character.

According to a second method, after said selection of said non-preferred character, said zone remains displayed on the screen and subsequently selecting another character from said zone, appends the corresponding selected character to the previously selected non-preferred character.

According to one embodiment, a (e.g. non-preferred) character may be related to one or more (e.g. pre-defined) corresponding (e.g. non-preferred) characters. According to one method, after said selection of a (e.g. non-preferred) character from the non-preferred characters' enlarged zone, said one or more (e.g. pre-defined) corresponding (e.g. non-preferred) characters are displayed in the non-preferred characters' enlarged zone and available for selection to be preferably be appended to the previously selected non-preferred character. As an example, after selecting the letter 'C' from the non-preferred characters' enlarged zone, the system may show the corresponding related characters (e.g. 'K', 'H', etc.) and the user may select a related character to, for example, enter (e.g. two) consecutive (e.g. non-preferred) characters (e.g. 'CK').

  - **All in predictive**
  - **Non-preferred in precise**
- **Press and hold a key for it's symbols or for all symbols. then tap**

According to one embodiment of the invention, a press-and-holding action on a key/zone may bring up (e.g. display) the corresponding symbols (e.g. such as special characters of at least said key). According to one method, the user may interact (e.g. tap) any of the symbols to enter said symbol. According to another embodiment, a predefined gliding action provided on any key may enter a corresponding symbol (e.g. such as a special character or function) of said key.

**Preferred/non preferred Char can include spchars**

- **Can be any number of characters relating to a key/zone**
- **zone can be dynamically defined**
  - **chars can constitute one/two/more lines**
    - **(no predefined in several keys)**
    - **Can belong to several groups depending on where the user interacts/taps**

Note that in the embodiments described throughout this application, a zone/key described may be dynamically defined based on the location of interaction with the keypad (e.g. including preferred characters) of the invention as described before. In this case, according to one method, the relationship/assignment of the non-preferred characters corresponding to one or more preferred

characters that are considered by the system based on such an interaction(s) may also be dynamically defined.

**Enter the beginning and the last portion of a word to enter it**

- **Inform by a gesture**

According to one embodiment of the invention, during the entry of the input information corresponding to a word, a user may provide a predefined interaction, such as a gliding action in the broadly ambiguous zone, to inform the system that the input information corresponding to a next portion of a word will not be provided by the user, hereafter referred to as the 'skipped portion'. After said interaction, if the user provides input information, the system relates said input information to a next portion of the desired word. The length and/or the corresponding characters of the skipped portion may be dynamically defined by the system, by considering the a predefined criterion and/or by considering the contents of a dictionary/word database, by, for example, finding words that match, preferably, all the/said input information relating to the entry of a word.

As an example, the user may enter a beginning and a last portion of a word, and the system may accordingly propose corresponding words that begin and end with said portions of a word.

**Threshold to make search**

According to one embodiment of the invention, after a predefined time interval, starting from the end or beginning of the user's last interaction (e.g. pressing on a key), the system may preferably begin to process the input information, by, for example, searching a dictionary/word database and may select words for proposal to the user.

**Threshold to show the word list**

According to one embodiment of the invention, after a predefined time interval, starting from the end or beginning of the user's last interaction (e.g. pressing on a key), the system may preferably display/propose word(s) (e.g. in the form of a word list) to the user.

**Show all new keymaps**

Fig. 461A shows another type of assignment of special characters to the keys of the keypad of the invention. Fig. 461B shows another type of assignment of special character and functions to the keys such as the Space and the Backspace keys of the keypad. In this example, up to eight gliding actions in various directions may each correspond to a predefined character or function. Optionally, two gliding actions, each having a different length, provided in a same direction, may each correspond to a different character. For example, a short and long gliding action in the direction 461011 may correspond respectively correspond to a first and second character (e.g. '?' and '¿').

**Picture Editing**

**Reserved location on a picture offered by a buyer**

**Before or after others**

**Horizontal gesture for other actions (e.g. navigate in the history of that pic)**

According to one embodiment of the invention, providing (e.g. first predefined) gesture(s) to the system, in a (e.g. horizontal) plane may preferably control the display and/or access to information of the history relating to the content (e.g. message/image which is one content in a discussion/channel/topic/thread) on which the user provides said gestures. Such gestures can, for example, be leftwards and rightwards gliding gestures. For example, if the user glides to the left on an image, the system may display a previous/initial/earlier content relating to said image given the present content displayed at that time. If the user glides to the right on an image, the system may display a next/last/later content relating to said image given the present content display at that time.

**Vertical gesture for all subjects history**

Preferably, providing (e.g. second predefined) gesture(s) to the system, in a (e.g. vertical) plane may preferably control the display and/or access to information of the history relating to the sequence of content (e.g. message(s)/image(s)) in a discussion/channel/topic/thread on which the user provides said gestures. Such gestures can, for example, be upwards and downwards gliding gestures. For example, if the user glides upwards on a discussion/channel, the system may display a previous/initial/earlier message content (e.g. in some predefined rendering state) relating to said discussion/channel given the present message content displayed at that time. If the user glides downwards on a discussion/channel, the system may display a next/last/later message content (e.g. in some predefined rendering state) relating to said discussion/channel given the present message content displayed at that time.

- **Public**

According to one embodiment of the invention, the public sequence of content (e.g. message(s)/image(s)) in a discussion/channel/topic/thread may be controlled by access control mechanisms (e.g. such as allowing unauthenticated users) to view and manipulate (e.g. add, modify, etc.) new and/or existing content(s) in a sequence of content. Such access controls may, preferably, be setup/controlled/manipulated by one or more authenticated users, and at least, initially, by the initial user or group of users who established (e.g. setup and enabled access to) the said sequence of content.

- **Private group**

According to one embodiment of the invention, the private sequence of content (e.g. message(s)/image(s)) in a discussion/channel/topic/thread may be controlled by access control mechanisms (e.g. such as allowing to only identified and authenticated users or groups of user) to view and manipulate (e.g. add, modify, etc.) new and/or existing content(s) in a sequence of content. Such access controls may, preferably, be setup/controlled/manipulated by one or more authenticated users, and at least, initially, by the initial user or group of users who established (e.g. setup and enabled access to) the said sequence of content.

- **Person to person**

According to one embodiment of the invention, the person-to-person sequence of content (e.g. message(s)/image(s)) in a discussion/channel/topic/thread may be controlled by access control mechanisms (e.g. such as allowing only two identified and authenticated users) to view and manipulate (e.g. add, modify, etc.) new and/or existing content(s) in a sequence of content. Such access controls may, preferably, be setup/controlled/manipulated by the (e.g. two) authenticated users who established (e.g. setup and enabled access to) the said sequence of content.

**Press and hold to see the pic without text**

According to one embodiment of the invention, providing an interaction, preferably a pressing-and-holding action on a content, such as an image, may preferably display said content without any additional content such as said text (e.g. on it).

**Gesture to see/write more comments on the back**

According to one embodiment of the invention, providing an interaction, preferably such as a gliding action on a content (e.g. such as an image), may preferably display additional content relating to said content (e.g. image). Said additional content may be one and/or a combination of other contents such as: images, text, hypertext links, audio, link(s) to other content(s), or a link(s) to another sequence of content.

**EyeFreeDial**

A method of entering (e.g. dialing) (e.g. telephone) numbers is described hereafter:

According to one embodiment of the invention, supported by the exemplary Fig. 462, an input system using a virtual dynamic keypad in the form of a telephone type keypad may be used for entering numbers. Preferably, the input interface of the system the input interface of said system may include substantially the whole touch sensitive surface used by the system, such as a (e.g. touch sensitive) screen (e.g. touch screen 462009) of a device. When the user touches the input interface, the system may dynamically locate said virtual dynamic keypad under the finger of the user such that the key (e.g. 462005) corresponding to the character '5' (herein referred as the key '5') of such keypad may be located at the impact point of the touching action. If the user removes his finger from the touch sensitive surface, the system enters the character '5'. Alternatively, after touching the screen and relating the said impact point to the key '5', the user may provide a sliding action towards another key of the virtual keypad model. Note that the user does not have to a specific location, but rather slide in a specific direction of a corresponding key. For example, to enter the character '3', the user touches the screen and slides towards the upper-right. For example, preferably to enter the character '8', the user touches the screen and slides (e.g. not a long gesture) downwards. To enter the character '0', the user slides a long gesture downwards. These matters have already been described in detail through various patent applications filed by this inventor.

With continuous description of the current embodiment, after entering a sequence of digits corresponding to a telephone number, a predefined interaction such as a gliding action including a press-and-holding action towards a predefined direction, such as rightward, on a touch sensitive surface may preferably dial the corresponding number. Note that, providing said interaction at any moment, may preferably relate to dialing the last entered number (e.g. may be used to redial a number). After dialing a number, a predefined interaction such as a tapping action on the touch sensitive surface may preferably terminating the call or dialing process. A predefined interaction such as a long-pressing action on the touch sensitive surface may preferably delete a previously entered character. A predefined interaction such as a press-and-holding action towards a predefined direction, such as leftward, on a touch sensitive surface may preferably delete all previously entered characters.

Accordingly, for star (*) or pound sign (#), after touching the touch sensitive surface, the user may provide a long slide in the direction corresponding to any of them.

According to one embodiment of the invention, the system may store predefined (e.g. telephone) number(s). Such (e.g. telephone) number(s) may be related/associated by the system to predefined directions or gestures on a touch sensitive surface. A predefined interaction/gesture, such as a slide-and-

hold action, in a said predefined direction on the touch sensitive surface, may preferably dial said predefined (telephone) number. The minimum length/lapse of time corresponding to the hold portion of the slide-and-hold interaction/gesture may be predefined. The minimum length of the interaction/gesture may be predefined. These minimum length parameters may be adjusted by the user and/or the system according to an arbitrary requirement(s). Instead of the slide-and-hold action immediately above, a predefined interaction/gesture, such as a slide with two fingers (e.g. without holding), in a predefined direction on the touch sensitive surface, may preferably dial said predefined (telephone) number.

With continuous description of the current embodiment and previous embodiment of the invention, after entering a sequence of digits corresponding to a (e.g. telephone) number by predefined interactions, as already described above, a predefined interaction, such as a particular predefined gesture that causes the system to dial a (e.g. telephone) number, may preferably cause the system to store (e.g. for later use/retrieval) and relate/associate said sequence of digits with said particular predefined gesture for (e.g. speed) dialing.

**Speed Dial**

**1st choice – from a/the telephone book/contact list (of the device)**

- **Enter a digit from 0-9 by gesture**
- **Provide the predefined Dialing gesture**
  With continuous description of the current embodiment, the dialing system may include a means (e.g. a predefined gliding action) for dialing a phone number by selecting it from a list (e.g. of phone numbers). In this case, the user may enter the entry number of the list that corresponds to the desired number. The entry number may be entered by entering said number using the gesture/gliding action(s) to enter digits as described. After entering the desired entry number, the user may provide a predefined interaction such as a gliding action including a press-and-holding action (e.g. for example, a glide-and-holding action rightward on the touch sensitive surface) to select entry number from the list and dial said entry number.

According to one method, said list may be a list such as the contact list of the device, a select/speed-dialing list (e.g. native of the device, or created through the dialing system of the invention).

Speed Dial a number

- Slide and hold or slide with two finger, towards a number

Note that in the virtual dynamic keypad may not be shown on the screen (e.g. at least) during user's interaction on the screen for entering a number and other corresponding functions described above.

**Alphabetical order**

As mentioned before the, the letters (e.g. all of the letters, preferred and/or non-preferred letters, etc.) of the keypad may be arranged in alphabetical order. Fig. 462A shows, as an example, the keypad of the invention having a plurality (e.g. four) of letter keys (e.g. 462001 to 642004) on and/or next to which the preferred and non-preferred characters are arranged/presented in alphabetical order. In this example, the preferred characters are shown on the keys (e.g. TWY on the key 462004), and the non-preferred characters are shown outside the keys (e.g. letters UVXZ 462021 on the key 462004). Such a keypad may be used with a data entry system such as the word predictive (e.g. fully-predictive and/or semi-predictive) data entry system of the invention. As an example, for a preferred letter, the user may preferably tap on a key, and for a non-preferred character the user may preferably tap on the broadly ambiguous zone 462007

between the keys. The use of preferred and non-preferred characters by a data entry system such as a word predictive system to predict words has already been described in detail.

In this example, the keypad may also include additional key(s) such as a Space key (462005) and/or a Backspace key (462006), which may also include additional function(s).

Note that, In the current embodiment, the preferred characters and/or the non-preferred characters, may be defined/modified based on the parameters such as thr accuracy of prediction in different languages while keeping the alphabetical order. Fig. 462B shows, as an example, an arrangement of letters on a keypad. In this example, the definition of the non-preferred characters and preferred characters of Fig. 462A are slightly modified, and are shown on the keys (462101 to 462104) of the keypad in small font, and the preferred characters are printed in a large font. In this example, the keypad may preferably include at least a broadly ambiguous zone (462107). Note that, the number of preferred characters assigned to a key are shown as an example and may vary.

Note that all of the letters of an alphabet may be assigned to the keys of a keypad as preferred characters. In this case the keypad may not include a broadly ambiguous zone. For example, in the examples above, all of the letters may be assigned to the (e.g. four) keys in alphabetical order.

With continuous description of the current embodiments, according to a first method, for a key interaction, the system may present the non-preferred characters (e.g 462021) in an enlarged format (e.g. 462022) (e.g. so that the user can precisely enter a non-preferred character by tapping on it) as described before. According to a second method, for a key interaction, the system may present all of the character of said key in an enlarged format preferably so that the user can precisely enter a character. According to a third method, for a key interaction, the system may present any number of predefined characters (e.g. in an enlarged format) preferably so that the user can precisely enter a character.

Fig. 465 shows a preferred arrangement of preferred characters (e.g. shown in large font) on the keys/zones of the keypad of the invention. In this example, the non-preferred characters (e.g. shown in small font) are also shown on the keys, but preferably, as mentioned before, according to a preferred method the non-preferred characters may be assigned to the broadly ambiguous zone 465007. Note that, as mentioned before, the broadly ambiguous zone is preferably part of the keypad of the invention.

Fig. 465A shows another preferred arrangement/assignment of the preferred and non-preferred characters of the keypad of the invention.

Fig. 465B shows an example of a linear arrangement of the keys and the arrangement/assignment of preferred and non-preferred characters of the keypad of the invention. In this example, a zone (e.g. not shown) outside said keys may be considered by the system as a broadly ambiguous zone of the keypad of the invention.

Fig. 465C shows an example of a linear arrangement/assignment of the preferred and non-preferred characters of the keypad of the invention. As mentioned before, when a user interacts with a zone on such a keypad, the systems considers/relates (e.g. ambiguously and/or precisely) a number of characters near the impact point of the user's interaction. In this example, the preferred characters that are shown in large font, are printed on the keypad (e.g. zone) such that the user may enter (e.g. precisely) the preferred characters by interacting with them. According to one method the system may (e.g. also and preferably simultaneously) consider said preferred character and the nearby characters as ambiguous characters.

According to one method, if the user interacts with (e.g. a zone corresponding to) non-preferred character(s), the system may consider the nearby non-preferred characters as ambiguous characters. According to one method, after such interaction, the system may also enlarge said characters and optionally the nearby preferred characters, so that the user can enter any of said considered characters precisely. Note that a sequence of such ambiguously entered characters and optionally the precisely entered characters, may be considered by the word predictive system to predict word(s).

Fig. 465D shows another type of keyboard similar to keyboard 465300 of Fig. 465C where in this example, all the characters (e.g. preferred and non-preferred characters) are arranged close to each other to reduce the size of the keypad.

**QWERTY order**

As mentioned before the, the letters (e.g. all of the letters, preferred and/or non-preferred letters, etc.) of the keypad may be arranged in the order of a standard (e.g. QWERTY) keyboard. Fig. 463A shows, as an example, a keypad of the invention including a plurality (e.g. four) of letter keys (463001 to 463004). The preferred characters (e.g. 463011) are shown in large font and non-preferred characters (e.g. 463012) are shown in small font on the keys of the keypad. According to one method, for preferred characters, the user may tap on the keys and for non-preferred characters the user may tap on a broadly ambiguous zone (not shown) outside said keys. Preferably the keys of the keypad may have different forms so that together, they constitute a QWERTY-like keyboard. In this example, the boarders between keys are shown by lines (463021 to 463023). Such keyboard may also be used with a data entry system as mentioned before. Note that, the preferred characters assigned to a key are shown as an example and may vary. For example, in Fig. 463A, the character 'N' was presented as a preferred character (e.g. shown in large font) and the character 'M' was presented as a non-preferred charater, and in Fig. 463B, the character 'M' 463111 is presented as a preferred character, and 'N' 463112 is presented as a non-preferred character. Also note that the number of preferred characters may vary, accordingly as required.

It must be noted, that a keypad of the system having a QWERTY arrangement, may have any number of keys.

Fig. 463C shows the keypad 463B in a split configuration having two portions each have two keys. In this example, the keys 463201 and 463202 form a first portion of the keypad and the keys 463203 and 463204 form a second protion of the keypad. Said portions are separated by a broodingly ambiguous zone 463207.

The keypad of the invention, as described above, may be resized, for example, to be in large format and.or in compact format. Fig. 463D shows a preferred embodiment of the invention, in this example, the keypad 463C is shown in a (e.g. vertically) compact format. In this example, the keypad includes additionally keys 463305 and 463306 relating to, for example, Space and Backspace as described throughout this application by the inventor. When a user touched a key, the non-preferred characters related to said key (e.g. 463304), may be shown in an enlarged format (e.g. 463332) so that the user may be able to enter at least one of them precisely. In this example, a word list 463331 presenting words corresponding to the input information provided by the user is also shown.

Note that all of the letters of an QWERTY-like keypad may be assigned to the keys of a keypad as preferred characters. In this case the keypad may not include a broadly ambiguous zone. For example, in the examples above, all of the letters may be assigned to the (e.g. four) keys in QWERTY-like keypads.

Note that letter arrangements other than Alphabetical and/or QWERTY-like keyboard arrangements may be consider by people skilled in the art based on the principles described above.

Such a keypad may be used with a data entry system such as the word predictive (e.g. fully-predictive and/or semi-predictive) data entry system of the invention. The use of preferred and non-preferred characters by a data entry system such as a word predictive system to predict words has already been described in detail.

It must be noted that in examples above, that although these embodiments, methods, principles, and examples refer to the use of keys, such keys are preferably zones on a touch sensitive surface such as a touchscreen.

It is understood that instead of a QWERTY-like keyboard, any other keyboard having any number of keys any character assignment, etc. may be used.

**Dynamic/Half dynamic**

- **Based on all / based on preferred**

As mentioned before, the data entry system of the invention may use a keyboard such as an on-screen (e.g. Alphabetically ordered, QWERTY-like, etc.) keyboard on a touch sensitive screen relating to an electronic device. As mentioned before, when user interacts with the keys, he may tap in an area of the keyboard being close to the character that the user intended to enter. The system may consider at least some of the neighboring character relating (e.g. near, around, or corresponding predefined characters) to the pressed area (e.g. zone). This may provide a set of ambiguous characters for each interation with the keyboard. By providing a sequence of such interactions, the user may dynamically provide an ambiguous input information to the data entry system (i.e. each of the number of such interactions with the keyboard may be related to at least one character such as a letter, such as to duplicate a virtual key interaction corresponding ambiguously corresponding to one or more characters). Note that, even if there are non-preferred characters presented on the keyboard, according to a preferred method, the system may consider only the preferred characters relating (e.g. near, around, or corresponding predefined characters) to the interaction with the keyboard. As an example, by considering Fig. 464A, when a user interacts with the keyboard at the touching/interaction point 464011, the system considers at least the letters 'E', 'R', and 'D' as ambiguously corresponding to said interaction. These matters have already been described in detail.

**The advantage of Preferred Characters in a Word Predictive System**

Preferred characters, in general, constitute about 70-80 percent of the characters that are typed. By considering that a that a good quality database may include 99% of the words used by an average user, and also by considering that an average word (e.g. in the English language has 4.5 letters), an average user may only be required to precisely enter about 1 non-preferred letter for 400-500 key interactions on average while using a (e.g. word predictive) data entry system based on preferred- and non-preferred character principles (e.g. as described above through this and other patent applications filed by this inventor). This permits a simplified and reduced user interface (e.g. keyboard) while maintaining high prediction accuracy of data entry. For devices (e.g. mobile phones, tablet computers, etc.) that include small screens, such a reduced keyboard is essential.

**After select**

- **cands**

**reverses kb**

- **replaces char**
    - **cands**
- **replaces until end**

According to one embodiment, during the entry of a word, the letters of one of the words presented in the word list may be those letters that the user has tapped on them on the corresponding keys, and the remaining one or more characters of said word corresponding to user's interaction with the broadly ambiguous zone may be presented by a predefined character such as a blank character (e.g. such word may hereafter be referred to as an incomplete word). According to one method, if the user selects said incomplete word, it may become the current predicted word and the system may enter into a correction procedure by switching the keypad into another layer wherein the non-preferred characters may preferably be enlarged (e.g. and the preferred characters may preferably be shown in reduced size) so as to be easily accessible to the user interaction with them. In this case, an interaction such as a tapping action on a (e.g. enlarged) non-preferred character (e.g. on a key) may replace a (e.g. preferably, the first) corresponding predefined character(s) of the (e.g. current (e.g. note that after each replacement the next predefined character of the incomplete word becomes the first predefined character of that word)) incomplete word by said non-preferred character. This procedure may be repeated to replace more (e.g. all of) said predefined characters by non-preferred characters. Note that, each time the user replaces a predefined character (e.g. by a non-preferred character), the system may propose one or more words from the database used by the system corresponding to the input information provided until then. As an example, in Fig. 466A, the system is in fully-predictive mode. In this example, the user desires to enter the word "wooter" which is not in the dictionary. After tapping outside the keys for the letter 'w' and tapping precisely the letters: 'o', 'o', and 't' and then tapping outside the keys for the letter 'e' and finally tapping on the letter 'r', in addition to predicting some words, as shown in the word list 466011, the word list may include an incomplete word 466021, wherein the letters 'w' and 'e' corresponding to the user's taps outside the keys are missing and each of them is preferably represented by a blank (e.g. space) character. Fig. 466B shows a similar approach when the system is in semi-predictive mode. In this example, the predicted words in the word list 466111 include the precise letters entered by the user. (e.g. For any of said modes) If the user selects an incomplete word 466121 (e.g. by tapping on it), said incomplete word is preferably selected as the current predicted word. At this time, as shown in Fig. 466C, the system (e.g. the keypad) may preferably automatically be switched to the

non-preferred mode/keypad (e.g. having letter keys 466201 to 466204 that include enlarged non-preferred characters) as described above (e.g. Note that preferably, tapping on any zone of the keypad in the non-preferred mode, may preferably correspond to precisely entering a non-preferred character and preferably not correspond to a preferred character which preferably is shown in a small font). Now the user may tap on the letters 'w' and 'e' to respectively replace the first and second predefined (e.g. blank) characters of the incomplete word to provide the word "wooter" 466131. Preferably after the word is completed, the system (e.g. the keypad) switches back to the preferred mode, so that the user may be able to append characters, if desired. Note that after the selection of an incomplete word, the system may propose additional words that preferably include the precise characters of the incomplete word. Additionally, after a predefined (e.g. blank) character of an incomplete word is replaced by a precise character, the system may predict/propose additional words that may preferably include all of the precise characters of the incomplete word. According to one method, before selecting an incomplete word, the user may activate a next function (e.g. by sliding down on a word list) so that the system proposes more words, if any, corresponding to the input information provided by the user until then. Preferably, after the activation of the next function, the system may preferably still include the incomplete word in the new (e.g. updated) word list.

The use of an incomplete word(s) and its completion may preferably be used to enter words that are not in the dictionary and/or accelerate the entry of uncommon words that are in the dictionary.

According to another embodiment of the invention, preferably when the system is in the fully-predictive mode (e.g. this embodiment may also be applied to semi-predictive mode), any (e.g. all) of the character(s) of an incomplete word (e.g. including the predefined (e.g. blank) character) may be considered by the system as requiring correction. In the current embodiment, after the user selects an incomplete word, for each of its characters the system may show the keypad in the mode (e.g. preferred and non-preferred) of the corresponding letter. In this case the user may enter each of the characters of the incomplete word one by one. Accordingly, if a to-be-replaced character of the incomplete word is the desired character (of the user), then the user may provide a predefined interaction (e.g. by tapping between the keys) to skip said character, except in the case of a blank character. In this embodiment, even if a precise character is mis-entered (e.g. to-be-replaced character), when the system is in the preferred character mode, tapping on any character of any key/zone may replace said to-be-replaced character.

**New letter arrangement**

Fig. 467A shows another method of (e.g. alphabetic) arrangement of letters of a keypad of the invention having four keys 467001-467004 and a broadly ambiguous zone 467007. Different scenarios may be considered, such as:

(1) According to one embodiment (e.g. hereafter may be referred to as the preferred scenario)(e.g. preferably, in the fully ambiguous mode), each of the keys represents the letters displayed on it,. The remaining letters are (e.g. t, u, v, w, x, y, z, not shown) represented by the broadly ambiguous zone 467007. According to one method, in this example, in order to enter a word, and interaction such as a tapping action on a key/zone may ambiguously correspond to any of the letters on said key/zone. As such, a sequence of interactions with key(s)/zone(s) may correspond to one or more words of a database used by the system. Note that according to one embodiment, the characters/letters assigned to the broadly ambiguous zone may be displayed on said zone or anywhere on the screen. Note that, according to one embodiment, the boarders of the broadly ambiguous zone may be displayed on the screen. In the example Fig. 467A, the broadly ambiguous zone 467007 is the zone preferrably between the letter keys and the space and backspace keys. In this example, the borders of the broadly ambiguous zone are not displayed.

(2) According to one embodiment, (e.g. preferably, in the semi-predictive mode), interacting with a key, may correspond to any of the preferred characters assigned to said key (e.g. in this example, the preferred letters displayed on a key are shown in large font, while the non-preferred letters are shown in small font). Interacting with the broadly ambiguous zone 467007 may preferably correspond to any of the non-preferred letters (e.g. small) shown on the keys (e.g. b, g, j, k, m, p, q) and the rest of the letters of the language that are not shown (e.g. t, u, v, w, x, y, z).

(e.g. In the embodiments above) optionally, according to one method, a predefined interaction such as tapping on any of the letters of a key may identify said letter and entering it (e.g. here in may be referred to as precisely entering a character/letter). According to a second method, a predefined interaction such as a tapping action on any preferred letter may precisely enter said letter. Accordingly, another type of interaction such as a (e.g. short) gliding action from a preferred character towards a non-preferred character may precisely enter said non-preferred character.

As an example, in Fig. 467A, a tapping action on the letter C may precisely enter said letter and a gliding action 467011 from the letter 'C' (e.g. or from the letter 'A') towards the letter 'B'may precisely enter said letter. Note that: a single preferred character may be related to two or more non-preferred characters from entering said non-preferred character precisely. Aslo note that a single non-preferred character may be related to two or more preferred characters to precisely enter said non-preferred character. As an example, from a single preferred character providing two gliding actions in two different directions may correspond to precisely entering two different characters. As an example, providing a gliding action 467021 from the letter L towards the letter K may correspond to precisely entering the letter K and providing a gliding action 467022 from the letter L towards the letter M, may correspond to precisely enter the letter M. Respectively, as an example, a single non-preferred character may be entered by each of two gliding actions provided from a different direction towards non-preferred character. As an example, the letter M may also be precisely enter my providing a gliding action 467023 from the letter N towards the letter M (e.g.) on the key (e.g. 567003). Preferably, the gliding action is provided from a non-preferred character to the adjacent non-preferred character to precisely enter said non-preferred character. As an example, in order to precisely enter the letter J, on the key 467003, the user may provide a gliding action 467031 from the letter I towards the letter J.

Note that, in addition to the letters, each of the keys and/or broadly ambiguous zone may also include one or more special characters as preferred and/or non-preferred characters.

Preferrably, the gesture for precisely entering an identified character may be a short gesture. A longer gesture from a key may preferrably be used for entering a corresponding special character assigned to said key. Note that, as mentioned before, each of the keys of the keypad may represent a group of special characters as described before.

The system may include a precise mode wherein a predefined interaction such as a gliding action such the Space 467006 or Backspace key 467005 in a predefined direction may enter the system into said precise more where the user can precisely enter (e.g. any) characters. Fig. 467B shows, as an example, a keypad 467100 of the invention in a precise mode. In this example, the letters are arranged in alphabetic order. Note that, although the letters can be presented in a continuous manner, in Fig. 467B they are shown as being assigned to five keys, 467101 to 467104, and the key 467106, this is because each of said key also represents a group of special characters as describes throughout this application. According to one method, said special character may be entered by providing an interaction from a corresponding key. In this example, the key 467107 is located between the Space and Backspace keys. In this examples, an interaction such as a tapping action on a (e.g. zone assigned to a) letter may precisely enter said character.

Fig. 467C shows another type of keypad of the invention in precise mode

Another method of assignment of letters of a language to a keypad of the invention is described using Fig 468. In this example, in addition to the keys 468001 to 468004 two broadly ambiguous zones 468007 and 468008 are considered. Interacting with the broadly ambiguous zone 468007 may ambiguously correspond to any of the none preferred characters shown/displayed on the keys 468001 to 468004 (e.g. the letters b, g, j, k, m, p, q) and interacting with the zone 468008 may correspond to the remaining characters of the language (e.g. the non-preferred characters t, u, v, w, x, y, z). Alternatively, a predefined interaction such as interacting near a key may (e.g. ambiguously) correspond to the non-preferred character(s) displayed on said key.

- **Alphabetical order**
- **Fully predictives**

**Semi predictive**

- **Broadly ambiguous includes small and non-shown chars**
- **Can include some special chars too**

**Can enter precise chars/word**

- **A character can have related char**
- **When tapping on it, related is also considered for prediction**

- **Gesture from a letter towards neighbor letter (left or right) a single (non-prefreed) letter can be related to 2 (preferred) letters**

**Precise mode**

- **2 lines**

- **3 lines**

**THE RESE BETWEEN SP AND BACK**

1- **TAP ON A LARGE LETTR FOR ALL AROUND**
2- **TAP ON THE LARGE LETTERS FOR PRECISE, ON THE TOP FOR OTHERS**
3- **TAP ANYWHERE ABOBE/UNDER FOR SMALLS**
4- **GESTURE FOR PREC SMALLS**

**Current is the one with highest accuracy**

**The precise/semi precise word**

- **If it is in the database and its freq meets a requirement, then it becomes current, if not**
    - **The current is the word with highest priority with the same length or longer**

**On tap on a precise/prefrerred letter, the related letter is also considered to propose a (one or more) recise word(s)**

**All fully precise mode or fully ambiguous mode**

- **Broadly amb zone may be related to all letters**

**In fully pred.**

- **Tap anywhere on a key also consideres as precise taps**
-

As mentioned before, during interaction with a key/zone, such as tapping on a key, in addition to relating said interaction to an ambiguous input signal, the system may also relate said interaction to a precise character, preferably the character with which the user interacts (e.g. taps on).
As such, when the user provides the input information corresponding to a word, the system may consider/propose two types of corresponding words. A first type may include one or more words corresponding to ambiguous input signals and the second type may include one or more words that include one, more, or all of the precisely identified characters considered by system. Note that in some cases, the precisely identified characters may comprise all of the characters of a word. As an example, the table immediately below shows the words corresponding to interacting with the keys 467002, 467001, and the zone 467007. If the user types anywhere on said keys and the broadly ambiguous zone, the system may propose one or more words of the first type such as the words "eat", "fat", "hat" (herein may be referred to as ambiguous words), and "gay". Additionally, if the user precisely taps on the letter F, then taps on the letter A, and finally taps on the zone 467007, the system may also propose the word "fat". Similarly, for interacting with the letter H instead of the letter F, the same may apply to the word "hat". By using this method the user may enter a desired word from a number of ambiguous words.
According to on method, the system proposes a (e.g. one or more) word of a second type only if said word, only if said word contains a (e.g. one or more) criterion such as having at least a predefined minimum frequency of use/occurance. Said frequency of use/occurance may be predefined number or a dynamically defined number, such as the relationship of frequency of said word and the frequency of an ambiguous word(s) wherein both types of words correspond to a same sequence of input signal(s). Note that in some cases, said second type of word may even become the current predicted word so that a predefined

interaction such as tapping on the Space key may enter said word. ACCORDING TO ONE METHOD, IF THE USER SELECTS SECOND TYPE OF WORD, THE SYSTEM MAY PROPOSE OTHER WORDS (E.G. HAVING THE SAME LENGTH OR LONGER) CORRESPONDING TO THE INPUT INFORMATION PROVIDED BY THE USER CORRESPONDING TO SAID SECOND TYPE OF WORD.

| | | |
|---|---|---|
| 217 | eat | 7556 |
| 217 | fat | 4614 |
| 217 | hat | 3141 |
| 217 | gay | 1886 |

According to one method, all of the characters/letters displayed on a key may be entered precisely by providing an interaction such as the tapping action on them. According to another method, when the user provides an interaction with a character displayed on a key to enter it precisely, the system may also consider a related (e.g. non-preferred) character/letter or one or more characters near said character, and based on these characters and additional input information provided during the entry of a word, the system may propose one or more corresponding words.

**Four groups of symbols**

**1 line**

**THE REST BETWEEN SP AND BACK**

**FOUR ZOES FOR SP CHARS**

**CAN TAP EVEN SOME (BRAODLY ZONE CORRESPONDS TO ALL)**

Fig. 470 shows a one line (e.g. linear) alphabetically ordered keypad. Several methods of entering text using this keyboard may be considered.

- According to a first method, interacting with a zone corresponding to a character (e.g. where the zone does not necessarily have to be over said character) may ambiguously correspond to said character and a number of characters near said character.
- According to a second method, interacting with a zone corresponding to a preferred character (e.g. shown in large font) (e.g. where the zone does not necessarily have to be over said character) may ambiguously correspond to said character and a number of preferred characters near said character.
- According to a third method, interacting with a zone corresponding to a (e.g.preferably preferred) character (e.g. shown in large font) (e.g. where the zone does not necessarily have to be over said character) may ambiguously correspond to said character.

In the methods just described above, a tapping action on a broadly ambiguous zone 470207 preferably may either correspond to any of the characters (e.g. letters/symbols) of the corresponding alphabet or to the non-preferred characters.

In the example of Fig. 470, a predefined action such as a tapping action on a preferred character may enter said character precisely and a gliding action, as described in Fig. 467A, may correspond to entering a non-preferred character precisely. For example, the gliding action 470212 provided from the letter E to the letter F, may correspond to precisely entering the letter F. Similarly, providing the gliding action 470211 may correspond to entering the character G. Also, as an example, providing any of the gliding actions 470213 or 470214 may correspond to precisely entering the character X. According to another method, a gliding action provided from a (e.g. preferred) character, may correspond to precisely entering another (e.g. preferred) character. Note that, in Fig. 470, the broadly ambiguous zone 470207 is, as an example, preferably located between the Backspace key 470205 and the Space key 470206.

Note that each of a group of characters of such a keypad may have a common zone from which providing an interaction, such as a long gliding action, may correspond to precisely entering a symbol such as a function or special character. Fig. 469B shows, as an example, the letters of the keypad 470000 of Fig. 470, may be divided into four zones wherein each zone may also correspond to a different group of special characters as shown and described before and throughout this application.

Fig. 469A shows another type of linear keypad having alphabetic order. In this example only the preferred characters are displayed and the rest of the characters are assigned to the broadly ambiguous zone 469107. As described before, interacting with a zone relating to a character, may correspond to either said character or to said characters and the characters near said character, depending on the method used as described above. Fig. 469B shows said keypad wherein the preferred characters are grouped in four different zones 469101 to 469104, wherein each zone also corresponds to a different group of symbols such as special characters.

Note that in the embodiments described throughout this application, according to one method, the broadly ambiguous zone may correspond to all of the letters of the corresponding alphabet. As an example, in embodiment corresponding to Fig. 469A or Fig. 467A, a user may provide the interaction corresponding to a partial number of (e.g. preferably preferred) characters corresponding to a desired word and, for the rest of the characters (e.g. preferred and/or non-preferred) of the desired word, the user may interact with (e.g. tap on) the broadly ambiguous zone. This matter has already been described in detail by this inventor.

**SWIPING**

In the embodiments described throughout this application, instead of using tapping actions corresponding to a sequence of (e.g. ambiguous and/or precise) characters, a gliding action interaction representing said sequence of characters my be used. To enter a word, according to one method a mixture of (e.g. one or more) such a gliding action and (e.g. one or more) other interactions such as tapping interactions may be used. These matters have already been described in detail before by this inventor.

**Can be Qwerty**

Note that in any of the embodiment throughout this application, any other letter arrangement may be considered by people skilled in the art to be used with the principles of data entry as described. For example, said letter arrangement may (e.g. partially or fully) resemble a qwerty arrangement.

According to one method, the current predicted word may be a word having the highest priority corresponding to the input information provided by the user, even if said input information corresponds to the portion of said word such as its beginning portion.

**On tap 5th k**

- **U as amb**
- **T as prec.**

**5th key to display**

With continuous description of the preferred scenario, as presented in Fig. 467A, according to one method, as shown in Fig. 471A when a user interacts (e.g. taps on) with the broadly ambiguous zone 471007, in addition to ambiguously relating said interaction to any character of a group of characters assigned to said zone (e.g. T, U, V, W, X, Y, Z, and preferably some special characters), the system may also relate said interaction to a predefined identified character (e.g. the character 'T') precisely, such as preferably based on the frequency of said groups of character.

With continuous description of the current embodiment, the letters assigned to a key may be presented to a user in two manners; a first group may be displayed in a first manner (e.g. a color, font, size, weight, etc.) and the rest of the characters of said key may be presented in a second manners (e.g. another color, font, style, size, weight, etc.). As such, according to one method, when a user interacts (e.g. taps on) with the a key, in addition to ambiguously relating said interaction to any character of a group of characters assigned to said key, the system may also relate said interaction to an identified character displayed in said first manner on/near which the user provides said interaction on said key. Said character may be presented in a word list. According to one method, preferably upon an/said interaction with a key, the system may present the characters displayed in the second manner on a location (e.g. preferably under/near the word list (e.g. on the screen)). If the user interacts with one of said characters, the system may replace said identified character. Note that selecting an identified character as such preferably resembles a similar procedure (as described before, in detail) to replace an identified (e.g. preferred) character by another identified (e.g. non-preferred) character. According to one method, same procedure may be applied to entering any character of the groups of (e.g. non-preferred) characters assigned to the broadly ambiguous zone of Fig. 467A. For example, as shown in Fig. 471A, when a user interacts with the zone 471007 the system may ambiguously relate said interaction to a character of the group of (e.g. non-preferred) characters (e.g. T, U, V, W, X, Y, Z) assigned to the broadly ambiguous zone and display it in a word list (e.g. the letter 'u' 471011). Additionally, the system may relate said interaction to a predefined identified character (e.g. 'T' 471012) of said group of characters. In addition to said characters, the system may also propose additional corresponding (e.g. longer)

words from the word database used by the system. As such, by providing a sequence of such interactions, in addition to predicting words corresponding to said sequence of interactions, the system may also present a word wherein all of its characters are identified characters. According to a preferred method, all of said words are presented in a same word list. Note that in this embodiment, all of the characters assigned to a key are preferably considered by the system as preferred characters (e.g. irrespective of the manner of display). As an example, the characters I, K, L, M, N assigned to the key 4671003 are all considered as preferred characters wherein some of the characters I, L, N are displayed in a first manner (e.g. large black font), while the other characters J, K, M are displayed in a second manner (e.g. small grey font). As an example, the user can enter any of the characters I, L, N (e.g. L) precisely by tapping on it. When such tapping action is provided, the system may also provide the characters displayed in the second manner J, K, M in a location on the screen. If the user taps on any (e.g. M) one of said characters displayed in said location, the system may preferably replace the entered character (e.g. L) by said character (e.g. M). Note that according to one embodiment the characters assigned to the broadly ambiguous zone may also be display in said zone. Fig. 471B shows, as an example, the keypad of the invention having four keys and a broadly ambiguous zone wherein the characters are respectively arranged in alphabetic manner on the four keys and in the broadly ambiguous zone. According to one embodiment, the principles of entering precise/identified characters of a key may also apply to the characters assigned to the broadly ambiguous zone. As an example, as shown in Fig. 471B, the characters T, U, V, X, Y, Z assigned to the zone 471107 are displayed in two different manners as described before. As such, as an example, in addition to ambiguously relating an interaction such as a tapping action on the broadly ambiguous zone 471107, the system may also relate said interaction to an identified character (e.g. one of the characters T, W, and Y) as described above. Upon said interaction, the system may also display, for example in a zone 471131 (e.g. near the word list), the characters (e.g. U, V, X, Z) displayed in the second manner on the broadly ambiguous zone 471107 so that the user can enter any of said characters precisely as described above for the keys.

Note that a group of characters assigned to a key of the keypad may include letters and/or special characters.

**<u>All precise letters from keys</u>**

**<u>5th key to display</u>**

According to another embodiment, preferably, in the fully ambiguous mode, all of the characters (e.g. letters) assigned to a key and/or to the broadly ambiguous zone(s), may preferably be

displayed on said key(s)/zone(s) in a same manner (e.g. color, font, style, etc.). As such when a user interacts (e.g. taps on) with a key and/or a broadly ambiguous zone, in addition to ambiguously relating said interaction to any character of a group of characters (e.g. letters and/or special characters) assigned to said key/zone (herein may be referred to as an ambiguous input signal and/or ambiguous interaction), the system may also relate said interaction to a predefined identified character on/near which the user provides said interaction on said key (herein may be referred to as a precise input signal and/or precise interaction). Said character may be presented in a word list. When a user enters input information, by providing a sequence of such interactions the system may present two types of words to the user. A first type of one or more words by relating said key/zone interactions to ambiguous input signals, and a second type of one or more words (e.g. the length of one of the words corresponds to the number of key and/or zone interactions, and the additional words may be longer words, for example wherein their beginning characters correspond to said key/zone interactions) by relating said key interactions to precise input signals. Note that, according to one method, the input information provided by the user may be a mixture of ambiguous and precise input signals as described throughout this and other patent applications filed by this inventor. As an example, if the user uses another method (e.g. such as a gliding action) for entering a precise character, the system may predict one or more words by considering said precise character and relating the rest of the key and/or zone interactions provided by the user to ambiguous signal(s). With continuous description of the current embodiment, Fig. 472A shows an exemplary keypad of the invention based on the description of this embodiment. As an example, when the user taps on the letter 'y' in zone 472107 the system may relate said interaction to the precise character 'y' and display it 472112 in a word list, while on the other hand, the system may also relate said interaction to an ambiguous character 'u' that is assigned to said zone (e.g. also shown 472111 in the word list). Note that, according to one method, if the user does not taps anywhere on said zone 472107 but not on any of the characters, according to a first method, the system may relate said interaction to a predefined character (e.g. 't') assigned to said zone. In this case, preferably the letter t is not displayed on said zone. According to a second method, upon such interaction, none of the characters that are assigned to said zone are selected by the system as an identified character. In this case, all of the characters assigned to said zone may preferably be displayed in said zone. Similarly, an interaction (e.g. such as tapping) on a character on a key may be, both, related by the system to a precise character, on or near said interaction and ambiguously related to any of the characters assigned to said key. As shown, in this example, the letters 'A' to 'D' are assigned to the key 472001, the letters 'E' to 'H' are assigned to the key 472002, the letters 'I' to 'N' are assigned to the key 472003, the letters 'O' to 'S' are assigned to the key 472004, and the letters 'T' to 'Z' are assigned to the broadly ambiguous zone 472107. Note that, in this

arrangement, by dispatching each of the vowels 'A', 'E', 'I', 'O', and 'U' to a separate key/zone while keeping an alphabetic order on the keypad, a familiar and highly accurate word prediction system is provided. In addition, having only four keys (e.g. an preferably an invisible zone between them) allows the user to type extremely fast.

It must be noted, that the embodiments shown/described throughout this application are shown as examples. Other types of keypad having a different number of keys and/or zones, different arrangement of characters on said keys/zone, different types of interaction(s) with said keys/zones may be considered by those skilled in the art. For example, the keyboard of the invention may have a total number keys and/or zones (e.g. 1 to 8, or more). Preferably, the broadly ambiguous zone(s) are located between any number of keys, and preferably its borders are not displayed on the screen. As an example, fig. 472B shows a keypad of the invention having four letter keys 472201-472204, wherein the each of said keys is assigned-to/represents a number of letters, and wherein the letters assigned to the keys are printed on the corresponding keys such that to form an alphabetically arranged keypad. In this example, according to one method, the principles of text entry similar to those described above and shown through fig. 472A may be considered. For example, when a user interacts (e.g. taps on) with a key, in addition to ambiguously relating said interaction to any character of a group of characters assigned to said key/zone, the system may also relate said interaction to a predefined identified character on/near which the user provides said interaction on said key. Said character may be presented in a word list. When a user enters input information, by providing a sequence of such interactions the system may present two types of words to the user. A first type of one or more words by relating said key/zone interactions to ambiguous input signals, and a second type of one or more words (e.g. the length of one of the words corresponds to the number of key and/or zone interactions, and the additional words may be longer words, for example wherein their beginning characters correspond to said key/zone interactions) by relating said key interactions to precise input signals.

In the embodiments above, in addition to the letters, a group of (e.g. ambiguously) characters assigned to a key may also include one or more symbols such as special characters. As show in fig. 472B, as an example, the key 472203 includes an apostrophe that may be included in some of the words of the database used by the system.

Note that other types of assignment of the letters (e.g. in alphabetical order) to the keys of the keypad may be considered. For example, fig. 472C shows another alphabetical keypad having four keys.

In some of the embodiments (e.g. in the embodiments above) or all of the embodiments of the invention, a broadly ambiguous zone (e.g. the zone, 427207 of fig. 427B) may represent some or all of the characters assigned to the keys or all of the characters/letters of a language (e.g. even if the

keys (e.g. the four letter keys) of the keypad together represent all of the characters/letters of a language). According to one method, at any moment during the entry of a word, the user may interact with (e.g. tap on) the broadly ambiguous zone for a character/letter of his desired word. As such, when the user provides a sequence of interactions including interactions with the letter keys and/or the broadly ambiguous zone, the system predicts one or more word corresponding to said interactions. This matter has already been described in detail before in this and in the previous patent applications filed by this inventor.

According to one method, in order to enter a word, an interaction such as a tapping action on a key/zone may ambiguously correspond to any of the letters on said key/zone. As such, a sequence of interactions with key(s)/zone(s) may correspond to one or more words of a database used by the system. Note that according to one embodiment, the characters/letters assigned to the broadly ambiguous zone may be displayed on said zone or anywhere on the screen. Note that, according to one embodiment, the boarders of the broadly ambiguous zone may be displayed on the screen. In the example Fig. 467A, the broadly ambiguous zone 467007 is the zone preferrably between the letter keys and the space and backspace keys. In this example, the borders of the broadly ambiguous zone are not displayed.

Note that selecting an identified character as such preferably resembles a similar procedure (as described before, in detail) to replace an identified (e.g. preferred) character by another identified (e.g. non-preferred) character. According to one method, same procedure may be applied to entering any character of the groups of (e.g. non-preferred) characters assigned to the broadly ambiguous zone of Fig. 467A. For example, as shown in Fig. 471A, when a user interacts with the zone 471007 the system may ambiguously relate said interaction to a character of the group of (e.g. non-preferred) characters (e.g. T, U, V, W, X, Y, Z) assigned to the broadly ambiguous zone and display it in a word list (e.g. the letter 'u' 471011). Additionally, the system may relate said interaction to a predefined identified character (e.g. 'T' 471012) of said group of characters. In addition to said characters, the system may also propose additional corresponding (e.g. longer) words from the word database used by the system. As such, by providing a sequence of such

interactions, in addition to predicting words corresponding to said sequence of interactions, the system may also present a word wherein all of its characters are identified characters. According to a preferred method, all of said words are presented in a same word list. Note that in this embodiment, all of the characters assigned to a key are preferably considered by the system as preferred characters (e.g. irrespective of the manner of display). As an example, the characters I, K, L, M, N assigned to the key 4671003 are all considered as preferred characters wherein some of the characters I, L, N are displayed in a first manner (e.g. large black font), while the other characters J, K, M are displayed in a second manner (e.g. small grey font). As an example, the user can enter any of the characters I, L, N (e.g. L) precisely by tapping on it. When such tapping action is provided, the system may also provide the characters displayed in the second manner J, K, M in a location on the screen. If the user taps on any (e.g. M) one of said characters displayed in said location, the system may preferably replace the entered character (e.g. L) by said character (e.g. M). Note that according to one embodiment the characters assigned to the broadly ambiguous zone may also be display in said zone. Fig. 471B shows, as an example, the keypad of the invention having four keys and a broadly ambiguous zone wherein the characters are respectively arranged in alphabetic manner on the four keys and in the broadly ambiguous zone. According to one embodiment, the principles of entering precise/identified characters of a key may also apply to the characters assigned to the broadly ambiguous zone. As an example, as shown in Fig. 471B, the characters T, U, V, X, Y, Z assigned to the zone 471107 are displayed in two different manners as described before. As such, as an example, in addition to ambiguously relating an interaction such as a tapping action on the broadly ambiguous zone 471107, the system may also relate said interaction to an identified character (e.g. one of the characters T, W, and Y) as described above. Upon said interaction, the system may also display, for example in a zone 471131 (e.g. near the word list), the characters (e.g. U, V, X, Z) displayed in the second manner on the broadly ambiguous zone 471107 so that the user can enter any of said characters precisely as described above for the keys.

Note that a group of characters assigned to a key of the keypad may include letters and/or special characters.

**zone fully predictive**

**5-6 keys**

**symbols from full keyboard**

Note that according to one method, each group of several characters may be assigned to a separate zone which is preferably also assigned to a different groups of special characters, as described throughout this application. For example, in fig. 467B, providing gliding action on/from, respectively, the zones, 467101-467104, may correspond to entering special characters from four

different groups of characters as described throughout this application, and providing gliding action on/from the zone 467105 may correspond to entering mouse functions as described before.
Also for example, in fig. 467C, providing gliding action on/from, respectively, the zones, 467201-467204, may correspond to entering special characters from four different groups of characters as described throughout this application.

- **Based on text characteristics**
    - **Color**
    - **Font**
    - **Size**
    - **Direction of words**
    - **Relationship of words between each other**
    - **Shadow**
- **Background**

Entering text with many different characteristics such as different colors, fonts, sizes, text location (e.g. on/in a document such as on an image), directions, text orientation, and/or in/on different context (e.g. backgrounds such as an image, background color of the image, etc.), audio, video, application, communication channel, etc. may be used in an application/function such as a search application/function to provide additional information to said application/function for faster and more accurate/relevant search results. As such, databases used by such a search application/function, may preferably include text and at least some of such different characteristics. As an example, if desired information such as a document (e.g. picture that includes a color text with words displayed in different directions, Internet web page, Internet website, an x-ray scan including text), it may be searched by providing a keyword(s) that may include one or more words of the text printed in the relevant, one or more colors, one or more directions, one or more fonts, one or more sizes, etc. According to one method, said search may also include an image (e.g. used as a background image to the keyword). Note that the relationship between the location and/or characteristics the word(s) in the keyword may define the search criterion(a). According to one method, the relationship (e.g. coefficient, etc.) of the characteristics of a (e.g. text) keyword(s) between each other, and the relationship of the (e.g. text) characteristics between each other of the corresponding result may preferably define the result.

Note that in a search, one or more of the characteristics as described above may provide sufficient information for a desired result. Also, note that, the characteristics provided for a search may be approximate (e.g. near) to the exact characteristics. For example, typing a word included in a

keyword may result in searching any corresponding data/document that includes any corresponding word that is written in any kind of yellow color. Accordingly, as an example, if the keyword includes as word written at an angle (e.g. on a slope, such as 60 degrees) the system may search the corresponding words written in a predefined slope close to said angle (e.g. 50 degrees to 70 degrees).

As an example, fig. 473 shows a search input (e.g. keyword) as described above. In this example, preferably the keyword 473000 provided relates to searching for a corresponding image. The keyword is preferably in the form of an image having a Yellow background color 473008 that indicates the approximate background color characteristic (e.g. color, average color, most of the image having said color, indicating the general color, etc.) of the corresponding image to be searched. The image to be search also preferably includes:

- the text 473001;
- said text is preferably written in the color Red;
- said text is preferably located in the (e.g. approximate) location in the image as indicated in the keyword 473000;
- said text is preferably written at the (e.g. approximate) angle in the keyword 473000; and
- the relative size of said text in the image to be searched is preferably similar to the relation of the size of the text 473001 to the size of the keyword 473000, etc.

Note that, preferably, the results of the search may include from all to at least one of the characteristics described/shown in the keyword.

**Each key/zone includes a number of sub-zones representing an identified chars**

**1st letter is a vowel**

**Any number of subzones**

**Four sub-group make it generalized**

**T is default**

**short gesture**
**long press**
**extra button**
**show the non-freq used chars and tap on them**

**gesture or long press for non-freq chars**

The fully ambiguous mode of the invention has already been described in detail. The following described and shown keypad (e.g. 474A to 474F, and 475A) may preferably be used with the fully ambiguous version of the invention (e.g. although they can also be used with the semi-predictive mode as being described later in this application). Fig. 474A shows a keypad of the invention

having an alphabetical order. The letters A-D are assigned to the key 474001, the letters E-H are assigned to the key 474002, the letters I-N are assigned to the key 474003, the letters O-S are assigned to the key 474004, and the letters T-Z are assigned to the zone/key 474007. In this example, the letters U-Z are shown on the zone 474007 (e.g. the letter T is preferably not shown). As described before, when a user interacts with a key/zone, the system may preferably (e.g. simultaneously) relate said interaction to two types of interaction: ambiguous interaction and precise interaction. To enter precisely a character/letter, the user may use precise interaction as described earlier. As described an shown before, a key/zone of the keypad may include several sub-zones (e.g. herein may be referred to as subzone) such that interacting with a subzone may enter precisely the character/letter assigned to said sub-zone. According to a preferred method, as shown in this example, any of the keys/zone(s) of the keypad may preferably include four sub-zones, wherein interacting with a subzone may preferably provide an ambiguous input signal and a precise input signal corresponding to an identified character assigned to said sub-zone. If more than four characters/letters are assigned to a key, then preferably, said four sub-zones represent four letters having the highest frequency of use among the group of characters assigned to said key.

As an example, in fig. 474A, the key 474001 is divided in four sub-zones each representing a different letter, respectively, the letters A, B, C, and D. Same is applied to the key 474002, wherein four subzones respectively represent the letters E, F, G, and H. The key 474003 is also divided in four sub-zones that respectively represent the letters I, L, M, and N, that in most languages (e.g. English, French) have higher frequency than the remaining letters (e.g. J, and K) assigned to said key (e.g. herein may be referred to as low frequency letters of a key). The key 474004 is also divided in four sub-zones that respectively represent the letters O, P, R, and S, that have higher frequency of use than the letter Q (e.g. the low frequency letter of said key) which is also assigned to said key. In the broadly ambiguous zone 474007, there are also four subzones 474017 respectively representing the letters U, V, W, and Y, which in the English language have higher priority than the low frequency letters X, and Z. In this example, interacting anywhere outside said four-subzones in the zone 474007 may correspond to an ambiguous input signal, and a precise input signal representing the letter T.

Note that the low frequency letters mentioned in this embodiment are user between 0.5 to 1.6 percent of times in most western languages. To enter precisely any of the low frequency letters, different methods such as those described earlier (e.g. long pressing on it, a (e.g. short/long) gesture in a predefined direction, a (e.g. short/long) gesture including a long pressing action, on tap on a key showing the low-frequency letters of the key in an enlarged manner to tap on it, etc.) may be used.

Note that in this example, the subzones of each of the keys and the broadly ambiguous zone begins with a vowel. This permits the user to easily remember the letters assigned to a key/zone.
Figs. 474A to 474F show, respectively, the preferred types of assignment of letters to the keys and/or corresponding subzones for the languages, English, Spanish, German, French/Portuguese, and Chinese (e.g. using Pinyins). The preferred type for Italian may be any of the figs. 474C or 474D (e.g. the Italian language does not have words including the letters W,X,Y, unless the Italian database includes words from other languages. In these examples, the low frequency letters of each key is shown in a different color (e.g. red), and the higher frequency letters are shown in black.

In the examples above, note that a first type of subzone (e.g. 474010, or 474020) may represent one character. In this case, interacting with a such subzone may preferably enter the corresponding character/letter precisely (e.g. said interaction may preferably also correspond to an ambiguous input signal). Another type of subzone (e.g. 474011, 474012, 474013, 474014, 474015) may represent or looks like representing more than one (e.g. preferably not more than two) characters. In this case, a first character (e.g. herein may be referred to as the main character (e.g. printed in black)) may be entered precisely by a first predefined type of method such as interacting with (e.g. tapping on) said subzone (e.g. said interaction may preferably also correspond to an ambiguous input signal), and a second character (e.g. the secondary character printed in red) of said subzone may precisely be entered by a second type of method such as:

- by providing another type of interaction such as providing another type of interaction (e.g. a gliding action in a predefined direction) with/from said subzone and/or with/from anywhere on the corresponding key or the corresponding broadly ambiguous zone.
- or upon tapping/interacting on a such subzone or anywhere on the corresponding key/broadly ambiguous zone, the system may present/display the secondary character(s)/letter(s) of said key/zone in a location on the screen so that preferably being easily accessible so that the user can interact with a secondary character to enter it precisely.
- Or upon touching/interacting with a zone, the system may show the secondary character in a large zone (e.g. large enough to be separately accessible) such that if the user removes his finger from the screen without providing a gliding action, the system enters the main character precisely. On the other hand, after upon touching/interacting with said zone if the user provides a gliding action towards said large zone relating to the secondary character, the system enters said secondary character precisely.
- Etc.

Note that the methods of entering secondary characters precisely may be resemble to those regarding the entry of none-preferred characters precisely as described throughout this application

and the previous patent applications filed by this inventor. Such methods may be applied to any of, fully predictive mode, and semi-predictive mode. According to one method, a word may be entered character by character precisely using this system of entering precise characters.

Note that the embodiments above are related to a keypad having a reduced size interface so that on devices with small screens, the user can enter text quickly by tapping anywhere on the keys and/or the broadly ambiguous zone when the user thinks the word is in the dictionary, and to enter precise characters easily (e.g. when the user thinks that) the word is not in the dictionary (herein such keypad may be referred to as compact keypad). Regarding the devices with, preferably, large screens, the keys and the broadly ambiguous zone of the keypad may be large enough such that the users can have easy direct access to any of the characters on the key/zone to enter it precisely. In this case, each of the sub-zones may be large enough for such access and wherein and preferably, each of such subzones represents a single identified character/letter (herein such keypad may be referred to as enlarged keypad). An example of such keypad is shown in Fig. 472A. According to one method (e.g. preferably depending on the size of the screen), the system automatically or the user manually may switch between the compact keypad and the enlarged keypad.

According to another method of precisely entering secondary characters, for all of the characters of a word (e.g. main character and/or secondary character) the user may preferably interact with (e.g. tap on) corresponding sub-zones, and the system preferably, for each such interaction, provides/presents the corresponding main character. If the corresponding provided/presented word, entered as such is not the desired word, the user may select said word by, for example tapping on it, and the system preferably enlarges said word such that the user can preferably have an easy access to each of its characters. At this time, the user may interact with (e.g. tap on) a main character and the system may change said main character to a corresponding secondary character. As such the user may easily change (e.g. correct) the presented word. Note that, because the likelihood of having (e.g. which is not in the dictionary) and including a secondary character is very low (e.g. with a good dictionary this likelihood is 1.5 out of 10000 characters, in the example of the English language), the likelihood of being required to correct two characters in a word is extremely low.

Note that according to a preferred method, when a user selects a word (e.g. an entered word as just described or any other word in a corresponding word list), the system may also propose/predict/present longer words beginning with the selected word.

By considering this likelihood just described, according to another method after the user enters and selects a word, entered precisely character-by-character as described above, the system may

propose some (e.g. preferably those related/corresponding words that are not in the dictionary) or all of the possible words (e.g. preferably with the same length) for such precise character-by-character data entry system for entry of a word. By using this method, the words that are not in a database of words used by the system, may be entered quickly and easily.

Note that, according to a preferred type of arrangement, the main character related to a secondary character may not have a high frequency of use. As an example, rather than relating characters 'Q' and 'R' (e.g. 'R' has a high frequency of use), as was shown in Fig. 474A, to a same sub-zone (e.g. 474013), the secondary character 'Q' may preferably be related to the main character 'P' and both be represented by a same sub-group (e.g. not shown).

**5th key + zone**
**zone includes key (Key in zone: tap on 5th key also consideres as tap on 5th zone)**

***Anywhere in the zone***

**t included/excluded in sub-zones (or any other 1 char)**
**show/not-show letters**
**do not show zone/sp/bs**

**Invisible**

**show with or w/o T**

**Gestures for all/some letters**

- **Premits having small keys**

Regarding the broadly ambiguous zone, different scenarios of presentation and/or interaction for input may be considered such as:

- Scenario 1: the broadly ambiguous zone may be a single (e.g. additional) key/zone (e.g. having several subzones) resembling to any of the letter keys such keys 474001 to 474004 of fig. 474A.
- Scenario 2: the broadly ambiguous zone may be a separate/additional zone relating to any of the keys of the keypad (e.g. including the (e.g. additional) key/zone of scenario 1).
- Scenario 3 (preferred): the broadly ambiguous zone (e.g. 474007) may be a large zone that also includes the subzones (e.g. 474017) of scenario 1. In this case, according to a preferred method, tapping anywhere on the broadly ambiguous zone (e.g. including tapping on the subzones 474017) may preferably correspond to, both, an ambiguous and a corresponding precise input signal (e.g. corresponding to an identified letter/character). According to a first method, one of the letters/characters (e.g. T) assigned to the broadly ambiguous zone may be entered precisely by default when the user interacts with (e.g. taps on) a location outside the subzones (e.g. 474017) in the broadly ambiguous zone (e.g. 474007). In this case, said letter

(e.g. T) may preferably not be printed anywhere in the broadly ambiguous zone (e.g. including in its included subzones) as shown in figs. 474A-F.

According to another method, such default letter/characters is not considered when the user interacts outside the subzones in the broadly ambiguous zone. In this case, as shown in fig. 474F, such letter (e.g. T) may preferably be assigned/printed to/on one of the corresponding subzones.

It must be noted that, at any moment the user may be allowed to hide the letters/subzones assigned to the broadly ambiguous zone. As such, preferably, the icons and/or borders relating to the space and backspace keys may also be hidden, so that to reduce the visible portion of the keypad. Also, the user may be allowed to reduce the size of the letter keys. In this case, according to one method, interacting with a key/zone may correspond to an ambiguous input signal assigne to said key, and to enter precise character, the user may use other methods (e.g. providing gliding actions in different direction on/from said key, each corresponding to a different letter/character assigned to said key) as described throughout this and the previous patent application filed by this inventor. Note that according to one method, the user may be enabled to make the letter keys invisible or just shoe the borders of them.

**A keys/zone represents some letters, or all of letters depending on the instance (e.g. spell help mode)**

**Although called broad may not be broad**

Note that, as mentioned before, a broadly ambiguous zone may represent some or all of the letters of a language. According to one method, this may depend on a condition such as for example if the system, respectively, is not in a spelling help mode or the system is in a spelling help mode, as described before in detail. note that not only a zone outside the keys of the keypad can act as a broadly ambiguous zone, but also any of the (e.g. four) keys of the keypad can act as a broadly ambiguous zone. Also note that a broadly ambiguous zone can have any number of characters/letter and may not be restricted to having significantly larger number of characters relating to the other keys/zone of the ketypad.

**When the system knows that a precise letter is entered, it may preferably apply it to all predicted words too**

Note that, when the system identifies an entered character as a precise character, the system preferably proposes/predicts words that include said identified character in the corresponding character position within the words.

**Ergonomic keys/zones**

Note that the keys of the keypad may have any arrangement. Fig. 475A, shows as an example, a keypad of the invention wherein its letter keys 475001 to 475004 are disposed diagonally so that the precise letter can be entered easier. The fig. also shows the broadly ambiguous zone 475007 which in this case is located between keys that includes a large zone wherein a portion of the zone is occupied by the sub-zones as described above,

**4 sub-zones for semi predictive**

Different keypads corresponding to the semi-predictive mode of the invention have been described and shown before. According to one embodiment, each of the keys of such keypad may have a number of zones such as four subzones. Fig. 476A shows an exemplary such keypad. In this example, the preferred characters on each key are shown in black font and the none-preferred characters are printed in red. Note that as described before in detail, in the semi-precise mode, for the preferred characters the user may interact such as tap on said characters or on a zone relating to said characters, and for the none-preferred characters the user may preferably interacts with the broadly ambiguous zone (e.g. 476007). By receiving a sequence of one or more such interactions the system may predict one or more words. This and the relating matters have already been described in detail before.

A keypad of the invention used by the semi-predictive mode of the invention may have any type of key and/or letter arrangements. As an example, such keypad may have any of the arrangements of the keypads of figs. 474A to 474F, and 475A. As an example, the letters printed in black font on the (e.g. four) letter keys may be considered as preferred characters, and the letters printed in red may be considered as non-preferred characters. Additionally the letters assigned to a broadly ambiguous zone (e.g. or any of the four keys) may also be considered as non-preferred characters. As such, as an example, in order to enter a word, for a preferred character/letter the user may interact with (e.g. tap on) a corresponding character/letter (e.g. printed in black) or with the subzone (e.g. in this example each key has four subzones each representing one of the preferred characters assigned to said key) corresponding to said character/letter. For all other characters (e.g. characters/letters printed in red on a key and the non-preferred characters (e.g. letters and/or special characters that words may include) assigned to the broadly ambiguous zone, the user may provide a predefined interaction such as tapping on the broadly ambiguous zone. This matter (e.g. semi-predictive mode) has already been described before in detail.

**Subzones can be different on each key/zone**

Note that the number of subzones may be different on each key and/or a broadly ambiguous zone.

**On Screen keys**

Note that a key can be a zone on a touch sensitive surface such as a touch screen

**Applies to any language**

**Chinese, Japanese, Arabic**

Note that any of all of the features, concepts, principles, embodiments, drawing of keypads, descriptions, etc., may be applied to any type of language /character set, such as for example, Roman alphabetical based language, phonetic based languages (e.g. (Pinyin-based) Chinese, Japanese), etc., as described before in detail.

**Can enlarge**

- **All precise**
- **Some precise**
- **Only pred.**

**Invisible mode**

Fig. 477A shown another example of the keypad of the invention on the screen 474009 of an electronic device. In this example, the letters are arranged in alphabetical order on four keys 477001-477004, and the broadly ambiguous zone 474007 (e.g. in this example, may be considered as a key).

The fully ambiguous mode of the invention has already been described in detail. The above keypad may preferably be used with the fully ambiguous version of the invention. In this example, The letters A to D are assigned to the key 477001, the letters E to H are assigned to the key 474003, the letters I to N are assigned to the key 477003, the letters O to S are assigned to the key 477004, and the letters T to Z are assigned to the zone/key 477007. As described before, when a user interacts with a key/zone, the system may preferably (e.g. simultaneously) relate said interaction to two types of interaction: ambiguous interaction and precise interaction. To enter precisely a character/letter, the user may use precise interaction as described earlier. As described an shown before, a key/zone of the keypad may include several sub-zones (e.g. herein may be referred to as subzone) such that interacting with a subzone may enter precisely the character/letter assigned to said sub-zone. According to a preferred method, as shown in this example, any of the keys/zone(s) of the keypad may preferably include a sub-zone corresponding to a different single letter (e.g. and or any special character (e.g. ambiguously assigned to said key). As such different keys of the keypad may have different numbers of subzones, and therefore their size may vary. For example, the key 477001 has four subzones each relating to a different single letter of the group of letters assigned to said key. As

such, the key 477002 has six subzones, the key 477003 has four subzones, the key 477004 has five subzones, and the broadly ambiguous zone/key 477007 has preferably seven subzones. In this embodiment, interacting with a subzone may preferably provide an ambiguous input signal corresponding to any of the letters assigned to the corresponding key and a precise input signal corresponding to an identified character assigned to said sub-zone. As such at any moment, the user may be able to enter both predictive and/or precise input information (e.g. the user may enter a word ambiguously by tapping anywhere on the keys and/or zone, or enter a chain of characters letter by letter precisely. Note that in this example, the characters/letters A-H are assigned to the left keys, and the characters/letters I to N are assigned to the right keys. This is beneficial specially in devices such as tablets because the user can faster remember and/or scan the alphabetically ordered letters.

According to one method, the system may have a switching method so that to reduce the size of the keypad of fig. 477A. As such, as shown in fig. 477B, after switching the keypad to such a mode. In this example, the size of the keys 477001 to 477004 are reduced, and the key/zone 477007 is replaced by the broadly ambiguous zone 477107. Now, interacting anywhere on the zone 477107 is preferably ambiguously related to any of the letters T to Z. according to one method, in this example, the number of subzones may be reduced such that to correspond to the main letters/characters, and the secondary characters may be entered as described before on in any other manner known by people skilled in the art.

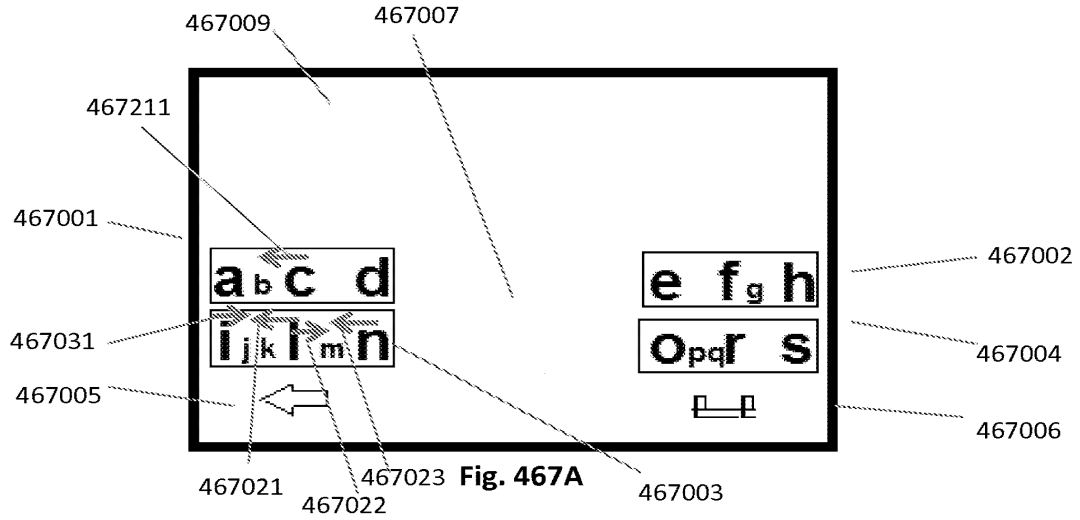


Fig. 467A

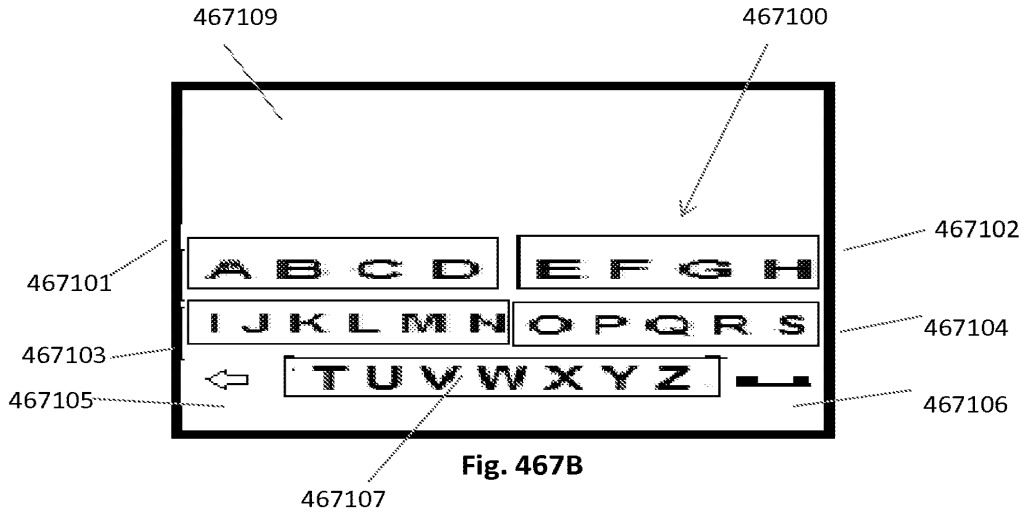


Fig. 467B

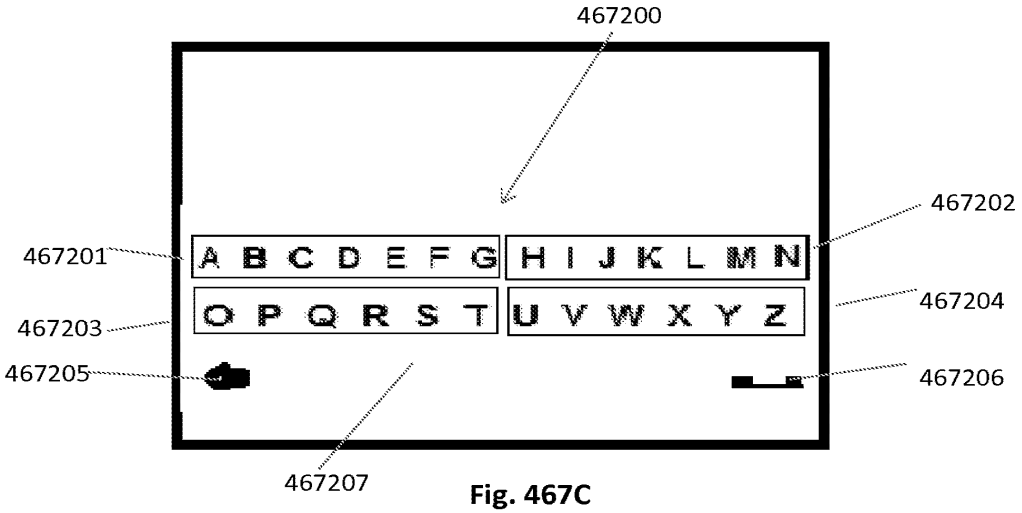


Fig. 467C

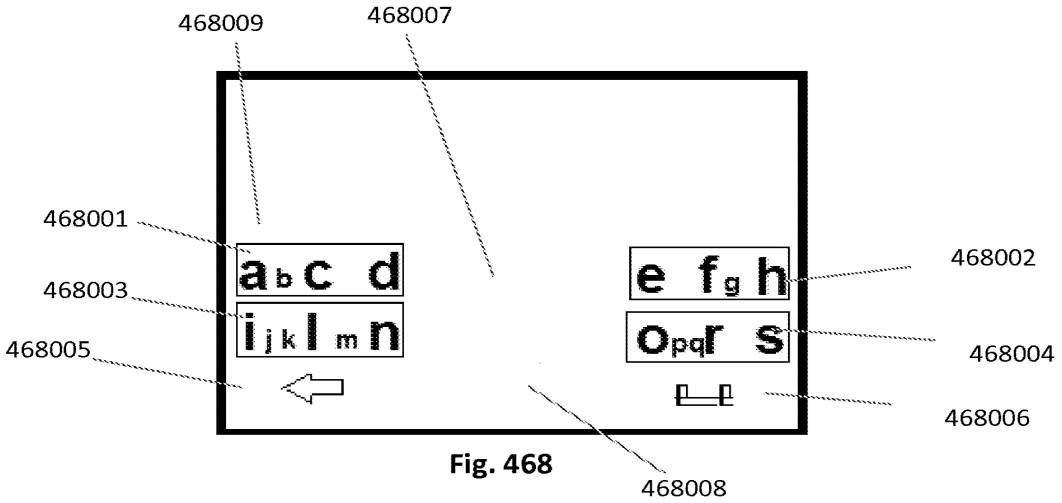


Fig. 468

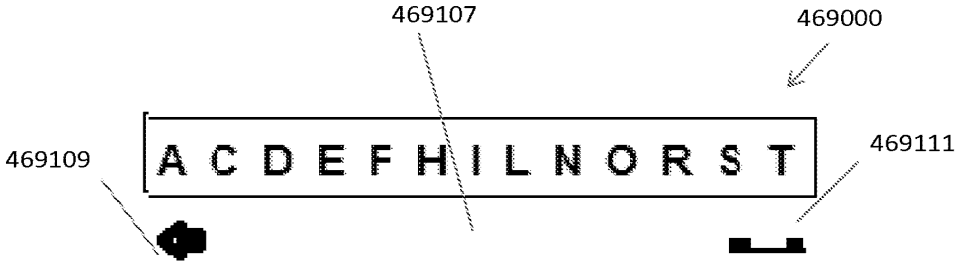


Fig. 469A

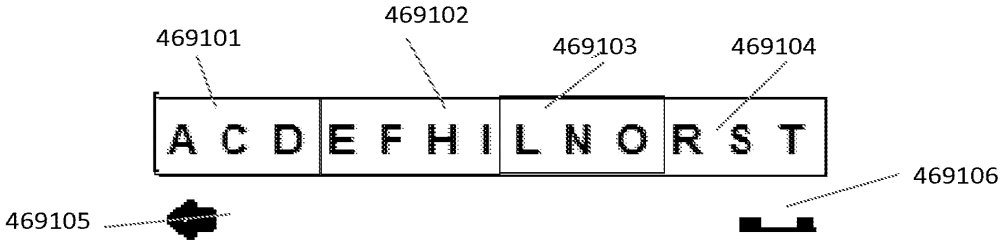


Fig. 469B

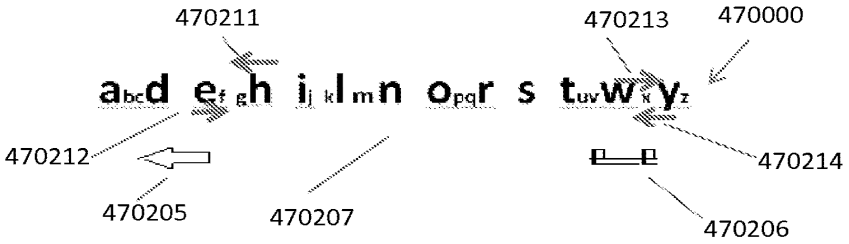


Fig. 470

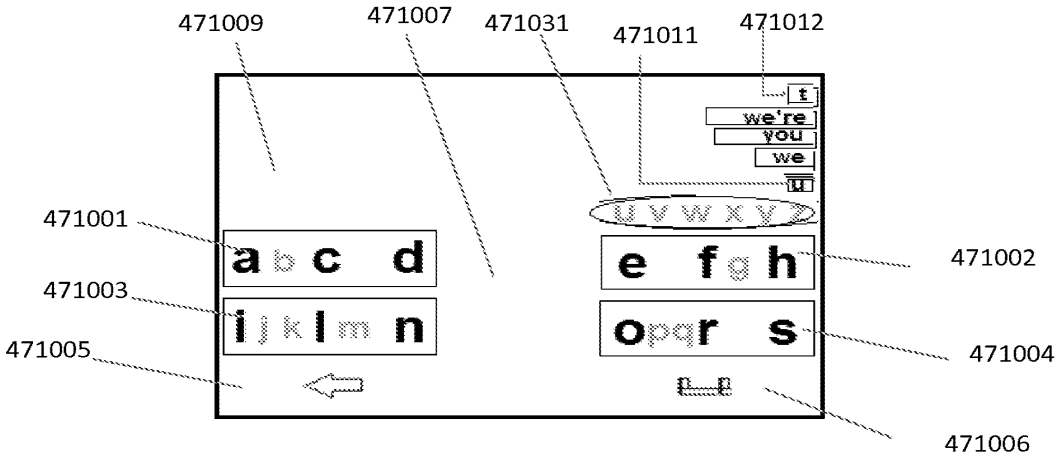


**Fig. 471A**

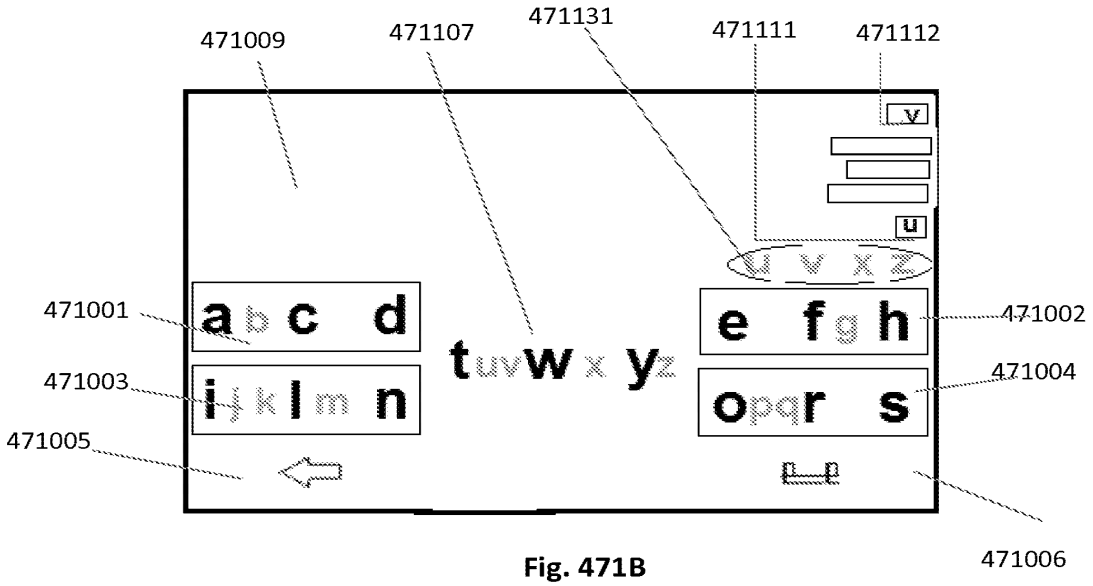


**Fig. 471B**

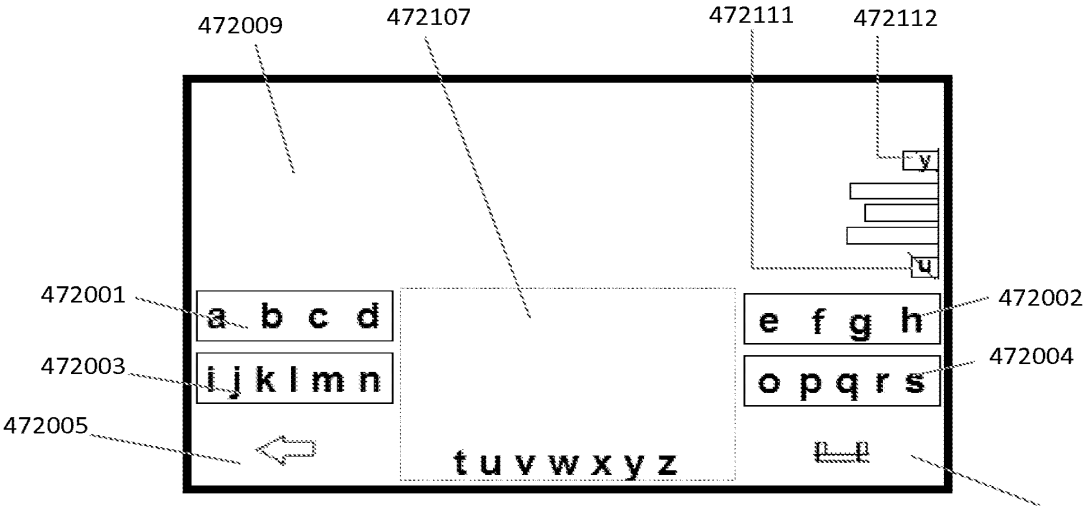


Fig. 472A

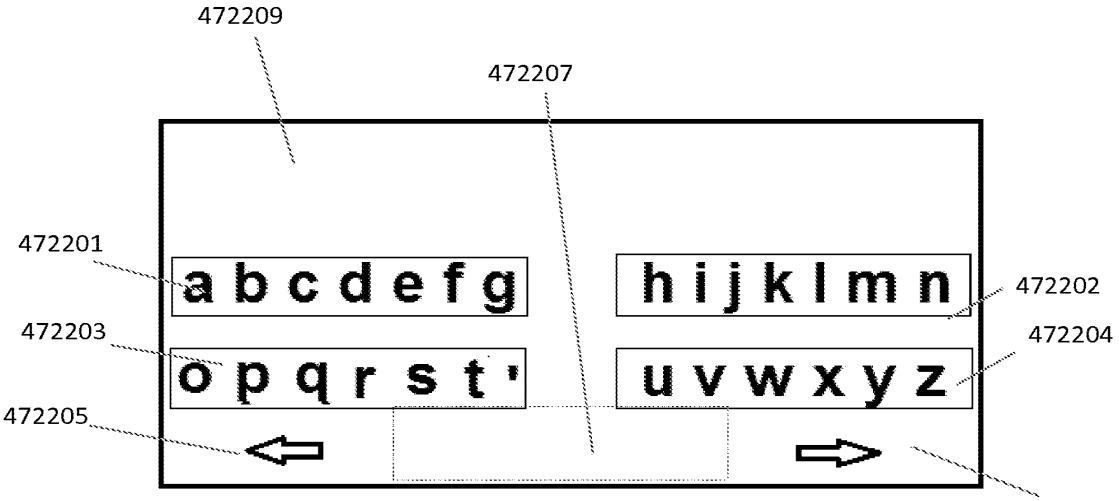


Fig. 472B

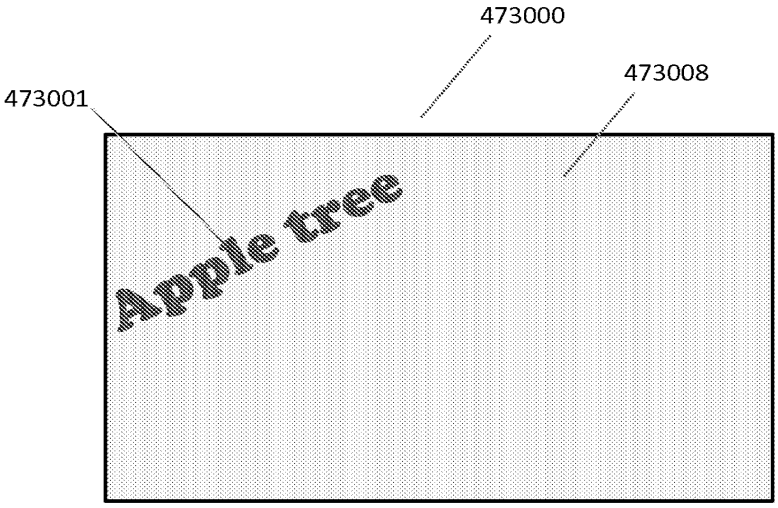


**Fig. 473**

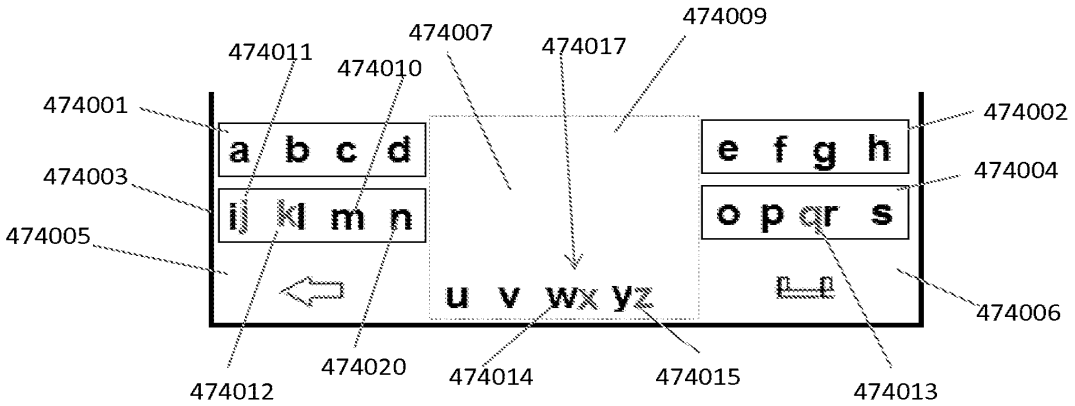


Fig. 474A

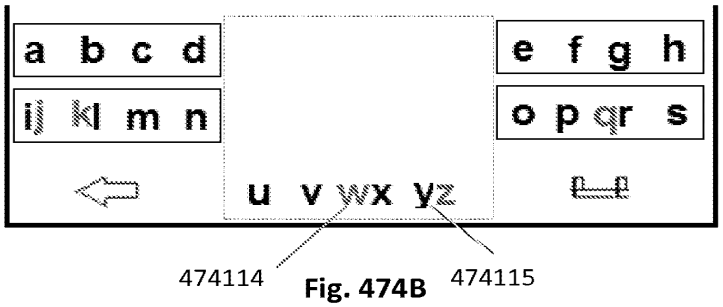


Fig. 474B

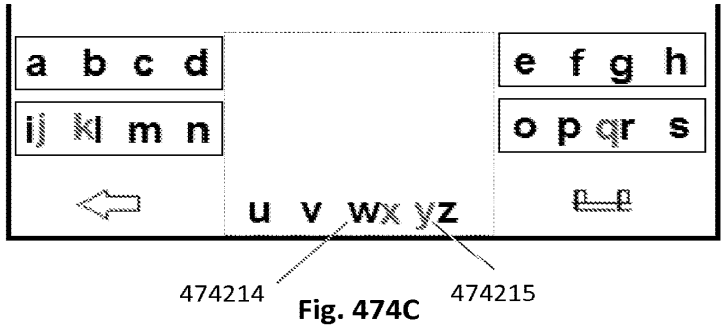


Fig. 474C

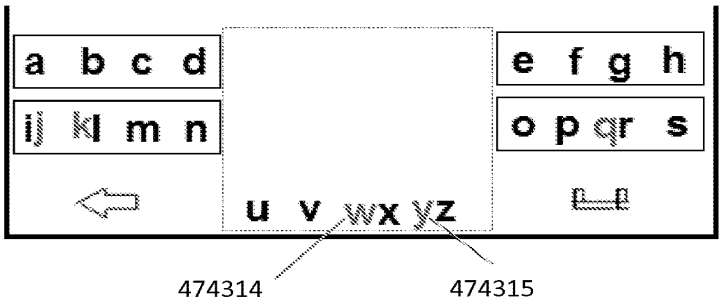


Fig. 474D

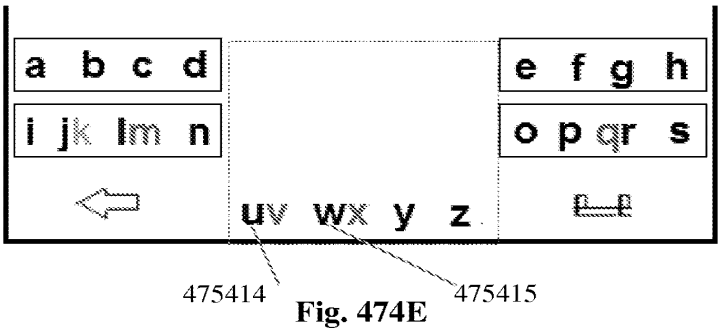


Fig. 474E

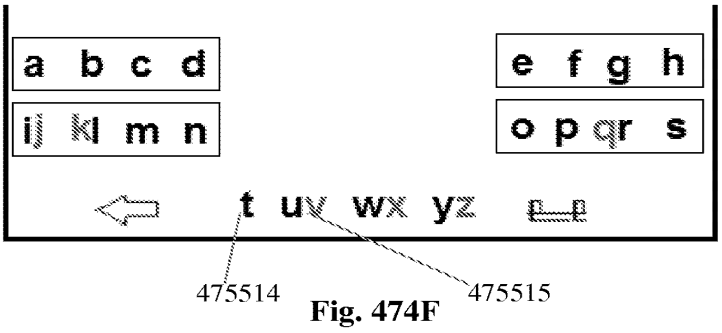


Fig. 474F

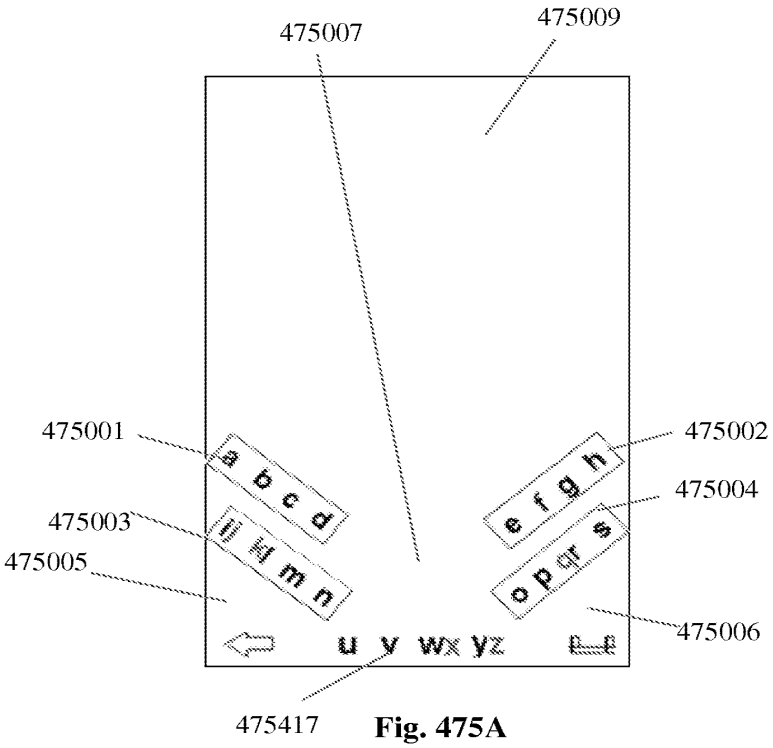


Fig. 475A

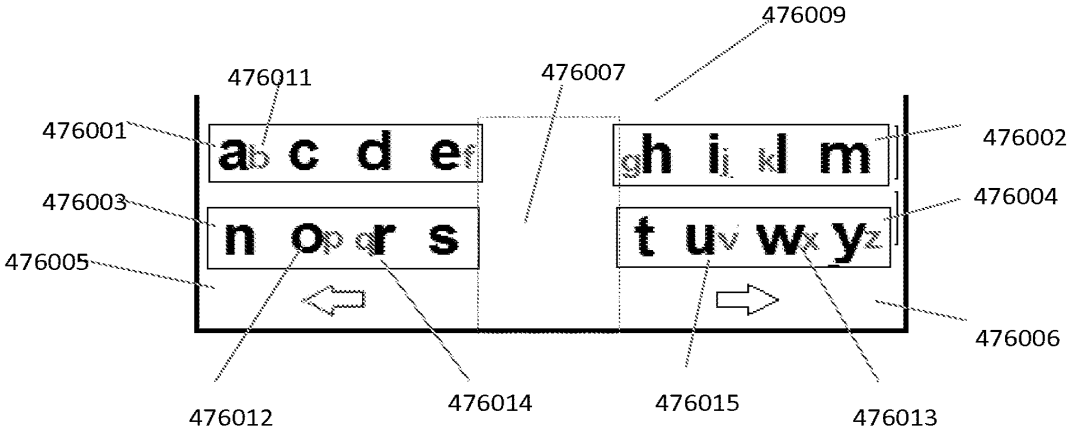


**Fig. 476A**

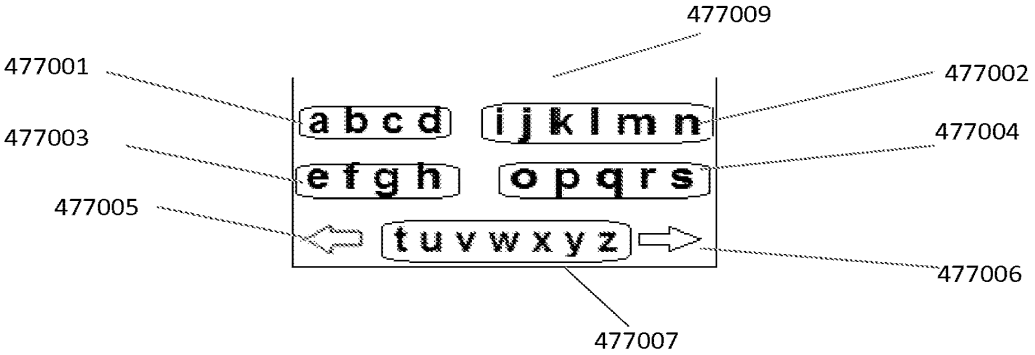


**Fig. 477A**

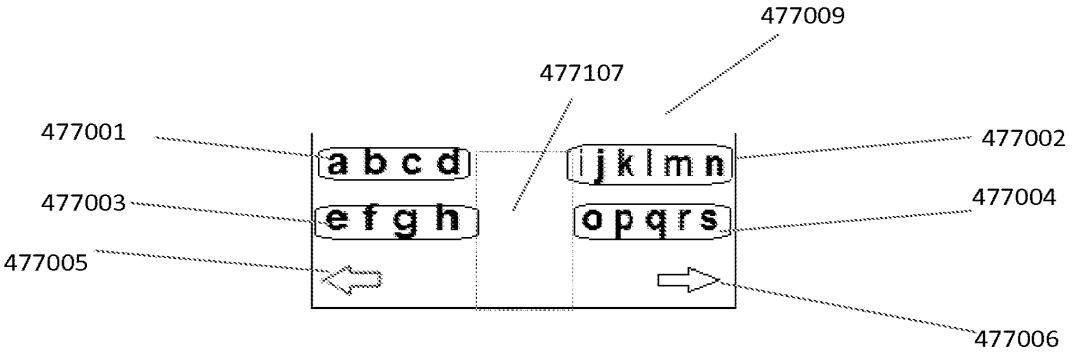


**Fig. 477B**

| Electronic Patent Application Fee Transmittal | |
|---|---|
| **Application Number:** | |
| **Filing Date:** | |
| **Title of Invention:** | IMPROVED DATA ENTRY SYSTEMS |
| **First Named Inventor/Applicant Name:** | Benjamin Firooz Ghassabian |
| **Filer:** | David L. Klein |
| **Attorney Docket Number:** | 2104-052-C20-USP |
| Filed as Small Entity | |

**Provisional Filing Fees**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| Provisional Application Filing Fee | 2005 | 1 | 130 | 130 |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| | | **Total in USD ($)** | | **130** |

| Electronic Acknowledgement Receipt | |
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| **EFS ID:** | 15861399 |
| **Application Number:** | 61827020 |
| **International Application Number:** | |
| **Confirmation Number:** | 3886 |
| **Title of Invention:** | IMPROVED DATA ENTRY SYSTEMS |
| **First Named Inventor/Applicant Name:** | Benjamin Firooz Ghassabian |
| **Customer Number:** | 32964 |
| **Filer:** | David L. Klein |
| **Filer Authorized By:** | |
| **Attorney Docket Number:** | 2104-052-C20-USP |
| **Receipt Date:** | 24-MAY-2013 |
| **Filing Date:** | |
| **Time Stamp:** | 05:54:48 |
| **Application Type:** | Provisional |

## Payment information:

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| Submitted with Payment | yes |
| Payment Type | Credit Card |
| Payment was successfully received in RAM | $130 |
| RAM confirmation Number | 7378 |
| Deposit Account | |
| Authorized User | |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|

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|---|---|---|---|---|---|
| 1 | Transmittal of New Application | 2104-052-C20-transmit.pdf | 666752<br>806850a17fd13daac88800e1942ba9b86ac9277f | no | 3 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Specification | 2104-052-C20-DESC-clean.pdf | 483364<br>f4e4eea8256d1ca8fb923192ba096173c0c23145 | no | 74 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Drawings-only black and white line drawings | 2104-052-C20-FIGS467A-C.pdf | 31665<br>9ca9cf876ab43bf20970265bb0a9413575efc375 | no | 1 |
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| 4 | Drawings-only black and white line drawings | 2104-052-C20-FIGS468-470.pdf | 30908<br>e64fb0e0eb9a515b3e596bc2580e0d6c89826b5f | no | 1 |
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| **Information:** | | | | | |
| 5 | Drawings-only black and white line drawings | 2104-052-C20-FIGS471A-B.pdf | 31094<br>7111ed6043584464bfcb3dc2534870f4e3751890 | no | 1 |
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| **Information:** | | | | | |
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| 7 | Drawings-only black and white line drawings | 2104-052-C20-FIGS473.pdf | 22316<br>f79a0ad55ea33bd39b5297b5528fa0d7274f1a2d | no | 1 |
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| 8 | Drawings-only black and white line drawings | 2104-052-C20-FIGS474A-D.pdf | 45420<br>45c54190b7ed154ff30657ece1af88410f448ace | no | 1 |
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| 10 | Drawings-only black and white line drawings | 2104-052-C20-FIGS476A-477B.pdf | 35292<br>dc4547de6c34868be413dd561be1fdf610d38d44 | no | 1 |
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| 11 | Fee Worksheet (SB06) | fee-info.pdf | 29748<br>9a1cbf5928459d1b7ff5a9590278d23d0a542325 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 1435408 | | |

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**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**<u>National Stage of an International Application under 35 U.S.C. 371</u>**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**<u>New International Application Filed with the USPTO as a Receiving Office</u>**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**