

through a user's sequential selection of characters, from a collection of characters, depicted on a display, comprising: a. dividing the characters of a collection of characters into a plurality of smaller, like-sized groups; b. providing at least one display window on a display screen; c. providing an action key for user selection of at least one of the plurality of smaller, like-sized groups of characters; d. selecting the action key to specify one of the plurality of smaller, like-sized groups of characters for display; e. displaying at least one of the characters in a specified character group in the display window; f. providing at least one selection button for at least one of the characters displayed; g. selecting a character from the characters displayed; and h. entering the selected character as input.

[0024] In accordance with yet another aspect of the present invention, there is provided a user operable character selection and entry system for compiling characters into a text string of characters by selection from a displayed character group comprising: at least one character group graphic display window within the screen; a selected character entry means wherein the character group display window is directly associated with a physical character entry key; means responsive to detecting the user activation of a physical key; means for detecting the user selection of a character group; and means responsive to detecting the user selected character group.

[0025] In accordance with a further aspect of the present invention, there is provided a user operable system for the multiplexed selection of characters, from a collection of characters, depicted on a display, comprising: at least one character group depicted in a spatial dimension on a display window of the system; navigation means for alternately displaying, in a time dimension, one of a plurality of character groups selected from the collection of characters on the display window; and means for detecting a user selected character within a displayed character group in order to output a signal representing the selected character.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] FIG. 1 is a representative illustration of an embodiment of the present invention displayed in accordance with a personal digital assistance device;

[0027] FIG. 2 is an illustrative example of one manner of dividing a collection of characters into a plurality of character groups for display in accordance with the present invention;

[0028] FIGS. 3A-3F display specific implementations of the character selection tool embodiment in accordance with the respective character groups of FIG. 2;

[0029] FIG. 4 is an alternative embodiment of the present invention enabling the selection of multiple characters with a single user operation;

[0030] FIGS. 5A and 5B are flowcharts depicting a methodology for implementing the present invention;

[0031] FIGS. 6 and 7 depict, respectively, the front and rear views of the personal digital assistance device of FIG. 1 in accordance with another aspect of the present invention;

[0032] FIGS. 8 and 9 depict, respectively, the front and rear views of a personal communication device in accordance with another aspect of the present invention; and

[0033] FIG. 10 depicts a cellular telephone employing software in accordance with the present invention to enable the rapid entry of textual information using a conventional telephone keypad.

[0034] The present invention will be described in connection with a preferred embodiment, however, it will be understood that there is no intent to limit the invention to the embodiment described. On the contrary, the intent is to cover all alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0035] For a general understanding of the present invention, reference is made to the drawings. In the drawings, like reference numerals have been used throughout to designate identical elements. The present invention is intended to be implemented in any device enabling or requiring data entry wherein a user selects characters to formulate text or mathematical expressions or the like to convey information, formulate operating code, make a telecommunication connection or for any other reason. Thus, data entry devices comprise personal desktop and portable computers, personal digital assistants, portable web access devices, telecommunications devices, digital watches, calculators and the like. For convenience, the preferred embodiments of the present invention are described herein in the context of entering text into a personal digital assistant (PDA) as generally illustrated in FIG. 1.

[0036] As used herein, the term collection of characters is intended to represent various categories (e.g. alphabetical characters, numerical characters, punctuation, QWERTY keyboard characters (upper and/or lower case), symbols (e.g., wingdings), functions, etc.), or combinations thereof that may be selected or desired for selection by a user inputting character data. While the term category is intended to represent a set of related characters, collection is intended to represent the possibility of one or more categories of characters or subsets of one or more categories, etc.

[0037] In FIG. 1, the PDA 10 (illustrated in U.S. Design Pat. No. D397,679) comprises a case 12 enclosing the battery and micro-computer based operating system, and supporting an electronic display 14 (e.g., LCD), located under a touch sensitive screen 18, keys 16 are physical buttons, some of which are soft keys and thereby user defined, and port (not shown) along the sides of case 12 for making connections with other devices using infrared (IR), radio frequency (RF), or direct connection. Operating programs for word processing and spreadsheet applications can be loaded into memory of the PDA operating system for use by the user. A stylus or pen 28 is slipped into a holder (not shown) along a side of the PDA case 12 and may also be employed by the user to enter data or initiate program specific functions by pressing the stylus upon the touch screen 18 where icons or characters are displayed on the screen 14. This coordinate selection method, as well as the supporting operating system and keys, is an entry process well known in the art.

[0038] FIG. 1 depicts a first embodiment of an apparatus and method of character data entry of the present invention. The apparatus of the present invention is realized when