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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
61/927,039	01/14/2014		130	2104-052-C50-USP		

CONFIRMATION NO. 2219

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: 01/23/2014

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Benjamin Firooz Ghassabian, Jerusalem, ISRAEL;

Applicant(s)

Benjamin Firooz Ghassabian, Jerusalem, ISRAEL;

Power of Attorney:
David Klein--41118

If Required, Foreign Filing License Granted: 01/23/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/927,039**

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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application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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

PTO/SB/16 (04-07)
Approved for use through 06/30/2010 OMB 0651-0032
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-C50-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
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

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)	2014-01-14
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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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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-C50-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	
EFS ID:	17905650
Application Number:	61927039
International Application Number:	
Confirmation Number:	2219
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-C50-USP
Receipt Date:	14-JAN-2014
Filing Date:	
Time Stamp:	12:17:21
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
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RAM confirmation Number	9860
Deposit Account	
Authorized User	

File Listing:

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

1	Specification	2104-052-C50-desc-clean.pdf	129673 33f3234394d030c41f6483e6277aec647d390381	no	15
Warnings:					
Information:					
2	Drawings-only black and white line drawings	2104-052-C49-490K-501C.pdf	474520 ea2d79238db3d97c90b5fbfc6c0cdd04f66bcc5c	no	9
Warnings:					
Information:					
3	Drawings-only black and white line drawings	2104-052-C50-figs502A-C.pdf	50847 a032c7e1e2b4f23680d2ffd136b62478a7649b48	no	1
Warnings:					
Information:					
4	Transmittal of New Application	2104-052-C50-transmittal.pdf	858086 dc2f4bc4bbfca428fa93ec81146903c68e4d0aab	no	3
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	29747 2df04e2a35c7fbd30cca4aaa61b287e31a00f9ed	no	2
Warnings:					
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		Total Files Size (in bytes):	1542873		

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<u>New Applications Under 35 U.S.C. 111</u>
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>
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Date: 14/January/2014

US Provisional Patent Application

Our ref: 052-c50

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;
- application number 61825049 filed on May 17th 2013;
- application number 61827020 filed on May 24th 2013;
- application number 61830114 filed on June 02nd 2013;
- application number 61833512 filed on June 11th 2013;
- application number 61833991 filed on June 12th 2013 ;
- application number 61834889 filed on June 14th 2013;
- application number 61835704 filed on June 17th 2013;
- application number 61837662 filed on June 21th 2013;
- application number 61838288 filed on June 23th 2013;
- application number 61838403 filed on June 24th 2013;
- application number 61841360 filed on June 30th 2013;
- application number 61843391 filed on July 07th 2013;
- application number 61846030 filed on July 14th 2013;
- application number 61858210 filed on July 25th 2013;
- application number 61860396 filed on July 31st 2013;
- application number 61865254 filed on August 13th 2013;
- application number 61866119 filed on August 15th 2013;
- application number 61868172 filed on August 21st 2013;
- application number 61869722 filed on August 25th 2013;
- application number 61875192 filed on September 09th 2013;
- application number 61878695 filed on September 17th 2013;
- application number 61879152 filed on September 18th 2013;
- application number 61882160 filed on September 25th 2013;

- application number 61893291 filed on October 21st 2013;
- application number 61899240 filed on November 03rd 2013:
- application number 61902242 filed on November 10th 2013;
- application number 61908122 filed on November 24th 2013;
- application number 61908248 filed on November 25th 2013;
- application number 61913472 filed on December 09th 2013;
- application number 61920572 filed on December 24th 2013; and
- application number 61926474 filed on January 13th 2014.

The drawings and text of the above applications are entirely 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.

Swipe
Direction on a key
And an ambiguous zone
Glides ending outside do not relate to swiping input method
Correspond to entering precise chars/functions
Letters, special chars, functions (e.g. SpellHelp)
tapping direction on a K

Preferably, a substantially straight gliding action (e.g. 500011 of Fig. 500I) traversing at least 2 keys may correspond to interacting with source and destination keys/zones (e.g. keys/zone 500002 and 500007, e.g. of a keypad of the invention in split mode). If a user desires to also interact with any of the others keys in addition to source and destination keys/zones (e.g. said other keys/zones may herein be referred to as middle keys/zones), the user may change a feature of a gliding action for each of said middle keys/zones, for example, change of speed, direction, pressures, etc. For example, the gliding action 500012 of Fig. 500I may correspond to interacting with the keys/zones 500002, 500004, and 500007. Fig. 500J shows the same interactions on a keypad of the invention in a non-split mode. Accordingly, the gliding actions 500051 and 500052 respectively correspond to interacting with the keys/zones 500003, 500004, and the keys/zones 500003, 500007, 500004 of the minimal keypad of Fig. 500M.

Providing a gliding action on a single key/zone may preferably correspond to two interactions (e.g. two tapping actions) on with said key/zone. Preferably, the order of presentation of the corresponding letters on the key/zone corresponds to the direction of the gliding action. For example, as shown in Fig. 500K, the gliding 500031 provided on the key 500002 may preferably correspond to the word "up" and the gliding action 500032, provided on the same key, may correspond to the word "it". Note that, such a gliding action may correspond to a portion of a word. In this case, in addition to considering to ambiguous interactions with the corresponding key, the direction of such gliding action preferably restricts the number of choices. For example, a tapping action on the key/zone 500003 and providing the gliding action 500031, may preferably correspond to the word "ail", while the tapping 500003 and the gliding action 500032 may preferably correspond to the word "fit". Note that the direction defined by two or more predefined actions (e.g. tapping actions) on an identical key/zone may correspond to a gliding action (e.g. simple or complex) on said key in the corresponding direction.

A gliding action ending outside the letters keys/zones of a keypad may correspond to entering a precise character and/or a function. For example, the gliding action 500041 starting and ending on two letter keys/zones 500001, 500003 may correspond to interacting with said two keys, and a

gliding action 500042 provided from the key 500001 traversing the key 500003 and ending outside the keypad of the invention, may correspond to the Spelling Help feature/function of the invention.

-Prediction based on user's typing behaviors (e.g. considering x, y, on touch)

- **If typing on a approximately same Y, considers as typing (e.g. fully) ambiguous (Method1)**
- **If typing on different Y, considers as typing (e.g. at least partially) precisely (Method2).**
    - **Considers all of typing precisely (e.g. N precise)**
    - **Considers at least one of them precise (e.g. N-1 to 1)**
    - **If does not find a word may consider the neighboring letters of at least one of the touched area.**
    - **2 different Y on the right zones and/or 2 different Y on left zones, or on the 5th zone**

-First predicts based on the detected method of typing, then if needed, the other method.
-Can be used with Spell-Help too
-Can combine methods1 and method2

The prediction of the words using the data entry system may dynamically vary based on some parameters. According to one embodiment of the invention, based on users' interaction with the keyboard during the entry of a chain of characters such as a word, the system may automatically use various methods of prediction.

According to a first procedure, during the entry of a word if two impact point(s) on a predefined area (e.g. the right side or the left side of the keyboard, preferably defined by a line that separates the right and left keys/zone) of a keyboard are located within the same (e.g. preferably vertical) axis, where said axis has a predefined width, may preferably inform the system that each of the input signals, of a corresponding impact, ambiguously corresponds to any of the characters assigned to the corresponding key/zone (e.g. herein may be referred to an ambiguous input signal). As an example, in Fig. 501A, tapping on twice on the letter 't' 501011 may ambiguously correspond to several words, such as, 'it' and 'up'. As another example, tapping on the letter 't' 501001, 'g' 501012, 'g' 501012, may ambiguously correspond to several words, such as 'too' and 'log'.

According to a second procedure, during the entry of a word if two impact point(s) on a predefined area of a keyboard are not located within the same (e.g. preferably vertical) axis, may preferably inform the system that each of the input signals, of a corresponding impact, precisely corresponds to an identified character on and/or near which the impact was provided (e.g. herein may be referred to an unambiguous input signal). As an example, in Fig 501A, tapping on the letter 'u' 501021 and the letter 'p' 501022 may precisely correspond to the word 'up'. According to another example, tapping the letter 'h' 501031 and the letter 'i' 501032 may precisely correspond to the word 'hi'. Note that the system may use a word completion software to (e.g. also) predict longer words including one or more identified characters. Note that, preferably, one of the words predicted as such, may be entered by providing a preferred interaction, such as pressing the space key.

Note that in the first procedure, preferably, in addition to relating the impacts to ambiguous input signals, the system may also relate said interactions to unambiguous input signals and propose a corresponding chain of unambiguous characters. Note that in the second procedure, preferably, in addition to relating the impacts to unambiguous input signals, the system may also relate said interactions to ambiguous input signals and propose one or more corresponding words.

According to one method, upon determining a procedure, the system may preferably first propose one or more words based on said procedure. If needed, the system may (e.g. further) propose one or more words based on another procedure (e.g. the other procedure).

Note that the first and second procedures may be combined to predict one or more words. As an example, during the entry of a word, one or more impacts may be related by the system to ambiguous input signal(s) and one or more impacts may be related to unambiguous input signal(s). As an example, during the entry of a word, if the majority of impacts are provided within the same (e.g. vertical) axis, and one or more other impacts are provided outside said axis, the system may preferably relate the impacts inside said axis to ambiguous input signals and may preferably relate those impacts outside said axis to unambiguous input signals. The system may propose one or more words accordingly.

The procedures described above/herein, may be used with any of the other methods of the word/text prediction systems. As an example, said procedures may be used/combined with the Spell Help methods of the invention.

Note that the procedures described above, are exemplary procedures. More procedures based on user interaction/behavior may be considered by those skilled in the art. As an example, during the entry of a word, (e.g. preferably, if one or more of the impacts is provided outside an axis in which a number of impacts are provided), the system may propose one or more words based on the following considerations: (1) the system considers all of said impacts (e.g. N impacts) as unambiguous input signals, (2) the system considers at least one of the impacts as being an ambiguous input signal (e.g. from 1 to N impacts). A such ambiguous input signal may preferably be related either to the key/zone on which the impact is provided or it may be preferably related to one or more character(s) on or located nearby said corresponding impact. Optionally, said ambiguous input signal may be related by the system to any character.

Note that based on user behavior such as typing with one or two hands the system may or may not relate the impacts to corresponding to ambiguous and/or unambiguous input signals. As an example, in Fig. 501B, the impacts 501111, 501112, and 501113 the system may not be able to relate said impacts to a first or a second procedure because if said impacts are provided by one finger they preferably should be related precise characters (e.g. only to the word 'can'), while if the impacts are provided by two hands then the user may have been related to ambiguous input signals. In this case, preferably, the system may consider each of the corresponding procedures to predict one or more words. In Fig. 501C, in addition to the impacts 501111, 501112, and 501113, the user has provided two more impacts 501114 and 501115. In this case, the system may preferably, at first, relate said impacts to unambiguous input signals because the left impacts 501112 and 501114 are provided on different vertical axis.

Note that, according to one method the system may use various means of recognition to recognize the intention of the user regarding typing precisely or ambiguously. Such means of recognition may be defined regardless of the consideration for the axis of typing as described above.

if monekey is a/bigng-of-a w =>
- prediction based on it
- spell help
if monkey is in dic.
-monkey <-> current
- from N (eg 3)

As mentioned before, during an instance of the data entry corresponding to a word, the system may relate/correspond the interactions such as tapping actions on a zone/key to both precise and/or to ambiguous input signal(s) (e.g. precise/identified and/or ambiguous characters). According to one embodiment, if a sequence of such input signals related by the system to precise characters correspond to a word and/or a stem (e.g. preferably corresponding to the beginning characters of a (e.g. one or more) word/s of a database of words used by the system), then said said identified chain of characters may be considered as having the highest priority for that instance and may be considered as the current word being entered. Accordingly, preferably, said word may be entered and/or presented as the first choice. According to one method, more words (e.g. word candidates) beginning with said chain of characters may be presented to the user. Optionally, (e.g. preferably, if none of the proposed words is the desired word), the system may also propose words relating/corresponding to (e.g. considered) ambiguous input signals. If such input signals are not related to a word and /or a stem of the dictionary, the system may propose words based on ambiguous input signals.

As an example, by considering the keyboard of fig. 501A, if the user taps anywhere on the keys 501001, 501004, 501003, and 501002, and the corresponding precise chain of characters (e.g. EHDY) the system may propose ambiguous words 'what', 'whale', 'rofl' and 'whatsoever'. On the other hand, if said pressing actions correspond to tapping precisely on the letters W, H, A, T the system may relate said chain of characters WHAT which is a worked of the database and also corresponds longer words that begin with said chain of characters. As an example, in this case, the system may relate said interaction to the words WHAT, WHAT'S , WHATSOVEVER, WHATEVER, WHAT'D, etc.

Note that, according to one method, the user interactions corresponding to entry of information corresponding to a word may be considered by the system to include ambiguous and/or precise input signals. As an example, an auto-correction system such as the ones described herein may be used with the system to propose a word(s) that may be considered by the system to include some (e.g. one or more) of the input signals as precise characters and one of more of the input signals as ambiguous (e.g. in case the system does not find a word in the word database if the system relates all the input signals to precise characters). The system may propose one or more words (e.g. short and/or long words) accordingly.

Preferably, the principles just described may be applied to the words having at least a predefined number of characters (e.g. preferably at least 3 or at least 4 characters).

The principles described above may be used with any technology such as those described in this and related applications. As an example, these principles may be used with the Spelling Help system (e.g. relating the precise and ambiguous interactions to the beginning and ending characters of a word) of the invention.

spell help
1st type, then another type

tap left + tap right

tap (precisely) big. + tap (precisely) end

Methods of Spelling Help by typing one or more beginning characters of a word and/or typing one or more ending characters of a word have been described before by this inventor. According to one method, the beginning characters of a word may be entered by using a first type of interaction and

the ending characters may be entered by using a second type of interaction. Said types of interaction may vary. As an example, the first type of interaction may be tapping on a location other than the right side of the corresponding keys/zones (e.g. zones/keys 501001 to 501004, and 501007 of the keypad of Fig. 501A) for the beginning characters, and the second type of interaction may be tapping on the right side of said corresponding keys/zones.

According to another method, during the entry of a word, (e.g. in addition to relating said interactions to a sequence of characters) the system (e.g. automatically) may relate a first number of key/zone interactions to beginning characters of a word, and may relate the rest of the key/zone interactions to the ending characters of said word.

According to another method, (e.g. after entering the input information (e.g. key presses) corresponding to one or more beginning characters of a word) and, preferably, interacting with a means such as a key/button corresponding to spelling help, the user may enter the input information corresponding to the one or more ending characters of the word. According to one method, said key/button may be provided/presented in the presented wordlist corresponding to the input information provided by the user. As an example, after entering the input information corresponding to a word, in addition to the corresponding word/s being presented to the user, the system may also display said key/button corresponding to the spell help. At any moment during the entry of the (beginning) portion of the word, the user may interact with said key/button and then enter input information corresponding to one or more ending characters of the word.

According to one embodiment, in order to predict a (e.g. one or more) word using the spell help (e.g. of the invention), the system may either consider all of the input information corresponding to the word (e.g. provided by the user) and/or a portion of it. As an example, the system may consider the input information corresponding to a (e.g. predefined) number of the beginning characters of the word and the input information corresponding to a (e.g. predefined) number (e.g. some or preferably all) of the ending characters of the word provided by the user. As an example, the system may consider the input information corresponding to four beginning characters of the word (e.g. even if the user provided an input information corresponding to more beginning characters) and the input information corresponding to the ending characters of the word.
Principles and methods regarding recording/considering a portion (e.g. a word, a phrase, a sentence) of a text (e.g. during the entry of a text) and entering them later by using a data entry system such as for example the data entry system of the invention have been described before. According to one embodiment, (e.g. instead of a gesture/gliding action) a means to inform the system of the beginning and/or the ending of the recording procedure may be in the form of an interaction with a key/button, for example, similar to the key/button used for the spell help system. According to one method, said key/button may be presented to the user during the entry of a word. A first interaction with said key/button may preferably correspond to the beginning of the recording procedure (e.g. which preferably includes the input information corresponding to the word being entered). A second interaction with said key/button, preferably during the entry of another word, may preferably end the recording procedure (e.g. which preferably includes said another word being entered). Note that said key/button may be presented separate from a wordlist. In this case, preferably, after the first interaction of said key/button, the system begins to record the input information corresponding to the text/word being entered, until a second interaction of said key/button.

wl includes spchars

Note that, for the word list of the invention has been described in detailed before, preferably upon display of said word list, a group of one or more keys/zones (e.g. herein referred to as word list keys/zones) may be displayed (e.g. next to and/or immediately underneath the word list). Upon actuating (e.g. tapping, gliding, etc.) a key/zone of said group of keys/zones, word(s) in said word

list may be modified, preferably adding an additional character corresponding to a key/zone of said group of keys/zones to the end of at least one word in said word list. Preferably, when the word list is not displayed, the word list keys/zones are not displayed.

on/from bs move for small/large keys
long-press and mode for split/unsplit

The description regarding positioning and resizing (e.g. splitting, changing the size of the keys, moving the keys) of a keyboard have been described herein. As described, according to one embodiment, providing a predefined interaction such as a gliding action action provided in a predefined direction from a key such as a backspace key may correspond to a function such as splitting or unsplitting the keyboard of the invention such as those splitting functions described throughout Figs. 490K to 490S. According to a preferred method, a gliding action corresponding to a splitting/unsplitting action may include a press-and-holding action. Preferably, such gliding actions not including a press-and-hold action may correspond to changing the size of the keys of the keyboard (e.g. increasing and decreasing the size of the keyboard). As an example, as shown in fig. 490T, providing a gliding action 490911 without including a press-and-hold action from the backspace key 490905 leftwards may correspond to increasing the width of the keys of the keyboard (e.g. see enlarged/increased keyboard of Fig. 490U), providing a gliding action 490921 without including a press-and-hold action from the backspace key 490905 rightwards may correspond to decreasing the width of the keys of the keyboard (e.g. see reduced/decreased keyboard of Fig. 490V), providing a gliding action without including a press-and-hold action from the backspace upwards may correspond to increasing (e.g. or decreasing) the height of the keys of the keyboard (e.g. preferably, upwards). Providing, for example, a gliding action without including a press-and-hold action from the backspace key diagonally towards the upper-left may increase/decrease the one or both of the width and the height of the keys of the keyboard (e.g. preferably, towards upper-left direction increases both height and width of the keyboard, and towards lower-right direction decreases both height and width of the keyboard. Also as an example, towards the upper-right increase the height and decreases the width of the keyboard. Other combinations of changing the height and/or width of the keyboard according to a corresponding predefined action may be considered by those skilled in the art).

Preferably, providing a gliding action without including a press-and-hold action from the backspace downwards may correspond to decreasing (e.g. or increasing) the height of the keys of the keyboard (e.g. preferably, downwards), and providing a gliding action without including a press-and-hold action from the backspace key diagonally towards the lower-left may increase the both the width and height of the keys of the keyboard (e.g. preferably, towards lower-left).

Preferably, a predefined action such as a press-and-hold action (e.g. and removing the finger) without providing a gliding action on a predefined zone such as the space key and/or the backspace key may correspond to resizing and/or repositioning the keyboard in a predefined/default instance. According to one method, said predefined/default zone may be a predefined instance of the keyboard (e.g. position and/or size, etc.) or another instance such as an instance defined by a user (e.g. the/a previous instance of the keyboard).

Preferably, if a first gliding action provided in a predefined direction is assigned to a first function (e.g. increasing the size of the keys/keyboard), a second gliding action provided in another (e.g. substantially opposite) direction may be assigned to another function such as preferably opposite/complementary function (e.g. decreasing the size of the keys/keyboard).

Note that, the interaction corresponding to splitting and/or resizing the keys of the keyboard may be interchanged.

Resizing preferably relates to (amb.) group of (letter) keys/zones
According to one aspect of the invention, preferably, resizing of the keyboard resizes some of the (e.g. ambiguous letter/character) key(s)/zone(s) of the keyboard (e.g. preferably the keys/zones that are (e.g. preferably ambiguously) associated with a group of characters (e.g. letters)).

Functions buttons/common punc. are not resized (or resized not less that to a usable size)
According to one aspect of the invention, preferably, some of the button(s)/key(s)/zone(s) (e.g. preferably button(s)/zone(s)/key(s)) of the keyboard are not resized and maintain a predefined size, when the keyboard is resized. As an example, the keys/zones that contain punctuation characters (e.g. period, comma) may have a fixed size while other (e.g. ambiguous letter) keys/zones may be of any size corresponding to the size of the keyboard.

According to one aspect of the invention, some key(s)/zone(s)/button(s) of the keyboard may be resized such that their size is bound by a predefined limited (e.g. key(s)/zone(s)/button(s) are not a size that is unusable (e.g. too small to use reliably, comfortably, confidently)).

According to one embodiment of the invention, key(s)/zone(s)/button(s) that are not (e.g. automatically) resized or resized to predefined limit (e.g. as just described) (e.g. according to the size of the keyboard) may contain characters (e.g. special characters) and/or, preferably, functions (e.g. mode keys, shift function, enter function), herein referred to as function buttons.

The visible portion, in form a bar (490Z2)
Activated on tap or on gesture
In form of a line (490Z3)
Activated on gesture

According to one embodiment of the invention, a portion of a function button may be visible while another portion of said function button may not be visible (e.g. displayed). According to one method, the portion not displayed may be delimited/indicated/highlight by one or more outline(s), preferably on at least one boundary/border of said function button or of said not display portion of said function button (e.g. 490971 to 490974 in Fig. 490Z1).

According to one preferred method, for a function button that may have a portion that is or is not displayed, said function button may be displayed as a bar (e.g. 490971 to 490974 in Fig. 490Z2), herein referred to as a bar function button. Preferably, said function button displayed as a bar may be activated/actuated (e.g. provide the system with an activation signal) by a predefined interaction such as a tapping action or a gesture interaction (e.g. sliding or gliding from the edge of the device/input means as already described). Displaying a function button as a bar the size of the input method may be reduced (e.g. the space occupied by the function button of the input method is reduced).

According to another preferred method, for a function button that may have a portion that is or is not displayed (e.g. said portion may be invisible), said function button may be a line (e.g. 490971 to 490974 in Fig. 490Z3), preferably displayed as a line (e.g. optionally not displayed), herein referred to as a line function button. Preferably, said line function button may be activated/actuated (e.g. provide the system with an activation signal) by a predefined interaction such as a gesture interaction (e.g. sliding or gliding from the edge of the device/input means as already described). Displaying a function button as a line function button the size of the input method may be reduced (e.g. the space occupied by the function button of the input method is reduced).

On sides of the screen (490W-490Y) or attached to the keyboard (490Y)
According to one method, the function button(s) may be located on the sides of the input means, such as a touch sensitive surface (e.g. a touchscreen), and preferably said function buttons may be located above the (e.g. ambiguous letter keys/zones 490901 to 490904) key(s)/zone(s) of a keyboard. In the example of Fig. **490**W, keys/zones 490971, 490972 and 490973, 490974 associated with special characters and/or functions, are displayed on the sides of the screen 490909. Keys/zones 490971 and 490972 are displayed on the left side of screen 490909, and keys/zones 490973 and 490974 are displayed on the right side of the screen 490909.

Furthermore, according to another method, upon resizing (e.g. reducing the width of) a keyboard, function button(s) may (e.g. automatically) be positioned at a location of substantially the same height of at least some of the (e.g. ambiguous letter) (e.g. ambiguous letter keys/zones 490901 to 490904) key(s)/zone(s) of the keyboard, while being located on the side(s) of the input means, such as a touch sensitive surface (e.g. a touch screen). In the example of Fig. **490**Y, keys/zones 490971, 490972, and 490973, 490974 associated with special characters and/or functions, are displayed on the sides of the screen 490909. Keys/zones 490971 and 490972 are displayed on the left side of screen 490909 at the same height of the keys of the keyboard, and keys/zones 490973 and 490974 are displayed on the right side of the screen 490909 at the same height of the keys of the keyboard.

According to one method, function button(s) may be located on (e.g. attached to) the (e.g. outer (such as the left most side and right most side) side(s) of key(s) of a keyboard. Preferably, upon resizing (e.g. reducing the width of) a keyboard, function button(s) may (e.g. automatically) be positioned/attached at the side(s) of the (e.g. ambiguous) keys of the keyboard. In the example of Fig. **490**X, keys/zones 490971, 490972, 490973 and 490974 associated with special characters and/or functions, are displayed on the sides the keyboard. Keys/zones 490971 and 490972 are displayed on the left side of the keyboard, and keys/zones 490973 and 490974 are displayed on the right side of the keyboard.

According to one embodiment, substantially all of the side bars may be located on one edge of the screen.

Slide up from a key for shift. Slide and hold for capslck

Enters the letter too

In precise: a) enters amb. letter and precise for monkey b) enters precise for all words

According to one embodiment, a predefined interaction with a key such as a gliding action in a predefined direction such as upward from a key (e.g. of an ambiguous or precise keyboard) may be related to a Shift function. Preferably such interaction may also be related to typing/entering a corresponding character in the corresponding Shifted Mode. Preferably, if said gliding action includes a press-and-holding action it may activate the capslock function.

Using an area of a touchscreen assigned to an input interface/means (e.g. keyboard) for implementing an application

According to one embodiment of the invention, the (e.g. system) resources (e.g. input means and/or screen areas of an input interface such as a touchscreen) allocated/assigned to an input method (e.g.

a native keyboard of an operating system/device) such as an input method of invention may be utilized by and/or made available to an executable object/component (e.g. such as a computer software/application), preferably in addition to the input method (e.g. alone), herein referred to as extra input method resource(s). Since the input method of the invention may be reduced in size and/or, for example, made invisible, the screen area(s) usually allocated to a full-sized input method/keyboard (e.g. that occupies a predefined area of the screen allocated by a (e.g. operating) system/device to an input means such as a keyboard) (e.g. considered larger than a input method with reduced size) and under control of the input method may be made available to another application. As another example, the extra input method resources such as a screen area may contain a chat application, such as, for example Skype, image editing method/application of the invention, video chat application, while a regular application area (e.g. all related operating system and device resource e.g. such as a touchscreen device/resource) of an operating system may be occupied by other application(s), such as, for example WhatsApp. According to the current embodiment, an input method such as the input method of the invention may (e.g. simultaneously) interact with applications in the extra input method resource or in the regular application area of an operating system.

Several advantages of such principles relating to current embodiment follow, as an example:

(1) the user can chat on an instant messaging application(s) with other users, for example, on WhatApp, Skype, Facebook, and at the same time the user can for example, send pictures, edit pictures (e.g. using the image editing method/application of the invention) from the application(s) operating in the extra input method resources (e.g. under control of the input method). Optionally, the user may share pictures with other users through any application(s). For example, an picture edited as such may be share through a chat application such as WhatsApp preferably operating in the regular application area of an operating system.

(2) a user can chat with a first group of users by using an instant message application as described, and in the extra input method resource area a user may video chat with a second group of users.

Note that, in the current embodiment, according to a preferred method, upon an interaction with an area corresponding to an application running in the regular application space of an operating system (e.g. touching the screen in the area assigned to said application), that application gains focus of the input method. Similarly, upon an interaction with an area corresponding to an application running in the extra input method resource (e.g. touching the screen in the area assigned to said application), that application gains focus of the input method. Alternatively, the input information provided by the input method is provided to both applications.

How to move keys and the wl

According to one embodiments of the invention, On the word list:

- Sliding in a predefined direction such as upwards may cause the system to propose more words corresponding to the input information provided by the user.
- Sliding downwards removes the word list and preferably deletes the word being entered.
- A gliding action including a long-press preferably corresponds to moving the wordlist (e.g. on the screen)
- A long pressing action on a word/stem may preferably cuses to provide/present by the system more words/stems beginning with that word/stem.

5 finger typing

As mentioned before, the input information provided by a user may be provided through any input means. As an example, interacting with the (e.g. 5 letter) keys/zones of the/a keypad (e.g.

model) of invention may be imitated by interaction (e.g. tapping/gliding) of (e.g. 5) fingers of a user on a touch sensitive surface such as a touchscreen. As an example, a user may lay at least one (e.g. preferably all five) fingers (e.g. of one hand) on the surface so that to permit to the system to approximately localize the locations of the corresponding fingers to hit the screen during a text entry session. Each of said fingers tapping on the corresponding localized location may imitate the input signal providided by interacting with the corresponding key of the (e.g. imaginary) keypad (model) of the invention. As such the user may enter text preferably anywhere on the screen without preferably having a user input interface on the screen. For some synbols/fuctions (e.g. such as spacing, backspacing, fucnctions, special characters, etc.) input other means (e.g. side bars/buttons, gliding actions, etc.) may be used.

4k-mimi

According to one embodiment, the broadly ambiguous zones (e.g. the zone between the 4 letter keys of the invention) may be divided in at least two subzone, one subzone corresponding to the letters/characters assigned to said broadly ambiguous zone, and the other subzone corresponding to the space and/or back space fucnctions as described previously in this application. Such a keypad may herein be referred to as "mini keypad). Fig. 502A shows as an example, an exemplary 4-key mini keypad, wherein the subzone 502007 is used for a group of (e.g. ambiguous (e.g. may also type identified letters by typing precisely on the letters)) letters, and the subzone 502008 is used by spece and/or backspace as described before in this application (e.g. see descriptions related to Figs. 499A to 499E).

4k super mini

With continuous description of the current embodiment, according to one method such the space and backspace keys (e.g. 502006 and 502005) of the keypad may be removed/excluded to provide an extremely small input interface. Such a keypad may herein be referred to as "super mini keypad). Fig. 502B shows as an example, an exemplary 4-key super mini keypad of the invention based on the mini keypad 502A with the difference that here the space key 502006 and the backspace 502005 key are removed/hidden.

Switch between mini and super mini

Preferably, a switching method/means may be used to switch between the mini and super mini keypads. As an example, a predefined interaction such as a gliding action (e.g. upwards or downwards, or etc.) provided from/on the sub-zone 502008 corresponding to the space/backspace may be used to switch back and forth between said mini and super mini keypads. Fig. 502C shows as an example, an exemplary small and split 5-zone keypad of the invention selected 502012 among others from a menu bar 502011 which was displayed (e.g. on the screen) by providing a predefined interaction on the space key 502006. As mentioned, a predefined interaction such a gliding action provided on a key (e.g. upwards on/from the key 502005) may switch the keyboard to a/the full-size keyboard of the invention.

Auto-Correction

According to one embodiment, the system may include a next word prediction method based on at least one predefined/target word (e.g. at least one of the last words being entered, a selected word, etc.). The next word(s) predicted as such may be presented to the user preferably in a word list. According to one method, the predicted words may be used in an auto-correction feature such that if a word is being typed by the user (e.g. if a user begins to type a word), one or more of said predicted next words corresponds to the input information provided by the user with (e.g. preferably minor (e.g. one, two, etc.) mistyping the system also proposes said said one or more predicted next words.

Correction on-the-fly on demand

According to one one embodiment, a correction means may be available to the user during the entry of a word, so that the user can ask the system to correct (e.g. propose words by considering/assuming that the user has mistyped on at least one key/zone). For a better prediction, according to one method, the user may be authorized to make less/few mistypes (e.g. 1 to 2) for short words and more mistypes (e.g. 1 to 4) for longer words.

Spell Help

The different methods of spell-help have been described before. According to one embodiment, (e.g. after interacting with the spell help means/button/icon) the user is preferably required to enter a few last characters of the word precisely. In this case, the system may preferably consider the beginning portion of the input information as being ambiguous. According to one method, the system may also consider that at least one of the input information corresponding top the beginning and/or the last characters of the word to have one or more mistyping/misspelling errors, and may predict one or more words accordingly.

Kb down/up, left/right

By a predefined interaction such as a quick gesture

If it's big only

According to one embodiment, if th*e keypad (e.g. herein may also be referred to as "keyboard") of the invention is located in a predefined location on the screen such as adjacent to an edge of the screen, the (e.g. a portion of) content displayed on the screen may preferably be located/relocated at a location on the screen (e.g. and/or in an area or portion of the screen) such that the keyboard does not cover (e.g. a portion of) the content. For example, if the keyboard is located adjacent (e.g. no distance between said edge and the keyboard) to at least on one of the (e.g. predefined) edges (e.g. top, bottom, left, right, a corner, etc.) of the screen, a/the content may be located/relocated as explained. Preferably, when/if the keypad and an (e.g. a predefined) edge of the screen are spaced by at least a predefined (e.g. size of) distance (e.g. 1 screen pixel), then the keyboard may cover at least a portion of the content of the screen. According to one embodiment, relocating the keypad on the screen as such may (e.g. automatically) relocate and/or resize the (e.g. or a portion) content on the screen accordingly.

According to one method, a predefined interaction such as a gliding action (e.g. including and/or excluding a long pressing action) from/on a portion of the keyboard such as for example a key of the keyboard (e.g. used for the data entry (e.g. a letter key, the/a space key, etc.)) may be used to relocate the keyboard on the screen. As such, preferably the form factor of the keyboard and/or preferably the size of the keyboard is not changed when such interaction is provided and/or when the keyboard is moved as such). According to one embodiment, (e.g. when a/the content on the screen and the keyboard are located on separate (e.g. distinctly different) portions of the screen) relocating/separating the keyboard from an edge of the screen (e.g. detaching/separating the keyboard from said edge by a distance) may automatically cause the system to enlarge the size of the content on the screen such that to occupy a larger portion (e.g. preferably all) of the screen such that at least a portion of the keyboard occupies/overlaps at least a portion of the content. As an example, if the keyboard is adjacent to a predefined edge of the screen such as the bottom edge or the top edge of the screen, moving it on the screen such that to detach it from said edge (e.g. such as to relocate the keyboard some predefined distance from said edge) may cause the system to automatically allocate a larger portion (e.g.by preferably including a portion of the screen previously occupied by the keyboard) of the screen (e.g. the whole screen) to the content such that the keyboard overlaps/covers a portion of the content.

With continuous description of the current embodiment, moving the keyboard (e.g. by a means such as the gliding action as described) on the screen such that to become adjacent to a predefined edge of the screen may automatically cause the system to reduce the size of the content on the screen such that preferably the keyboard does not cover the content (e.g. the portion of the

screen used by the keyboard and the portion of the screen used by the content are/become separated from each other).

According to one embodiment, if the size of the keyboard is less than a predefined size (e.g. its width and its height are respectively less than the width and the height of the screen) moving the keyboard (e.g. anywhere on the screen including positioning the keyboard on/near an edge) on the screen preferably does not (e.g. automatically) affect the size and/or the location of the content on the screen.

With continuous description of the current embodiments, as an example, if the keyboard is adjacent to the bottom of the screen and the content is located above it, providing a gliding action from a key (e.g. the space key) of the keyboard in an upwards direction, for example, may move the keyboard upwards such that to get separated from the bottom edge of the screen. At this time, preferably, the size of the space assigned to the content (e.g. herein may be referred to as the size of the content) enlarges to preferably include more information on the screen. As an example the size of the content may be enlarged to also occupy (e.g. at least a portion of) the space that was allocated to the keyboard when it was adjacent to said edge. In this case, preferably, the keyboard overlaps the content. Accordingly, moving the keyboard as explained, towards the bottom of the screen such that to become adjacent to the bottom edge of the screen may preferably cause the content to be resized and/or relocated in its original/previous (e.g. previous location before attaching the keyboard to bottom edge in this example) location (e.g. above the keyboard). Note that the bottom edge of the keyboard is used to describe this example. The example described may be applied to any other edge of the screen such as the top, left or the right edge of the screen.

Note that, (e.g. when the keyboard is overlapping the content on the screen) by moving the keyboard on the screen by interacting with a portion (as described) of the keyboard enables a user to position the keyboard very close (e.g. to even 1 screen pixel) to an edge of the screen, without resizing/moving the content on the screen.

According to one method, a predefined interaction such as a quick gesture (e.g. from a key such as the space key) may preferably relocate/move the keyboard on/to an edge of the screen preferably the edge of the device towards which the gesture is provided. In this case, according to one method, the content on the screen may (automatically) be relocated and/or resized accordingly.

Preferably, the automatic relocation and or/resizing of the content relative to relocation of the keyboard as explained may become effective or non-effective by using a switching means for example a button of the settings of the system.

Note that in the description herein the "content" generally refers to as the information displayed or to be displayed on the screen regardless/excluding (e.g. if the keyboard was not displayed) of the keyboard. Also note that, "enlarging" or "reducing" the size of the content is preferably referred to resizing the content (e.g. of the screen) and/or adding more information to the content or removing a portion of the information of the content (e.g. of the screen).

Quick switch between (e.g. 2) types keyboards (e.g. small and large)

According to one embodiment, a predefined interaction (e.g. a gliding action (e.g. upwards) on/from a key such as the backspace key (e.g. 502005)) may switch between at least two types/sizes of the keyboard of the invention (e.g. from the full-sized keyboard to the slpit/4-key keyboard, etc.)

Swiping/Gliding

Long, short

Shifting

Relating a Swiping/gliding actions provided on/over one or more zones/keys to interacting (e.g. tapping) on said keys have been described before. According to one embodiment, a short gliding

action provided from/on a first key/zone towards another (e.g. an adjacent) key/zone may correspond to interacting with said first key/zone and an adjacent key/zone located in the direction of the gliding action. Preferably, a long gliding action provided from/on a first key/zone towards another key/zone may correspond to interacting with said first key/zone and another key/zone (e.g. located in the direction of the gliding) preferably the key/zone located after a key/zone adjacent to said first key/zone.
According to a preferred method, any of said short and/or long gestures are preferably ended on the keyboard. Accordingly, any gesture from the keyboard upwards and ending outside the keyboard may be related to a shift function. Note that, during the entry of the input information corresponding to a word, preferably if a gesture ends on a space key, the system may enter a space character after said word.
Note that according to a preferred method, a tapping action on a key may correspond to one interaction with said key, a gliding action beginning and ending on a key may preferably correspond to two interactions with said key, and a complex gliding action (e.g. a back-and-forth gliding action) having a N number of gliding actions separated by a characteristics such as the change of direction/angle, pause, etc., between the simple (e.g. substantially straight) gliding actions (e.g. constituting a/the complex gliding action) wherein said complex gliding action begins and ends on a key may preferably correspond to N+1 (e.g. in this example, three) interactions with said key, and so on.

According to one method, in addition to relating a gliding action to an ambiguous zone, the system may also relate the gliding action to the letters on/near which the gliding action begins, ends, and/or changes its characteristics such as the change of direction/angle, pause, etc.

Sliding long from a zone to another zone
According to one embodiment, providing if the trajectory of a swiping action provided from a first zone to a second zone travels extensively over any of said zones, said swiping action may be related to interacting at least two times with the zone on which the swiping action has travelled extensively, and accordingly at least one time with the other zone key/zone (e.g. also depending on the length of the of the trajectory of the swiping action on said key.)

Ad

One or more

According to one embodiment of the invention, the word list of the proposed word list may include one or more advertisement (e.g. ads) banners/icons. Said ads may be presented to the user based on a context such as, for example, the geographical location of the device of the user, the text that the user is entering, the text that is printed/displayed on the screen of the user's device, the information (e.g. birthday) of the an entity such as a person (e.g. the user, his/her friends), etc.). Preferably said ads are small in size, and upon interaction with an ad the ad may be enlarged.

According to one method, the one or more advertisements are preferably displayed when there are not enough predicted word choices in the word list.

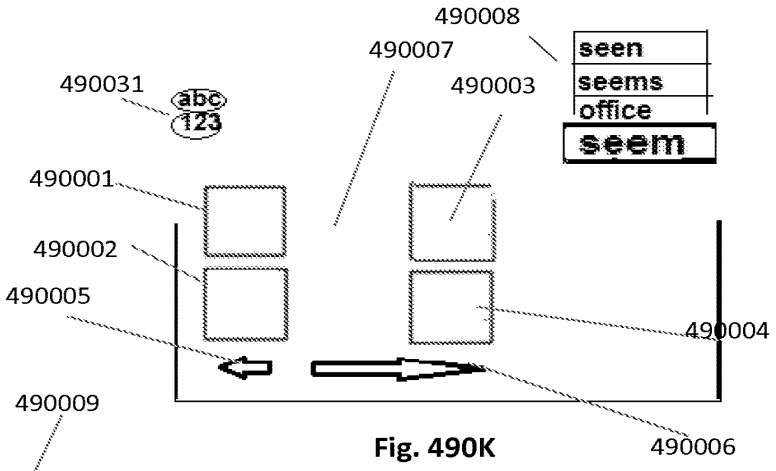

Fig. 490K

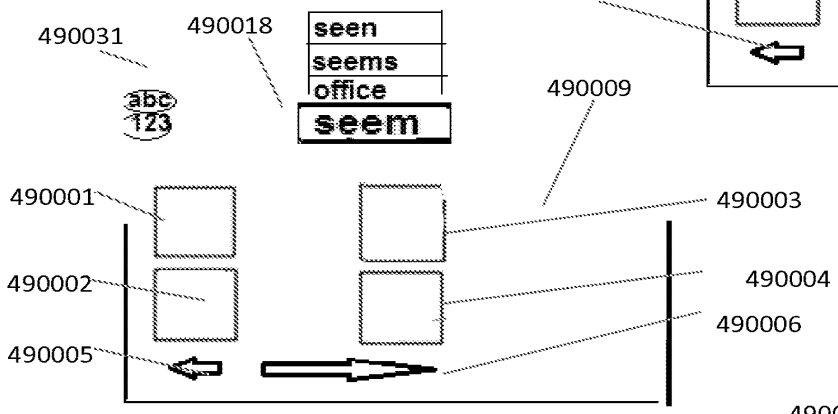

Fig. 490L

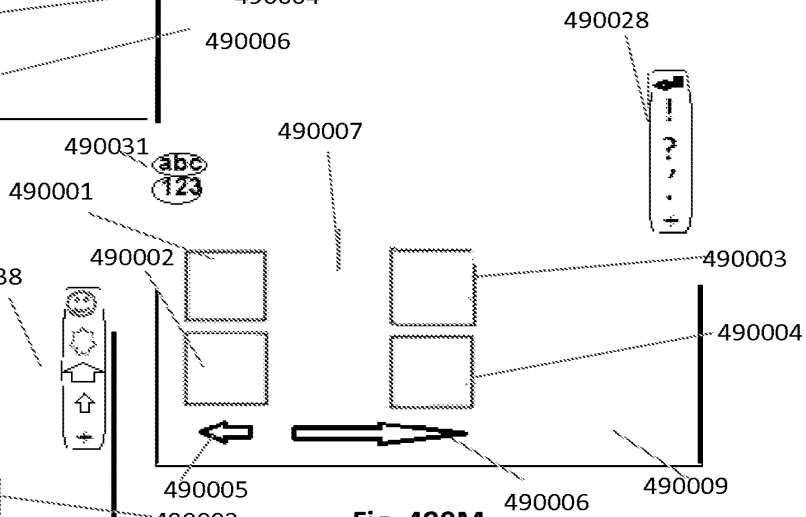

Fig. 490M

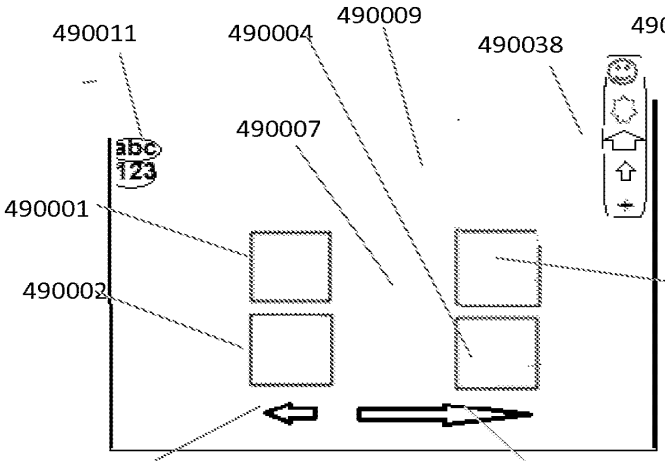

Fig. 490N

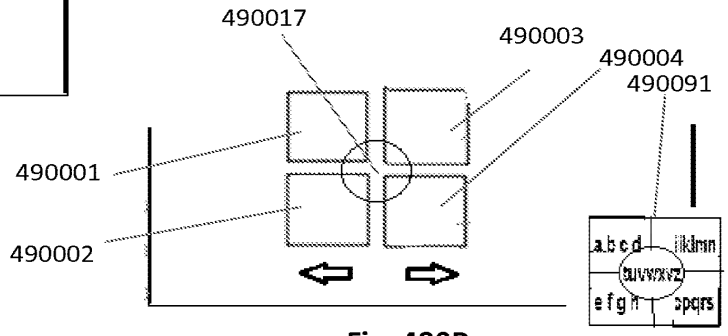

Fig. 490P

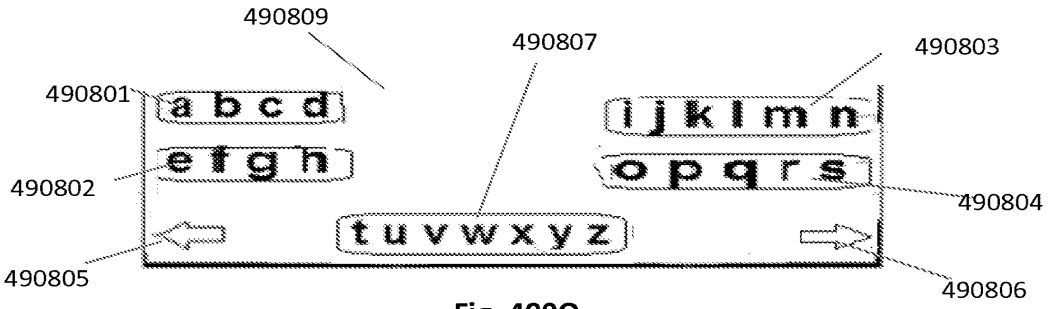

Fig. 490Q

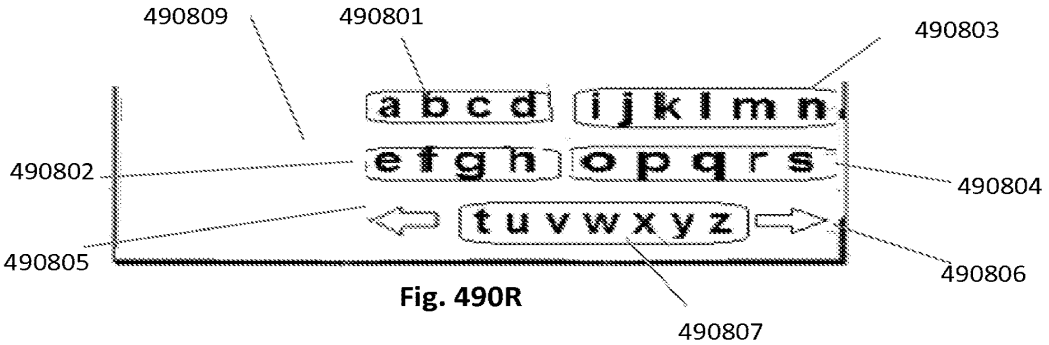

Fig. 490R

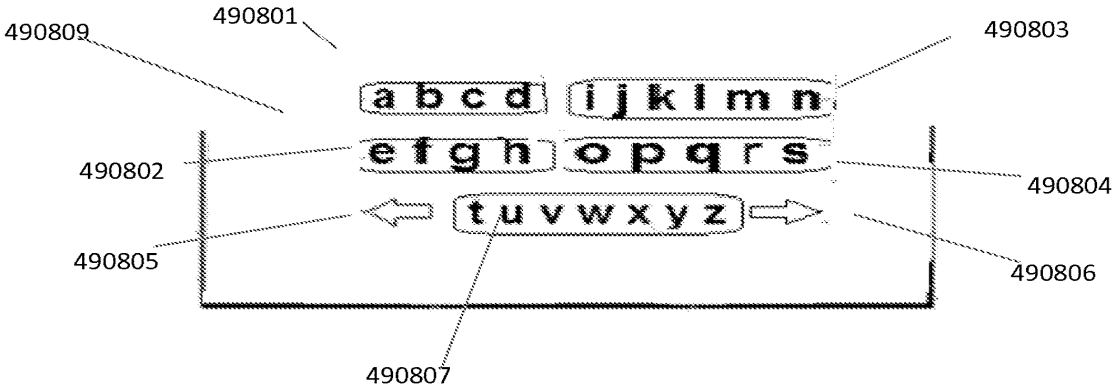

Fig. 490S

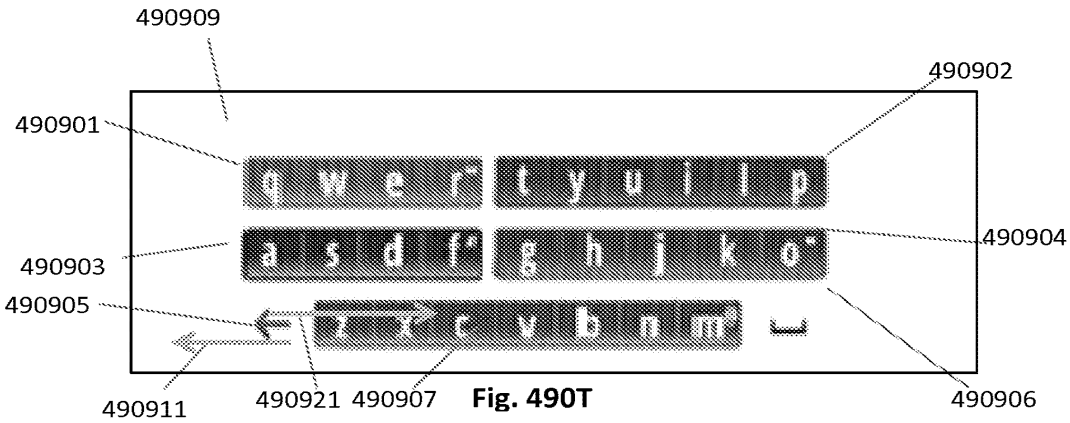

Fig. 490T

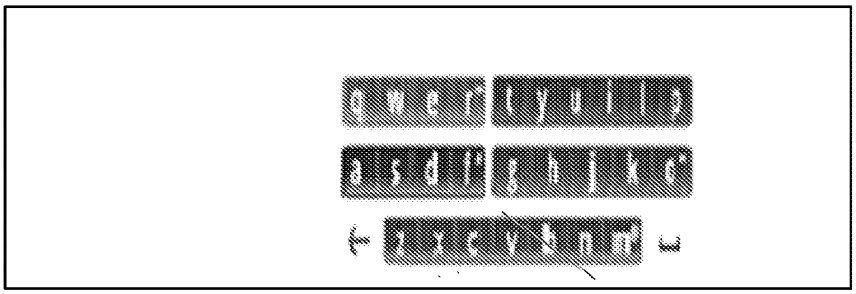

Fig. 490U

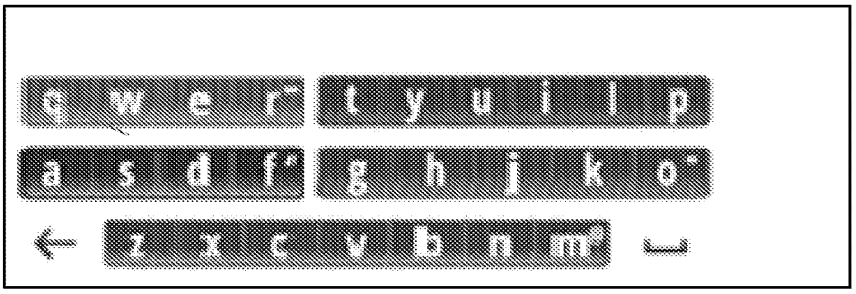

Fig. 490V

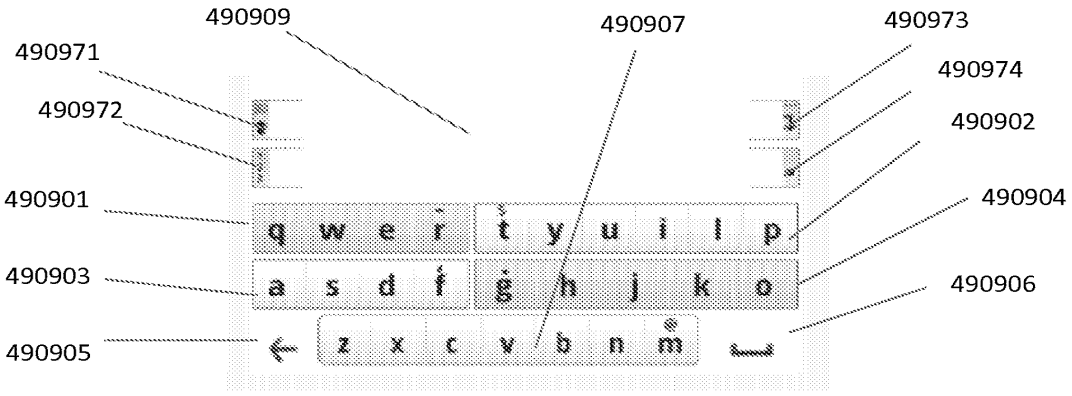

Fig. 490W

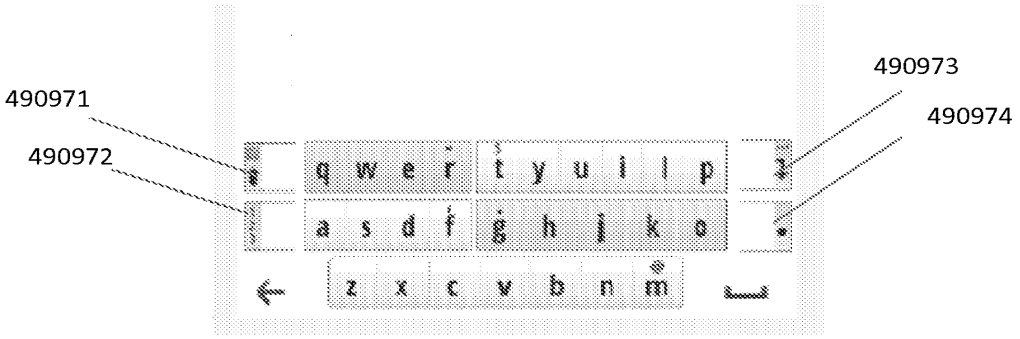

Fig. 490X

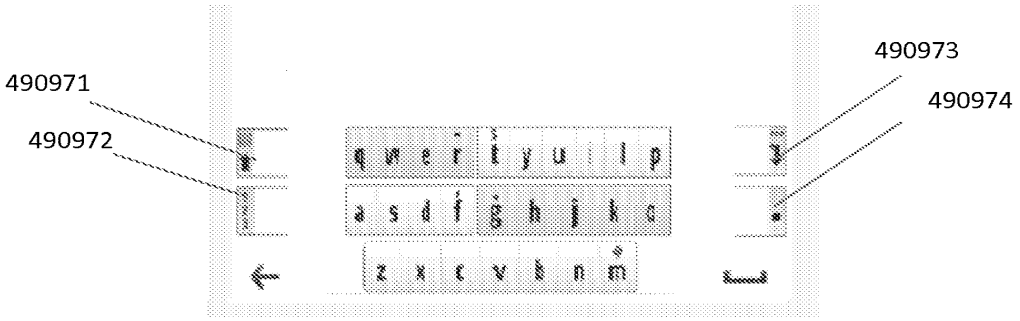

Fig. 490Y

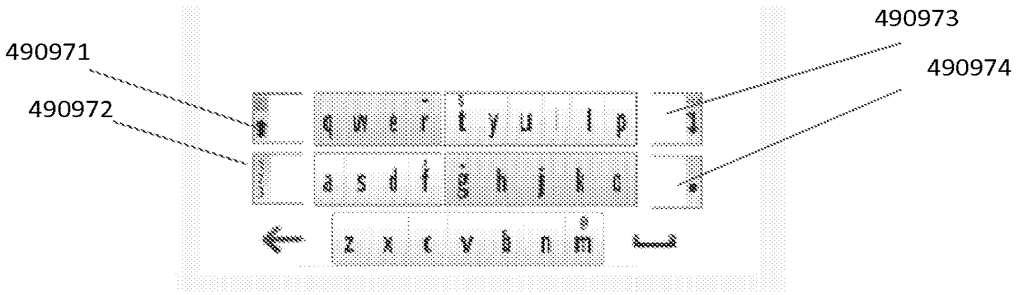

Fig. 490Z1

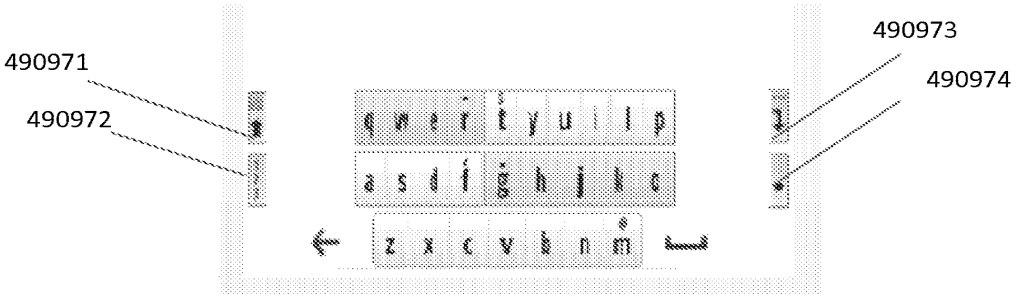

Fig. 490Z2

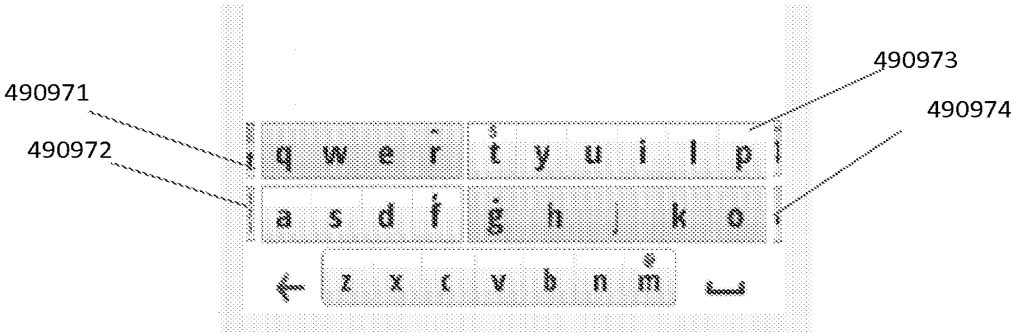

Fig. 490Z3

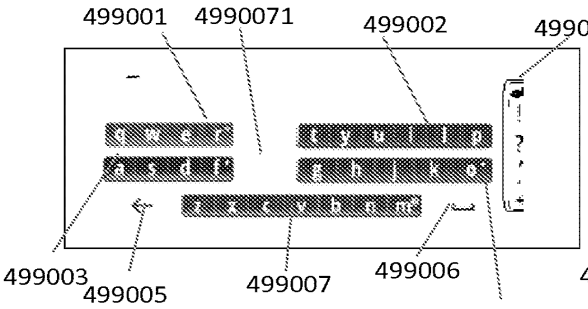

Fig. 499A

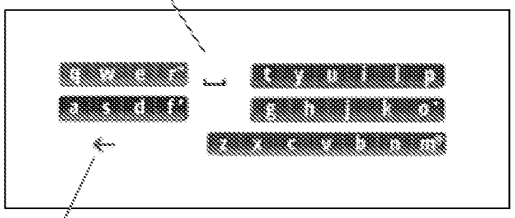

Fig. 499B

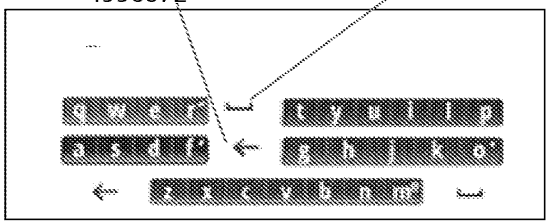

Fig. 499A1

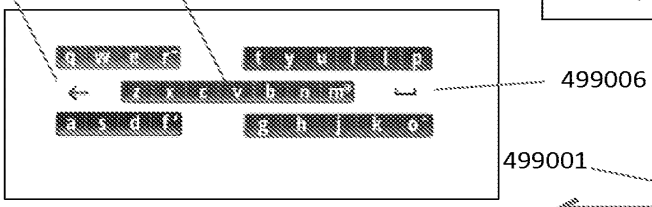

Fig. 499C

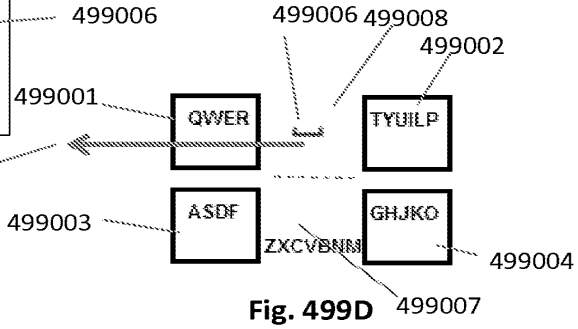

Fig. 499D

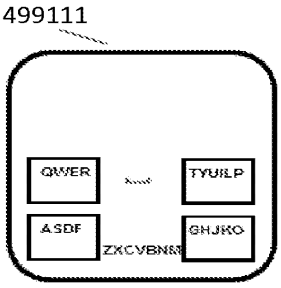

Fig. 499F

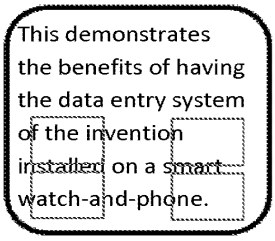

Fig. 499G

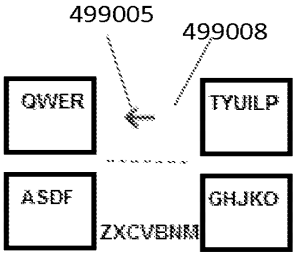

Fig. 499E

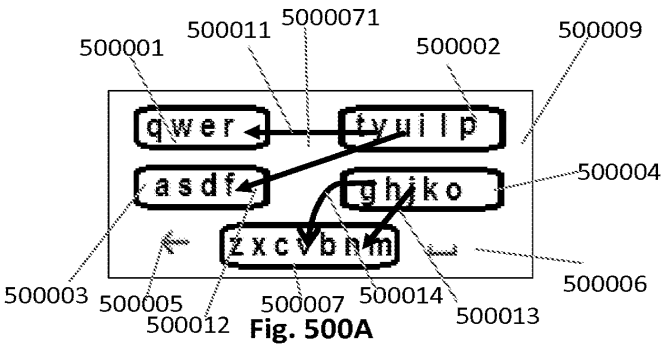

Fig. 500A

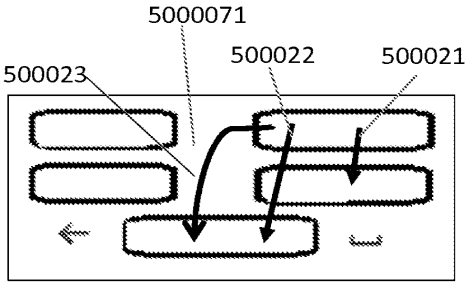

Fig. 500B

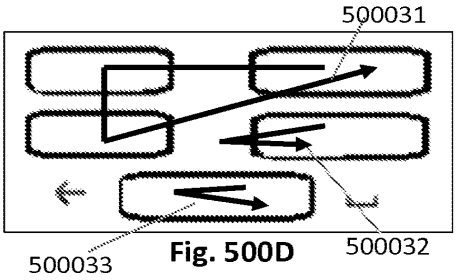

Fig. 500D

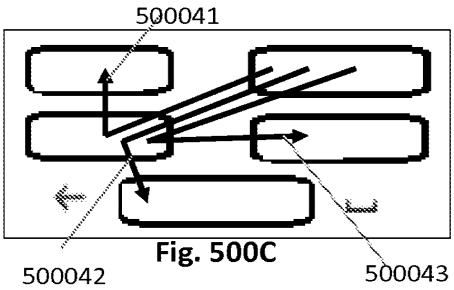

Fig. 500C

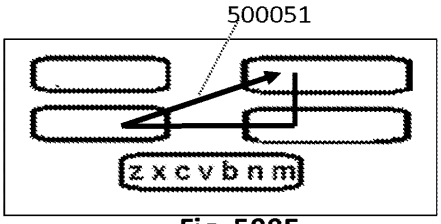

Fig. 500E

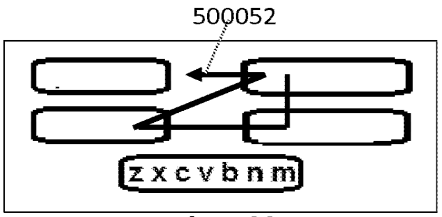

Fig. 500F

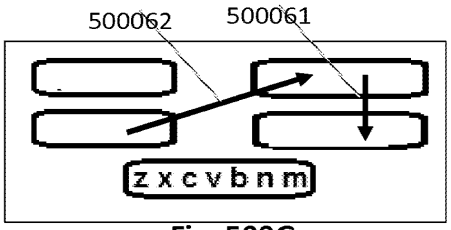

Fig. 500G

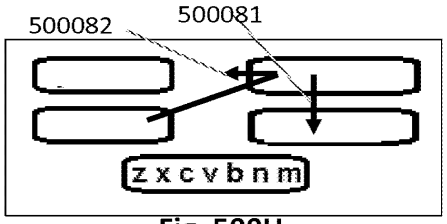

Fig. 500H

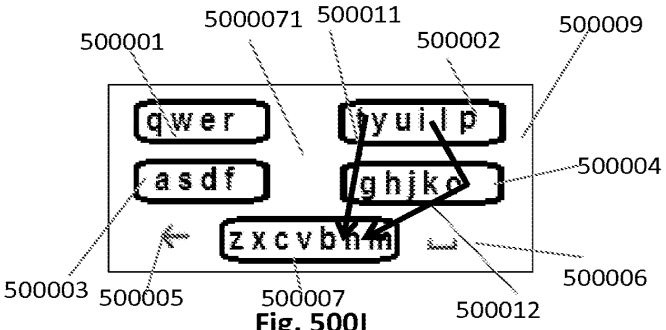

Fig. 500I

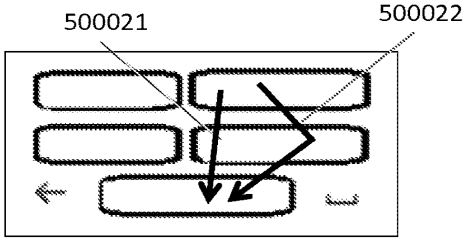

Fig. 500J

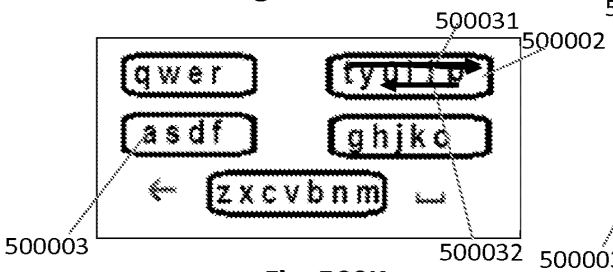

Fig. 500K

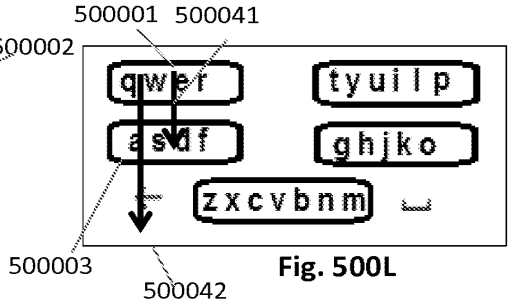

Fig. 500L

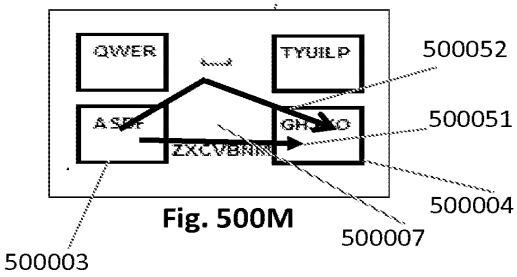

Fig. 500M

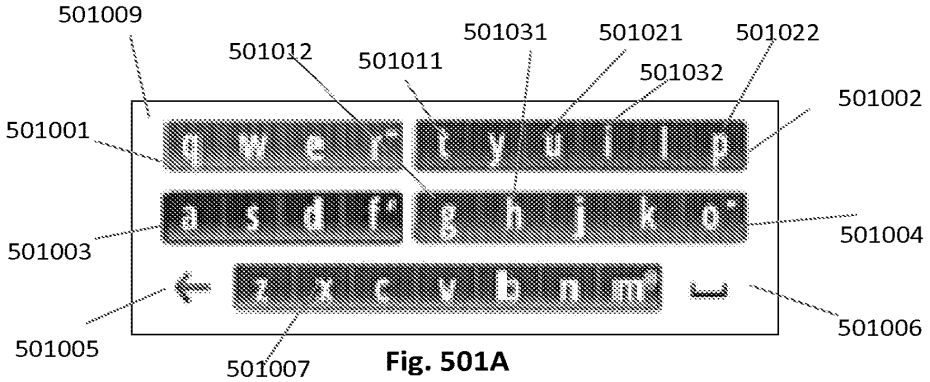

Fig. 501A

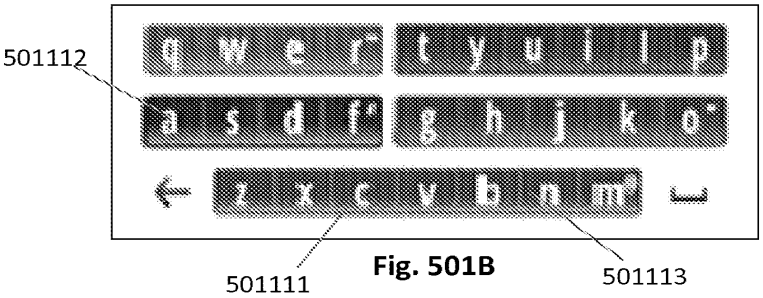

Fig. 501B

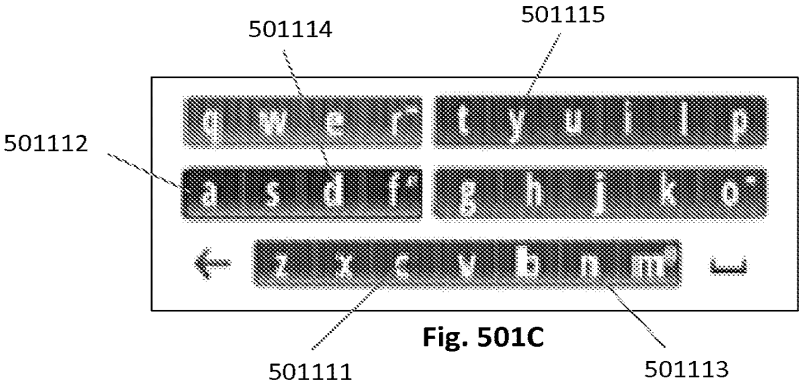

Fig. 501C

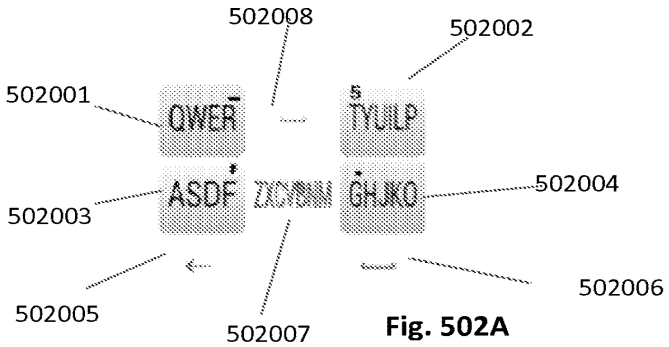

Fig. 502A

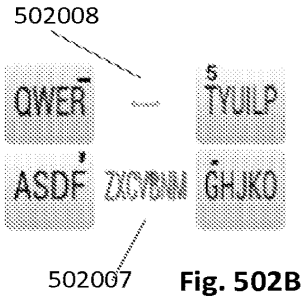

Fig. 502B

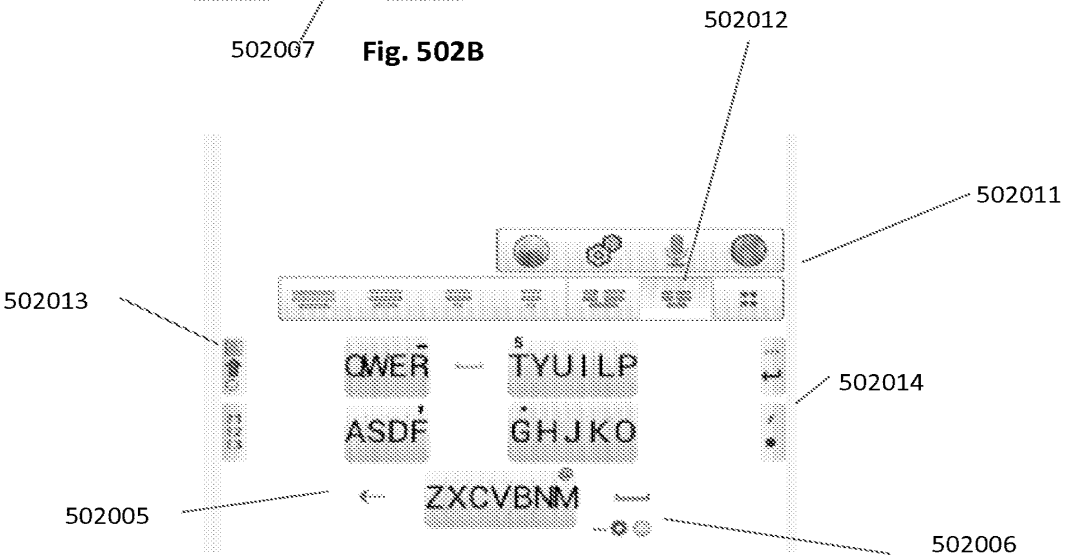

Fig. 502C