(19) World Intellectual Property Organization
(10) International Publication Number
WO 2004/097618 A2

(43) International Publication Date
11 November 2004 (11.11.2004)

(51) International Patent Classification: G06F 3/033

(21) International Application Number: PCT/EP2004/050597

(22) International Filing Date: 23 April 2004 (23.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
03124113.1 29 April 2003 (29.04.2003) CN


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(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(54) Title: ALLOWING SCREEN FUNCTIONS TO SHARE A COMMON DISPLAY ARE OF A TOUCH SCREEN

(57) Abstract: A method for allowing two screen functions to share a common display are (35) of an interactive display screen (5) associated with an electronic device (1). The method includes determining automatically (21) a required function to be performed in the common display are (35). The required function typically being a character scribing function (25) and a candidate character display function (24) associated with a scribed character scribed on the common display are (35). The method performs controlling the common display are (35) in order to perform only the required function.
ALLOWING SCREEN FUNCTIONS TO SHARE A COMMON DISPLAY AREA OF A TOUCH SCREEN

FIELD OF THE INVENTION

This invention relates to interdependent screen functions sharing a common display area of touch screen. The invention is particularly useful for, but not necessarily limited to, a character scribing function and an interdependent candidate character display function sharing the common display area.

BACKGROUND OF THE INVENTION

A frequently used interface between man and machine is a display screen. Increasingly, such screens are not just used for one way communication, that is to display data to the user, but also as means for the user to input data to the relevant apparatus, for example by way of a touch screen.

One of the main growth areas for touch screen devices is in small hand held portable devices, such as mobile telephones, personal digital assistants (PDA), global positioning system (GPS) navigators and the like. These adopt various methods for entering symbols or data into them, for instance buttons, voice recognition, hand writing recognition virtual buttons (such as virtual keyboard), etc. In the last case various buttons appear on the screen and touching the screen at a point corresponding to one of those buttons causes the device to react as if the corresponding button itself had been touched. The construction of touch screens is well known in the art and touch detection can be by way of many well-known systems, such as capacitive or inductive sensing or contact switches.
When portable hand held electronic devices use a touch screen for receiving scribed character inputs, the screen is separated into several areas that perform different screen functions. One of these areas provides for a character scribing function allowing a character scribed on the touch screen for capturing by the device. Another one of these areas provides for displaying a candidate character display function that displays on the touch screen candidate characters that have been identified by the electronic device as characters that may identify the scribed character. This separating of screen functions into several areas may lead to a number of undesirable limitations. One of these limitations is because the touch screen of portable hand held electronic devices is relatively small, therefore the separate area for displaying candidate characters can only display a small number of acceptably sized candidate characters. Another of these limitations is because the area that provides for the character scribing function may be unacceptably small for some users. Accordingly, it would be beneficial if these limitations to be at least alleviated.

In this specification, including the claims, the terms ‘comprises’, ‘comprising’ or similar terms are intended to mean a non-exclusive inclusion, such that a method or apparatus that comprises a list of elements does not include those elements solely, but may well include other elements not listed.

SUMMARY OF THE INVENTION

According to one aspect of the invention there is provided a method for allowing at least two screen functions to share a common display area of an interactive display screen associated with an electronic device, the method including:

determining automatically a required function to be performed in the common display area, the required function being one of the screen functions; and

controlling the common display area in order to perform only the required function.
Suitably, there is an interdependent functional relationship between the screen functions.

Suitably, the required function is a character scribing function allowing a character scribed on the display area to be captured by the device. In one alternative, the required function is a candidate character display function associated with a scribed character scribed on the common display area.

Preferably, the determining automatically determines that the required function is the character scribing function by sensing a scribed line on the common display area.

Suitably, the character scribing function displays a scribed character in the common display area.

Suitably, the method is further characterized by the common display area defaulting to one of the screen functions after the step of controlling.

Suitably, the method includes a further step of defaulting to the candidate character display function, the candidate character display function displaying in the common display area candidate characters that have been identified by the electronic device as characters that may identify the scribed character.

Preferably, the defaulting occurs after scribing on the screen area ceases for a pre-determined time.

Suitably, the method also provides for allowing a user to select a desired character from one of the candidate characters and inserting the desired character into text displayed in a sentence display area of the interactive display screen.
BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be readily understood and put into practical effect, reference will now be made to a preferred embodiment as illustrated with reference to the accompanying drawings in which:

Fig. 1 is a schematic block diagram of an electronic device in accordance with the invention;

Fig. 2 illustrates a prior art interactive display screen;

Fig. 3 further illustrates a prior art interactive display screen;

Fig. 4 is a flow diagram illustrating a method for allowing at least two screen functions to share a common display area of the interactive display screen of the device of Fig. 1; and

Figs. 5 and 6 illustrates operation of the interactive display screen during the method of Fig. 2.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

In the drawings, like numerals on different Figs are used to indicate like elements throughout. With reference to Fig. 1, there is illustrated an electronic device 1, the device 1 illustrated is a radio communications device comprising a radio frequency communications unit 2 coupled to be in communication with a processor 3. An user interface in the form of an interactive display screen or touch screen 5 (typically a Liquid Crystal
Display) and an optional keypad 6 are also coupled to be in communication with the processor 3.

The processor 3 includes an encoder/decoder 11 with an associated Read Only Memory (ROM) 12 storing data for encoding and decoding voice or other signals that may be transmitted or received by electronic device 1. The processor 3 also includes a micro-processor 13 coupled to both an encoder/decoder 11 and an associated character Read Only Memory (ROM) 14. Micro-processor 13 is also coupled to a Random Access Memory (RAM) 4 and a static programmable memory 16. The static programmable memory 16 stores, amongst other features and functions, a phone book database of numbers and associated identifiers (names of people associated with each of the numbers).

Auxiliary outputs of micro-processor 13 are coupled to an alert module 15 that typically contains a speaker, vibrator motor and associated drivers. The character Read only memory 14 stores code for decoding or encoding text messages that may be received by the communication unit 2, input at the touch screen 5 or optional keypad 6. In this embodiment the character Read Only Memory 14 also stores operating code (OC) for micro-processor 13 and a template set of characters for character recognition. The operating code (OC) is used to run applications on the electronic device 1.

The radio frequency communications unit 2 is a combined receiver and transmitter having a common antenna 7. The communications unit 2 has a transceiver 8 coupled to antenna 7 via a radio frequency amplifier 9. The transceiver 8 is also coupled to a combined modulator/demodulator 10 that couples the communications unit 2 to the processor 3.
In Figs. 2 and 3 there is illustrated a prior art interactive display screen 5 that displays a sentence display area 33, a Character scribing area 32 and a candidate character display area 31. In use, the Character scribing area 32 allows for a user to scribe a character typically with the aid of a stylus. On such character is shown as scribed in the Character scribing area 32 in Fig. 2. Upon completion of scribing a character in the Character scribing area 32, the display screen 5 then displays in the candidate character display area 31 candidate characters that may possibly be the character the user intended to scribe. This is shown specifically in Fig. 3.

As shown in both Figs. 2 and 3, this prior art interactive display screen 5 has separate areas for the Character scribing area 32 and a candidate character display area 31. Accordingly, in this example, the number of displayed candidate characters is limited to 6 and the Character scribing area 32 is relatively small. This may be undesirable and the user may have to request further candidate characters to be displayed in the candidate character display area 31. Once the desired character is displayed (the character that the user intended to scribe in the Character scribing area 32), in the candidate character display area 31, the user may select this desired character by simply touching the screen where it is displayed. Accordingly, the selected desired character will then be displayed by inserting the desired character into the text displayed in the sentence display area 33.

Referring to Figs. 4 to 6 there is illustrated a method 20 for allowing at least two screen functions to share a common display area 35 of an interactive display screen 5 associated with the electronic device 1.
Assuming the electronic device 1 is operating in a manner to provide a candidate character display function step 24, then the common display area 35 is controlled to provide for displaying default candidate characters, no characters or candidate characters that may identify a previously scribed character scribed in the common display area 35. The processor 3 controls the method 20 to continuously test for a scribing operation to be detected at a test step 22, the scribing operation being performed in the common display area 35. If no scribing operation is detected at the test step 22 then the interactive display screen 5 continues to provide the candidate character display function step 24.

Once a scribing operation, in the common display area 35, is detected at a test step 22 then the processor 3 controls the method 20 to perform a character scribing function step 25 as shown specifically in Fig. 5. During the performing of the character scribing function, step 25 allows a scribed character ("X" being the illustrated scribed character) that is scribed on the common display area 35 to be captured by the device 1 and processed by well known character recognition techniques. The processor 3 controls the method 20 to continuously test for a scriber timeout to be detected at a test step 23. In this regard, a scriber timeout occurs when the processor does not detect any scribing in the common display area 35 for a predefined time (typically 3 seconds). If no scriber timeout occurs at the test step 23 then the interactive display screen 5 continues to provide the character scribing function step 25.

Once a scriber timeout occurs and is detected by a test step 23 then the processor 3 controls the method 20 to perform the candidate character display function step 24 as shown specifically in Fig. 6. When in the
candidate character display function step 24 the processor 3 now controls the interactive display screen 5 such that candidate characters (including character "ê") are displayed in the common display area 35. These candidate characters are conventional font characters identified, by one of the character recognition techniques, as candidate characters that may represent or identify the scribed character that was scribed on common display area 35. A user can then select, by touching a candidate character, a representation of the intended scribed character in a conventional font. Once selected, the intended scribed character ("ê") is, in a conventional font, displayed with other characters in the sentence display area 33.

Hence, from the above it will be apparent that test steps 22 and 23 when combined provide for a determining automatically step 21 for determining automatically a required function to be performed in the common display area 35, the required function being one of the screen functions. These screen functions are the character scribing function of step 25 and the candidate character display function of step 24 that is associated with a scribed character scribed on the common display area during step 25. Also, as will be apparent to a person skilled in the art, there is an interdependent functional relationship between the screen functions. From the determining automatically step 21, the method provides for controlling the common display area 35 in order to perform only the required function of either step 24 or 25.

Advantageously, the determining automatically step 21 automatically determines that the required function is the character scribing function step 25 by sensing a scribed line on the common display area at the test step 22. The method 20 also provides for the common
display area 35 defaulting to the candidate character display function step
24 when the scriber timeout at step 23 occurs or no scribing is detected at
step 22. Also, because only one of the required screen functions can be
performed and displayed in the common display area 25 then the common
display area can be enlarged an to utilize the space of the separate areas
31,32 as shown in the prior art screens of FIGs 2 and 3. Accordingly, the
present invention allows more candidate characters to be concurrently
displayed when compared with the prior art. Also, the common display
area 35 allows for a larger area for the performing of the character scrib
function that can provide for more accurate scribing of characters.

The detailed description provides a preferred exemplary
embodiment only, and is not intended to limit the scope, applicability, or
configuration of the invention. Rather, the detailed description of the
preferred exemplary embodiment provides those skilled in the art with an
enabling description for implementing preferred exemplary embodiment
of the invention. It should be understood that various changes may be
made in the function and arrangement of elements without departing from
the spirit and scope of the invention as set forth in the appended claims.
WE CLAIM:

1. A method for allowing at least two screen functions to share a common display area of an interactive display screen associated with an electronic device, the method including:
   determining automatically a required function to be performed in the common display area, the required function being one of the screen functions; and
   controlling the common display area in order to perform only the required function.

2. A method as claimed in claim 1, wherein there is an interdependent functional relationship between the screen functions.

3. A method as claimed in claim 1, wherein the required function is a character scribing function allowing a character scribed on the display area to be captured by the device.

4. A method as claimed in claim 1, wherein the required function is a candidate character display function associated with a scribed character scribed on the common display area.

5. A method as claimed in claim 1, wherein the determining automatically determines that the required function is the character scribing function by sensing a scribed line on the common display area.

6. A method as claimed in claim 5, wherein the character scribing function displays a scribed character in the common display area.

7. A method as claimed in claim 1, wherein the method is further characterized by the common display area defaulting to one of the screen functions after the step of controlling.
8. A method as claimed in claim 6, wherein the method includes a further step of defaulting to the candidate character display function, the candidate character display function displaying in the common display area candidate characters that have been identified by the electronic device as characters that may identify the scribed character.

9. A method as claimed in claim 8, wherein the defaulting occurs after scribing on the screen area ceases for a pre-determined time.

10. A method as claimed in claim 9, wherein the method also provides for allowing a user to select a desired character from one of the candidate characters and inserting the desired character into text displayed in a sentence display area of the interactive display screen.