(19) **Japan Patent Office** (JP)

(12) **Japanese Unexamined Patent Application Publication** (A)

(11) Japanese Unexamined Patent Application Publication
2000-148366
(P2000-148366A)

(43) Publication date: May 26, 2000

(51) Int. Cl.[7]	Identification codes	FI		Theme code (reference)
G 0 6 F 3/023		G 0 6 F 3/023	3 1 0 L	5 B 0 1 9
H 0 3 M 11/04		3/02	3 7 0 A	5 B 0 2 0
G 0 6 F 3/02	370	15/02	3 1 0 D	
H 0 3 M 11/10		3/023	3 1 0 J	
11/12				

Request for examination: Not yet requested Number of claims: 10; OL (Total of 12 pages), continued on the last page

(21) Application number: Japanese Patent Application H10-315522

(22) Date of application: November 6, 1998

(71) Applicant: 000002185
Sony, Corp.
6-7-35 Kita-shinagawa, Shinagawa-ku, Tokyo

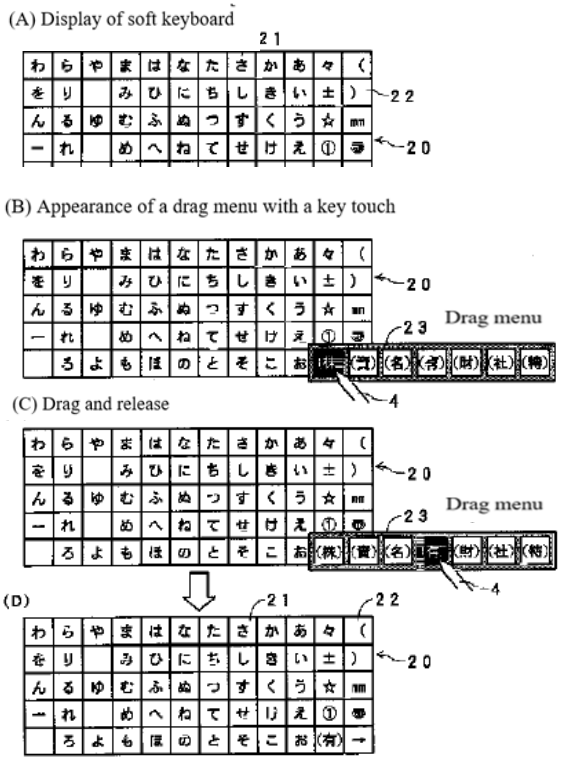
(72) Inventor: Masaaki SAKATA
% Sony LSI Design, Inc.
134 Gohdo-cho. Hodogaya-ku. Yokohama, Kanagawa

(74) Agent: 100091546
Masami SATOH, Patent Attorney

F term (reference): 5B019 DA08 HA06
5B020 CC06 CC12 CC19 CC20 DD30
FF12 FF17 GG13

(54) [TITLE OF THE INVENTION] CHARACTER AND SYMBOL INPUT DEVICE AND CHARACTER AND SYMBOL INPUTTING METHOD

(57) [Abstract]
[PURPOSE] A selective input of a special character or symbol can be done by a simple operation when a character or symbol is selected and entered by using a software keyboard shown on a display screen.
[SOLUTION] A similar character or symbol group is allocated to one to plural preliminarily-defined specific positions in a table of a plurality of characters and symbols constituting a software keyboard 20. When any key position among the specific positions is selected and instructed, a list 23 of the preliminarily allocated similar character and symbol group is shown corresponding to the position. A selective instruction is carried out in the list 23 of the similar character and symbol group by a selection instruction means 4 and one character or symbol in a similar character and symbol group is selected and entered.



[Scope of Patent Claims]
[Claim 1] A character and symbol input device, characterized by comprising
a display means for displaying a software keyboard comprising a list display of a plurality of characters and symbols,
a selection instruction means for carrying out a selective instruction of a key position corresponding to one character or symbol from the aforementioned software keyboard, and entering the character or symbol corresponding to the key position selected and instructed as the confirmed character or symbol, and
a means for displaying a list of a plurality of characters and symbols contained in a preliminarily allocated similar character and symbol group corresponding to a key position when a key position from one to plural specified positions determined in advance of the aforementioned list display of the aforementioned software keyboard is selected and instructed by the aforementioned selection instruction means, and for receiving the selective instruction of one desired character or symbol by the aforementioned selection instruction means from the list of similar characters and symbols displayed.
[Claim 2] The character and symbol input device according to claim 1,
characterized in that a list of a plurality of characters and symbols contained in the aforementioned similar character and symbol groups is displayed when one key position among one to plural specified positions is instructed by the aforementioned selection instruction means for longer than a preset certain period of time.
[Claim 3] The character and symbol input device according to claim 1,
characterized in that the list of a plurality of characters and symbols contained in the aforementioned similar character and symbol groups is displayed within the range of one key position from among one to plural specified positions when an instruction position by the aforementioned selection instruction means is moved in slide motion.
[Claim 4] The character and symbol input device according to claim 1,
characterized in that a character or a symbol immediately selected and instructed by the aforementioned selection instruction means from a list of a plurality of characters and symbols contained in the aforementioned similar character and symbol groups is displayed as the character or symbol of the aforementioned specified position of the aforementioned software keyboard.
[Claim 5] The character and symbol input device according to claim 4,
characterized in that one side and the other side of a character or symbol used as a pair are separately allocated as a similar character and symbol group to two positions of the aforementioned specified positions of the aforementioned software keyboard as a similar character and symbol group, and
by the aforementioned selection instruction means, when one side of the character or symbol from the similar character and symbol group at one of the two positions of the aforementioned specified position is selected and changed, the pair of the aforementioned selected character or symbol is displayed as the character or symbol of the other of the two positions of the aforementioned specified positions of the aforementioned software keyboard.
[Claim 6] A character and symbol input method, characterized in that, in a method of entering characters and symbols using a software keyboard comprising a table of a plurality of characters and symbols displayed on a display screen,
a similar character and symbol group is allocated to one to plural specified positions preliminary defined from the aforementioned list,
when one key position of the aforementioned specified position is selected and instructed, a list of a plurality of characters and symbols contained in the preliminarily allocated similar character and symbol group corresponding to the position is displayed, and
selective instruction is carried out by the aforementioned selection instruction means to the list of a plurality of characters and symbols contained in the aforementioned similar character and symbol group to select and enter one character or symbol from among the aforementioned similar character and symbol group.
[Claim 7] The character and symbol input method according to claim 6, characterized in that
when one character or symbol position from among one to plural specified positions is instructed by the aforementioned selection instruction means over longer than a preset certain period of time, a list of a plurality of characters and symbols contained in the aforementioned similar character and symbol group is displayed.
[Claim 8] The character and symbol input method according to claim 6, characterized in that
when an instructed position is moved in a sliding motion by the aforementioned selection instruction means within the range of one key position from among one to plural specified positions, a list of a plurality of characters and symbols contained in the aforementioned similar character and symbol group is displayed.
[Claim 9] The character and symbol input method according to claim 6, characterized in that
a character or a symbol immediately selected and instructed by the aforementioned selection instruction means from the list of a plurality of characters and symbols contained in the aforementioned similar character and symbol group is displayed as the character or symbol of the aforementioned specified position of the aforementioned software keyboard.
[Claim 10] The character and symbol input method according to claim 9, characterized in that
one side and the other side of a character or symbol used as a pair are separately allocated as a similar character and symbol group to two positions of the aforementioned specified positions of the aforementioned software keyboard, and
when one side the character or symbol from the similar character and symbol group at one of the two positions of the aforementioned specific position is selected and changed by the aforementioned selection instruction means, the pair of the aforementioned selected character or symbol is displayed as the character or symbol of the other of the aforementioned two positions of the aforementioned specified positions of the aforementioned software keyboard.
[Detailed Description of the Invention]
[0001]
[Field of the Invention] The present invention relates to a character and symbol input device suitable as a graphic user

interface of portable information devices, such as the so-called electronic notebooks, for example, and to a character and symbol input method. The “character and symbol” refers to a character or a symbol in this Description.

[0002]

[Prior Art] Since there is no space to provide a keyboard with many keys to the equipment body in this type of small portable information devices, when a user wants to enter a character or a symbol, a software keyboard consisting of a list display of characters and symbols to be input is displayed on the screen of a display device, such as LCD (liquid crystal display), and the like, and this software keyboard is used to enter a character or a symbol on the screen.

[0003] This software keyboard is configured so that each character or symbol position from the list of characters and symbols corresponds to the key of character or symbol thereof; a touch pen, a trackball, or the like, is used to select the display position (which becomes a key position of the character or symbol in question in the software keyboard) of the character or symbol to be input from the list that constitutes the software keyboard, thereby, the selected character or symbol can be entered as a confirmed character.

[0004] By the way, many special characters and symbols exist in the Japanese character expression in a computer in addition to Japanese-syllabary Chinese characters. For example, there are

- symbols whose expression is difficult to specified (“々 [used for repeating the preceding character]”, ““[used for repeating the preceding character]”, “〆 [old-style character expressing the same]”, and the like)
- mathematical symbols (“±”, “×“, “=“, “≤“, and the like)
- graphic symbols (“★“, “◇“, and the like)
- circled characters (“①“, “②“, “③“, and the like)
- common special characters (“KK”, “Inc.” and the like), and
- parentheses (“「”, “{“, “<“, and the like).

[0005] The following methods are used conventionally as the methods of selecting and entering these special characters and symbols:

① a method of including all special characters and symbols in the list of the software keyboard;

② a method of pre-determining a special reading to a special character or symbol, for example, spelling out the word “repetition” will display character “々”, and selecting by the conversion of kana into kanji; and

③ a method of entering a special character or symbol by the JIS code, and the like.

[0006]

[Problem to be Solved by the Invention] (1) However, the method of preparing the keys of the special characters and symbols other than the 50 sounds for a list display has a problem in that the area occupying the screen of the software keyboard becomes larger, so the display must be made larger.

[0007] (2) The method of pre-determining a specific reading to a special character or symbol and selecting by the conversion of kana into kanji has a problem in that a user will need to memorize the reading, or he/she may need to find out what the specific reading is, imposing a heavy burden to the user.

[0008] (3) The method of entering a special character or symbol by the JIS code and the like requires a user to search the character code of the desired character from a substantially large character code list and to enter such code, which also imposes a heavy burden to the user.

[0009] In view of the issues described above, the objective of the present invention is to enable a selective input of the special characters and symbols described above by an easy operation.

[0010]

[Means for Solving the Problem] In order to solve the problems described above, the character and symbol input device according to the present invention is provided with a display means for displaying a software keyboard comprising a list display of a plurality of characters and symbols; a selection instruction means for selecting and instructing a key position corresponding to one character or symbol from the software keyboard and entering the character or symbol corresponding to the key position selected and instructed as the confirmed character or symbol; and a means for displaying a list of a plurality of characters and symbols contained in a preliminarily allocated similar character and symbol group corresponding to a key position when the key position of one to plural specified positions determined in advance among the list displays of the software keyboard is selected and instructed by the selection instruction means, and for receiving the selective instruction of one character or symbol in request by the aforementioned selection instruction means from the list of a plurality of characters and symbols contained in the similar character and symbol groups displayed.

[0011] In the present invention, special characters and symbols are divided into one to a plurality of similar character and symbol groups and allocated to the specific key positions from the list displays of a plurality of characters and symbols that constitute the software keyboard for every similar character and symbol group. And one character or symbol from the similar character and symbol group is displayed on the specific key position of the software keyboard, for example.

[0012] When a user selects and instructs this specific key position, a list of a plurality of characters and symbols contained in the similar character and symbol group allocated to that key position is displayed overlapping on top of the software keyboard, for example. When a user selects and instructs a desired character or symbol from the list of this similar character and symbol group, the selected and instructed character or symbol is confirmed and entered.

[0013] Therefore, only one character or symbol in each similar character and symbol group is displayed in the list display that constitutes the software keyboard, so the area that occupies the display screen of the software keyboard is not that large.

[0014] In addition, a selective input of a special character or symbol can be carried out simply by selecting and instructing a character or symbol using a pointing device, for example, a touch pen, and the like, which results in a dramatic reduction of a user’s burdens.

[0015]

[Mode for Carrying Out the Invention] Embodiments of the character and symbol input device according to the present invention applied to a portable information device will be described below with reference to the drawings.

[0016] FIG. 3 shows the appearance of a portable information device of this embodiment, and FIG. 4 is a block diagram showing the internal configuration thereof.

[0017] This portable information device 1 is provided with a display 2 consisting of LCD. A tablet 3 consisting of a touch panel is provided to the display screen of this display 2, and when the top of the display screen of the display 2 is touched with a touch pen 4, the tablet 3 reads the coordinate position on the touched display screen and outputs that coordinate data.

[0018] As shown in FIG. 4, a microcomputer is built inside the portable information device 1. Namely, CPU 11, ROM 12, and work RAM 13 are connected to a system bus 10; the display 2 is connected to the system bus 10 via a display interface 14; and the tablet 3 is connected to the system bus 10 via an interface 15.

[0019] And when a power key 6 is turned on, and a predetermined position is touched with the touch pen 4, for example, the software keyboard (hereinafter will be abbreviated to a soft keyboard for the sake of convenience) 20 as shown in FIG. 1 is displayed on the display 2. A program and data for the software keyboard are stored in ROM12.

[0020] As will be described below, when a key position is selected with the touch pen 4 from the soft keyboard 20, the selected position is transmitted to CPU 11 via work RAM 13 through the tablet 3, and the character or symbol of the selected key position is determined and confirmed so that character input can be performed.

[0021] As shown in FIG. 1, in the case of this embodiment, the soft keyboard 20 comprises a table consisting of hiragana of 50 sounds, and ten special characters and symbols in two columns at the right end side of FIG. 1. That is, the soft keyboard 20 is provided with keys 21 for selecting and instructing each hiragana of 50 sounds and keys 22 for selecting ten special characters and symbols.

[0022] Only the hiragana being displayed corresponds to each key 21 for selecting hiragana of 50 sounds, and is stored in ROM 12, and the corresponding hiragana can be selected and entered by selecting and instructing each key 21 with the touch pen 4.

[0023] On the other hand, each of special character and symbol groups that have been grouped to each similar attribute corresponds to each of the ten keys 22 for selecting a special character or symbol, and stored in ROM 12, and when each key 22 is selected and instructed with the touch pen 4, a list of special characters and symbols of the corresponding group is displayed as will be described below, and from this list, a desired special character or symbol can be selected and entered.

[0024] FIG. 2 shows an example of ten special character and symbol groups allocated to each key 22 for selecting ten special characters and symbols. The first group is a group of symbols in which specification of reading is difficult. The second group is a group of mathematical symbols. The third group is a group of graphic symbols. The fourth group is a group of circled numbers. The fifth group is a group of common special characters. The sixth group is a group of one side of pairs of parenthesis. The seventh group is a group of the other side of the pairs of parenthesis. The eighth group is a group of unit symbols. The ninth group is a group of graphic symbols, such as a zip code and a telephone mark. The tenth group is a group of arrows with different directions.

[0025] FIG. 1 shows a default state (initial state) of the soft keyboard 20, and the first special character or symbol in each group in FIG. 2 is displayed on each display field of keys 22 for selecting special characters and symbols. As will be described below, soft keyboard 20 is configured so that the special character or the symbol displayed in the field of keys 22 for selecting special characters and symbols of this soft keyboard 20 may be changed into the special character or symbol selected immediately before.

[0026] [First embodiment of a character and symbol input method] The first embodiment of the character and symbol input method in a portable information device provided with the configuration described above will be described.

[0027] FIG. 5 and FIG. 6, which is the continuation of FIG. 5, are flow charts describing the operation of this first embodiment. FIG. 7 is a collection of drawings showing the changes of the screen in the vicinity of the soft keyboard 20 on the display 2 when a character or symbol is entered.

[0028] When a user operates a power button 6 and then sets to a mode of entering a character, the processing routines of FIG. 5 and FIG. 6 start. Once this processing routine begins, first, initialization is performed in Step S101, and the input key variable, the pressed key variable, and the menu done variable are set to be the default values on RAM 13.

[0029] The meanings of these variables are as follows.

Input key variable: A confirmed input character or symbol

Pressed key variable: Pressed key

Menu done variable: Whether a list display of special characters and symbols are being displayed or not. And the default values are as follows.

Input key variable = blank

Pressed key variable = undefined state

Menu done variable = false (non-display).

[0030] As will be described below, in this example, when a desired special character or symbol is selected from the list of each similar group unit of special characters and symbols, the

touch pen 4 is operated without being lifted-up from the tablet 3 (dragged), so that the list of this similar group unit displayed when selecting and instructing the key 22 with the touch pen 4 is called a drag menu.

[0031] Once the initialization in Step S101 is completed, the process goes to Step S102, where the soft keyboard 20 consisting of the list of characters and symbols is displayed on a portion of the screen of the display 2 (refer to FIG. 7(A)), and the process then goes to the following step S103. In this step S103, the key input state of the soft keyboard 20 is detected by checking the state of the three variables described above.

[0032] In the following step S104, a determination is made as to whether the menu done variable is "true"; i.e. a drag menu has been opened or not. When a drag menu is not opened and the menu done variable has become "false", the process goes to Step S121 of FIG. 6, and a determination is made as to whether the key 21 or the key 22 from the soft keyboard has been pressed. When a determination is made that no key is pressed, the process returns to Step S103.

[0033] In Step S121, when a determination is made that the key 21 or the key 22 has been pressed, the process goes to Step S122, the pressed key variable is changed from an undefined state into "the pressed key", and then the process goes to the following step S123. In Step S123, the pressed key is determined whether it is the key 21 for selecting 50 sounds, or the key 22 for selecting a special character or symbol.

[0034] As the result of determination in Step S123, when a determination is made that the pressed key is the key 21 for selecting 50 sounds, the process goes to Step S124 and waits for the touch pen 4 to be released from the key 21 (that is, to be separated from the tablet 3); once the touch pen 4 is released from the key 21, the process goes to Step S125, and as the input key variable = pressed key, the character of the pressed key 21 is set to be a confirmed input character. And after proceeding to Step S126 and returning the pressed key variable to an undefined state, the process returns to Step S103.

[0035] In Step S123, when the pressed key is determined to be the key 22 for selecting a special character or symbol, the process goes to Step S128, and as shown in FIG. 7(B), the drag menu 23, which is a list of groups of the similar character and symbol group allocated to the pressed key 22 is selected, and the drag menu 23 is displayed overlapping on top of the soft keyboard 20. The process then goes to Step S129, menu done variable = true, and the fact that the drag menu 23 is in overlapping display is memorized. Next, the process returns to Step S103.

[0036] In the drag menu 23, the character or symbol position currently being chosen by the touch pen 4 is shown highlighted, for example, as shown in FIG. 7(B).

[0037] As described above, when the drag menu 23 is displayed overlapping on top of the soft keyboard 20, in Step S104, a determination is made that menu done variable = true, so the process goes to Step S105, and a determination is made as to whether the touch pen 4 is separated from the tablet 3.

[0038] When a determination is made that the touch pen 4 is not separated from the tablet 3 in Step S105, the process goes to Step S111, and a determination is made as to whether the touch pen 4 is moved inside the drag menu 23 without being lifted off the tablet 3; i.e. the key is dragged. In this step S111, when a determination is made that the key is not dragged, the process returns to Step S103. When a determination is made that the key has been dragged, the process goes to Step S112.

[0039] In Step S112, when the instruction position of the pen 4 shifts to the key area of the adjacent character or symbol from the key area of the character or symbol being highlighted by the dragging movement of the touch pen 4, the key area of the character or symbol from which the pen 4 has moved away is no longer highlighted, and the key area of the character or symbol onto which the pen 4 hovers is highlighted (refer to the drag menu 23 in FIG. 7(C)). And in the following step S113, the value of the pressed key variable is set to be the key on which the pen 4 hovers by dragging. And the process returns to Step S103.

[0040] In Step S105, when a determination is made that the pen 4 hovering on top of the drag menu 23 is lifted off from the tablet 3, the process goes to Step S106, and the input key variable = pressed key variable. That is, the confirmed input character is the character chosen from the drag menu 23.

[0041] Next, the process goes to Step S107, where the order of the characters and symbols are replaced, so that the first character or symbol in the drag menu 23 becomes the selected character or symbol, and the drag menu 23 is redisplayed. Next, the process goes to Step S108, where the display of the drag menu 23 is cancelled. The display of the character or symbol of the key 22 selected and instructed with the pen 4 when the drag menu 23 of the soft keyboard 20 has been displayed is changed into the display of the selected character or symbol (refer to FIG. 7(D)).

[0042] Then, the process goes to Step S109, menu done variable = false, and the menu done variable is returned to the state where the drag menu 23 is not displayed. The process further goes to Step S110, and after the pressed key variable returns to an undefined state, the process returns to Step S103.

[0043] A character and symbol input operation such as above is further described using concrete examples with reference to FIG. 7.

[0044] In order to select and enter "A", for example, from hiragana of 50 sounds, on the screen of the display 2, a user specifies the position of the key 21 of "A" of the soft keyboard 20 with the touch pen 4 and lifts the touch pen 4 off the screen.

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.