PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : G06F 3/00

A2

(11) International Publication Number: WO 00/58816

(43) International Publication Date: 5 October 2000 (05.10.00)

(21) International Application Number: PCT/CA00/00328

(22) International Filing Date: 29 March 2000 (29.03.00)

(30) Priority Data:

2,267,438	29 March 1999 (29.03.99)	CA
09/280,058	29 March 1999 (29.03.99)	US

(71) Applicant *(for all designated States except US)*: NOW SEE HEAR INTERACTIVE INC. [CA/CA]; 34 Palmerston Gardens, Toronto, Ontario M6G 1V9 (CA).

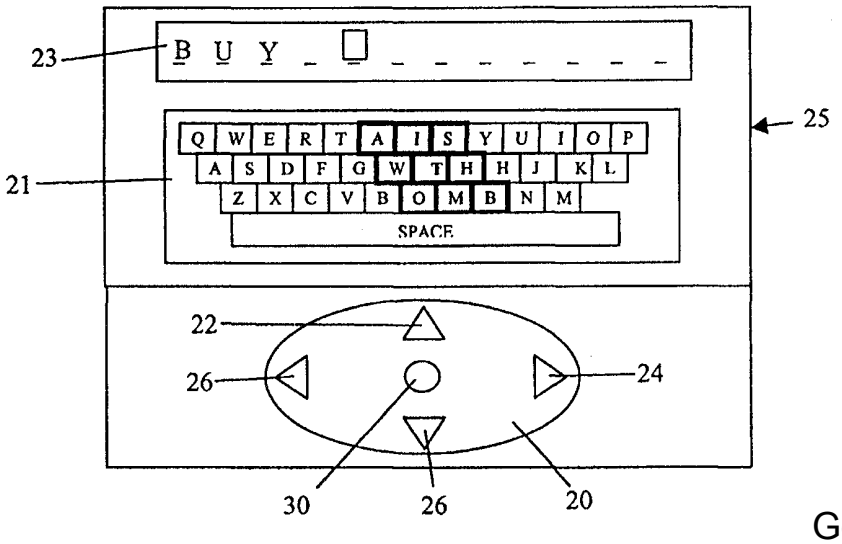
(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: BELLMAN, Thomas, Jeffrey [CA/CA]; 34 Palmerston Gardens, Toronto, Ontario M6G 1V9 (CA). MACKENZIE, I., Scott [CA/CA]; 20 Echo Drive, Guelph, Ontario N1G 1H2 (CA).

(74) Agents: PILLAY, Kevin et al.; Fasken Martineau Dumoulin LLP, Toronto Dominion Bank Tower, Box 20, Suite 4200, Toronto, Dominion Centre, Toronto, Ontario M5K 1N6 (CA).

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
Without international search report and to be republished upon receipt of that report.

(54) Title: A METHOD FOR MOBILE TEXT ENTRY



(57) Abstract

A method for inputting characters in a device having a character display and a navigation key responsive to user manipulation for navigating a cursor in the character display. The characters are displayed in a predetermined layout on the display for character input. The layout contains a fixed set of characters as well as a dynamic subset of characters. The dynamic subset is determined by a previously entered single character or string of characters. A character is selected by a user from one of the aforementioned sets. It is selected by navigating a cursor to the desired character. In a preferred embodiment, the device may include a pager, a cellular telephone, or the like.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania
AM	Armenia
AT	Austria
AU	Australia
AZ	Azerbaijan
BA	Bosnia and Herzegovina
BB	Barbados
BE	Belgium
BF	Burkina Faso
BG	Bulgaria
BJ	Benin
BR	Brazil
BY	Belarus
CA	Canada
CF	Central African Republic
CG	Congo
CH	Switzerland
CI	Côte d'Ivoire
CM	Cameroon
CN	China
CU	Cuba
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GA	Gabon
GB	United Kingdom
GE	Georgia
GH	Ghana
GN	Guinea
GR	Greece
HU	Hungary
IE	Ireland
IL	Israel
IS	Iceland
IT	Italy
JP	Japan
KE	Kenya
KG	Kyrgyzstan
KP	Democratic People's Republic of Korea
KR	Republic of Korea
KZ	Kazakstan
LC	Saint Lucia
LI	Liechtenstein
LK	Sri Lanka
LR	Liberia
LS	Lesotho
LT	Lithuania
LU	Luxembourg
LV	Latvia
MC	Monaco
MD	Republic of Moldova
MG	Madagascar
MK	The former Yugoslav Republic of Macedonia
ML	Mali
MN	Mongolia
MR	Mauritania
MW	Malawi
MX	Mexico
NE	Niger
NL	Netherlands
NO	Norway
NZ	New Zealand
PL	Poland
PT	Portugal
RO	Romania
RU	Russian Federation
SD	Sudan
SE	Sweden
SG	Singapore
SI	Slovenia
SK	Slovakia
SN	Senegal
SZ	Swaziland
TD	Chad
TG	Togo
TJ	Tajikistan
TM	Turkmenistan
TR	Turkey
TT	Trinidad and Tobago
UA	Ukraine
UG	Uganda
US	United States of America
UZ	Uzbekistan
VN	Viet Nam
YU	Yugoslavia
ZW	Zimbabwe

A Method for Mobile Text Entry

This invention relates to hand-held personal electronic devices such as cellular telephone systems, pagers, and the like, and in particular it relates to text entry for such devices.

BACKGROUND OF THE INVENTION

There is an increasingly strong demand around the world for portable communication devices such as cellular phone and pagers. As technology advances these products are becoming more portable and more affordable. Such devices have been able to receive text messages for some time now, but with the growing ubiquity of email, products that have the capability to send text messages are now beginning to surface.

The requirement of mobility imposes a unique set of restrictions on the design of a text entry strategy. Typically there is only enough space on the device for a very few extra buttons. Therefore, a full keyboard, even a miniature one, is not feasible. Also, a user may not always have both hands free when operating the device, so it is desirable that text can be input with only one hand. In this disclosure, the term "mobile text entry" refers to text entry limited by this set of restrictions.

One method that addresses the issue of mobile text entry is a telephone keypad method. It is well known that keys 2 through 9 on a telephone keypad contain three reference letters of the alphabet. Entering a letter involves selecting the key it appears on as well as specifying which of the three letters is desired. The letter selection can be achieved in several different ways.

A second method for text entry is referred to as the date stamp method. The method is so named because, as with a date stamp, a desired character is made visible by rotating a wheel containing an entire set of characters. Cursor keys are used to navigate a cursor in a display while increment and decrement keys are used to cycle sequentially through the character set at the cursor position. Players of video arcade games are familiar with this technique, which is used to input the player's initials into a list of high scorers. Selection of a character is performed implicitly by simply moving the cursor to another location. In effect, the cursor position is a moveable editing window of one character.

A third method is referred to as a soft keyboard method. In this method a display is functionally split into an output and an input section. The input section of the display either

shows the full character set or allows for parts of the character set to be viewed by scrolling. The character output appears in a ticker tape fashion along one or more lines in the display section. Arrow keys are used to move a cursor around the character set and characters are selected by explicitly depressing a select key.

For example, an on-screen keyboard, sometimes called a soft keyboard, is a character set that appears on a device's Liquid Crystal Display (LCD) or on a computer monitor. With an on-screen keyboard, the advantage of have a fixed layout is familiarity. As familiarity increases, the time to locate a character in the layout approaches zero. The disadvantage of the fixed layout is that the distance between characters, and thus the time to move the cursor, stylus or finger from one character to the next, is often high.

The problem with the aforementioned techniques is that an excessive number of keystrokes are required for text entry. The fewer the keystrokes required, the more efficient the text entry system. By bringing likely next characters closer to the cursor, keystrokes are reduced, which can lead to an increase in entry speeds. This can be accomplished by surrounding the cursor with a dynamic region. The larger the number of dynamic positions that are available on the keyboard, the more likely a desired character will occur within the available positions.

In U.S. patent number 5,128,672 a dynamic keyboard is disclosed. However, the keyboard disclosed requires the presence of numerous physical keys, which is not practical for use with cellular phones and pagers. In U.S. patent 5,797,098 a dynamic keyboard is also disclosed, but this keyboard only displays several options at a time. If the desired character is not presented on the display, it is necessary to scroll to the following screen and repeat the search for the character. This may need to be repeated several times until the character is found which can be tedious and frustrating for the user.

It is an object of the present invention to obviate or mitigate some of these problems.

SUMMARY OF THE INVENTION

In general terms, the present invention provides a method for inputting characters in a device having a character display, and a navigation key responsive to user manipulation for navigating a cursor in the character display. The method comprises the steps of:

(a) displaying a character set having a predetermined layout on the display, the layout being fixed for one or more character input;

(b) displaying a subset of the character set in a dynamic layout wherein the subset of characters are determined by at least one preceding input character; and

(c) selecting at least one of the characters from the layouts by navigating the cursor to a desired character.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other embodiments of the invention will now be described by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a schematic top view of a hybrid keyboard layout according to an embodiment of the invention;

Figure 2 is a schematic diagram showing a pager having a cursor control key;

Figure 3 is a top view of part of a keyboard according to the present invention;

Figure 4 is an example of a character probability look-up table;

Figures 5a and 5b are examples of a probability matrix;

Figures 6a and 6b are schematic diagrams of a layout after different keys are selected;

Figure 7 is an illustration of characters assigned to particular positions in the dynamic region;

Figures 8a and 8b are schematic diagrams of a layout incorporating the fixed positions of figure 7 after different keys are selected;

Figures 9a, 9b, 9c, 9d, 9e, and 9f illustrate various positioning patterns for a dynamic region;

Figures 10a, 10b, and 10c are schematic diagrams representing various dynamic region layouts;

Figures 11a, 11b, 11c, 11d and 11e illustrate various positions and arrangements of the dynamic region layout within the fixed layout;

Figure 12 illustrates a positioning algorithm for the dynamic region;

Figures 13a and 13b are flow charts showing the display of characters in the dynamic region;

Figures 14a and 14b show steps for generating a list for display in the dynamic region;

Figure 15 is a flow diagram showing the steps for arranging characters in the dynamic region.

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.