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(54) **METHOD AND APPARATUS FOR TEXT SELECTION**

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G06F 3/048 (2013.01)

(52) **U.S. Cl.**
USPC **715/773**; 715/781; 715/863; 715/864

(58) **Field of Classification Search**
USPC 715/781, 773, 863, 864
See application file for complete search history.

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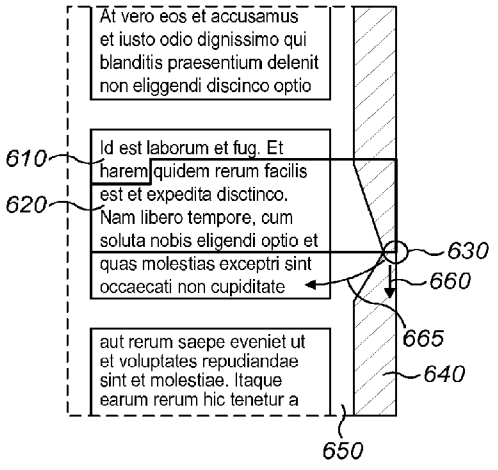
(57) **ABSTRACT**

A method includes, displaying a content selection icon on a touch-sensitive display of an electronic device, detecting touch input at a touch location on the display operable to select a content selection function associated with the content selection icon, and, modifying the displayed content selection icon to display a touch portion at a location on the display corresponding to said detected touch location and a content selection portion operatively coupled to, but spatially separated from, the touch portion.

4 Claims, 11 Drawing Sheets



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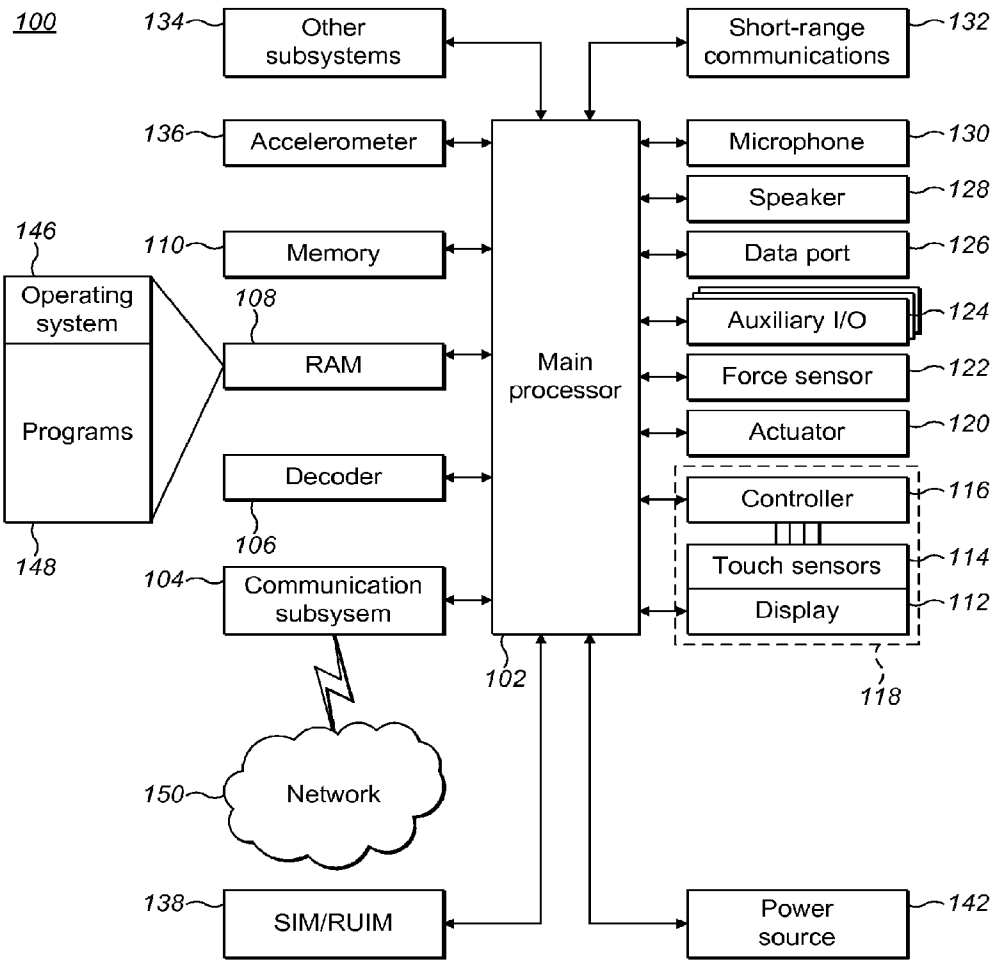
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Short-range communications
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136
Accelerometer
Microphone
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Speaker
128
146
110
Memory
Data port
126
Operating system
108
Auxiliary I/O
124
RAM
Main processor
Force sensor
122
Programs
Actuator
120
Decoder
Controller
116
106
Touch sensors
114
148
104
Communication subsysem
Display
112
102
118
Network
150
138
SIM/RUIM
Power source
142

FIG. 1

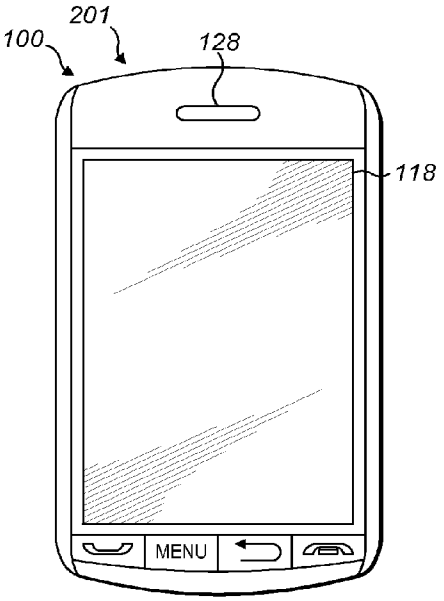

FIG. 2

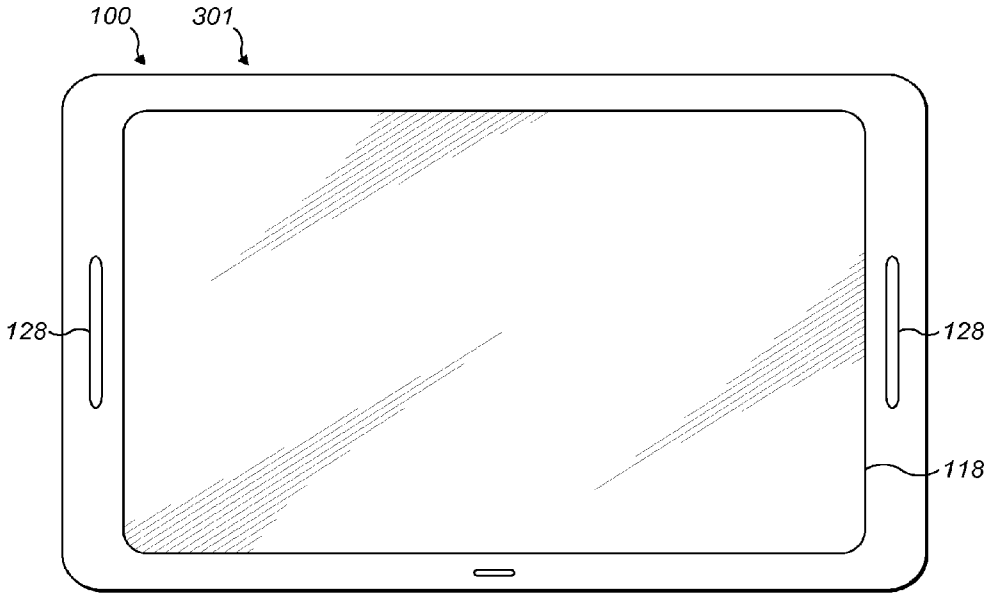

FIG. 3

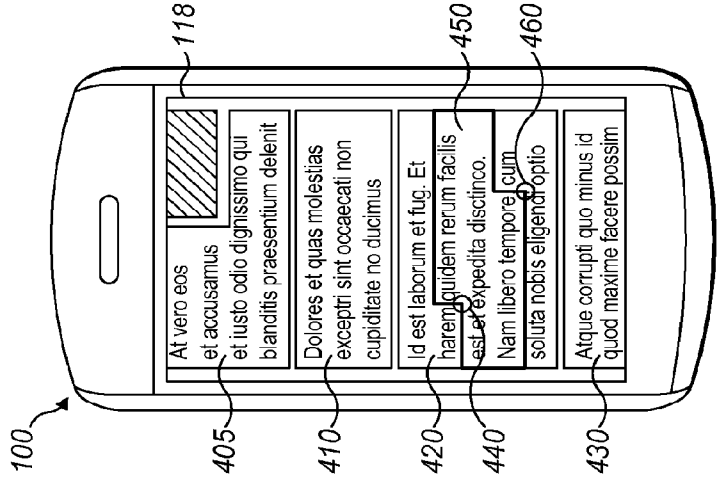

FIG. 4A

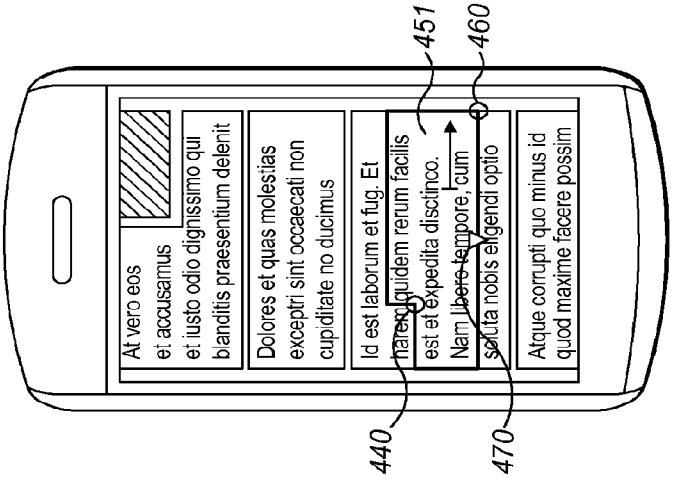

FIG. 4B

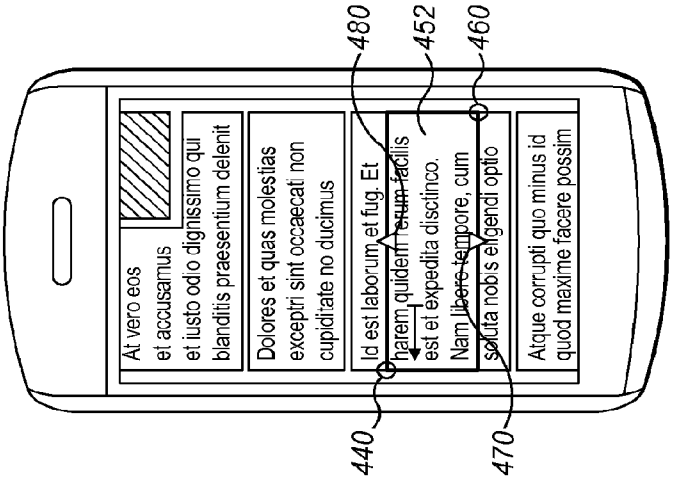

FIG. 4C

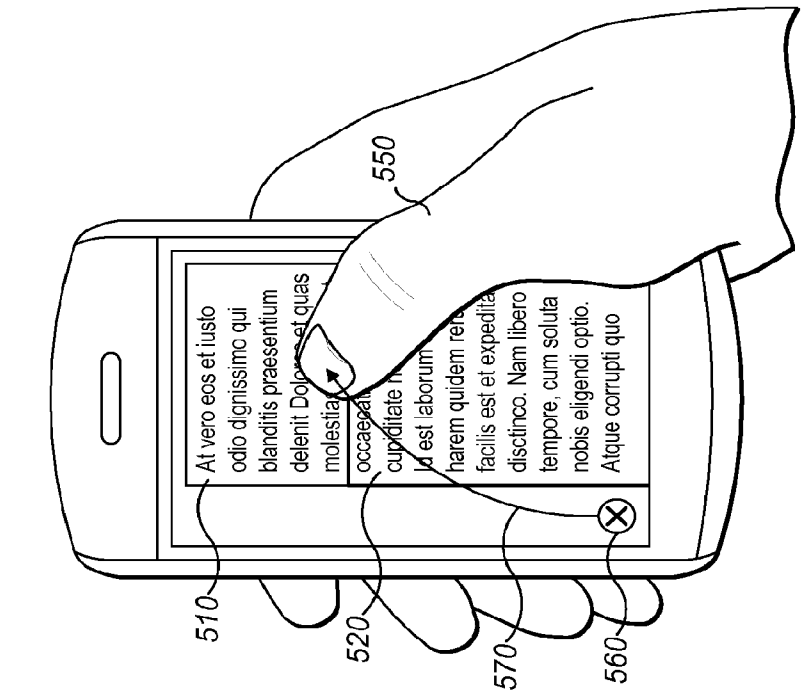
At vero eos et iusto
odio dignissimo qui
blanditis praesentium
delenit Dolores et quas
molestias
occaecati
cupiditate
id est laborum
harem quidem rer
facilis est et expedita
disctinco. Nam libero
tempore, cum soluta
nobis eligendi optio.
Atque corrupti quo
550
510
520
570
560

FIG. 5B

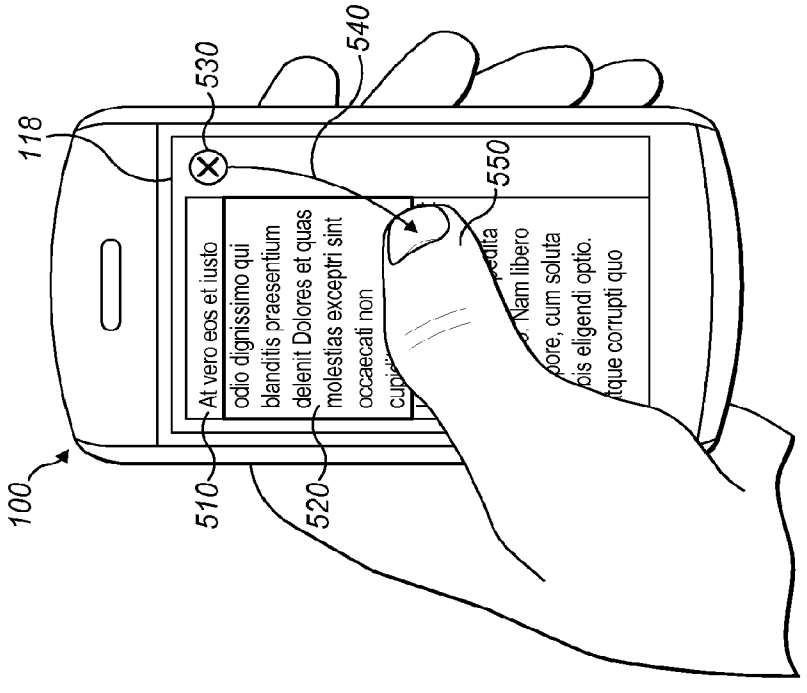
118
530
540
At vero eos et iusto
odio dignissimo qui
blanditis praesentium
delenit Dolores et quas
molestias exceptri sint
occaecati non
550
Nam libero
ore, cum soluta
ois eligendi optio.
tque corrupti quo
100
510
520

FIG. 5A

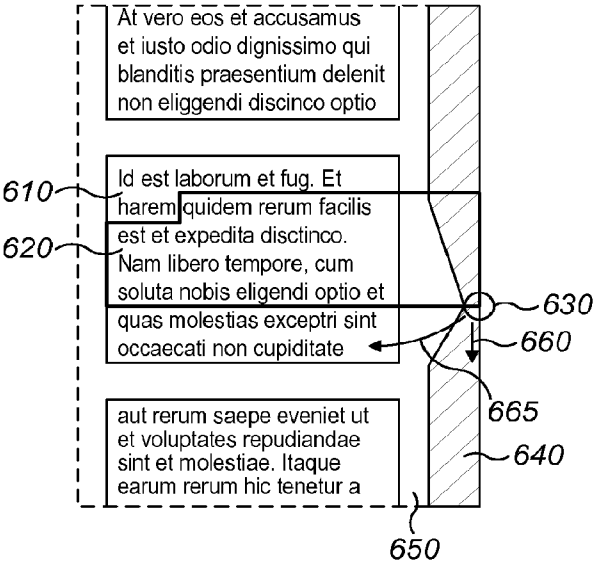

FIG. 6A

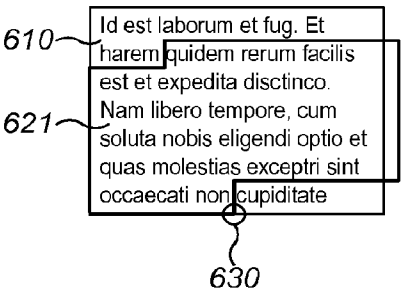

FIG. 6B

FIG. 6C

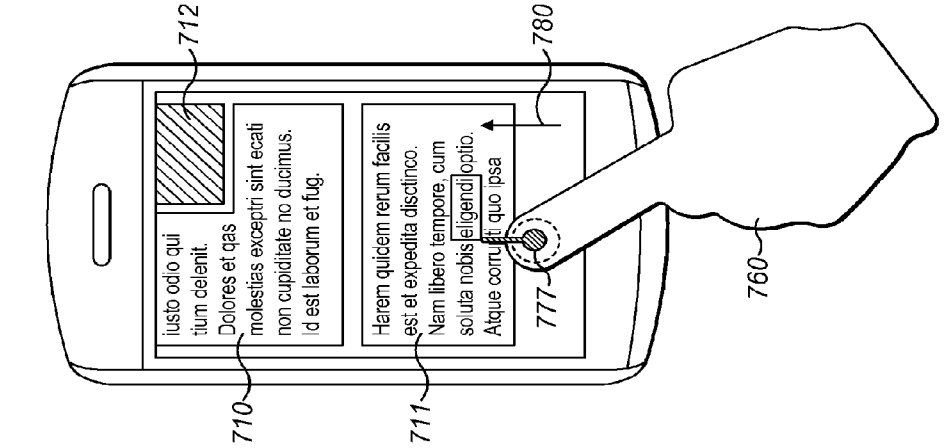

FIG. 7C

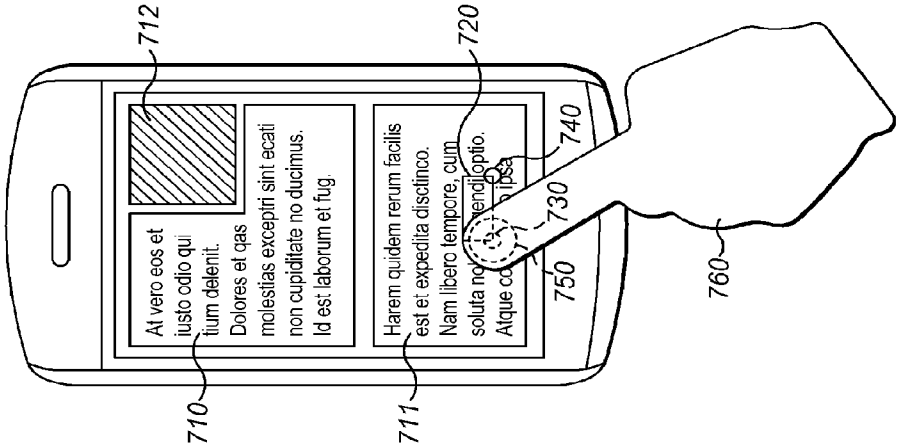

FIG. 7B

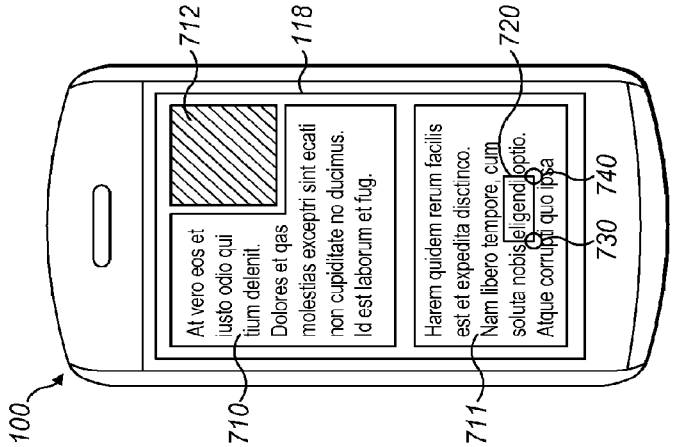

FIG. 7A

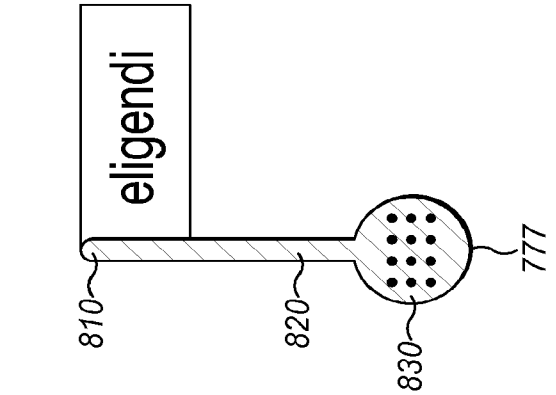

FIG. 8C

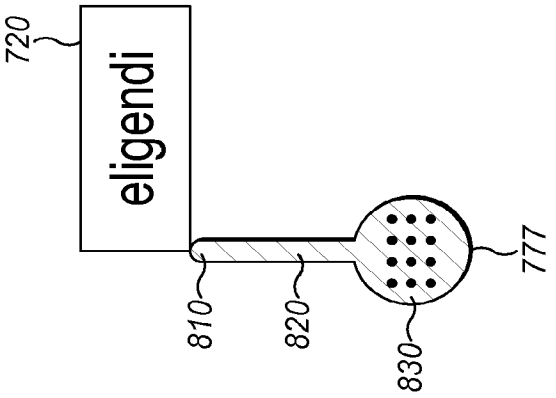

FIG. 8B

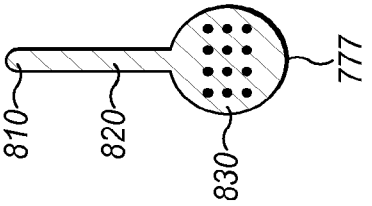

FIG. 8A

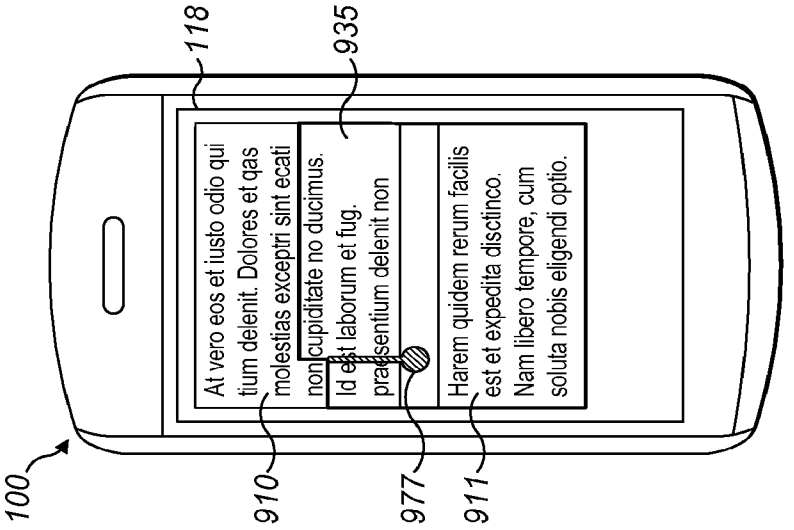
118
935
At vero eos et iusto odio qui tium delenit. Dolores et qas molestias exceptri sint ecati non cupiditate no ducimus.
Id est laborum et fug. praesentium delenit non
Harem quidem rerum facilis est et expedita disctinco. Nam libero tempore, cum soluta nobis eligendi optio.
100
910
977
911

FIG. 9B

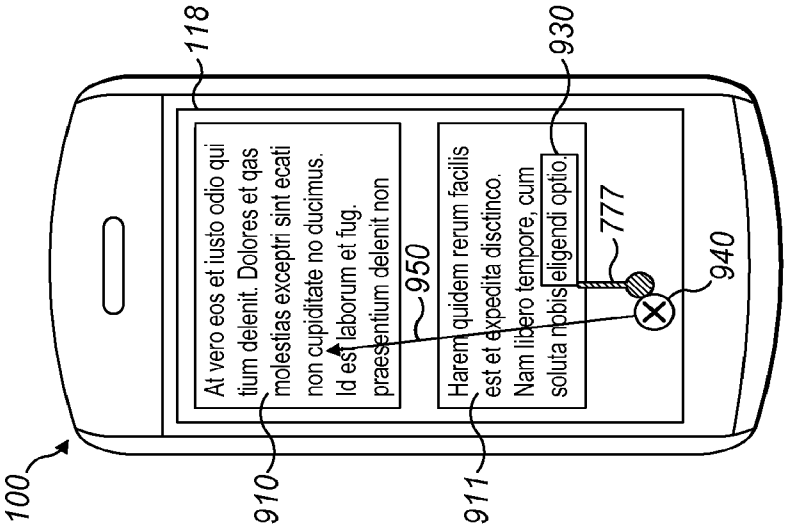
118
930
At vero eos et iusto odio qui tium delenit. Dolores et qas molestias exceptri sint ecati non cupiditate no ducimus.
Id est laborum et fug. praesentium delenit non
950
Harem quidem rerum facilis est et expedita disctinco. Nam libero tempore, cum soluta nobis eligendi optio.
777
940
100
910
911

FIG. 9A

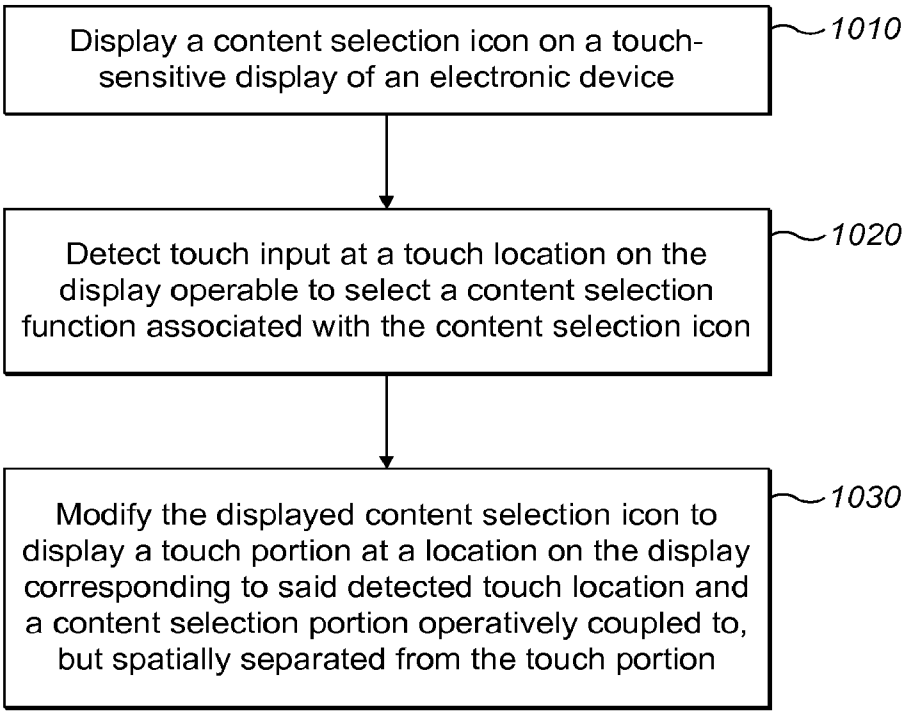
Display a content selection icon on a touch-sensitive display of an electronic device
1010
Detect touch input at a touch location on the display operable to select a content selection function associated with the content selection icon
1020
Modify the displayed content selection icon to display a touch portion at a location on the display corresponding to said detected touch location and a content selection portion operatively coupled to, but spatially separated from the touch portion
1030

FIG. 10

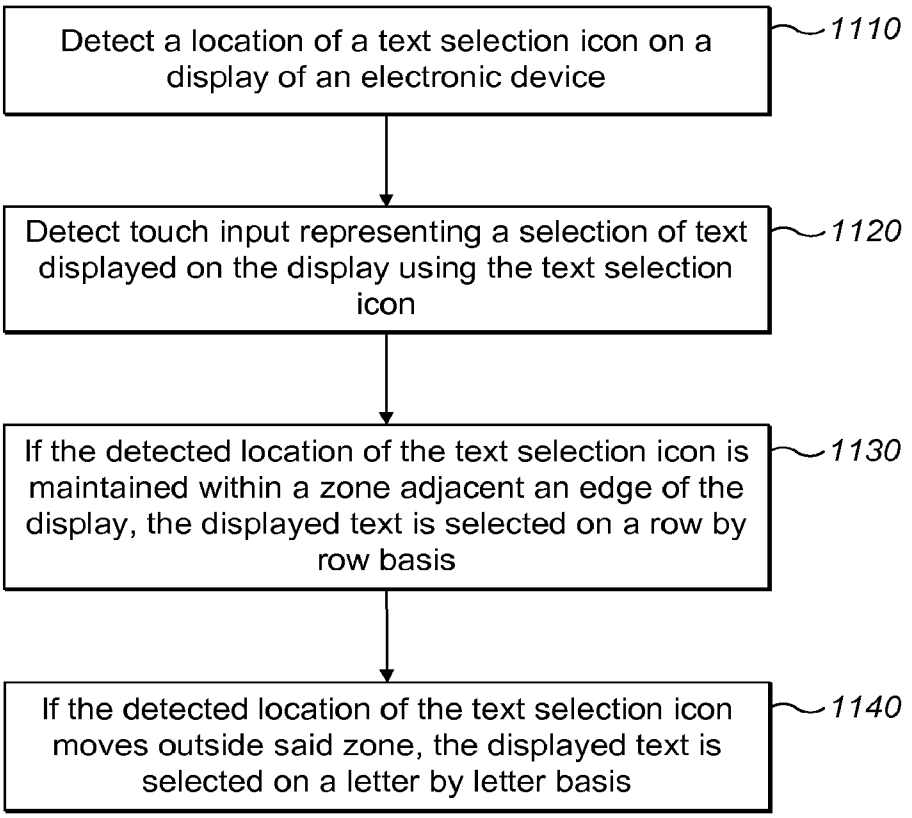
Detect a location of a text selection icon on a display of an electronic device
1110
Detect touch input representing a selection of text displayed on the display using the text selection icon
1120
If the detected location of the text selection icon is maintained within a zone adjacent an edge of the display, the displayed text is selected on a row by row basis
1130
If the detected location of the text selection icon moves outside said zone, the displayed text is selected on a letter by letter basis
1140

FIG. 11

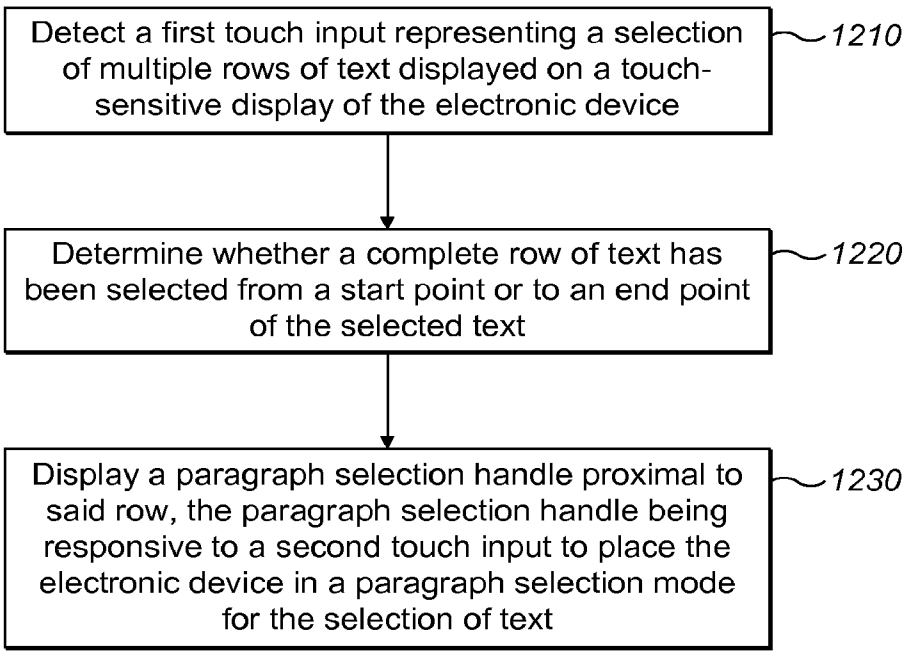
Detect a first touch input representing a selection of multiple rows of text displayed on a touch-sensitive display of the electronic device
1210
Determine whether a complete row of text has been selected from a start point or to an end point of the selected text
1220
Display a paragraph selection handle proximal to said row, the paragraph selection handle being responsive to a second touch input to place the electronic device in a paragraph selection mode for the selection of text
1230

FIG. 12

METHOD AND APPARATUS FOR TEXT SELECTION

The present application is a continuation of application Ser. No. 13/459,980, filed Apr. 30, 2012, titled "METHOD AND APPARATUS FOR TEXT SELECTION," the contents of which is incorporated herein by reference in its entirety.

FIELD OF THE TECHNOLOGY

Background

Electronic devices, including portable electronic devices, have gained widespread use and may provide a variety of functions including, for example, telephonic, electronic messaging and other personal information manager (PIM) application functions. Portable electronic devices include, for example, several types of mobile stations such as simple cellular telephones (feature phones), smart phones, wireless personal digital assistants (PDAs), tablet computers, and laptop computers with wireless 802.11 or Bluetooth® capabilities.

Portable electronic devices such as PDAs or smart telephones are generally intended for handheld use and ease of portability. Smaller devices are generally desirable for portability. A touch-sensitive display, also known as a touchscreen display, is particularly useful on handheld devices, which are small and have limited space for user input and output. The information displayed on the touch-sensitive displays, such as text, may be modified based on the functions and operations being performed.

Improvements in devices with touch-sensitive displays, including the selection of content on those devices, are desirable.

BRIEF DESCRIPTION OF DRAWINGS

Examples of the present proposed approach will now be described in detail with reference to the accompanying drawings, in which:

FIG. **1** is a block diagram of a portable electronic device in accordance with the disclosure;

FIG. **2** is a front view of a smartphone in accordance with example embodiments of the present disclosure;

FIG. **3** is a front view of a tablet computer is accordance with example embodiments of the present disclosure;

FIGS. **4**A to **4**C illustrate an electronic device in accordance with an embodiment showing the initiation of a paragraph selection mode;

FIGS. **5**A and **5**B illustrate an electronic device in accordance with an embodiment showing example touch inputs;

FIGS. **6**A to **6**C illustrate a method of switching between row and letter selection in accordance with the disclosure;

FIGS. **7**A to **7**C illustrate an electronic device in accordance with an embodiment showing the movement of content in response to a touch input;

FIGS. **8**A to **8**C show a selection handle in accordance with the disclosure;

FIGS. **9**A and **9**B illustrate an electronic device in accordance with an embodiment showing the extension of a selection handle in response to user input;

FIG. **10** is a flowchart illustrating a method of modifying a selection icon in accordance with the disclosure;

FIG. **11** is a flowchart illustrating a method of row-by-row selection in accordance with the disclosure; and,

FIG. **12** is a flowchart illustrating a method of paragraph selection in accordance with the disclosure.

DETAILED DESCRIPTION

The following describes an apparatus for and method of determining a selection of a selection option based on received user input.

For simplicity and clarity of illustration, reference numerals may be repeated among the figures to indicate corresponding or analogous elements. Numerous details are set forth to provide an understanding of the examples described herein. The examples may be practiced without these details. In other instances, well-known methods, procedures, and components are not described in detail to avoid obscuring the examples described. The description is not to be considered as limited to the scope of the examples described herein.

The disclosure generally relates to an electronic device, such as a portable electronic device or non-portable electronic device. Examples of portable electronic devices include mobile, or handheld, wireless communication devices such as pagers, feature phones, cellular smart-phones, wireless organizers, personal digital assistants, wirelessly enabled notebook computers, tablet computers, mobile internet devices, electronic navigation devices, and so forth. The portable electronic device may be a portable electronic device without wireless communication capabilities, such as handheld electronic games, digital photograph albums, digital cameras, media players, e-book readers, and so forth. Examples of non portable electronic devices include desktop computers, electronic white boards, smart boards utilized for collaboration, built-in monitors or displays in furniture or appliances, and so forth.

Example Electronic Device

A block diagram of an example of an electronic device **100** is shown in FIG. **1**. The electronic device **100** includes multiple components, such as a processor **102** that controls the overall operation of the electronic device **100**. Communication functions, including data and voice communications, are performed through a communication subsystem **104**. Data received by the electronic device **100** is decompressed and decrypted by a decoder **106**. The communication subsystem **104** receives messages from and sends messages to a wireless network **150**. The wireless network **150** may be any type of wireless network, including, but not limited to, data wireless networks, voice wireless networks, and networks that support both voice and data communications. A power source **142**, such as one or more rechargeable batteries or a port to an external power supply, powers the electronic device **100**.

The processor **102** interacts with other components, such as a Random Access Memory (RAM) **108**, memory **110**, a touch-sensitive display **118**, one or more actuators **120**, one or more force sensors **122**, an auxiliary input/output (I/O) subsystem **124**, a data port **126**, a speaker **128**, a microphone **130**, short-range communications **132** and other device subsystems **134**. The touch-sensitive display **118** includes a display **112** and touch sensors **114** that are coupled to at least one controller **116** that is utilized to interact with the processor **102**. Input via a graphical user interface is provided via the touch-sensitive display **118**. Information, such as text, characters, symbols, images, icons, and other items that may be displayed or rendered on a electronic device, is displayed on the touch-sensitive display **118** via the processor **102**. The processor **102** may also interact with an accelerometer **136** that may be utilized to detect direction of gravitational forces or gravity-induced reaction forces.

To identify a subscriber for network access, the electronic device **100** may utilize a Subscriber Identity Module or a Removable User Identity Module (SIM/RUIM) card **138** for communication with a network, such as the wireless network **150**. Alternatively, user identification information may be programmed into memory **110**.

The electronic device **100** includes an operating system **146** and software programs, applications, or components **148** that are executed by the processor **102** and are typically stored in a persistent, updatable store such as the memory **110**. Additional applications or programs may be loaded onto the electronic device **100** through the wireless network **150**, the auxiliary I/O subsystem **124**, the data port **126**, the short-range communications subsystem **132**, or any other suitable subsystem **134**.

A received signal such as a text message, an e-mail message, or web page download is processed by the communication subsystem **104** and input to the processor **102**. The processor **102** processes the received signal for output to the display **112** and/or to the auxiliary I/O subsystem **124**. A subscriber may generate data items, for example e-mail messages, which may be transmitted over the wireless network **150** through the communication subsystem **104**. For voice communications, the overall operation of the electronic device **100** is similar. The speaker **128** outputs audible information converted from electrical signals, and the microphone **130** converts audible information into electrical signals for processing.

The touch-sensitive display **118** may be any suitable touch-sensitive display, such as a capacitive, resistive, infrared, surface acoustic wave (SAW) touch-sensitive display, strain gauge, optical imaging, dispersive signal technology, acoustic pulse recognition, and so forth. A capacitive touch-sensitive display includes one or more capacitive touch sensors **114**. The capacitive touch sensors may comprise any suitable material, such as indium tin oxide (ITO).

One or more touches, also known as touch contacts or touch events, may be detected by the touch-sensitive display **118**. The processor **102** may determine attributes of the touch, including a location of the touch. Touch location data may include data for an area of contact or data for a single point of contact, such as a point at or near a center of the area of contact. The location of a detected touch may include x and y components, e.g., horizontal and vertical components, respectively, with respect to one's view of the touch-sensitive display **118**. For example, the x location component may be determined by a signal generated from one touch sensor, and the y location component may be determined by a signal generated from another touch sensor. A touch may be detected from any suitable input member, such as a finger, thumb, appendage, or other objects, for example, a stylus (active or passive), pen, or other pointer, based on the nature of the touch-sensitive display **118**. Multiple simultaneous touches may be detected.

One or more gestures may also be detected by the touch-sensitive display **118**. A gesture, such as a swipe, also known as a flick, is a particular type of touch on a touch-sensitive display **118** and may begin at an origin point and continue to an end point, for example, a concluding end of the gesture. A gesture may be identified by attributes of the gesture, including the origin point, the end point, the distance traveled, the duration, the velocity, and the direction, for example. A gesture may be long or short in distance and/or duration. Two points of the gesture may be utilized to determine a direction of the gesture. A gesture may also include a hover. A hover may be a touch at a location that is generally unchanged over a period of time or is associated with the same selection item for a period of time.

The optional actuator(s) **120** may be depressed or activated by applying sufficient force to the touch-sensitive display **118** to overcome the actuation force of the actuator **120**. The actuator(s) **120** may be actuated by pressing anywhere on the touch-sensitive display **118**. The actuator(s) **120** may provide input to the processor **102** when actuated. Actuation of the actuator(s) **120** may result in provision of tactile feedback.

Optional force sensors **122** may be disposed in conjunction with the touch-sensitive display **118** to determine or react to forces applied to the touch-sensitive display **118**. The force sensor **122** may be disposed in line with a piezo actuator **120**. The force sensors **122** may be force-sensitive resistors, strain gauges, piezoelectric or piezoresistive devices, pressure sensors, quantum tunneling composites, force-sensitive switches, or other suitable devices

The touch-sensitive display **118** includes a display area in which information may be displayed, and a non-display area extending around the periphery of the display area. The display area generally corresponds to the area of the display **112**. Information is not displayed in the non-display area by the display, which non-display area is utilized to accommodate, for example, electronic traces or electrical connections, adhesives or other sealants, and/or protective coatings around the edges of the display area. The non-display area may be referred to as an inactive area and is not part of the physical housing or frame of the electronic device. Typically, no pixels of the display are in the non-display area, thus no image can be displayed by the display **112** in the non-display area. Optionally, a secondary display, not part of the primary display **112**, may be disposed under the non-display area. Touch sensors may be disposed in the non-display area, which touch sensors may be extended from the touch sensors in the display area or distinct or separate touch sensors from the touch sensors in the display area. A touch, including a gesture, may be associated with the display area, the non-display area, or both areas. The touch sensors may extend across substantially the entire non-display area or may be disposed in only part of the non-display area.

Example Smartphone Electronic Device

Referring now to FIG. **2**, a front view of an example electronic device **100** which is a smartphone **201** is illustrated. The smartphone **201** is a mobile phone which offers more advanced computing capability than a basic non-smartphone cellular phone. For example, the smartphone **201** may have the ability to run third party applications which are stored on the smartphone.

The smartphone **201** may include the components discussed above with reference to FIG. **1** or a subset of those components. The smartphone **201** includes a housing which houses at least some of the components discussed above with reference to FIG. **1**.

The example smartphone **201** also includes other input interfaces such as one or more buttons, keys or navigational input mechanisms. In the example illustrated, at least some of these additional input interfaces are disposed for actuation at a front side of the smartphone.

Example Tablet Electronic Device

Referring now to FIG. **3**, a front view of an example electronic device **100** which is a tablet computer **301** is illustrated. The tablet computer **301** may include many of the same features and components of the smartphone **201** of FIG. **2**. However, the tablet computer **301** of FIG. **3** is generally larger than the smartphone **201**. The tablet computer **301** may include the components discussed above with reference to

FIG. **1** or a subset of those components. The tablet computer **301** includes a housing which houses at least some of the components discussed above with reference to FIG. **1**.

Content Selection

The display **112** of an electronic device **100** is primarily used for displaying content. Through the use of user input means on the electronic device **100**, such as touch sensors **114**, the user can select content to perform actions on. User interfaces should provide a user with a way of efficiently and intuitively selecting which content they wish to select.

In the following description, text-based content type will be used for illustrating improved methods of selecting content. However, it should be clear that the proposed solutions can be implemented with content types other than text. Text is used to illustrate the methods as it is a good example of a content type that would benefit from such methods, particularly because there are a number of ways it can be grouped. Textual content may be treated as individual letters, or it may be considered as grouping of letters in the form of words, or groupings of words in the form of sentences, or other groupings such as by row, paragraph, column and page.

Given how many different ways there are of grouping text, there may also be different ways a user may wish to select it, as a user may be more interested in selecting a certain paragraph than a certain word. Finer tuned selections (such as selection by letter) allow for greater accuracy of the selection, but would take longer to perform for larger selections (such as selection by paragraph). A user interface may enable a user to perform both fine tuned and larger selections, allowing the user intuitively to switch between the different granularities for text selection.

Paragraph Selection

FIGS. **4**A to **4**C illustrate a method of switching between granularities of selection. In these examples, the method provides a way of performing letter-by-letter selection as well as paragraph selection.

FIG. **4**A shows an electronic device **100** with a touch-sensitive-display **118**, the touch-sensitive display **118** displaying four paragraphs of text **405**, **410**, **420** and **430**, a selected portion of text **450** and selection handles at the start **440** and end **460** of the selected text **450**. The selected portion of text **450** may have been selected in response to a touch input representing a selection of text.

If the device receives a user input indicating that the end selection handle **460** should be moved (for example a touch and drag of the selection handle **460**), the end of the text selection **450** may move with it. A small movement of the end selection handle **460** to the right may cause the end of the text selection **450** to move onto the next letter, snapping to the nearest letter to the moved end selection handle **460**. Similarly, small movements of the start selection handle **440** may cause the start of the text selection **450** to snap to the letter nearest to the start selection handle **440**. This described modification of the text selection **450** by snapping to whatever letter is closest to a selection handle will be referred to as a letter-by-letter selection.

If a user wished to select large portions of the text, for example the fourth **430** paragraph, they may encounter difficulties with selecting the whole of the fourth paragraph **430** as the end of the paragraph is not displayed on the display **112** due to it being below the visible region of the display **112** in this example. Therefore, to include the fourth paragraph **430** in the selection, the user may have to drag the end selection handle **460** down to the bottom of the display **112**, then scroll the screen (either by initiating a scrolling gesture or by allowing the screen to 'creep' up in response to the selection handle's **460** close proximity to the bottom), and, once the end of the fourth paragraph **430** comes into view, continue moving the end selection handle **460** to the end of the fourth paragraph **430**. This results in a cumbersome, time consuming user interaction.

The method reduces the burden on the user by providing a paragraph selection mode and determining when to make it available. It may do so by determining whether the selected portion of text **450** has been modified such that either the first or last row of the selection **450** is a complete row of text. If the top or bottom ends of the selected text **450** contains a complete row, then either the end selection handle **460** has been moved to the end of a row, or the start selection handle **440** has been moved to the start of a row, or both events have occurred. In such an instance, as a selection handle has been moved to an outer edge of a row, there may be a possibility that the user intends to start selecting whole paragraphs. Therefore, in response to detecting a selection handle selecting a complete a row, a paragraph selection handle is displayed so that a user can then perform paragraph selection.

FIG. **4**B illustrates a paragraph selection handle **470** being displayed in response to a user input. In this example, the selected text **450** of FIG. **4**A has been expanded to the selected text **451**. This expansion is the result of a movement of the end selection handle **460** to the end of the row, thereby selecting the whole end row of the selected portion of text **451** and thus providing the device **100** with an indication that a paragraph selection mode may be required. The paragraph selection handle **470** may be positioned on the same row as the complete row just selected. In this example, the paragraph selection handle **470** appears on the bottom row, as that is the complete row just selected by movement of the end selection handle **460**. The paragraph selection handle **470** may also be positioned this way because the most likely direction of further paragraph selection may be downwards if the end selection handle **460** has been moved to the end of the row.

Similarly, if the start selection handle **440** is moved to completely select a row, as shown in FIG. **4**C, then a paragraph selection handle **480** may be displayed on a first row of the newly expanded selected text **452**. In FIG. **4**C, paragraph selection handles are displayed both on the top **480** and bottom **470** of the selected text **452**, as both start **440** and end **460** handles have been moved to completely select a row. If only one of the start **440** or end **460** handles have moved to completely select a row, then the paragraph selection handle may appear only on the completed row and not the other (as shown previously in FIG. **4**B).

In addition to, or instead of the criteria that a start or end row of a selected portion of text **450** must be completely selected before paragraph selection handles can be displayed, there may be a requirement that the selected portion of text **450** is above a certain size. For example, there may be a requirement that the selected portion of text **450** spans at least three rows before the paragraph selection handles can be displayed. This may be to avoid the instance where only one or two rows have been selected, leading to the possibility of the paragraph selection handles and start or end selection handles being too close together to individually control by touch input. Having a minimum row requirement may also be beneficial as that way the device may only display the paragraph selection handles once the selected text **450** is larger than a threshold value, thereby indicating a higher likelihood that the user may wish to perform paragraph selections.

The paragraph selection handles themselves may allow the user to select text in a paragraph aware manner. For example, if the paragraph selection handle **470** shown in FIG. **4**B were dragged down a small amount, the selected portion of text **451** may expand so as to extend to the end of the current para-

graph. This may be displayed by showing the bottom of the selection area move down to the end of the current paragraph, along with the handles **470** and **460**. However, this may result in the paragraph selection handle **470** moving away from the original location of the user's touch that was dragging the paragraph selection handle **470**. Therefore, if the user wished to continue with paragraph selection, the user would have to reselect the now moved paragraph selection handle. This would be especially problematic if the end of the selected paragraph was not visible on the display.

To address the above problem, the method may instead ensure that the paragraph selection handle **470** being moved is always coupled to the location of the touch input moving it. Thus, as the paragraph selection handle is dragged **470**, the underlying content itself moves in the display so that the end of the current paragraph lies under the touch input position. In other words, the display may automatically scroll to the end of the paragraph being selected. In this manner, the user will be able to see how the end point of the selection changes because the display scrolls so as to always show the end point. Similarly, dragging the top paragraph selection handle **480** upwards results in the selection extending to the starts of the paragraphs above, the size of the drag determining how many paragraphs above the current one to extend to. As long as the user drags the paragraph selection handle **470**, the device will remain in paragraph selection mode.

If a user drags a bottom paragraph selection handle **470** downwards, the selection area may expand downwards to the end of the paragraph. Further dragging the bottom paragraph selection handle **470** downwards may cause the selection area **452** to expand to the end of a lower paragraph (such as paragraph **430**). Similarly, the extent of the drag upwards of a top paragraph selection handle **480** may determine how many paragraphs up the selection area **452** is extended to.

Dragging the selection handles in the opposite direction, however, may result in different behaviour. For example, dragging a bottom selection handle **470** upwards may cause the selection area **452** to return to what it was prior to being modified by the bottom paragraph selection handle **470**. Optionally, dragging the bottom selection handle **470** upwards may cause the selection area **452** to contract in discrete amounts such that for each drag upwards, the selection area **452** contracts so that it covers one less full paragraph. Once the selection area **452** only covers one whole or paragraph, a further movement upward of the bottom selection handle **470** upwards may have no effect on the selection area **452**.

A flowchart illustrating a method of performing paragraph selection is shown in FIG. **10**. The method may be carried out by software executed, for example, by the processor **102**. Coding of software for carrying out such a method is within the scope of a person of ordinary skill in the art given the present description. The method may contain additional or fewer processes than shown and/or described, and may be performed in a different order. Computer-readable code executable by at least one processor of the portable electronic device to perform the method may be stored in a computer-readable medium, which may be a non-transitory or tangible storage medium.

In the method shown in FIG. **10**, a first touch input representing a selection of multiple rows of text displayed on a touch-sensitive display of an electronic device is detected **1210**. A determination is made as to whether a complete row of text has been selected from a start point or to an end point of the selected text **1220**. A paragraph selection handle proximal to the row is displayed, the paragraph selection handle being responsive to a second touch input to place the electronic device in a paragraph selection mode for the selection of text **1230**.

Row Selection

In the previous section, a method for enabling and performing paragraph selection was disclosed. In addition to, or independently of this method, a method for enabling row-by-row selection is provided below.

In letter-by-letter selection mode, as a selection handle is moved, the corresponding part of the selection area (selected portion of text) snaps to the letter nearest to the selection handle. Therefore, in letter-by-letter mode, as a selection handle is moved across a row, letters are individually added or removed from the selection. However, as a selection handle is moved up or down to a different row, the nearest letter to the selection handle is on a different row and so, when the selection area snaps to that area, it snaps to include all the other letters in the row up to the selection handle. Therefore, moving a selection handle to the very right or left of a row, and subsequently moving the selection handle up or down, results in the entire rows being added or removed from the selection at a time. In this way, it is possible to perform row-by-row selection simply by using the mechanics provided by existing letter-by-letter selection.

However, performing the above type of row-by-row selection has some drawbacks. To perform row-by-row selection in this manner requires that a selection handle moves straight up or down along the side of the text. Moving the selection handle into the text and away from the edge may result in individual letters being selected instead of rows. Therefore, using a letter-by-letter selection mechanism for row-by-row selection may be too sensitive to small deviations in the horizontal movement of the selection handle.

FIGS. **5**A and **5**B illustrate possible sources of deviations. FIG. **5**A shows an electronic device **100** with a touch-sensitive display **118**, displaying on the touch-sensitive display some text **510** and a selection of the text **520**. When a user attempts to perform row-by-row selection with the thumb **550** of the left hand, they may start the gesture at point **530** and begin to drag a selection handle straight down. this drag movement **540** begins to curve into the text and away from the edge because of the natural curvature of a thumb's movement. This may lead to text selection by letter rather than by row. Similarly, in FIG. **5**B, the natural curvature of movement of a user's right thumb may result in a gesture **570** starting at point **560** to deviate from a straight line path and a curve into the text. This curvature may be further exaggerated by performing the gesture quickly.

One way to solve the above problem is to incorporate a dedicated row-by-row selection mode, such as is illustrated in FIGS. **6**A to **6**C. FIG. **6**A shows a portion of a display **114** containing text **610**, a selection area **620**, and a selection handle **630**. In this example, the selection handle **630** has been dragged to the side of the text, and in doing so has enabled a row-by-row selection mode. Upon entering this mode, moving the selection handle **630** up and down **660** results in the same behavior as the letter-by-letter based row-by-row implementation. This is because moving the selection handle **630** up and down **660** snaps the corresponding end of the selection area **620** to the row closest to the selection handle **630**. In this row selection mode, there may be a threshold area **640** provided, such that when a selection handle **630** is moved outside of this threshold area **640**, the selection mode returns to letter-by-letter selection mode. For example, moving the selection handle **630** into the text region (or 'letter-by-letter selection mode' region) **650** may cause row-by-row mode to end. This is illustrated in FIG. **6**B, which shows the resulting

selection area **621** from such a movement **665** of the selection handle **630** into the text region. Continuing to move the selection handle **630** within the threshold area may result in row-by-row selection mode to be maintained, as shown in FIG. **6**C, where the selection area **622** has been extended by row.

The threshold area **640** may vary in width to compensate for the aforementioned curvature of thumb movement. By causing the threshold area to increase with area **640** at regions further from the start point of the selection handle **630**, it may allow for more horizontal variation in the movement of the selection handle. The width of the threshold area **640** at various points along its length may be controlled dynamically, such that it varies according to various factors. One such factor may be the number of rows already selected, since there is a higher chance that the user will continue to remain in row-by-row selection mode if a large number of rows have already been selected. Moreover, the width of the threshold area **640** may be increased so as to require a larger, more deliberate movement of the selection handle **630** into the text area **650** before letter-by-letter mode is activated instead of row-by-row selection. The threshold area **640** may increase as more rows are selected. Similarly, if the selection area **620** is reduced, the likelihood of returning to letter-by-letter mode increases, and so the threshold area **640** may decrease as a result. Another possible factor may be the speed of the movement of the selection handle **630**. For example, if it is moved quickly, there is a higher chance of deviation from a straight line, and so the width of the threshold area **640** may be increased to compensate for this.

This method may be applied to column-by-column selection rather than row-by-row selection, depending on the orientation of the text. For example, in certain language systems, the text may be arranged in vertical lines rather than horizontal lines.

A flowchart illustrating a method of performing row-by-row selection is shown in FIG. **11**. The method may be carried out by software executed, for example, by the processor **102**. Coding of software for carrying out such a method is within the scope of a person of ordinary skill in the art given the present description. The method may contain additional or fewer processes than shown and/or described, and may be performed in a different order. Computer-readable code executable by at least one processor of the portable electronic device to perform the method may be stored in a computer-readable medium, which may be a non-transitory or tangible storage medium.

In the method shown in FIG. **11**, the location of a text selection icon on a display of an electronic device is detected **1110**. Detect touch input representing a selection of text displayed on the display using the text selection icon **1130**. If the detected location of the text selection icon is maintained within a zone adjacent an edge of the display, the displayed text is selected on a row-by-row basis **1130**. If the detected location of the text selection icon moves outside this zone, the displayed text is selected on a letter-by-letter basis **1140**.

Selection Handle

Selection handles may be used for controlling selection areas on a display. Examples of the use of said selection handles have been previously. Methods are now described which improve on existing selection handle technology, and may be used in any combination with the methods previously described or may be implemented independently.

FIG. **7**A shows an electronic device with a touch-sensitive screen, and displayed on that screen is a first paragraph of text **710**, a second paragraph of text **711**, and a picture **712**. In an example, a selection **720** has already been made and a start selection handle **730** and end selection handle **740** are displayed in connection with the start and end points of the selection **720**. This selection **720** may have been made by an earlier touch input.

FIG. **7**B shows a user **760** touching the selection handle **730**, and in doing so obscuring the selection handle **730** and also letters near to the touch area **750**. A problem therefore arises, in that the user is unable to see the current location of the selection handle **730** will not be able to accurately determine what is currently selected, when adjusting the selection area **720**.

One proposed solution is illustrated in FIG. **7**C. On performing a touch interaction with the selection handle **730**, the contents of the display may move **780** such that the text in close proximity to the touched selection handle **730** is not obscured by the touch input object **760**. In this way, the user may be able to view the content just selected. Also, or instead of this movement **780**, an extended selection handle **777** may appear. This extended selection handle **777** may provide a graphical link between the point of touch on the touch-sensitive display **118** and the corresponding end of a selection area **720**. The touch point may not only be graphically coupled to the end of the selection area **720** by the extended selection handle **777**, but may also be operatively coupled to it. Therefore, if the touch point moves (for example, because the user **760** performs a drag while still touching on the selection handle **777**), the corresponding end of the selection area **720** may move as well.

FIG. **8**A shows a more detailed view of the extended selection handle **777**. On this extended selection handle **777** there may be a touch portion **830** (also referred to as a 'handle'), a neck portion **820** (also referred to as a 'cursor neck') and a content selection portion **810** (also referred to as a 'content selection portion'). The touch portion **830** may be the portion of the selection handle **777** that responds to user input and can be touched and dragged to cause the rest of the selection handle **777** to be moved. If a touch input is used to drag the selection handle **777**, the touch portion may remain coupled to the location on the display corresponding to the detected touch location such that it always remains under the user's finger as the selection handle **777** is moved.

The content selection portion **810** may be coupled to a selection area **720**. For example, as shown in FIG. **8**B, the content selection portion **810** is coupled to a start end of the selection area **720** such that as the selection handle **777** moves, as does the start of the selection area **720**. This may be represented graphically in a different way, such as shown in FIG. **8**C, where the content selection portion **810** is also coupled to the start end of the selection area **720**, but is displayed to reach the top left portion of the selection area **720**. Functionally, there may be no difference between the two selection handles **777** shown in FIGS. **8**B and **8**C.

The neck portion **820** graphically connects the touch portion **830** to the content selection portion **810**. While the touch portion **830** may be obscured by a user's touch, the user may be able to see the neck portion **820** extending from the touch portion **830** (under the user's finger) to the content selection portion **810**. This may indicate to the user that the touch portion **830** and content selection portion **810** are connected, and that by dragging the touch portion **830**, the content selection portion **810** will also be moved. Referring back to FIG. **7**C, although the part of the selection area **720** that the user touched has moved away, because the extended selection handle **777** has been displayed the user will see a connection between where they originally pressed and where the corresponding selection area **720** has now moved to. The extended selection handle **777** may be displayed as an animation, showing a transformation of the original selection handle **730**

to the extended selection handle **777**. Such an animation may be a neck portion extending out of the original selection handle **730** at the same rate as the underlying content moves up **780**.

FIG. **9**A shows an electronic device **100** with a touch-sensitive display **118** displaying a first and second paragraph **910** and **911**, a selection area **930** and an extended selection handle **777** coupled to the start of the selection area **930**. If a user touches **940** the touch portion of the extended selection handle **777** and drags **950** it to a different location, the user's finger (or other touch object) may not obscure the start area of the selection area **930**, because the start of the selection area **930** is spatially separated from the touch portion of the extended selection handle **777**. Therefore, the user may adjust the selection area **930** while still being able to see where the start of the selection area **930** is being moved. Similarly, the end of the selection area **930** may be moved through use of an extended selection handle coupled to the end of the selection area **930**.

However, as the user performs a drag to move the extended selection handle **777**, there may be a delay between the receipt of the touch input indicating a drag and the updating of the display to show the new position of the extended selection handle **777** and selection area **930**. A result of such a delay may be that the user's finger (or other touch object) does obscure a part of the selection area **930** or nearby text as the drag is performed. In other words the selection area **930** may not be able to move as fast as the drag motion and may become obscured as a result. Also, as a user's finger changes position on the touch-sensitive display **118**, the angle the finger makes to the display may change and there may be a difference between location where the touch is registered and the location the user thinks they are touching.

FIG. **9**B provides a possible solution to this problem. As the extended selection handle is moved, the neck portion may extend **977** to increase the distance between the touch portion and the content selection portion. In other words, to prevent the physical location of the touch object 'catching up' with the coupled part of the selection area **935**, the neck portion extends faster than the finger moves. This extension may also cater for a changed angle of the user's finger. The length of the neck portion may change dynamically depending on factors including the speed of the drag, position of the selection area with respect to the edges of the screen, the detected angle of the user's finger and the size of the font of the content being selected. The neck portion may have a maximum length and it may have a minimum length.

A flowchart illustrating a method of modifying a selection handle is shown in FIG. **10**. The method may be carried out by software executed, for example, by the processor **102**. Coding of software for carrying out such a method is within the scope of a person of ordinary skill in the art given the present description. The method may contain additional or fewer processes than shown and/or described, and may be performed in a different order. Computer-readable code executable by at least one processor of the portable electronic device to perform the method may be stored in a computer-readable medium, which may be a non-transitory or tangible storage medium.

In the method shown in FIG. **10**, a content selection icon is displayed on a touch-sensitive display of an electronic device **1010**. A touch input is detected at a location operable to select a content selection function associated with the content selection icon **1020**. On detecting the touch, the content selection icon is modified to display a touch portion at a location on the display corresponding to the detected touch location, and a content selection portion operatively couple to, but spatially separated from the touch portion **1030**.

The present disclosure may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the disclosure is, therefore, indicated by the appended claims rather than by the foregoing description. All changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope.

The invention claimed is:

1. A method for an electronic device comprising:
detecting a location of a text selection icon on a touch-screen display of the electronic device;
detecting touch input reflecting a selection of text displayed on the display using the text selection icon;
determining a zone adjacent an edge of the display, which comprises determining that a width of the zone is narrower at a starting point in a movement of the text selection icon than the width of the zone at a later point in the movement; and
selecting displayed text in a row selection mode responsive to a determination that the detected location of the text selection icon is within the zone adjacent the edge of the display or selecting displayed text in a letter selection mode responsive to a determination that the detected location of the text selection icon is outside the zone adjacent the edge of the display.

2. The method according to claim **1**, further comprising:
determining a movement of the text selection icon, wherein the determination that the detected location of the text selection icon is within or outside the zone adjacent the edge of the display is made throughout the movement.

3. An electronic device comprising:
a touch-screen display configured to receive touch input;
at least one processor configured to:
detect a location of a text selection icon on the display;
detect a touch input reflecting a selection of text displayed on the display using the text selection icon,
determine a zone adjacent an edge of the display, wherein a width of the zone is narrower at a starting point in a movement of the text selection icon than the width of the zone at a later point in the movement; and
select displayed text in a row selection mode responsive to a determination that the detected location of the text selection icon is within the zone adjacent the edge of the display or selecting displayed text in a letter selection mode responsive to a determination that the detected location of the text selection icon is outside the zone adjacent the edge of the display.

4. The electronic device according to claim **3**, wherein the at least one processor is further configured to:
determine a movement of the text selection icon, wherein the determination that the detected location of the text selection icon is within or outside the zone adjacent the edge of the display is made throughout the movement.

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