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**(54) DEVICE, METHOD, AND GRAPHICAL USER INTERFACE FOR DETERMINING WHETHER TO SCROLL OR SELECT CONTENTS**

VORRICHTUNG, VERFAHREN UND GRAFISCHE BENUTZEROBERFLÄCHE ZUR  
ENTSCHEIDUNG ÜBER DAS SCROLLEN ODER AUSWÄHLEN VON BILDSCHIRMINHALTEN

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(73) Proprietor: **Apple Inc.**  
**Cupertino CA 95014 (US)**

(72) Inventors:  

- **BERNSTEIN, Jeffrey Traer**  
**Cupertino, CA 95014 (US)**
- **MISSIG, Julian**  
**Cupertino, CA 95014 (US)**

• **BROWN, Matthew I.**  
**Cupertino, CA 95014 (US)**

(74) Representative: **Barton, Russell Glen**  
**Withers & Rogers LLP**  
**4 More London Riverside**  
**London SE1 2AU (GB)**

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• **JUN REKIMOTO ET AL: "PreSensell: Bi-directional Touch and Pressure Sensing Interactions with Tactile Feedback", CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS ARCHIVE. CHI '06 EXTENDED ABSTRACTS ON HUMAN FACTORS IN COMPUTING SYSTEMS, ACM, US, 22 April 2006 (2006-04-22), pages 1253-1258, XP007908748, ISBN: 978-1-59593-298-3**

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## Description

### RELATED APPLICATIONS

**[0001]** This application claims priority to U.S. Provisional Patent Application Serial No. 61/778,416, filed on March 13, 2013, entitled "Device, Method, and Graphical User Interface for Determining Whether to Scroll or Select Content;" U.S. Provisional Patent Application No. 61/747,278, filed December 29, 2012, entitled "Device, Method, and Graphical User Interface for Manipulating User Interface Objects with Visual and/or Haptic Feedback,".

**[0002]** This application is also related to the following: U.S. Provisional Patent Application Serial No. 61/778,092, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Selecting Object within a Group of Objects;" U.S. Provisional Patent Application Serial No. 61/778,125, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Navigating User Interface Hierarchies;" U.S. Provisional Patent Application Serial No. 61/778,156, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Manipulating Framed Graphical Objects;" U.S. Provisional Patent Application Serial No. 61/778,179, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Scrolling Nested Regions;" U.S. Provisional Patent Application Serial No. 61/778,171, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Displaying Additional Information in Response to a User Contact;" U.S. Provisional Patent Application Serial No. 61/778,191, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Displaying User Interface Objects Corresponding to an Application;" U.S. Provisional Patent Application Serial No. 61/778,211, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Facilitating User Interaction with Controls in a User Interface;" U.S. Provisional Patent Application Serial No. 61/778,239, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Forgoing Generation of Tactile Output for a Multi-Contact Gesture;" U.S. Provisional Patent Application Serial No. 61/778,284, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Providing Tactile Feedback for Operations Performed in a User Interface;" U.S. Provisional Patent Application Serial No. 61/778,287, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Providing Feedback for Changing Activation States of a User Interface Object;" U.S. Provisional Patent Application Serial No. 61/778,363, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Transitioning between Touch Input to Display Output Relationships;" U.S. Provisional Patent Application Serial No. 61/778,367, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Moving a User Interface Object Based on an Intensity of a Press Input;"

U.S. Provisional Patent Application Serial No. 61/778,265, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Transitioning between Display States in Response to a Gesture;" U.S. Provisional Patent Application Serial No. 61/778,373, filed on March 12, 2013, entitled "Device, Method, and Graphical User Interface for Managing Activation of a Control Based on Contact Intensity;" U.S. Provisional Patent Application Serial No. 61/778,412, filed on March 13, 2013, entitled "Device, Method, and Graphical User Interface for Displaying Content Associated with a Corresponding Affordance;" U.S. Provisional Patent Application Serial No. 61/778,413, filed on March 13, 2013, entitled "Device, Method, and Graphical User Interface for Selecting User Interface Objects;" U.S. Provisional Patent Application Serial No. 61/778,414, filed on March 13, 2013, entitled "Device, Method, and Graphical User Interface for Moving and Dropping a User Interface Object;" and U.S. Provisional Patent Application Serial No. 61/778,418, filed on March 13, 2013, entitled "Device, Method, and Graphical User Interface for Switching between User Interfaces".

**[0003]** This application is also related to the following: U.S. Provisional Patent Application Serial No. 61/645,033, filed on May 9, 2012, entitled "Adaptive Haptic Feedback for Electronic Devices;" U.S. Provisional Patent Application Serial No. 61/665,603, filed on June 28, 2012, entitled "Adaptive Haptic Feedback for Electronic Devices;" and U.S. Provisional Patent Application Serial No. 61/681,098, filed on August 8, 2012, entitled "Adaptive Haptic Feedback for Electronic Devices,".

### TECHNICAL FIELD

**[0004]** This relates generally to electronic devices with touch-sensitive surfaces, including but not limited to electronic devices with touch-sensitive surfaces that detect inputs for manipulating user interfaces.

### BACKGROUND

**[0005]** The use of touch-sensitive surfaces as input devices for computers and other electronic computing devices has increased significantly in recent years. Exemplary touch-sensitive surfaces include touch pads and touch screen displays. Such surfaces are widely used to manipulate user interface objects on a display.

**[0006]** Exemplary manipulations include adjusting the position and/or size of one or more user interface objects or activating buttons or opening files/applications represented by user interface objects, as well as associating metadata with one or more user interface objects or otherwise manipulating user interfaces. Exemplary user interface objects include digital images, video, text, icons, control elements such as buttons and other graphics. A user will, in some circumstances, need to perform such manipulations on user interface objects in a file management program (e.g., Finder from Apple Inc. of Cupertino,

California), an image management application (e.g., Aperture or iPhoto from Apple Inc. of Cupertino, California), a digital content (e.g., videos and music) management application (e.g., iTunes from Apple Inc. of Cupertino, California), a drawing application, a presentation application (e.g., Keynote from Apple Inc. of Cupertino, California), a word processing application (e.g., Pages from Apple Inc. of Cupertino, California), a website creation application (e.g., iWeb from Apple Inc. of Cupertino, California), a disk authoring application (e.g., iDVD from Apple Inc. of Cupertino, California), or a spreadsheet application (e.g., Numbers from Apple Inc. of Cupertino, California).

**[0007]** But existing methods for performing these manipulations are cumbersome and inefficient. In addition, existing methods take longer than necessary, thereby wasting energy. This latter consideration is particularly important in battery-operated devices.

**[0008]** US2006197753 discloses a multi-functional hand-held device capable of configuring user inputs based on how the device is to be used. Preferably, the multi-functional hand-held device has at most only a few physical buttons, keys, or switches so that its display size can be substantially increased. The multi-functional hand-held device also incorporates a variety of input mechanisms, including touch sensitive screens, touch sensitive housings, display actuators, audio input, etc. The device also incorporates a user-configurable GUI for each of the multiple functions of the devices.

**[0009]** US2011018695 discloses an apparatus for displaying a view of an application on a touch-sensitive display include detecting a touch on the touch-sensitive display. When the touch is at a first force, first feedback is provided and a first function is performed. When the touch is at a second force, second feedback is provided and a second function is performed. The first function and the second function are different. The first force and the second force are different.

**[0010]** EP2299351 discloses an information processing apparatus including a display section capable of displaying information on its display surface, a touch panel capable of detecting a position in the display surface where an operation tool has contacted with as a contact position, a pressure value detection section detecting a pressure value which is a size of a pressure applied to the contact surface by a contact between the operation tool and the contact surface, a process control section specifying a first processing or a second processing as a processing subject to be executed in accordance with a change of the detected pressure value, a first processing section executing the first processing when the first processing is specified to be a processing subject to be executed, and a second processing section executing the second processing when the second processing is specified to be a processing subject to be executed.

## SUMMARY

**[0011]** Accordingly, there is a need for electronic devices with faster, more efficient methods and interfaces for manipulating user interfaces. Such methods and interfaces optionally complement or replace conventional methods for manipulating user interfaces. Such methods and interfaces reduce the cognitive burden on a user and produce a more efficient human-machine interface. For battery-operated devices, such methods and interfaces conserve power and increase the time between battery charges.

**[0012]** The above deficiencies and other problems associated with user interfaces for electronic devices with touch-sensitive surfaces are reduced or eliminated by the disclosed devices. In some embodiments, the device is a desktop computer. In some embodiments, the device is portable (e.g., a notebook computer, tablet computer, or handheld device). In some embodiments, the device has a touchpad. In some embodiments, the device has a touch-sensitive display (also known as a "touch screen" or "touch screen display"). The device has a graphical user interface (GUI), one or more processors, memory and one or more modules, programs or sets of instructions stored in the memory for performing multiple functions. The user interacts with the GUI primarily through finger contacts and gestures on the touch-sensitive surface. In some embodiments, the functions optionally include image editing, drawing, presenting, word processing, website creating, disk authoring, spreadsheet making, game playing, telephoning, video conferencing, e-mailing, instant messaging, workout support, digital photographing, digital videoing, web browsing, digital music playing, and/or digital video playing. Executable instructions for performing these functions are, optionally, included in a non-transitory computer readable storage medium or other computer program product configured for execution by one or more processors.

**[0013]** There is a need for electronic devices with faster, more efficient methods and interfaces for determining whether to scroll or select content, for example, to more efficiently select and scroll content displayed on a user interface. Such methods and interfaces may complement or replace conventional methods for interacting with user interface content. Such methods and interfaces reduce the cognitive burden on a user and produce a more efficient human-machine interface. For battery-operated devices, such methods and interfaces conserve power and increase the time between battery charges.

**[0014]** In accordance with some embodiments, there is provided a method, comprising: at an electronic device (100) with a touch-sensitive surface and a display (112), wherein the device includes one or more sensors (165) to detect intensities of contacts with the touch-sensitive surface (112); displaying content on the display that includes a sequence of text characters (1902); while a focus selector (19212) is over the content, detecting a gesture on the touch-sensitive surface, the gesture including:

a first contact on the touch-sensitive surface; and first movement (19208-a - 19208-b) of the first contact across the touch-sensitive surface that corresponds to first movement of the focus selector on the display; and second movement (19208-b - 19208-c) of the first contact across the touch-sensitive surface that corresponds to second movement of the focus selector on the display; and in response to detecting first movement of the first contact: in accordance with a determination that the first contact has an intensity above a selection intensity threshold (ITD) at the start of the first movement, selecting a first range of text characters (19214) in the sequence of text characters that is selected in accordance with the first movement of the focus selector over the content; and, in accordance with a determination that the first contact has an intensity below the selection intensity threshold and above a cursor preview threshold (ITL), at the start of the first movement, moving a selection cursor to a respective position in the sequence of text characters on the display by an amount that is determined in accordance with the first movement of the focus selector on the display without selecting the content in accordance with a determination that the first contact has an intensity below the cursor preview threshold, at the start of the first movement, scrolling the content by an amount that is determined in accordance with the first movement of the focus selector on the display, without displaying the selection cursor or selecting the content; and, in response to detecting the second movement of the first contact: in accordance with a determination that the first contact is at an intensity above the selection intensity threshold, and that the selection cursor has reached an edge of displayed text, selecting a second range of text characters in the sequence of text characters that is different from the first set of characters, and scrolling the text wherein the second range of text characters is selected in accordance with: the second movement of the focus selector over the content; the respective position where the selection cursor was placed in accordance with the first movement of the focus selector over the content; and the scrolling of the text; and in accordance with a determination that the first contact is at an intensity above the selection intensity threshold, and that the selection cursor has not reached an edge of displayed text, selecting a second range of text characters in the sequence of text characters that is different from the first set of characters, without scrolling the text wherein the second range of text characters is selected in accordance with: the second movement of the focus selector over the content; and the respective position where the selection cursor was placed in accordance with the first movement of the focus selector over the content..

[0015] In accordance with some embodiments, there is provided an electronic device includes a display unit configured to display content, a touch-sensitive surface unit configured to receive user contacts, one or more sensors configured to detect intensity of contacts with the touch-sensitive surface unit and a processing unit

coupled to the display unit, the touch-sensitive surface unit and the sensors. The processing unit is configured to: perform the above recited method.

[0016] Thus, electronic devices with displays, touch-sensitive surfaces and one or more sensors to detect intensity of contacts with the touch-sensitive surface are provided with faster, more efficient methods and interfaces for determining whether to scroll or select content, thereby increasing the effectiveness, efficiency, and user satisfaction with such devices. Such methods and interfaces may complement or replace conventional methods for interacting with user interface content.

[0017] Other aspects of the invention are apparent from the appended claim set.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0018] For a better understanding of the various described embodiments, reference should be made to the Description of Embodiments below, in conjunction with the following drawings in which like reference numerals refer to corresponding parts throughout the figures.

Figure 1A is a block diagram illustrating a portable multifunction device with a touch-sensitive display in accordance with some embodiments.

Figure 1B is a block diagram illustrating exemplary components for event handling in accordance with some embodiments.

Figure 2 illustrates a portable multifunction device having a touch screen in accordance with some embodiments.

Figure 3 is a block diagram of an exemplary multifunction device with a display and a touch-sensitive surface in accordance with some embodiments.

Figure 4A illustrates an exemplary user interface for a menu of applications on a portable multifunction device in accordance with some embodiments.

Figure 4B illustrates an exemplary user interface for a multifunction device with a touch-sensitive surface that is separate from the display in accordance with some embodiments.

Figures 5A-5W illustrate exemplary user interfaces for zooming a user interface while performing an operation.

Figures 6A-6D are flow diagrams illustrating a method of zooming a user interface while performing an operation.

Figure 7 is a functional block diagram of an electronic device.

Figures 8A-8AA illustrate exemplary user interfaces for determining whether to scroll or select content in accordance with some embodiments.

Figures 9A-9E are flow diagrams illustrating a method of determining whether to scroll or select content in accordance with some embodiments.

Figure 10 is a functional block diagram of an electronic device in accordance with some embodiments.

Figures 11A-11Y illustrate exemplary user interfaces for interacting with user interface content.

Figures 12A-12C are flow diagrams illustrating a method of interacting with user interface content.

Figure 13 is a functional block diagram of an electronic device.

## DESCRIPTION OF EMBODIMENTS

**[0019]** The methods, devices and GUIs described herein provide visual and/or haptic feedback that makes manipulation of user interface objects more efficient and intuitive for a user. For example, in a system where the clicking action of a trackpad is decoupled from the contact intensity (e.g., contact force, contact pressure, or a substitute therefore) that is needed to reach an activation threshold, the device can generate different tactile outputs (e.g., "different clicks") for different activation events (e.g., so that clicks that accomplish a particular result are differentiated from clicks that do not produce any result or that accomplish a different result from the particular result). Additionally, tactile outputs can be generated in response to other events that are not related to increasing intensity of a contact, such as generating a tactile output (e.g., a "detent") when a user interface object is moved to a particular position, boundary or orientation, or when an event occurs at the device.

**[0020]** Additionally, in a system where a trackpad or touch-screen display is sensitive to a range of contact intensity that includes more than one or two specific intensity values (e.g., more than a simple on/off, binary intensity determination), the user interface can provide responses (e.g., visual or tactile cues) that are indicative of the intensity of the contact within the range. In some implementations, a pre-activation-threshold response and/or a post-activation-threshold response to an input are displayed as continuous animations. As one example of such a response, a preview of an operation is displayed in response to detecting an increase in contact intensity that is still below an activation threshold for performing the operation. As another example of such a response, an animation associated with an operation continues even after the activation threshold for the operation has been reached. Both of these examples provide a user

with a continuous response to the force or pressure of a user's contact, which provides a user with visual and/or haptic feedback that is richer and more intuitive. More specifically, such continuous force responses give the user the experience of being able to press lightly to preview an operation and/or press deeply to push "past" or "through" a predefined user interface state corresponding to the operation.

**[0021]** Additionally, for a device with a touch-sensitive surface that is sensitive to a range of contact intensity, multiple contact intensity thresholds can be monitored by the device and different functions can be mapped to different contact intensity thresholds. This serves to increase the available "gesture space" providing easy access to advanced features for users who know that increasing the intensity of a contact at or beyond a second "deep press" intensity threshold will cause the device to perform a different operation from an operation that would be performed if the intensity of the contact is between a first "activation" intensity threshold and the second "deep press" intensity threshold. An advantage of assigning additional functionality to a second "deep press" intensity threshold while maintaining familiar functionality at a first "activation" intensity threshold is that inexperienced users who are, in some circumstances, confused by the additional functionality can use the familiar functionality by just applying an intensity up to the first "activation" intensity threshold, whereas more experienced users can take advantage of the additional functionality by applying an intensity at the second "deep press" intensity threshold.

**[0022]** Additionally, for a device with a touch-sensitive surface that is sensitive to a range of contact intensity, the device can provide additional functionality by allowing users to perform complex operations with a single continuous contact. For example, when selecting a group of objects, a user can move a continuous contact around the touch-sensitive surface and can press while dragging (e.g., applying an intensity greater than a "deep press" intensity threshold) to add additional elements to a selection. In this way, a user can intuitively interact with a user interface where pressing harder with a contact causes objects in the user interface to be "stickier."

**[0023]** A number of different approaches to providing an intuitive user interface on a device where a clicking action is decoupled from the force that is needed to reach an activation threshold and/or the device is sensitive to a wide range of contact intensities are described below. Using one or more of these approaches (optionally in conjunction with each other) helps to provide a user interface that intuitively provides users with additional information and functionality, thereby reducing the user's cognitive burden and improving the human-machine interface. Such improvements in the human-machine interface enable users to use the device faster and more efficiently. For battery-operated devices, these improvements conserve power and increase the time between battery charges. For ease of explanation, systems, meth-

ods and user interfaces for including illustrative examples of some of these approaches are described below, as follows:

- Many electronic devices have graphical user interfaces that are responsive to user inputs and enable the user to request performance of an operation (e.g., scroll a document, move a user interface object) in accordance with the user inputs. In some circumstances (e.g., for greater accuracy), it is convenient to make the input in a "zoomed-in" user interface. User inputs for zooming and user inputs for activating operations are often distinct, and require sequential performance. It would be beneficial to provide a way for a user to zoom while making a user input for activating an operation (for example, to allow a user to drag an object across a wide area and then zoom into accurately place the object). The examples described below provide a convenient and intuitive method of zooming a user interface, in accordance with an intensity of a contact, while performing an operation. In particular, Figure 5A-5W illustrate exemplary user interfaces for zooming a user interface while performing an operation. Figures 6A-6D are flow diagrams illustrating a method of zooming a user interface while performing an operation. The user interfaces in Figures 5A-5W are used to illustrate the processes in Figures 6A-6D.
- Many electronic devices have graphical user interfaces that display content upon which multiple operations are, optionally, performed with the same type of gesture (e.g., gestures are overloaded). Sometimes, overloaded gestures are distinguished based on context or a selected mode of operation however separately selecting a mode of operation and performing a gesture can be confusing and inefficient for a user. Thus, it would be beneficial to provide users with an additional degree of control over which of the multiple operations corresponding to a single gesture are performed. The embodiments described below provide a convenient and efficient method of determining whether to scroll or select content based on the intensity of a contact on a touch-sensitive surface. In particular, Figures 8A-8AA illustrate exemplary user interfaces for determining whether to scroll or select content. Figures 9A-9E are flow diagrams illustrating a method of determining whether to scroll or select content. The user interfaces in Figures 8A-8AA are used to illustrate the processes in Figures 9A-9E.
- Many electronic devices have graphical user interfaces that display content upon which multiple operations are, optionally, performed with the same type of gesture (e.g., gestures are overloaded). Sometimes, overloaded gestures are distinguished based on context or a selected mode of operation however

separately selecting a mode of operation and performing a gesture can be confusing and inefficient for a user. Thus, it would be beneficial to provide users with an additional level of control over which of the multiple operations corresponding to a single gesture are performed. The examples described below provide a convenient and efficient method of for determining whether to scroll or enlarge content based on the intensity of a contact on a touch-sensitive surface. In particular, Figures 11A-11Y illustrate exemplary user interfaces for determining whether to scroll or enlarge content. Figures 12A-12C are flow diagrams illustrating a method of determining whether to scroll or enlarge content. The user interfaces in Figures 11A-11Y are used to illustrate the processes in Figures 12A-12C.

## EXEMPLARY DEVICES

- [0024]** Reference will now be made in detail to embodiments, examples of which are illustrated in the accompanying drawings. In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the various described embodiments. However, it will be apparent to one of ordinary skill in the art that the various described embodiments may be practiced without these specific details. In other instances, well-known methods, procedures, components, circuits, and networks have not been described in detail so as not to unnecessarily obscure aspects of the embodiments.
- [0025]** It will also be understood that, although the terms first, second, etc. are, in some instances, used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another. For example, a first contact could be termed a second contact, and, similarly, a second contact could be termed a first contact, without departing from the scope of the various described embodiments. The first contact and the second contact are both contacts, but they are not the same contact.
- [0026]** The terminology used in the description of the various described embodiments herein is for the purpose of describing particular embodiments only and is not intended to be limiting. As used in the description of the various described embodiments and the appended claims, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will also be understood that the term "and/or" as used herein refers to and encompasses any and all possible combinations of one or more of the associated listed items. It will be further understood that the terms "includes," "including," "comprises," and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, inte-

gers, steps, operations, elements, components, and/or groups thereof.

**[0027]** As used herein, the term "if" is, optionally, construed to mean "when" or "upon" or "in response to determining" or "in response to detecting," depending on the context. Similarly, the phrase "if it is determined" or "if [a stated condition or event] is detected" is, optionally, construed to mean "upon determining" or "in response to determining" or "upon detecting [the stated condition or event]" or "in response to detecting [the stated condition or event]," depending on the context.

**[0028]** Embodiments of electronic devices, user interfaces for such devices, and associated processes for using such devices are described. In some embodiments, the device is a portable communications device, such as a mobile telephone, that also contains other functions, such as PDA and/or music player functions. Exemplary embodiments of portable multifunction devices include, without limitation, the iPhone®, iPod Touch®, and iPad® devices from Apple Inc. of Cupertino, California. Other portable electronic devices, such as laptops or tablet computers with touch-sensitive surfaces (e.g., touch screen displays and/or touch pads), are, optionally, used. It should also be understood that, in some embodiments, the device is not a portable communications device, but is a desktop computer with a touch-sensitive surface (e.g., a touch screen display and/or a touch pad).

**[0029]** In the discussion that follows, an electronic device that includes a display and a touch-sensitive surface is described. It should be understood, however, that the electronic device optionally includes one or more other physical user-interface devices, such as a physical keyboard, a mouse and/or a joystick.

**[0030]** The device typically supports a variety of applications, such as one or more of the following: a drawing application, a presentation application, a word processing application, a website creation application, a disk authoring application, a spreadsheet application, a gaming application, a telephone application, a video conferencing application, an e-mail application, an instant messaging application, a workout support application, a photo management application, a digital camera application, a digital video camera application, a web browsing application, a digital music player application, and/or a digital video player application.

**[0031]** The various applications that are executed on the device optionally use at least one common physical user-interface device, such as the touch-sensitive surface. One or more functions of the touch-sensitive surface as well as corresponding information displayed on the device are, optionally, adjusted and/or varied from one application to the next and/or within a respective application. In this way, a common physical architecture (such as the touch-sensitive surface) of the device optionally supports the variety of applications with user interfaces that are intuitive and transparent to the user.

**[0032]** Attention is now directed toward embodiments of portable devices with touch-sensitive displays. Figure

1A is a block diagram illustrating portable multifunction device 100 with touch-sensitive displays 112 in accordance with some embodiments. Touch-sensitive display 112 is sometimes called a "touch screen" for convenience, and is sometimes known as or called a touch-sensitive display system. Device 100 includes memory 102 (which optionally includes one or more computer readable storage mediums), memory controller 122, one or more processing units (CPU's) 120, peripherals interface 118, RF circuitry 108, audio circuitry 110, speaker 111, microphone 113, input/output (I/O) subsystem 106, other input or control devices 116, and external port 124. Device 100 optionally includes one or more optical sensors 164. Device 100 optionally includes one or more intensity sensors 165 for detecting intensity of contacts on device 100 (e.g., a touch-sensitive surface such as touch-sensitive display system 112 of device 100). Device 100 optionally includes one or more tactile output generators 167 for generating tactile outputs on device 100 (e.g., generating tactile outputs on a touch-sensitive surface such as touch-sensitive display system 112 of device 100 or touchpad 355 of device 300). These components optionally communicate over one or more communication buses or signal lines 103.

**[0033]** As used in the specification and claims, the term "intensity" of a contact on a touch-sensitive surface refers to the force or pressure (force per unit area) of a contact (e.g., a finger contact) on the touch sensitive surface, or to a substitute (proxy) for the force or pressure of a contact on the touch sensitive surface. The intensity of a contact has a range of values that includes at least four distinct values and more typically includes hundreds of distinct values (e.g., at least 256). Intensity of a contact is, optionally, determined (or measured) using various approaches and various sensors or combinations of sensors. For example, one or more force sensors underneath or adjacent to the touch-sensitive surface are, optionally, used to measure force at various points on the touch-sensitive surface. In some implementations, force measurements from multiple force sensors are combined (e.g., a weighted average) to determine an estimated force of a contact. Similarly, a pressure-sensitive tip of a stylus is, optionally, used to determine a pressure of the stylus on the touch-sensitive surface. Alternatively, the size of the contact area detected on the touch-sensitive surface and/or changes thereto, the capacitance of the touch-sensitive surface proximate to the contact and/or changes thereto, and/or the resistance of the touch-sensitive surface proximate to the contact and/or changes thereto are, optionally, used as a substitute for the force or pressure of the contact on the touch-sensitive surface. In some implementations, the substitute measurements for contact force or pressure are used directly to determine whether an intensity threshold has been exceeded (e.g., the intensity threshold is described in units corresponding to the substitute measurements). In some implementations, the substitute measurements for contact force or pressure are converted to an estimated force or

pressure and the estimated force or pressure is used to determine whether an intensity threshold has been exceeded (e.g., the intensity threshold is a pressure threshold measured in units of pressure).

**[0034]** As used in the specification and claims, the term "tactile output" refers to physical displacement of a device relative to a previous position of the device, physical displacement of a component (e.g., a touch-sensitive surface) of a device relative to another component (e.g., housing) of the device, or displacement of the component relative to a center of mass of the device that will be detected by a user with the user's sense of touch. For example, in situations where the device or the component of the device is in contact with a surface of a user that is sensitive to touch (e.g., a finger, palm, or other part of a user's hand), the tactile output generated by the physical displacement will be interpreted by the user as a tactile sensation corresponding to a perceived change in physical characteristics of the device or the component of the device. For example, movement of a touch-sensitive surface (e.g., a touch-sensitive display or trackpad) is, optionally, interpreted by the user as a "down click" or "up click" of a physical actuator button. In some cases, a user will feel a tactile sensation such as an "down click" or "up click" even when there is no movement of a physical actuator button associated with the touch-sensitive surface that is physically pressed (e.g., displaced) by the user's movements. As another example, movement of the touch-sensitive surface is, optionally, interpreted or sensed by the user as "roughness" of the touch-sensitive surface, even when there is no change in smoothness of the touch-sensitive surface. While such interpretations of touch by a user will be subject to the individualized sensory perceptions of the user, there are many sensory perceptions of touch that are common to a large majority of users. Thus, when a tactile output is described as corresponding to a particular sensory perception of a user (e.g., an "up click," a "down click," "roughness"), unless otherwise stated, the generated tactile output corresponds to physical displacement of the device or a component thereof that will generate the described sensory perception for a typical (or average) user.

**[0035]** It should be appreciated that device 100 is only one example of a portable multifunction device, and that device 100 optionally has more or fewer components than shown, optionally combines two or more components, or optionally has a different configuration or arrangement of the components. The various components shown in Figure 1A are implemented in hardware, software, or a combination of both hardware and software, including one or more signal processing and/or application specific integrated circuits.

**[0036]** Memory 102 optionally includes high-speed random access memory and optionally also includes non-volatile memory, such as one or more magnetic disk storage devices, flash memory devices, or other non-volatile solid-state memory devices. Access to memory 102 by other components of device 100, such as CPU

120 and the peripherals interface 118, is, optionally, controlled by memory controller 122.

**[0037]** Peripherals interface 118 can be used to couple input and output peripherals of the device to CPU 120 and memory 102. The one or more processors 120 run or execute various software programs and/or sets of instructions stored in memory 102 to perform various functions for device 100 and to process data.

**[0038]** In some embodiments, peripherals interface 118, CPU 120, and memory controller 122 are, optionally, implemented on a single chip, such as chip 104. In some other embodiments, they are, optionally, implemented on separate chips.

**[0039]** RF (radio frequency) circuitry 108 receives and sends RF signals, also called electromagnetic signals. RF circuitry 108 converts electrical signals to/from electromagnetic signals and communicates with communications networks and other communications devices via the electromagnetic signals. RF circuitry 108 optionally includes well-known circuitry for performing these functions, including but not limited to an antenna system, an RF transceiver, one or more amplifiers, a tuner, one or more oscillators, a digital signal processor, a CODEC chipset, a subscriber identity module (SIM) card, memory, and so forth. RF circuitry 108 optionally communicates with networks, such as the Internet, also referred to as the World Wide Web (WWW), an intranet and/or a wireless network, such as a cellular telephone network, a wireless local area network (LAN) and/or a metropolitan area network (MAN), and other devices by wireless communication. The wireless communication optionally uses any of a plurality of communications standards, protocols and technologies, including but not limited to Global System for Mobile Communications (GSM), Enhanced Data GSM Environment (EDGE), high-speed downlink packet access (HSDPA), high-speed uplink packet access (HSUPA), Evolution, Data-Only (EV-DO), HSPA, HSPA+, Dual-Cell HSPA (DC-HSPDA), long term evolution (LTE), near field communication (NFC), wideband code division multiple access (W-CDMA), code division multiple access (CDMA), time division multiple access (TDMA), Bluetooth, Wireless Fidelity (Wi-Fi) (e.g., IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and/or IEEE 802.11n), voice over Internet Protocol (VoIP), Wi-MAX, a protocol for e-mail (e.g., Internet message access protocol (IMAP) and/or post office protocol (POP)), instant messaging (e.g., extensible messaging and presence protocol (XMPP), Session Initiation Protocol for Instant Messaging and Presence Leveraging Extensions (SIMPLE), Instant Messaging and Presence Service (IMPS)), and/or Short Message Service (SMS), or any other suitable communication protocol, including communication protocols not yet developed as of the filing date of this document.

**[0040]** Audio circuitry 110, speaker 111, and microphone 113 provide an audio interface between a user and device 100. Audio circuitry 110 receives audio data from peripherals interface 118, converts the audio data

to an electrical signal, and transmits the electrical signal to speaker 111. Speaker 111 converts the electrical signal to human-audible sound waves. Audio circuitry 110 also receives electrical signals converted by microphone 113 from sound waves. Audio circuitry 110 converts the electrical signal to audio data and transmits the audio data to peripherals interface 118 for processing. Audio data is, optionally, retrieved from and/or transmitted to memory 102 and/or RF circuitry 108 by peripherals interface 118. In some embodiments, audio circuitry 110 also includes a headset jack (e.g., 212, Figure 2). The headset jack provides an interface between audio circuitry 110 and removable audio input/output peripherals, such as output-only headphones or a headset with both output (e.g., a headphone for one or both ears) and input (e.g., a microphone).

**[0041]** I/O subsystem 106 couples input/output peripherals on device 100, such as touch screen 112 and other input control devices 116, to peripherals interface 118. I/O subsystem 106 optionally includes display controller 156, optical sensor controller 158, intensity sensor controller 159, haptic feedback controller 161 and one or more input controllers 160 for other input or control devices. The one or more input controllers 160 receive/send electrical signals from/to other input or control devices 116. The other input control devices 116 optionally include physical buttons (e.g., push buttons, rocker buttons, etc.), dials, slider switches, joysticks, click wheels, and so forth. In some alternate embodiments, input controller(s) 160 are, optionally, coupled to any (or none) of the following: a keyboard, infrared port, USB port, and a pointer device such as a mouse. The one or more buttons (e.g., 208, Figure 2) optionally include an up/down button for volume control of speaker 111 and/or microphone 113. The one or more buttons optionally include a push button (e.g., 206, Figure 2).

**[0042]** Touch-sensitive display 112 provides an input interface and an output interface between the device and a user. Display controller 156 receives and/or sends electrical signals from/to touch screen 112. Touch screen 112 displays visual output to the user. The visual output optionally includes graphics, text, icons, video, and any combination thereof (collectively termed "graphics"). In some embodiments, some or all of the visual output corresponds to user-interface objects.

**[0043]** Touch screen 112 has a touch-sensitive surface, sensor or set of sensors that accepts input from the user based on haptic and/or tactile contact. Touch screen 112 and display controller 156 (along with any associated modules and/or sets of instructions in memory 102) detect contact (and any movement or breaking of the contact) on touch screen 112 and converts the detected contact into interaction with user-interface objects (e.g., one or more soft keys, icons, web pages or images) that are displayed on touch screen 112. In an exemplary embodiment, a point of contact between touch screen 112 and the user corresponds to a finger of the user.

**[0044]** Touch screen 112 optionally uses LCD (liquid

crystal display) technology, LPD (light emitting polymer display) technology, or LED (light emitting diode) technology, although other display technologies are used in other embodiments. Touch screen 112 and display controller 156 optionally detect contact and any movement or breaking thereof using any of a plurality of touch sensing technologies now known or later developed, including but not limited to capacitive, resistive, infrared, and surface acoustic wave technologies, as well as other proximity sensor arrays or other elements for determining one or more points of contact with touch screen 112. In an exemplary embodiment, projected mutual capacitance sensing technology is used, such as that found in the iPhone®, iPod Touch®, and iPad® from Apple Inc. of Cupertino, California.

**[0045]** Touch screen 112 optionally has a video resolution in excess of 100 dpi. In some embodiments, the touch screen has a video resolution of approximately 160 dpi. The user optionally makes contact with touch screen 112 using any suitable object or appendage, such as a stylus, a finger, and so forth. In some embodiments, the user interface is designed to work primarily with finger-based contacts and gestures, which can be less precise than stylus-based input due to the larger area of contact of a finger on the touch screen. In some embodiments, the device translates the rough finger-based input into a precise pointer/cursor position or command for performing the actions desired by the user.

**[0046]** In some embodiments, in addition to the touch screen, device 100 optionally includes a touchpad (not shown) for activating or deactivating particular functions. In some embodiments, the touchpad is a touch-sensitive area of the device that, unlike the touch screen, does not display visual output. The touchpad is, optionally, a touch-sensitive surface that is separate from touch screen 112 or an extension of the touch-sensitive surface formed by the touch screen.

**[0047]** Device 100 also includes power system 162 for powering the various components. Power system 162 optionally includes a power management system, one or more power sources (e.g., battery, alternating current (AC)), a recharging system, a power failure detection circuit, a power converter or inverter, a power status indicator (e.g., a light-emitting diode (LED)) and any other components associated with the generation, management and distribution of power in portable devices.

**[0048]** Device 100 optionally also includes one or more optical sensors 164. Figure 1A shows an optical sensor coupled to optical sensor controller 158 in I/O subsystem 106. Optical sensor 164 optionally includes charge-coupled device (CCD) or complementary metal-oxide semiconductor (CMOS) phototransistors. Optical sensor 164 receives light from the environment, projected through one or more lens, and converts the light to data representing an image. In conjunction with imaging module 143 (also called a camera module), optical sensor 164 optionally captures still images or video. In some embodiments, an optical sensor is located on the back of device

100, opposite touch screen display 112 on the front of the device, so that the touch screen display is enabled for use as a viewfinder for still and/or video image acquisition. In some embodiments, another optical sensor is located on the front of the device so that the user's image is, optionally, obtained for videoconferencing while the user views the other video conference participants on the touch screen display.

**[0049]** Device 100 optionally also includes one or more contact intensity sensors 165. Figure 1A shows a contact intensity sensor coupled to intensity sensor controller 159 in I/O subsystem 106. Contact intensity sensor 165 optionally includes one or more piezoresistive strain gauges, capacitive force sensors, electric force sensors, piezoelectric force sensors, optical force sensors, capacitive touch-sensitive surfaces, or other intensity sensors (e.g., sensors used to measure the force (or pressure) of a contact on a touch-sensitive surface). Contact intensity sensor 165 receives contact intensity information (e.g., pressure information or a proxy for pressure information) from the environment. In some embodiments, at least one contact intensity sensor is collocated with, or proximate to, a touch-sensitive surface (e.g., touch-sensitive display system 112). In some embodiments, at least one contact intensity sensor is located on the back of device 100, opposite touch screen display 112 which is located on the front of device 100.

**[0050]** Device 100 optionally also includes one or more proximity sensors 166. Figure 1A shows proximity sensor 166 coupled to peripherals interface 118. Alternately, proximity sensor 166 is coupled to input controller 160 in I/O subsystem 106. In some embodiments, the proximity sensor turns off and disables touch screen 112 when the multifunction device is placed near the user's ear (e.g., when the user is making a phone call).

**[0051]** Device 100 optionally also includes one or more tactile output generators 167. Figure 1A shows a tactile output generator coupled to haptic feedback controller 161 in I/O subsystem 106. Tactile output generator 167 optionally includes one or more electroacoustic devices such as speakers or other audio components and/or electromechanical devices that convert energy into linear motion such as a motor, solenoid, electroactive polymer, piezoelectric actuator, electrostatic actuator, or other tactile output generating component (e.g., a component that converts electrical signals into tactile outputs on the device). Contact intensity sensor 165 receives tactile feedback generation instructions from haptic feedback module 133 and generates tactile outputs on device 100 that are capable of being sensed by a user of device 100. In some embodiments, at least one tactile output generator is collocated with, or proximate to, a touch-sensitive surface (e.g., touch-sensitive display system 112) and, optionally, generates a tactile output by moving the touch-sensitive surface vertically (e.g., in/out of a surface of device 100) or laterally (e.g., back and forth in the same plane as a surface of device 100). In some embodiments, at least one tactile output generator sensor is located on

the back of device 100, opposite touch screen display 112 which is located on the front of device 100.

**[0052]** Device 100 optionally also includes one or more accelerometers 168. Figure 1A shows accelerometer 168 coupled to peripherals interface 118. Alternately, accelerometer 168 is, optionally, coupled to an input controller 160 in I/O subsystem 106. In some embodiments, information is displayed on the touch screen display in a portrait view or a landscape view based on an analysis of data received from the one or more accelerometers. Device 100 optionally includes, in addition to accelerometer(s) 168, a magnetometer (not shown) and a GPS (or GLONASS or other global navigation system) receiver (not shown) for obtaining information concerning the location and orientation (e.g., portrait or landscape) of device 100.

**[0053]** In some embodiments, the software components stored in memory 102 include operating system 126, communication module (or set of instructions) 128, contact/motion module (or set of instructions) 130, graphics module (or set of instructions) 132, text input module (or set of instructions) 134, Global Positioning System (GPS) module (or set of instructions) 135, and applications (or sets of instructions) 136. Furthermore, in some embodiments memory 102 stores device/global internal state 157, as shown in Figures 1A and 3. Device/global internal state 157 includes one or more of: active application state, indicating which applications, if any, are currently active; display state, indicating what applications, views or other information occupy various regions of touch screen display 112; sensor state, including information obtained from the device's various sensors and input control devices 116; and location information concerning the device's location and/or attitude.

**[0054]** Operating system 126 (e.g., Darwin, RTXC, LINUX, UNIX, OS X, WINDOWS, or an embedded operating system such as VxWorks) includes various software components and/or drivers for controlling and managing general system tasks (e.g., memory management, storage device control, power management, etc.) and facilitates communication between various hardware and software components.

**[0055]** Communication module 128 facilitates communication with other devices over one or more external ports 124 and also includes various software components for handling data received by RF circuitry 108 and/or external port 124. External port 124 (e.g., Universal Serial Bus (USB), FIREWIRE, etc.) is adapted for coupling directly to other devices or indirectly over a network (e.g., the Internet, wireless LAN, etc.). In some embodiments, the external port is a multi-pin (e.g., 30-pin) connector that is the same as, or similar to and/or compatible with the 30-pin connector used on iPod (trademark of Apple Inc.) devices.

**[0056]** Contact/motion module 130 optionally detects contact with touch screen 112 (in conjunction with display controller 156) and other touch sensitive devices (e.g., a touchpad or physical click wheel). Contact/motion mod-

ule 130 includes various software components for performing various operations related to detection of contact, such as determining if contact has occurred (e.g., detecting a finger-down event), determining an intensity of the contact (e.g., the force or pressure of the contact or a substitute for the force or pressure of the contact) determining if there is movement of the contact and tracking the movement across the touch-sensitive surface (e.g., detecting one or more finger-dragging events), and determining if the contact has ceased (e.g., detecting a finger-up event or a break in contact). Contact/motion module 130 receives contact data from the touch-sensitive surface. Determining movement of the point of contact, which is represented by a series of contact data, optionally includes determining speed (magnitude), velocity (magnitude and direction), and/or an acceleration (a change in magnitude and/or direction) of the point of contact. These operations are, optionally, applied to single contacts (e.g., one finger contacts) or to multiple simultaneous contacts (e.g., "multitouch"/multiple finger contacts). In some embodiments, contact/motion module 130 and display controller 156 detect contact on a touchpad.

**[0057]** In some embodiments, contact/motion module 130 uses a set of one or more intensity thresholds to determine whether an operation has been performed by a user (e.g., to determine whether a user has "clicked" on an icon). In some embodiments at least a subset of the intensity thresholds are determined in accordance with software parameters (e.g., the intensity thresholds are not determined by the activation thresholds of particular physical actuators and can be adjusted without changing the physical hardware of device 100). For example, a mouse "click" threshold of a trackpad or touch screen display can be set to any of a large range of pre-defined thresholds values without changing the trackpad or touch screen display hardware. Additionally, in some implementations a user of the device is provided with software settings for adjusting one or more of the set of intensity thresholds (e.g., by adjusting individual intensity thresholds and/or by adjusting a plurality of intensity thresholds at once with a system-level click "intensity" parameter).

**[0058]** Contact/motion module 130 optionally detects a gesture input by a user. Different gestures on the touch-sensitive surface have different contact patterns and intensities. Thus, a gesture is, optionally, detected by detecting a particular contact pattern. For example, detecting a finger tap gesture includes detecting a finger-down event followed by detecting a finger-up (lift off) event at the same position (or substantially the same position) as the finger-down event (e.g., at the position of an icon). As another example, detecting a finger swipe gesture on the touch-sensitive surface includes detecting a finger-down event followed by detecting one or more finger-dragging events, and subsequently followed by detecting a finger-up (lift off) event.

**[0059]** Graphics module 132 includes various known

software components for rendering and displaying graphics on touch screen 112 or other display, including components for changing the visual impact (e.g., brightness, transparency, saturation, contrast or other visual property) of graphics that are displayed. As used herein, the term "graphics" includes any object that can be displayed to a user, including without limitation text, web pages, icons (such as user-interface objects including soft keys), digital images, videos, animations and the like.

**5** **[0060]** In some embodiments, graphics module 132 stores data representing graphics to be used. Each graphic is, optionally, assigned a corresponding code. Graphics module 132 receives, from applications etc., one or more codes specifying graphics to be displayed **10** along with, if necessary, coordinate data and other graphic property data, and then generates screen image data to output to display controller 156.

**[0061]** Haptic feedback module 133 includes various **15** software components for generating instructions used by tactile output generator(s) 167 to produce tactile outputs at one or more locations on device 100 in response to user interactions with device 100.

**[0062]** Text input module 134, which is, optionally, a **20** component of graphics module 132, provides soft keyboards for entering text in various applications (e.g., contacts 137, e-mail 140, IM 141, browser 147, and any other application that needs text input).

**[0063]** GPS module 135 determines the location of the **25** device and provides this information for use in various applications (e.g., to telephone 138 for use in location-based dialing, to camera 143 as picture/video metadata, and to applications that provide location-based services such as weather widgets, local yellow page widgets, and map/navigation widgets).

**30** **[0064]** Applications 136 optionally include the following modules (or sets of instructions), or a subset or superset thereof:

- 40** • contacts module 137 (sometimes called an address book or contact list);
- telephone module 138;
- video conferencing module 139;
- 45** • e-mail client module 140;
- instant messaging (IM) module 141;
- workout support module 142;
- 50** • camera module 143 for still and/or video images;
- image management module 144;
- 55** • browser module 147;
- calendar module 148;

- widget modules 149, which optionally include one or more of: weather widget 149-1, stocks widget 149-2, calculator widget 149-3, alarm clock widget 149-4, dictionary widget 149-5, and other widgets obtained by the user, as well as user-created widgets 149-6;
- widget creator module 150 for making user-created widgets 149-6;
- search module 151;
- video and music player module 152, which is, optionally, made up of a video player module and a music player module;
- notes module 153;
- map module 154; and/or
- online video module 155.

**[0065]** Examples of other applications 136 that are, optionally, stored in memory 102 include other word processing applications, other image editing applications, drawing applications, presentation applications, JAVA-enabled applications, encryption, digital rights management, voice recognition, and voice replication.

**[0066]** In conjunction with touch screen 112, display controller 156, contact module 130, graphics module 132, and text input module 134, contacts module 137 are, optionally, used to manage an address book or contact list (e.g., stored in application internal state 192 of contacts module 137 in memory 102 or memory 370), including: adding name(s) to the address book; deleting name(s) from the address book; associating telephone number(s), e-mail address(es), physical address(es) or other information with a name; associating an image with a name; categorizing and sorting names; providing telephone numbers or e-mail addresses to initiate and/or facilitate communications by telephone 138, video conference 139, e-mail 140, or IM 141; and so forth.

**[0067]** In conjunction with RF circuitry 108, audio circuitry 110, speaker 111, microphone 113, touch screen 112, display controller 156, contact module 130, graphics module 132, and text input module 134, telephone module 138 are, optionally, used to enter a sequence of characters corresponding to a telephone number, access one or more telephone numbers in address book 137, modify a telephone number that has been entered, dial a respective telephone number, conduct a conversation and disconnect or hang up when the conversation is completed. As noted above, the wireless communication optionally uses any of a plurality of communications standards, protocols and technologies.

**[0068]** In conjunction with RF circuitry 108, audio circuitry 110, speaker 111, microphone 113, touch screen 112, display controller 156, optical sensor 164, optical sensor controller 158, contact module 130, graphics

module 132, text input module 134, contact list 137, and telephone module 138, videoconferencing module 139 includes executable instructions to initiate, conduct, and terminate a video conference between a user and one or more other participants in accordance with user instructions.

**[0069]** In conjunction with RF circuitry 108, touch screen 112, display controller 156, contact module 130, graphics module 132, and text input module 134, e-mail client module 140 includes executable instructions to create, send, receive, and manage e-mail in response to user instructions. In conjunction with image management module 144, e-mail client module 140 makes it very easy to create and send e-mails with still or video images taken with camera module 143.

**[0070]** In conjunction with RF circuitry 108, touch screen 112, display controller 156, contact module 130, graphics module 132, and text input module 134, the instant messaging module 141 includes executable instructions to enter a sequence of characters corresponding to an instant message, to modify previously entered characters, to transmit a respective instant message (for example, using a Short Message Service (SMS) or Multimedia Message Service (MMS) protocol for telephony-based instant messages or using XMPP, SIMPLE, or IMPS for Internet-based instant messages), to receive instant messages and to view received instant messages. In some embodiments, transmitted and/or received instant messages optionally include graphics, photos, audio files, video files and/or other attachments as are supported in a MMS and/or an Enhanced Messaging Service (EMS). As used herein, "instant messaging" refers to both telephony-based messages (e.g., messages sent using SMS or MMS) and Internet-based messages (e.g., messages sent using XMPP, SIMPLE, or IMPS).

**[0071]** In conjunction with RF circuitry 108, touch screen 112, display controller 156, contact module 130, graphics module 132, text input module 134, GPS module 135, map module 154, and music player module 146, workout support module 142 includes executable instructions to create workouts (e.g., with time, distance, and/or calorie burning goals); communicate with workout sensors (sports devices); receive workout sensor data; calibrate sensors used to monitor a workout; select and play music for a workout; and display, store and transmit workout data.

**[0072]** In conjunction with touch screen 112, display controller 156, optical sensor(s) 164, optical sensor controller 158, contact module 130, graphics module 132, and image management module 144, camera module 143 includes executable instructions to capture still images or video (including a video stream) and store them into memory 102, modify characteristics of a still image or video, or delete a still image or video from memory 102.

**[0073]** In conjunction with touch screen 112, display controller 156, contact module 130, graphics module 132, text input module 134, and camera module 143, image management module 144 includes executable in-

structions to arrange, modify (e.g., edit), or otherwise manipulate, label, delete, present (e.g., in a digital slide show or album), and store still and/or video images.

**[0074]** In conjunction with RF circuitry 108, touch screen 112, display system controller 156, contact module 130, graphics module 132, and text input module 134, browser module 147 includes executable instructions to browse the Internet in accordance with user instructions, including searching, linking to, receiving, and displaying web pages or portions thereof, as well as attachments and other files linked to web pages.

**[0075]** In conjunction with RF circuitry 108, touch screen 112, display system controller 156, contact module 130, graphics module 132, text input module 134, e-mail client module 140, and browser module 147, calendar module 148 includes executable instructions to create, display, modify, and store calendars and data associated with calendars (e.g., calendar entries, to do lists, etc.) in accordance with user instructions.

**[0076]** In conjunction with RF circuitry 108, touch screen 112, display system controller 156, contact module 130, graphics module 132, text input module 134, and browser module 147, widget modules 149 are mini-applications that are, optionally, downloaded and used by a user (e.g., weather widget 149-1, stocks widget 149-2, calculator widget 149-3, alarm clock widget 149-4, and dictionary widget 149-5) or created by the user (e.g., user-created widget 149-6). In some embodiments, a widget includes an HTML (Hypertext Markup Language) file, a CSS (Cascading Style Sheets) file, and a JavaScript file. In some embodiments, a widget includes an XML (Extensible Markup Language) file and a JavaScript file (e.g., Yahoo! Widgets).

**[0077]** In conjunction with RF circuitry 108, touch screen 112, display system controller 156, contact module 130, graphics module 132, text input module 134, and browser module 147, the widget creator module 150 are, optionally, used by a user to create widgets (e.g., turning a user-specified portion of a web page into a widget).

**[0078]** In conjunction with touch screen 112, display system controller 156, contact module 130, graphics module 132, and text input module 134, search module 151 includes executable instructions to search for text, music, sound, image, video, and/or other files in memory 102 that match one or more search criteria (e.g., one or more user-specified search terms) in accordance with user instructions.

**[0079]** In conjunction with touch screen 112, display system controller 156, contact module 130, graphics module 132, audio circuitry 110, speaker 111, RF circuitry 108, and browser module 147, video and music player module 152 includes executable instructions that allow the user to download and play back recorded music and other sound files stored in one or more file formats, such as MP3 or AAC files, and executable instructions to display, present or otherwise play back videos (e.g., on touch screen 112 or on an external, connected display

via external port 124). In some embodiments, device 100 optionally includes the functionality of an MP3 player, such as an iPod (trademark of Apple Inc.).

**[0080]** In conjunction with touch screen 112, display controller 156, contact module 130, graphics module 132, and text input module 134, notes module 153 includes executable instructions to create and manage notes, to do lists, and the like in accordance with user instructions.

**[0081]** In conjunction with RF circuitry 108, touch screen 112, display system controller 156, contact module 130, graphics module 132, text input module 134, GPS module 135, and browser module 147, map module 154 are, optionally, used to receive, display, modify, and store maps and data associated with maps (e.g., driving directions; data on stores and other points of interest at or near a particular location; and other location-based data) in accordance with user instructions.

**[0082]** In conjunction with touch screen 112, display system controller 156, contact module 130, graphics module 132, audio circuitry 110, speaker 111, RF circuitry 108, text input module 134, e-mail client module 140, and browser module 147, online video module 155 includes instructions that allow the user to access, browse, receive (e.g., by streaming and/or download), play back (e.g., on the touch screen or on an external, connected display via external port 124), send an e-mail with a link to a particular online video, and otherwise manage online videos in one or more file formats, such as H.264. In some embodiments, instant messaging module 141, rather than e-mail client module 140, is used to send a link to a particular online video.

**[0083]** Each of the above identified modules and applications correspond to a set of executable instructions for performing one or more functions described above and the methods described in this application (e.g., the computer-implemented methods and other information processing methods described herein). These modules (i.e., sets of instructions) need not be implemented as separate software programs, procedures or modules, and thus various subsets of these modules are, optionally, combined or otherwise re-arranged in various embodiments. In some embodiments, memory 102 optionally stores a subset of the modules and data structures identified above. Furthermore, memory 102 optionally stores additional modules and data structures not described above.

**[0084]** In some embodiments, device 100 is a device where operation of a predefined set of functions on the device is performed exclusively through a touch screen and/or a touchpad. By using a touch screen and/or a touchpad as the primary input control device for operation of device 100, the number of physical input control devices (such as push buttons, dials, and the like) on device 100 is, optionally, reduced.

**[0085]** The predefined set of functions that are performed exclusively through a touch screen and/or a touchpad optionally include navigation between user in-

terfaces. In some embodiments, the touchpad, when touched by the user, navigates device 100 to a main, home, or root menu from any user interface that is displayed on device 100. In such embodiments, a "menu button" is implemented using a touchpad. In some other embodiments, the menu button is a physical push button or other physical input control device instead of a touchpad.

**[0086]** Figure 1B is a block diagram illustrating exemplary components for event handling in accordance with some embodiments. In some embodiments, memory 102 (in Figures 1A) or 370 (Figure 3) includes event sorter 170 (e.g., in operating system 126) and a respective application 136-1 (e.g., any of the aforementioned applications 137-151, 155, 380-390).

**[0087]** Event sorter 170 receives event information and determines the application 136-1 and application view 191 of application 136-1 to which to deliver the event information. Event sorter 170 includes event monitor 171 and event dispatcher module 174. In some embodiments, application 136-1 includes application internal state 192, which indicates the current application view(s) displayed on touch sensitive display 112 when the application is active or executing. In some embodiments, device/global internal state 157 is used by event sorter 170 to determine which application(s) is (are) currently active, and application internal state 192 is used by event sorter 170 to determine application views 191 to which to deliver event information.

**[0088]** In some embodiments, application internal state 192 includes additional information, such as one or more of: resume information to be used when application 136-1 resumes execution, user interface state information that indicates information being displayed or that is ready for display by application 136-1, a state queue for enabling the user to go back to a prior state or view of application 136-1, and a redo/undo queue of previous actions taken by the user.

**[0089]** Event monitor 171 receives event information from peripherals interface 118. Event information includes information about a sub-event (e.g., a user touch on touch-sensitive display 112, as part of a multi-touch gesture). Peripherals interface 118 transmits information it receives from I/O subsystem 106 or a sensor, such as proximity sensor 166, accelerometer(s) 168, and/or microphone 113 (through audio circuitry 110). Information that peripherals interface 118 receives from I/O subsystem 106 includes information from touch-sensitive display 112 or a touch-sensitive surface.

**[0090]** In some embodiments, event monitor 171 sends requests to the peripherals interface 118 at pre-determined intervals. In response, peripherals interface 118 transmits event information. In other embodiments, peripheral interface 118 transmits event information only when there is a significant event (e.g., receiving an input above a predetermined noise threshold and/or for more than a predetermined duration).

**[0091]** In some embodiments, event sorter 170 also

includes a hit view determination module 172 and/or an active event recognizer determination module 173.

**[0092]** Hit view determination module 172 provides software procedures for determining where a sub-event has taken place within one or more views, when touch sensitive display 112 displays more than one view. Views are made up of controls and other elements that a user can see on the display.

**[0093]** Another aspect of the user interface associated with an application is a set of views, sometimes herein called application views or user interface windows, in which information is displayed and touch-based gestures occur. The application views (of a respective application) in which a touch is detected optionally correspond to programmatic levels within a programmatic or view hierarchy of the application. For example, the lowest level view in which a touch is detected is, optionally, called the hit view, and the set of events that are recognized as proper inputs are, optionally, determined based, at least in part, on the hit view of the initial touch that begins a touch-based gesture.

**[0094]** Hit view determination module 172 receives information related to sub-events of a touch-based gesture. When an application has multiple views organized in a hierarchy, hit view determination module 172 identifies a hit view as the lowest view in the hierarchy which should handle the sub-event. In most circumstances, the hit view is the lowest level view in which an initiating sub-event occurs (i.e., the first sub-event in the sequence of sub-events that form an event or potential event). Once the hit view is identified by the hit view determination module, the hit view typically receives all sub-events related to the same touch or input source for which it was identified as the hit view.

**[0095]** Active event recognizer determination module 173 determines which view or views within a view hierarchy should receive a particular sequence of sub-events. In some embodiments, active event recognizer determination module 173 determines that only the hit view should receive a particular sequence of sub-events. In other embodiments, active event recognizer determination module 173 determines that all views that include the physical location of a sub-event are actively involved views, and therefore determines that all actively involved views should receive a particular sequence of sub-events. In other embodiments, even if touch sub-events were entirely confined to the area associated with one particular view, views higher in the hierarchy would still remain as actively involved views.

**[0096]** Event dispatcher module 174 dispatches the event information to an event recognizer (e.g., event recognizer 180). In embodiments including active event recognizer determination module 173, event dispatcher module 174 delivers the event information to an event recognizer determined by active event recognizer determination module 173. In some embodiments, event dispatcher module 174 stores in an event queue the event information, which is retrieved by a respective event re-

ceiver module 182.

**[0097]** In some embodiments, operating system 126 includes event sorter 170. Alternatively, application 136-1 includes event sorter 170. In yet other embodiments, event sorter 170 is a stand-alone module, or a part of another module stored in memory 102, such as contact/motion module 130.

**[0098]** In some embodiments, application 136-1 includes a plurality of event handlers 190 and one or more application views 191, each of which includes instructions for handling touch events that occur within a respective view of the application's user interface. Each application view 191 of the application 136-1 includes one or more event recognizers 180. Typically, a respective application view 191 includes a plurality of event recognizers 180. In other embodiments, one or more of event recognizers 180 are part of a separate module, such as a user interface kit (not shown) or a higher level object from which application 136-1 inherits methods and other properties. In some embodiments, a respective event handler 190 includes one or more of: data updater 176, object updater 177, GUI updater 178, and/or event data 179 received from event sorter 170. Event handler 190 optionally utilizes or calls data updater 176, object updater 177 or GUI updater 178 to update the application internal state 192. Alternatively, one or more of the application views 191 includes one or more respective event handlers 190. Also, in some embodiments, one or more of data updater 176, object updater 177, and GUI updater 178 are included in a respective application view 191.

**[0099]** A respective event recognizer 180 receives event information (e.g., event data 179) from event sorter 170, and identifies an event from the event information. Event recognizer 180 includes event receiver 182 and event comparator 184. In some embodiments, event recognizer 180 also includes at least a subset of: metadata 183, and event delivery instructions 188 (which optionally include sub-event delivery instructions).

**[0100]** Event receiver 182 receives event information from event sorter 170. The event information includes information about a sub-event, for example, a touch or a touch movement. Depending on the sub-event, the event information also includes additional information, such as location of the sub-event. When the sub-event concerns motion of a touch, the event information optionally also includes speed and direction of the sub-event. In some embodiments, events include rotation of the device from one orientation to another (e.g., from a portrait orientation to a landscape orientation, or vice versa), and the event information includes corresponding information about the current orientation (also called device attitude) of the device.

**[0101]** Event comparator 184 compares the event information to predefined event or sub-event definitions and, based on the comparison, determines an event or sub-event, or determines or updates the state of an event or sub-event. In some embodiments, event comparator

184 includes event definitions 186. Event definitions 186 contain definitions of events (e.g., predefined sequences of sub-events), for example, event 1 (187-1), event 2 (187-2), and others. In some embodiments, sub-events in an event 187 include, for example, touch begin, touch end, touch movement, touch cancellation, and multiple touching. In one example, the definition for event 1 (187-1) is a double tap on a displayed object. The double tap, for example, comprises a first touch (touch begin) on the displayed object for a predetermined phase, a first lift-off (touch end) for a predetermined phase, a second touch (touch begin) on the displayed object for a predetermined phase, and a second lift-off (touch end) for a predetermined phase. In another example, the definition for event 2 (187-2) is a dragging on a displayed object. The dragging, for example, comprises a touch (or contact) on the displayed object for a predetermined phase, a movement of the touch across touch-sensitive display 112, and lift-off of the touch (touch end). In some embodiments, the event also includes information for one or more associated event handlers 190.

**[0102]** In some embodiments, event definition 187 includes a definition of an event for a respective user-interface object. In some embodiments, event comparator 184 performs a hit test to determine which user-interface object is associated with a sub-event. For example, in an application view in which three user-interface objects are displayed on touch-sensitive display 112, when a touch is detected on touch-sensitive display 112, event comparator 184 performs a hit test to determine which of the three user-interface objects is associated with the touch (sub-event). If each displayed object is associated with a respective event handler 190, the event comparator uses the result of the hit test to determine which event handler 190 should be activated. For example, event comparator 184 selects an event handler associated with the sub-event and the object triggering the hit test.

**[0103]** In some embodiments, the definition for a respective event 187 also includes delayed actions that delay delivery of the event information until after it has been determined whether the sequence of sub-events does or does not correspond to the event recognizer's event type.

**[0104]** When a respective event recognizer 180 determines that the series of sub-events do not match any of the events in event definitions 186, the respective event recognizer 180 enters an event impossible, event failed, or event ended state, after which it disregards subsequent sub-events of the touch-based gesture. In this situation, other event recognizers, if any, that remain active for the hit view continue to track and process sub-events of an ongoing touch-based gesture.

**[0105]** In some embodiments, a respective event recognizer 180 includes metadata 183 with configurable properties, flags, and/or lists that indicate how the event delivery system should perform sub-event delivery to actively involved event recognizers. In some embodiments, metadata 183 includes configurable properties, flags,

and/or lists that indicate how event recognizers interact, or are enabled to interact, with one another. In some embodiments, metadata 183 includes configurable properties, flags, and/or lists that indicate whether sub-events are delivered to varying levels in the view or programmatic hierarchy.

**[0106]** In some embodiments, a respective event recognizer 180 activates event handler 190 associated with an event when one or more particular sub-events of an event are recognized. In some embodiments, a respective event recognizer 180 delivers event information associated with the event to event handler 190. Activating an event handler 190 is distinct from sending (and deferred sending) sub-events to a respective hit view. In some embodiments, event recognizer 180 throws a flag associated with the recognized event, and event handler 190 associated with the flag catches the flag and performs a predefined process.

**[0107]** In some embodiments, event delivery instructions 188 include sub-event delivery instructions that deliver event information about a sub-event without activating an event handler. Instead, the sub-event delivery instructions deliver event information to event handlers associated with the series of sub-events or to actively involved views. Event handlers associated with the series of sub-events or with actively involved views receive the event information and perform a predetermined process.

**[0108]** In some embodiments, data updater 176 creates and updates data used in application 136-1. For example, data updater 176 updates the telephone number used in contacts module 137, or stores a video file used in video player module 145. In some embodiments, object updater 177 creates and updates objects used in application 136-1. For example, object updater 176 creates a new user-interface object or updates the position of a user-interface object. GUI updater 178 updates the GUI. For example, GUI updater 178 prepares display information and sends it to graphics module 132 for display on a touch-sensitive display.

**[0109]** In some embodiments, event handler(s) 190 includes or has access to data updater 176, object updater 177, and GUI updater 178. In some embodiments, data updater 176, object updater 177, and GUI updater 178 are included in a single module of a respective application 136-1 or application view 191. In other embodiments, they are included in two or more software modules.

**[0110]** It shall be understood that the foregoing discussion regarding event handling of user touches on touch-sensitive displays also applies to other forms of user inputs to operate multifunction devices 100 with input-devices, not all of which are initiated on touch screens. For example, mouse movement and mouse button presses, optionally coordinated with single or multiple keyboard presses or holds; contact movements such as taps, drags, scrolls, etc., on touch-pads; pen stylus inputs; movement of the device; oral instructions; detected eye movements; biometric inputs; and/or any combination thereof are optionally utilized as inputs corresponding to

sub-events which define an event to be recognized.

**[0111]** Figure 2 illustrates a portable multifunction device 100 having a touch screen 112 in accordance with some embodiments. The touch screen optionally displays one or more graphics within user interface (UI) 200. In this embodiment, as well as others described below, a user is enabled to select one or more of the graphics by making a gesture on the graphics, for example, with one or more fingers 202 (not drawn to scale in the figure) or one or more styluses 203 (not drawn to scale in the figure). In some embodiments, selection of one or more graphics occurs when the user breaks contact with the one or more graphics. In some embodiments, the gesture optionally includes one or more taps, one or more swipes (from left to right, right to left, upward and/or downward) and/or a rolling of a finger (from right to left, left to right, upward and/or downward) that has made contact with device 100. In some implementations or circumstances, inadvertent contact with a graphic does not select the graphic. For example, a swipe gesture that sweeps over an application icon optionally does not select the corresponding application when the gesture corresponding to selection is a tap.

**[0112]** Device 100 optionally also includes one or more physical buttons, such as "home" or menu button 204. As described previously, menu button 204 is, optionally, used to navigate to any application 136 in a set of applications that are, optionally, executed on device 100. Alternatively, in some embodiments, the menu button is implemented as a soft key in a GUI displayed on touch screen 112.

**[0113]** In one embodiment, device 100 includes touch screen 112, menu button 204, push button 206 for powering the device on/off and locking the device, volume adjustment button(s) 208, Subscriber Identity Module (SIM) card slot 210, head set jack 212, and docking/charging external port 124. Push button 206 is, optionally, used to turn the power on/off on the device by depressing the button and holding the button in the depressed state for a predefined time interval; to lock the device by depressing the button and releasing the button before the predefined time interval has elapsed; and/or to unlock the device or initiate an unlock process. In an alternative embodiment, device 100 also accepts verbal input for activation or deactivation of some functions through microphone 113. Device 100 also, optionally, includes one or more contact intensity sensors 165 for detecting intensity of contacts on touch screen 112 and/or one or more tactile output generators 167 for generating tactile outputs for a user of device 100.

**[0114]** Figure 3 is a block diagram of an exemplary multifunction device with a display and a touch-sensitive surface in accordance with some embodiments. Device 300 need not be portable. In some embodiments, device 300 is a laptop computer, a desktop computer, a tablet computer, a multimedia player device, a navigation device, an educational device (such as a child's learning toy), a gaming system, or a control device (e.g., a home

or industrial controller). Device 300 typically includes one or more processing units (CPU's) 310, one or more network or other communications interfaces 360, memory 370, and one or more communication buses 320 for interconnecting these components. Communication buses 320 optionally include circuitry (sometimes called a chipset) that interconnects and controls communications between system components. Device 300 includes input/output (I/O) interface 330 comprising display 340, which is typically a touch screen display. I/O interface 330 also optionally includes a keyboard and/or mouse (or other pointing device) 350 and touchpad 355, tactile output generator 357 for generating tactile outputs on device 300 (e.g., similar to tactile output generator(s) 167 described above with reference to Figure 1A), sensors 359 (e.g., optical, acceleration, proximity, touch-sensitive, and/or contact intensity sensors similar to contact intensity sensor(s) 165 described above with reference to Figure 1A). Memory 370 includes high-speed random access memory, such as DRAM, SRAM, DDR RAM or other random access solid state memory devices; and optionally includes non-volatile memory, such as one or more magnetic disk storage devices, optical disk storage devices, flash memory devices, or other non-volatile solid state storage devices. Memory 370 optionally includes one or more storage devices remotely located from CPU(s) 310. In some embodiments, memory 370 stores programs, modules, and data structures analogous to the programs, modules, and data structures stored in memory 102 of portable multifunction device 100 (Figure 1A), or a subset thereof. Furthermore, memory 370 optionally stores additional programs, modules, and data structures not present in memory 102 of portable multifunction device 100. For example, memory 370 of device 300 optionally stores drawing module 380, presentation module 382, word processing module 384, website creation module 386, disk authoring module 388, and/or spreadsheet module 390, while memory 102 of portable multifunction device 100 (Figure 1A) optionally does not store these modules.

**[0115]** Each of the above identified elements in Figure 3 are, optionally, stored in one or more of the previously mentioned memory devices. Each of the above identified modules corresponds to a set of instructions for performing a function described above. The above identified modules or programs (i.e., sets of instructions) need not be implemented as separate software programs, procedures or modules, and thus various subsets of these modules are, optionally, combined or otherwise re-arranged in various embodiments. In some embodiments, memory 370 optionally stores a subset of the modules and data structures identified above. Furthermore, memory 370 optionally stores additional modules and data structures not described above.

**[0116]** Attention is now directed towards embodiments of user interfaces ("UI") that is, optionally, implemented on portable multifunction device 100.

**[0117]** Figure 4A illustrates an exemplary user inter-

face for a menu of applications on portable multifunction device 100 in accordance with some embodiments. Similar user interfaces are, optionally, implemented on device 300. In some embodiments, user interface 400 includes the following elements, or a subset or superset thereof:

- Signal strength indicator(s) 402 for wireless communication(s), such as cellular and Wi-Fi signals;
- Time 404;
- Bluetooth indicator 405;
- Battery status indicator 406;
- Tray 408 with icons for frequently used applications, such as:
  - Icon 416 for telephone module 138, labeled "Phone," which optionally includes an indicator 414 of the number of missed calls or voicemail messages;
  - Icon 418 for e-mail client module 140, labeled "Mail," which optionally includes an indicator 410 of the number of unread e-mails;
  - Icon 420 for browser module 147, labeled "Browser;" and
  - Icon 422 for video and music player module 152, also referred to as iPod (trademark of Apple Inc.) module 152, labeled "iPod;" and
- Icons for other applications, such as:
  - Icon 424 for IM module 141, labeled "Text;"
  - Icon 426 for calendar module 148, labeled "Calendar;"
  - Icon 428 for image management module 144, labeled "Photos;"
  - Icon 430 for camera module 143, labeled "Camera;"
  - Icon 432 for online video module 155, labeled "Online Video"
  - Icon 434 for stocks widget 149-2, labeled "Stocks;"
  - Icon 436 for map module 154, labeled "Map;"
  - Icon 438 for weather widget 149-1, labeled "Weather;"

- Icon 440 for alarm clock widget 149-4, labeled "Clock;"
- Icon 442 for workout support module 142, labeled "Workout Support;"
- Icon 444 for notes module 153, labeled "Notes;" and
- Icon 446 for a settings application or module, which provides access to settings for device 100 and its various applications 136.

**[0118]** It should be noted that the icon labels illustrated in Figure 4A are merely exemplary. For example, icon 422 for video and music player module 152 are labeled "Music" or "Music Player." Other labels are, optionally, used for various application icons. In some embodiments, a label for a respective application icon includes a name of an application corresponding to the respective application icon. In some embodiments, a label for a particular application icon is distinct from a name of an application corresponding to the particular application icon.

**[0119]** Figure 4B illustrates an exemplary user interface on a device (e.g., device 300, Figure 3) with a touch-sensitive surface 451 (e.g., a tablet or touchpad 355, Figure 3) that is separate from the display 450 (e.g., touch screen display 112). Device 300 also, optionally, includes one or more contact intensity sensors (e.g., one or more of sensors 357) for detecting intensity of contacts on touch-sensitive surface 451 and/or one or more tactile output generators 359 for generating tactile outputs for a user of device 300.

**[0120]** Although some of the examples which follow will be given with reference to inputs on touch screen display 112 (where the touch sensitive surface and the display are combined), in some embodiments, the device detects inputs on a touch-sensitive surface that is separate from the display, as shown in Figure 4B. In some embodiments the touch sensitive surface (e.g., 451 in Figure 4B) has a primary axis (e.g., 452 in Figure 4B) that corresponds to a primary axis (e.g., 453 in Figure 4B) on the display (e.g., 450). In accordance with these embodiments, the device detects contacts (e.g., 460 and 462 in Figure 4B) with the touch-sensitive surface 451 at locations that correspond to respective locations on the display (e.g., in Figure 4B, 460 corresponds to 468 and 462 corresponds to 470). In this way, user inputs (e.g., contacts 460 and 462, and movements thereof) detected by the device on the touch-sensitive surface (e.g., 451 in Figure 4B) are used by the device to manipulate the user interface on the display (e.g., 450 in Figure 4B) of the multifunction device when the touch-sensitive surface is separate from the display. It should be understood that similar methods are, optionally, used for other user interfaces described herein.

**[0121]** Additionally, while the following examples are given primarily with reference to finger inputs (e.g., finger

contacts, finger tap gestures, finger swipe gestures), it should be understood that, in some embodiments, one or more of the finger inputs are replaced with input from another input device (e.g., a mouse based input or stylus input). For example, a swipe gesture is, optionally, replaced with a mouse click (e.g., instead of a contact) followed by movement of the cursor along the path of the swipe (e.g., instead of movement of the contact). As another example, a tap gesture is, optionally, replaced with a mouse click while the cursor is located over the location of the tap gesture (e.g., instead of detection of the contact followed by ceasing to detect the contact). Similarly, when multiple user inputs are simultaneously detected, it should be understood that multiple computer mice are, optionally, used simultaneously, or a mouse and finger contacts are, optionally, used simultaneously.

**[0122]** As used herein, the term "focus selector" refers to an input element that indicates a current part of a user interface with which a user is interacting. In some implementations that include a cursor or other location marker, the cursor acts as a "focus selector," so that when an input (e.g., a press input) is detected on a touch-sensitive surface (e.g., touchpad 355 in Figure 3 or touch-sensitive surface 451 in Figure 4B) while the cursor is over a particular user interface element (e.g., a button, window, slider or other user interface element), the particular user interface element is adjusted in accordance with the detected input. In some implementations that include a touch-screen display (e.g., touch-sensitive display system 112 in Figure 1A or touch screen 112 in Figure 4A) that enables direct interaction with user interface elements on the touch-screen display, a detected contact on the touch-screen acts as a "focus selector," so that when an input (e.g., a press input by the contact) is detected on the touch-screen display at a location of a particular user interface element (e.g., a button, window, slider or other user interface element), the particular user interface element is adjusted in accordance with the detected input. In some implementations focus is moved from one region of a user interface to another region of the user interface without corresponding movement of a cursor or movement of a contact on a touch-screen display (e.g., by using a tab key or arrow keys to move focus from one button to another button); in these implementations, the focus selector moves in accordance with movement of focus between different regions of the user interface. Without regard to the specific form taken by the focus selector, the focus selector is generally the user interface element (or contact on a touch-screen display) that is controlled by the user so as to communicate the user's intended interaction with the user interface (e.g., by indicating, to the device, the element of the user interface with which the user is intending to interact). For example, the location of a focus selector (e.g., a cursor, a contact or a selection box) over a respective button while a press input is detected on the touch-sensitive surface (e.g., a touchpad or touch screen) will indicate that the user is intending to activate the respective button

(as opposed to other user interface elements shown on a display of the device).

**[0123]** The user interface figures described below include various intensity diagrams that show the current intensity of the contact on the touch-sensitive surface relative to one or more intensity thresholds (e.g., a contact detection intensity threshold  $IT_0$ , a light press intensity threshold  $IT_L$ , a deep press intensity threshold  $IT_D$ , and/or one or more other intensity thresholds). This intensity diagram is typically not part of the displayed user interface, but is provided to aid in the interpretation of the figures. In some embodiments, the light press intensity threshold corresponds to an intensity at which the device will perform operations typically associated with clicking a button of a physical mouse or a trackpad. In some embodiments, the deep press intensity threshold corresponds to an intensity at which the device will perform operations that are different from operations typically associated with clicking a button of a physical mouse or a trackpad. In some embodiments, when a contact is detected with an intensity below the light press intensity threshold (e.g., and above a nominal contact-detection intensity threshold  $IT_0$  below which the contact is no longer detected), the device will move a focus selector in accordance with movement of the contact on the touch-sensitive surface without performing an operation associated with the light press intensity threshold or the deep press intensity threshold. Generally, unless otherwise stated, these intensity thresholds are consistent between different sets of user interface figures.

**[0124]** An increase of intensity of the contact from an intensity below the light press intensity threshold  $IT_L$  to an intensity between the light press intensity threshold  $IT_L$  and the deep press intensity threshold  $IT_D$  is sometimes referred to as a "light press" input. An increase of intensity of the contact from an intensity below the deep press intensity threshold  $IT_D$  to an intensity above the deep press intensity threshold  $IT_D$  is sometimes referred to as a "deep press" input. An increase of intensity of the contact from an intensity below the contact-detection intensity threshold  $IT_0$  to an intensity between the contact-detection intensity threshold  $IT_0$  and the light press intensity threshold  $IT_L$  is sometimes referred to as detecting the contact on the touch-surface. A decrease of intensity of the contact from an intensity above the contact-detection intensity threshold  $IT_0$  to an intensity below the contact intensity threshold  $IT_0$  is sometimes referred to as detecting liftoff of the contact from the touch-surface. In some embodiments  $IT_0$  is zero. In some embodiments  $IT_0$  is greater than zero. In some illustrations a shaded circle or oval is used to represent intensity of a contact on the touch-sensitive surface. In some illustrations a circle or oval without shading is used to represent a respective contact on the touch-sensitive surface without specifying the intensity of the respective contact.

**[0125]** In some embodiments described herein, one or more operations are performed in response to detecting a gesture that includes a respective press input or in re-

sponse to detecting the respective press input performed with a respective contact (or a plurality of contacts), where the respective press input is detected based at least in part on detecting an increase in intensity of the contact (or plurality of contacts) above a press-input intensity threshold. In some embodiments, the respective operation is performed in response to detecting the increase in intensity of the respective contact above the press-input intensity threshold (e.g., a "down stroke" of the respective press input). In some embodiments, the press input includes an increase in intensity of the respective contact above the press-input intensity threshold and a subsequent decrease in intensity of the contact below the press-input intensity threshold, and the respective operation is performed in response to detecting the subsequent decrease in intensity of the respective contact below the press-input threshold (e.g., an "up stroke" of the respective press input).

**[0126]** In some embodiments, the device employs intensity hysteresis to avoid accidental inputs sometimes termed "jitter," where the device defines or selects a hysteresis intensity threshold with a predefined relationship to the press-input intensity threshold (e.g., the hysteresis intensity threshold is  $X$  intensity units lower than the press-input intensity threshold or the hysteresis intensity threshold is 75%, 90% or some reasonable proportion of the press-input intensity threshold). Thus, in some embodiments, the press input includes an increase in intensity of the respective contact above the press-input intensity threshold and a subsequent decrease in intensity of the contact below the hysteresis intensity threshold that corresponds to the press-input intensity threshold, and the respective operation is performed in response to detecting the subsequent decrease in intensity of the respective contact below the hysteresis intensity threshold (e.g., an "up stroke" of the respective press input). Similarly, in some embodiments, the press input is detected only when the device detects an increase in intensity of the contact from an intensity at or below the hysteresis intensity threshold to an intensity at or above the press-input intensity threshold and, optionally, a subsequent decrease in intensity of the contact to an intensity at or below the hysteresis intensity, and the respective operation is performed in response to detecting the press input (e.g., the increase in intensity of the contact or the decrease in intensity of the contact, depending on the circumstances).

**[0127]** For ease of explanation, the description of operations performed in response to a press input associated with a press-input intensity threshold or in response to a gesture including the press input are, optionally, triggered in response to detecting either: an increase in intensity of a contact above the press-input intensity threshold, an increase in intensity of a contact from an intensity below the hysteresis intensity threshold to an intensity above the press-input intensity threshold, a decrease in intensity of the contact below the press-input intensity threshold, and/or a decrease in intensity of the

contact below the hysteresis intensity threshold corresponding to the press-input intensity threshold. Additionally, in examples where an operation is described as being performed in response to detecting a decrease in intensity of a contact below the press-input intensity threshold, the operation is, optionally, performed in response to detecting a decrease in intensity of the contact below a hysteresis intensity threshold corresponding to, and lower than, the press-input intensity threshold.

#### USER INTERFACES AND ASSOCIATED PROCESSES

##### Zooming a User Interface while Performing an Operation

**[0128]** Many electronic devices have graphical user interfaces that are responsive to user inputs and enable the user to request performance of an operation (e.g., scroll a document, move a user interface object) in accordance with the user inputs. In some circumstances, the user desires to perform the operation in a zoomed in user interface, in order to have more precision. In existing methods, if the user wants to zoom the user interface while in the middle of an operation, the user has to stop the operation, or partly complete the operation, to zoom the interface, and then resume the operation. The examples described below improve on existing methods by allowing the user to zoom the user interface in or out using the same continuous gesture or contact as the gesture or contact that is activating the operation. The user changes the intensity of the gesture or contact used to activate the operation to zoom the user interface in or out. Thus, the user can activate an operation and zoom the user interface with a smooth gesture or contact input.

**[0129]** Figures 5A-5W illustrate exemplary user interfaces for zooming a user interface while performing an operation in accordance with some examples. The user interfaces in these figures are used to illustrate the processes described below, including the processes in Figures 6A-6D. Figures 5A-5W include intensity diagrams that show the current intensity of the contact on the touch-sensitive surface relative to a plurality of intensity thresholds including a light press intensity threshold (e.g., " $IT_L$ ") and a deep press intensity threshold (e.g., " $IT_D$ "). In some examples, operations similar to those described below with reference to " $IT_L$ " are performed with reference to a different intensity threshold (e.g., " $IT_D$ ").

**[0130]** In some examples, the device is an electronic device with a separate display (e.g., display 450) and a separate touch-sensitive surface (e.g., touch-sensitive surface 451). In some examples, the device is portable multifunction device 100, the display is touch-sensitive display system 112, and the touch-sensitive surface includes tactile output generators 167 on the display (Figure 1A). For convenience of explanation, the examples described with reference to Figures 5A-5W and Figures 6A-6D will be discussed with reference to display 450

and a separate touch-sensitive surface 451, however analogous operations are, optionally, performed on a device with a touch-sensitive display system 112 in response to detecting the contacts described in Figures 5A-5W on the touch-sensitive display system 112 while displaying the user interfaces shown in Figures 5A-5W on the touch-sensitive display system 112; in such examples, the focus selector is, optionally: a respective contact, a representative point corresponding to a contact (e.g., a centroid of a respective contact or a point associated with a respective contact), or a centroid of two or more contacts detected on the touch-sensitive display system 112, in place of cursor 18910.

**[0131]** Figure 5A illustrates application window 18904 displayed on display 450 (e.g., display 340, touch screen 112) of a device (e.g., device 300, device 100). Application window 18904 is associated with an application (e.g., a web browser, an email application, a word processing application, a drawing application, a spreadsheet, a presentation, etc.).

**[0132]** Document 18906 is displayed in application window 18904. Document 18906 is displayed at zoom level 18906-a in Figure 5A. Document 18906 is, optionally, a drawing or a presentation document. Document 18906 includes objects 18908-1, 18908-2, and 18908-3. Cursor 18910 is also displayed on display 450. Cursor 18910 is an example of a focus selector. In Figure 5A, the device detects movement 18911 of contact 18912 to location 18912-a that corresponds to movement of cursor 18910 over user interface object 18908-1 while the intensity of contact 18912 is between  $IT_0$  and  $IT_L$ . In Figure 5B, cursor 18910 is located over, and puts focus on, object 18908-1.

**[0133]** Figure 5B shows contact 18912 detected on touch-sensitive surface 451 of the device. In Figures 5A-5B, the device detects an increase in intensity of contact 18912 from an intensity between  $IT_0$  and  $IT_L$  in Figure 5A to an intensity above  $IT_L$  in Figure 5B. In response to detecting the increase in intensity of contact 18912 in Figures 5A-5B, the device selects object 18908-1.

**[0134]** In Figures 5B-5C, movement 18914 of contact 18912 is detected on touch-sensitive surface 451 while object 18908-1 is selected. Movement 18914 moves contact 18912 from location 18912-a in Figure 5B to location 18912-b in Figure 5C on touch-sensitive surface 451. In response to detection of movement 18914 of contact 18912, cursor 18910 moves from location 18910-a to location 18910-b on display 450, and object 18908-1 moves from location 18908-1-a to location 18908-1-b on display 450, as shown in Figure 5C; object 18908-1 is dragged to location 18908-1-b in accordance with movement 18914 of contact 18912. In Figures 5A-5C, contact 18912 remains continuously detected on touch-sensitive surface 451.

**[0135]** Figures 5C-5D show the intensity of continuously detected contact 18912 increasing from an intensity between  $IT_L$  and  $IT_D$  in Figure 5C to an intensity above  $IT_D$  in Figure 5D. In response to detection of the

increase in the intensity of contact 18912 in Figures 5C-5D, the device zooms document 18906 from zoom level 18906-a in Figure 5C to zoom level 18906-b in Figure 5D, and objects 18908-1, 18908-2, and 18908-3 are concurrently enlarged in accordance with the zooming of document 18906.

**[0136]** In some examples, zoom level 18906-b is a predefined zoom level. In some other examples, zoom level 18906-b is dynamically selected in accordance with a maximum intensity of contact 18912 (e.g., zoom level 18906-b is selected from a range of zoom levels based on a maximum intensity of contact 18912). In some other examples, zoom level 18906-b is dynamically selected in accordance with the current intensity of contact 18912 (e.g., zoom level 18906-b is selected from a range of zoom levels based on a current intensity of contact 18912).

**[0137]** Figures 5E-5F show, while document 18906 is displayed at zoom level 18906-b, the device detecting movement 18916 of contact 18912 on touch-sensitive surface 451 while object 18908-1 is still selected. Movement 18916 moves contact 18912 from location 18912-b in Figure 5E to location 18912-c in Figure 5F on touch-sensitive surface 451. In response to detection of movement 18916 of contact 18912, cursor 18910 moves from location 18910-b in Figure 5E to location 18910-c in Figure 5F on display 450, and object 18908-1 moves from location 18908-1-b in Figure 5E to location 18908-1-c in Figure 5F on display 450; object 18908-1 is dragged to location 18908-1-c in accordance with movement 18916 of contact 18912. Document 18906 remains at zoom level 18906-b (e.g., while contact 18912 continues to have an intensity above  $IT_D$  or a hysteresis intensity threshold associated with, and below,  $IT_D$ ). At this point, contact 18912 is, optionally, lifted off touch-sensitive surface 451 to complete the movement of object 18908-1 (e.g., as shown in Figures 5G and 5H). In some examples, movement of object 18908-1 is completed in response to detecting a decrease in intensity of contact 18912 below  $IT_L$  or a hysteresis intensity threshold associated with, and below,  $IT_L$  even if the contact continues to be detected on touch-sensitive surface 451.

**[0138]** In Figures 5G-5H, after detecting movement 18916 of contact 18912, contact 18912 is, optionally, lifted off from touch-sensitive surface 451. In some examples, in response to detection of the liftoff of contact 18912, document 18906 reverts back to zoom level 18906-a, as shown in Figure 5G, and objects 18908-1, 18908-2, and 18908-3 also revert zoom level along with document 18906 reverting back to zoom level 18906-a. In some examples, in response to detection of the liftoff of contact 18912, document 18906 remains at zoom level 18906-b, as shown in Figure 5H, and objects 18908-1, 18908-2, and 18908-3 maintain zoom level along with document 18906.

**[0139]** In Figures 5F and 5I, after detecting movement 18916 of contact 18912, the intensity of contact 18912 is, optionally, decreased without lifting off contact 18912.

For example, Figures 5F and 5I show the intensity of contact 18912 decreasing from an intensity above  $IT_D$  in Figure 5F to an intensity between  $IT_L$  and  $IT_D$  in Figure 5I. In response to detection of the decrease in the intensity of contact 18912 in Figures 5F and 5I, document 18906 zooms from zoom level 18906-b to zoom level 18906-c, as shown in Figure 5I, and objects 18908-1, 18908-2, and 18908-3 also zoom along with document 18906.

**[0140]** In Figures 5I-5J, the intensity of contact 18912 continues to be decreased without lifting off contact 18912. For example, Figures 5I-5J show the intensity of contact 18912 decreasing from an intensity between  $IT_L$  and  $IT_D$  in Figure 5I to an intensity between  $IT_0$  and  $IT_L$  in Figure 5J. In response to detection of the decrease in the intensity of contact 18912 in Figures 5I-5J, document 18906 zooms from zoom level 18906-c to zoom level 18906-a, as shown in Figure 5J, and objects 18908-1, 18908-2, and 18908-3 also zoom along with document 18906. Zoom level 18906-c is different from zoom level 18906-a and 18906-b. For example, zoom level 18906-c is, optionally, higher than zoom level 18906-a but lower than zoom level 18906-b.

**[0141]** Figure 5K illustrates application window 18920 displayed on display 450. Application window 18920, like application window 18904, is associated with an application (e.g., a web browser, an email application, a word processing application, a drawing application, a spreadsheet, a presentation, etc.). Document 18922 is displayed in application window 18920. Document 18922 is displayed at zoom level 18922-a. Document 18922 is, optionally, a web page, a word processing document, or a text document. Document 18922 includes content 18924 (e.g., text). In Figure 5K, portion 18924-a of content 18924 is displayed in document 18922.

**[0142]** Figure 5K shows contact 18926 detected on touch-sensitive surface 451. Contact 18926 has an intensity between  $IT_0$  and  $IT_L$ . In Figures 5K-5L, movement 18928 of contact 18926 is detected on touch-sensitive surface 451. Movement 18928 moves contact 18926 from location 18926-a in Figure 5K to location 18926-b in Figure 5L on touch-sensitive surface 451. In response to the detection of movement 18928 of contact 18926, document 18922 is scrolled. In accordance with the scrolling of document 18922, portion 18924-b of content 18924 is displayed, as shown in Figure 5L.

**[0143]** After movement 18928, contact 18926 is lifted off, and then new contact 18930 is detected on touch-sensitive surface 451, as shown in Figure 5M. Contact 18930 has an intensity between  $IT_0$  and  $IT_L$ . Figure 5N shows the intensity of contact 18930 increasing to an intensity above  $IT_D$ . In response to detection of the increase in the intensity of contact 18930 in Figures 5M-5N, document 18922 is zoomed from zoom level 18922-a in Figure 5M to zoom level 18922-b in Figure 5N. Portion 18924-b of content 18924 is zoomed in accordance of the zooming of document 18922.

**[0144]** In some examples, zoom level 18922-b is a pre-

defined zoom level. In some other examples, zoom level 18922-b is dynamically selected in accordance with a maximum intensity of contact 18930 (e.g., zoom level 18922-b is selected from a range of zoom levels based on a maximum intensity of contact 18930). In some other examples, zoom level 18922-b is dynamically selected in accordance with the current intensity of contact 18930 (e.g., zoom level 18922-b is selected from a range of zoom levels based on a current intensity of contact 18930).

**[0145]** After the increase in the intensity of contact 18930 in Figures 5M-5N, contact 18930 is lifted off, and then new contact 18932 is detected on touch-sensitive surface 451, as shown in Figure 5O. Contact 18932 has an intensity between  $IT_0$  and  $IT_L$  in Figure 5O. Movement 18934 of contact 18932 is detected on touch-sensitive surface 451 in Figures 5O-5P. Movement 18934 moves contact 18932 from location 18932-a in Figure 5O to location 18932-b in Figure 5P on touch-sensitive surface 451. In response to the detection of movement 18934 of contact 18932 in Figures 5O-5P, document 18922 is scrolled while displayed at zoom level 18922-b. In accordance with the scrolling of document 18922, portion 18924-c of content 18924 is displayed, as shown in Figure 5P. At this point, contact 18932 is, optionally, lifted off touch-sensitive surface 451 to complete the scrolling of document 18922.

**[0146]** In some examples, contacts 18930 and 18932 are the same contact. That is, after contact 18926 is lifted off, contact 18930 is detected as described above with reference to Figure 5M. The intensity of contact 18930 increases as described above with reference to Figure 5N, and document 18922 zooms in response. Then, without liftoff, contact 18930 moves on the touch-sensitive surface 451 (e.g., with movement analogous to that described with reference to the movement 18934 of contact 18932 described above with reference to Figure 5O), and document 18922 scrolls in response.

**[0147]** In some examples, contacts 18926 and 18930 are the same contact. That is, contact 18926 moves as described above with reference to Figures 5K-5L, and document 18922 scrolls in response. Then, without liftoff, the intensity of contact 18926 increases like the intensity of contact 18930 increases as described above with reference to Figure 5N, and document 18922 zooms in response. Then, contact 18926 is lifted off, and contact 18932 is detected as described above with reference to Figures 5O-5P. In some examples, contacts 18926, 18930 and 18932 are the same continuously detected contact (e.g., the operations shown in Figures 5K-5P are performed in response to a gesture including a continuously detected contact).

**[0148]** Figure 5Q illustrates application window 18940 displayed on display 450. Application window 18940, like application window 18904 or 18920, is associated with an application (e.g., a web browser, an email application, a word processing application, a drawing application, a spreadsheet, a presentation, etc.). Document 18942 is

displayed in application window 18940. Document 18942 is displayed at zoom level 18942-a. Document 18942 is, optionally, a web page, a word processing document, or a text document. Document 18942 includes content 18944 (e.g., text). In Figure 5Q, portion 18944-a of content 18944 is displayed in document 18942.

**[0149]** Figure 5Q also shows contact 18946 detected on touch-sensitive surface 451. Contact 18946 has an intensity between  $IT_0$  and  $IT_L$ . In Figures 5Q and 5R, the device detects movement 18948 of contact 18946 on touch-sensitive surface 451. Movement 18948 moves contact 18946 from location 18946-a in Figure 5Q to location 18946-b in Figure 5R on touch-sensitive surface 451. In response to the detection of movement 18948 of contact 18946 in Figures 5Q-5R, document 18942 is scrolled. In accordance with the scrolling of document 18942, portion 18944-b of content 18944 is displayed, as shown in Figure 5R.

**[0150]** While contact 18946 continues to be detected, contact 18950 is detected on touch-sensitive surface 451, as shown in Figure 5R. Contact 18950 has an intensity between  $IT_0$  and  $IT_L$ . In Figures 5R-5S the device detects an increase in intensity of contact 18950 from an intensity between  $IT_0$  and  $IT_L$  in Figure 5R to an intensity above  $IT_D$  in Figure 5S. In response to detection of the increase in the intensity of contact 18950, document 18942 is zoomed from zoom level 18942-a in Figure 5R to zoom level 18942-b in Figure 5S. Portion 18944-b of content 18944 is zoomed in accordance of the zooming of document 18942.

**[0151]** In Figures 5S-5T the device detects a decrease in intensity of contact 18950 from an intensity above  $IT_D$  in Figure 5S to an intensity below  $IT_D$  or a hysteresis intensity threshold associated with, and below,  $IT_D$  in Figure 5T. In response to detection of the decrease in the intensity of contact 18950, document 18942 is maintained at zoom level 18942-b in Figure 5S. In Figures 5T-5U, the device detects an increase in intensity of contact 18950 increasing from an intensity below  $IT_D$  in Figure 5T to an intensity above  $IT_D$  in Figure 5U. In response to detection of the increase in the intensity of contact 18950 in Figure 5T-5U, document 18942 is zoomed from zoom level 18942-b in Figure 5T to zoom level 18942-c in Figure 5U. Portion 18944-b of content 18944 is zoomed in accordance of the zooming of document 18942. In some examples, zoom level 18942-b is a zoom level that is a predefined increment from zoom level 18942-a, and zoom level 18942-c is a zoom level that is the predefined increment from zoom level 18942-b.

**[0152]** After document 18942 zooms to zoom level 18942-c in Figure 5U, contact 18950 is, optionally, lifted off of touch-sensitive surface 451, as shown in Figure 5V. Figure 5V illustrates contact 18946 continuing to be detected on touch-sensitive surface 451, but contact 18950 has lifted off. Document 18942 maintains zoom level 18942-c. In some other examples, for document 18942 to maintain zoom level 18942-c, continued detection of contact 18950 on touch-sensitive surface 451 is

needed.

**[0153]** In Figures 5V-5W, the device detects movement 18952 of contact 18946 on touch-sensitive surface 451. Movement 18952 moves contact 18946 from location 18946-b in Figure 5V to location 18946-c in Figure 5W on touch-sensitive surface 451. In response to the detection of movement 18952 of contact 18946, document 18942 is scrolled. In accordance with the scrolling of document 18942, portion 18944-c of content 18944 is displayed, as shown in Figure 5W. At this point, contact 18946 is, optionally, lifted off touch-sensitive surface 451 to complete the scrolling of document 18942. In some examples, after contact 18946 is lifted off of touch-sensitive surface 451, document 18942 is maintained at zoom level 18942-c. In some examples, after contact 18946 is lifted off of touch-sensitive surface 451, document 18942 is displayed at zoom level 18942-a.

**[0154]** Figures 6A-6D are flow diagrams illustrating a method 19000 of zooming a user interface while performing an operation in accordance with some examples. The method 19000 is performed at an electronic device (e.g., device 300, Figure 3, or portable multifunction device 100, Figure 1A) with a display, a touch-sensitive surface, and one or more sensors to detect intensity of contacts. In some examples, the display is a touch screen display and the touch-sensitive surface is on the display. In some examples, the display is separate from the touch-sensitive surface. Some operations in method 19000 are, optionally, combined and/or the order of some operations is, optionally, changed.

**[0155]** As described below, the method 19000 provides an intuitive way to zoom a user interface while performing an operation. The method reduces the cognitive burden on a user when zooming a user interface while performing an operation, thereby creating a more efficient human-machine interface. For battery-operated electronic devices, enabling a user to zoom a user interface while performing an operation faster and more efficiently conserves power and increases the time between battery charges.

**[0156]** The device displays (19002) a user interface (e.g., including an electronic document) at a first zoom level on the display. Figure 5A, for example, shows application window 18904, which is associated with an application and presents a user interface for the application, displayed on display 450. Document 18906 is displayed in application window 18904 in Figure 5A. Similarly, Figure 5K shows application 18920 with document 18922 displayed on display 450. Figure 5Q shows application 18940 with document 18942 displayed on display 450.

**[0157]** While the user interface is displayed at the first zoom level (e.g., a first magnification), the device detects (19004) a first input that includes movement of a contact on the touch-sensitive surface. For example, Figures 5B-5C show an input that includes contact 18912 and movement 18914 of contact 18912 detected on touch-sensitive surface 451 while document 18906 is displayed at zoom level 18906-a. Figures 5K-5L show an input that includes

contact 18926 and movement 18928 of contact 18926 detected on touch-sensitive surface 451 while document 18922 is displayed at zoom level 18922-a. Figures 5Q-5R show an input that includes contact 18946 and movement 18948 of contact 18946 detected on touch-sensitive surface 451 while document 18942 is displayed at zoom level 18942-a. In some examples, the touch-sensitive surface is (19006) a fingerprint sensor (e.g., the touch-sensitive surface is a high-resolution touch-sensitive surface that is capable of detecting features formed by ridges in a fingerprint placed on the touch-sensitive surface).

**[0158]** In response to detecting the first input, the device initiates (19008) a respective operation associated with the user interface. For example, in Figures 5B-5C, in response to the detection of movement 18914, object 18908-1 is moved to location 18908-1-b in Figure 5C; the operation is the dragging movement of object 18908-1. In Figures 5K-5L, in response to the detection of movement 18928, document 18922 is scrolled so that portion 18924-b is displayed in Figure 5L; the operation is the scrolling of document 18922. In Figures 5Q-5R, in response to the detection of movement 18948, document 18942 is scrolled so that portion 18944-b is displayed in Figure 5R; the operation is the scrolling of document 18942.

**[0159]** In some examples, the respective operation is (19010) a document editing operation for editing an electronic document displayed in the user interface (e.g., dragging a picture to a different location or resizing content in a word processing document or a presentation document). For example, the operation in Figures 5B-5C is the dragging of an object, which is, optionally, an icon, a picture, an image, or a shape, to list a few examples. In some examples, the respective operation is (19012) a document navigation operation for navigating through an electronic document displayed in the user interface (e.g., scrolling through a document). For example, the operation in Figures 5K-5L or 5Q-5R is the scrolling of a document.

**[0160]** In some examples, after detecting the first input and before detecting the second input, the device detects (19014) a liftoff of the contact corresponding to the first input. For example, Figure 5M shows contact 18930 detected on touch-sensitive surface 451 after contact 18926 has been lifted off.

**[0161]** After (19016) initiating the respective operation, the device detects (19018) a second input, where detecting the second input includes detecting an increase in intensity of a contact on the touch-sensitive surface (e.g., from a first intensity value to a second intensity value of a plurality of intensity values detectable by the device). For example, in Figures 5C-5D, after movement of object 18908-1 has been initiated, an increase in the intensity of contact 18912 is detected; the input is the increase in intensity of the continuously detected contact 18912. In Figures 5M-5N, after the scrolling of document 18922 has been initiated, contact 18930 and an increase in the intensity of contact 18930 is detected; the input is newly

detected contact 18930 the increase in intensity of contact 18930. In Figures 5R-5S, after the scrolling of document 18942 has been initiated, contact 18950 and an increase in the intensity of contact 18950 is detected; the input is newly detected contact 18950 the increase in intensity of contact 18950.

**[0162]** In response to detecting the second input, the device zooms (19020) the user interface to a second zoom level (e.g., a second magnification) different from the first zoom level (e.g., the first magnification) in accordance with the increase in intensity of the contact. In some examples, the user interface includes a first portion (e.g., a menu or toolbar) and a second portion (e.g., content such as an electronic document) and zooming the user interface includes zooming the second portion of the user interface without zooming the first portion of the user interface. For example, in Figure 5D, in response to the increase in the intensity of contact 18912, document 18906 is zoomed to zoom level 18906-b in accordance with the increase in intensity of contact 18912. In Figure 5N, in response to the increase in the intensity of contact 18930, document 18922 is zoomed to zoom level 18922-b in accordance with the increase in intensity of contact 18930. In Figure 5S, in response to the increase in the intensity of contact 18950, document 18942 is zoomed to zoom level 18942-b in accordance with the increase in intensity of contact 18950.

**[0163]** In some examples, the second zoom level (e.g., zoom level 18906-b, 18922-b, or 18942-b) is (19022) dynamically selected in accordance with a maximum intensity of the contact (e.g., contact 18912, 18930, or 18950, respectively) corresponding to the second input (e.g., the second zoom level is selected from a range of zoom levels based on a maximum intensity of the contact). In some examples, the second zoom level (e.g., zoom level 18906-b, 18922-b, or 18942-b) is (19024) dynamically selected in accordance with a current intensity of the contact (e.g., contact 18912, 18930, or 18950, respectively) corresponding to the second input (e.g., the second zoom level is selected from a range of zoom levels based on a current intensity of the contact). In some examples, the second zoom level (e.g., zoom level 18906-b, 18922-b, or 18942-b) is (19026) a predefined zoom level (e.g., zoom level is a predefined zoom level such as 150% or 200%).

**[0164]** In some examples, the second input includes (19028) one or more cycles of increasing the intensity of a respective contact above a first intensity threshold (e.g.,  $IT_D$ ) starting at a lower intensity threshold (e.g.,  $IT_L$  or a hysteresis intensity threshold associated with, and below,  $IT_D$ ) that is below the first intensity threshold, and the second zoom level is selected in accordance with a number of cycles that the respective contact has increased above the first intensity threshold and a predefined zoom-level increment (e.g., in response to detecting multiple increases/decreases in intensity, the device keeps zooming the user interface further in, such as by 10% increments, 20% increments, 30% increments, or

the like). For example, in Figures 5R-5S, in response to a first cycle including an increase in intensity of contact 18950 from an intensity below  $IT_D$  (or a hysteresis intensity threshold that is associated with, and below,  $IT_D$ ) to an intensity above  $IT_D$ , the device increases the zoom level of document 18942 from a first zoom level 18942-a in Figure 5R to a second zoom level 18942-b in Figure 5S. Subsequently, in Figures 5T-5U, in response to a second cycle including an increase in intensity of contact

18950 from an intensity below  $IT_D$  to an intensity above  $IT_D$ , the device increases the zoom level of document 18942 from the second zoom level 18942-b in Figure 5T to a third zoom level 18942-c in Figure 5U. Zoom level 18942-b is a zoom level that is a predefined increment from zoom level 18942-a, and zoom level 18942-c is a zoom level that is the predefined increment from zoom level 18942-b.

**[0165]** In some examples, after detecting the second input and before detecting the third input, the device detects (19030) a liftoff of the contact corresponding to the second input. For example, Figure 5O shows contact 18932 detected on touch-sensitive surface 451 after contact 18930 has been lifted off.

**[0166]** While (19032) the user interface is displayed at the second zoom level (e.g., the second magnification), the device detects (19034) a third input that includes movement of a contact on the touch-sensitive surface. In response to detecting the third input, the device completes (19036) the respective operation. In some examples, the third input includes movement of the contact and subsequent liftoff of the contact from the touch-sensitive surface. In some examples the respective operation includes resizing a window, selecting text, or moving a user interface object across the display. For example, in Figures 5E-5F, movement 18916 of contact 18912 is detected while document 18906 is displayed at zoom level 18906-b. In response to detection of movement 18916, object 18908-1 is moved from location 18908-1-b in Figure 5E to location 18908-1-c in Figure 5F. In Figures 5O-5P, movement 18934 of contact 18932 is detected while document 18922 is displayed at zoom level 18922-b. In response to detection of movement 18934, document 18922 is scrolled so that portion 18924-c of content 18924 is displayed in Figure 5P. In Figures 5V-5W, movement 18952 of contact 18946 is detected while document 18942 is displayed at zoom level 18942-b. In response to detection of movement 18952, document 18942 is scrolled so that portion 18944-c of content 18944 is displayed in Figure 5W.

**[0167]** In some examples, the first input, the second input and the third input are (19038) part of a single gesture that includes a continuously detected contact on the touch-sensitive surface. In some examples, the first input, the second input, and the third input are made by a single finger contact. For example, movement 18914 of contact 18912, the increase in the intensity of contact 18912, and movement 18916 of contact 18912, as shown in Figures 5A-5F, are, optionally, all part of a single ges-

ture that includes continuously detected contact 18912.

**[0168]** In some examples, the first input, the second input and the third input are (19040) performed sequentially by a same continuously detected contact on the touch-sensitive surface (e.g., while a user is performing an operation corresponding to movement of a contact, the user can increase the intensity of the contact to zoom in for finer control of the operation). In some examples, the first press input and the second press input are made by a single continuously detected (unbroken) contact on the touch-sensitive surface. For example, movement 18914 of contact 18912, the increase in the intensity of contact 18912, and movement 18916 of contact 18912, as shown in Figures 5A-5F, are, optionally, sequential inputs performed by continuously detected contact 18912.

**[0169]** In some examples, after (19042) zooming the user interface to the second zoom level, the device detects (19044) a fourth input, where detecting the fourth input includes detecting a decrease in intensity of a contact on the touch-sensitive surface. In response to detecting the fourth input, the device zooms (19046) the user interface to a third zoom level (e.g., a third magnification) different from the second zoom level (e.g., the second magnification) and the first zoom level (e.g., the first magnification) in accordance with the decrease in intensity of the contact. In some examples, while the user is performing the respective operation, the zoom level is dynamically increased and decreased in accordance with changes in intensity of the continuously detected contact. For example, in Figures 5F and 5I-5J, after document 18906 is zoomed to zoom level 18906-b, the intensity of contact 18912 is decreased. In response to detection of the decrease in intensity, document 18906 is zoomed from zoom level 18906-b in Figure 5F to zoom level 18906-c in Figure 5I, and then subsequently zoomed from zoom level 18906-c in Figure 5I to zoom level 18906-a in Figure 5J in accordance with the decrease in intensity.

**[0170]** In some examples, the contact corresponding to the second input is (19048) different from a contact corresponding to the first input and the third input (e.g., the user uses another finger to press on the touch-sensitive surface while performing a gesture associated with the respective operation to zoom the user interface while the respective operation is being performed). For example, while performing an operation with the index finger of the user's right hand on the touch-sensitive surface, the user can press down with a thumb of the user's left hand on the touch-sensitive surface to zoom the user interface. As shown in Figures 5R-5W, for example, the contact (contact 18950) that performs the inputs that cause the device to zoom document 18942 is different from the contact (contact 18946) that performs the inputs that cause the device to scroll document 18942.

**[0171]** In some examples, after (19050) completing the respective operation, the device detects (19052) liftoff of the contact corresponding to the third input, and in re-

sponse to detecting liftoff of the contact corresponding to the third input, the device displays (19054) the user interface at the first zoom level. Figures 5F-5G show, for example, after object 18908-1 is moved to location 18908-1-c (as shown in Figure 5F), document 18906 reverting back to zoom level 18906-a in response to detection of the liftoff of contact 18912 in Figure 5G.

**[0172]** In some examples, after (19050) completing the respective operation, the device detects (19055) liftoff of the contact corresponding to the third input, and in response to detecting liftoff of the contact corresponding to the third input, the device maintains (19054) display of the user interface at the second zoom level. Figures 5F and 5H show, for example, after object 18908-1 is moved to location 18908-1-c (as shown in Figure 5F), document 18906 maintaining zoom level 18906-b in response to detection of the liftoff of contact 18912 in Figure 5H.

**[0173]** It should be understood that the particular order in which the operations in Figures 6A-6D have been described is merely exemplary and is not intended to indicate that the described order is the only order in which the operations could be performed. One of ordinary skill in the art would recognize various ways to reorder the operations described herein. Additionally, it should be noted that details of other processes described herein with respect to other methods described herein (e.g., those listed in paragraph [0038]) are also applicable in an analogous manner to method 19000 described above with respect to Figures 6A-6D. For example, the contacts, gestures, user interface objects, intensity thresholds, and focus selectors described above with reference to method 19000 optionally have one or more of the characteristics of the contacts, gestures, user interface objects, intensity thresholds, and focus selectors described herein with reference to other methods described herein (e.g., those listed in paragraph [0038]). For brevity, these details are not repeated here.

**[0174]** In accordance with some examples, Figure 7 shows a functional block diagram of an electronic device 19100 configured in accordance with the principles of the various described examples. The functional blocks of the device are, optionally, implemented by hardware, software, or a combination of hardware and software to carry out the principles of the various described examples. It is understood by persons of skill in the art that the functional blocks described in Figure 7 are, optionally, combined or separated into sub-blocks to implement the principles of the various described examples. Therefore, the description herein optionally supports any possible combination or separation or further definition of the functional blocks described herein.

**[0175]** As shown in Figure 7, an electronic device 19100 includes a display unit 19102 configured to display a user interface at a first zoom level on the display unit 19102, a touch-sensitive surface unit 19104 configured to receive inputs and contacts, one or more sensor units 19105 to detect intensity of contacts with the touch-sen-

sitive surface unit 19104, and a processing unit 19106 coupled to the display unit 19102, the touch-sensitive surface unit 19104, and the sensor units 19105. In some examples, the processing unit 19106 includes a detecting unit 19108, an initiating unit 19110, a zooming unit 19112, a completing unit 19114, a display enabling unit 19116, and a maintaining unit 19118.

**[0176]** The processing unit 19106 is configured to: while the user interface is displayed at the first zoom level, detect a first input that includes movement of a contact on the touch-sensitive surface unit 19104 (e.g., with the detecting unit 19108); in response to detecting the first input, initiate a respective operation associated with the user interface (e.g., with the initiating unit 19110); after initiating the respective operation: detect a second input, wherein detecting the second input includes detecting an increase in intensity of a contact on the touch-sensitive surface unit 19104 (e.g., with the detecting unit 19108), and in response to detecting the second input, zoom the user interface to a second zoom level different from the first zoom level in accordance with the increase in intensity of the contact (e.g., with the zooming unit 19112); and while the user interface is displayed at the second zoom level: detect a third input that includes movement of a contact on the touch-sensitive surface unit 19104 (e.g., with the detecting unit 19108), and in response to detecting the third input, complete the respective operation (e.g., with the completing unit 19114).

**[0177]** In some examples, the first input, the second input and the third input are part of a single gesture that includes a continuously detected contact on the touch-sensitive surface unit 19104.

**[0178]** The operations in the information processing methods described above are, optionally implemented by running one or more functional modules in information processing apparatus such as general purpose processors (e.g., as described above with respect to Figures 1A and 3) or application specific chips.

**[0179]** The operations described above with reference to Figures 6A-6D are, optionally, implemented by components depicted in Figures 1A-1B or Figure 7. For example, detection operations 19004, 19018, and 19034, initiating operation 19008, zooming operation 19020, and completing operation 19036 are, optionally, implemented by event sorter 170, event recognizer 180, and event handler 190. Event monitor 171 in event sorter 170 detects a contact on touch-sensitive display 112, and event dispatcher module 174 delivers the event information to application 136-1. A respective event recognizer 180 of application 136-1 compares the event information to respective event definitions 186, and determines whether a first contact at a first location on the touch-sensitive surface corresponds to a predefined event or sub-event, such as selection of an object on a user interface. When a respective predefined event or sub-event is detected, event recognizer 180 activates an event handler 190 associated with the detection of the event or sub-event. Event handler 190 optionally utilizes or calls data updater

176 or object updater 177 to update the application internal state 192. In some examples, event handler 190 accesses a respective GUI updater 178 to update what is displayed by the application. Similarly, it would be clear to a person having ordinary skill in the art how other processes can be implemented based on the components depicted in Figures 1A-1B.

#### Determining whether to Scroll or Select Content

**[0180]** Many electronic devices have graphical user interfaces that display content (e.g., text, images, tables, document icons and/or application shortcut icons) upon which multiple operations are, optionally, performed with the same type of gesture. For example, a word processing application window, optionally, displays editable text that is, optionally, scrolled and/or selected by a user moving a contact, e.g., on a touch sensitive surface. When this gesture overloading happens within the same application, the different operations (e.g., scrolling and selecting) are typically associated with different modes of operation. For example, in some circumstances, a user wants to scroll content without selecting the content and in other circumstances, a user wants to select content without scrolling the content, while in other circumstances a user wants to scroll content while selecting the content. Given the complexity of a user interface environment where a single gesture corresponds to multiple operations, there is a need to provide methods and user interfaces that enable the user to more efficiently and conveniently interact with content in the user interface environment.

**[0181]** The embodiments described below provide improved methods and user interfaces for determining whether to scroll or select content when navigating a complex user interface environment. More specifically, these methods and user interfaces simplify the process of switching between content scrolling and selecting modes of operation. According to embodiments described below, a content scrolling and/or selecting mode of operation is initiated upon the detection of a gesture including a contact on a touch-sensitive surface and movement of the contact across the touch-sensitive surface corresponding to movement of a focus selector over the content. The user controls whether the gesture initiates the content scrolling and/or selecting mode of operation through the intensity of the contact. A user presses down lightly (e.g., with a light press intensity) on the touch-sensitive surface to initiate a scrolling mode of operation and presses down heavily (e.g., with a deep press intensity) on the touch-sensitive surface to initiate a selecting mode of operation, or vice versa. In some methods, the user switches modes of operation, for example, by selecting a different mode from a menu of options or making a second contact in addition to the gesture for activating the operation. Advantageously, the methods and user interfaces described below simplify the process of switching between modes of operation associated with

a same gesture (e.g., scrolling and/or selecting text) by eliminating the need for additional inputs, such as going through a menu or making an additional contact.

**[0182]** Figures 8A-8AA illustrate exemplary user interfaces for determining whether to scroll or select content in accordance with some embodiments. The user interfaces in these figures are used to illustrate the processes described below, including the processes in Figures 9A-9E. Figures 8A-8AA include intensity diagrams that show the current intensity of the contact on the touch-sensitive surface relative to a plurality of intensity thresholds including a cursor-preview intensity threshold (e.g., light press intensity threshold "IT<sub>L</sub>"), a cursor-insertion intensity threshold (e.g., deep press intensity threshold "IT<sub>D</sub>") and a selection intensity threshold (e.g., deep press intensity threshold "IT<sub>D</sub>"). These intensity diagrams are typically not part of the displayed user interface, but are provided to aid in the interpretation of the figures.

**[0183]** In some embodiments, the device is an electronic device with a separate display (e.g., display 450) and a separate touch-sensitive surface (e.g., touch-sensitive surface 451). In some embodiments, the device is portable multifunction device 100, the display is touch-sensitive display system 112, and the touch-sensitive surface includes tactile output generators 167 on the display (Figure 1A). For convenience of explanation, the embodiments described with reference to Figures 8A-8AA and Figures 9A-9E will be discussed with reference to display 450 and a separate touch-sensitive surface 451, however analogous operations are, optionally, performed on a device with a touch-sensitive display system 112 in response to detecting the contacts described in Figures 8A-8AA on the touch-sensitive display system 112 while displaying the user interfaces shown in Figures 8A-8AA on the touch-sensitive display system 112; in such embodiments, the focus selector is, optionally: a respective contact, a representative point corresponding to a contact (e.g., a centroid of a respective contact or a point associated with a respective contact), or a centroid of two or more contacts detected on the touch-sensitive display system 112, in place of focus cursor 19204 or selection cursor 19212.

**[0184]** Figure 8A illustrates exemplary user interface 19206 displaying text 19202 and cursor 19204. In Figure 8A, user interface 19206 is displayed on display 450 of an electronic device that also includes touch-sensitive surface 451 and one or more sensors for detecting intensity of contacts with touch-sensitive surface. In some embodiments, touch-sensitive surface 451 is a touch screen display that is optionally display 450 or a separate display.

**[0185]** Figures 8A-8AA illustrate various embodiments where focus cursor 19204 (e.g., a mouse pointer), controlled by contact 19208 on touch-sensitive surface 451 and movement 19210 thereof, moves over at least a portion of text 19202. In response, depending on the intensity of contact 19202 detected on touch-sensitive surface 451, at least a portion of text 19202 is scrolled and/or

selected. For example, when the intensity of contact 19208 exceeds a selection intensity threshold (e.g., deep press intensity threshold "IT<sub>D</sub>"), the portion of text 19202 is selected. In contrast, when the intensity of contact 19208 does not exceed the selection intensity threshold (e.g., "IT<sub>D</sub>"), text 19202 is scrolled without the portion of the text being selected.

**[0186]** Figures 8A-8W illustrate detection of a contact 19208, corresponding to focus cursor 19204 or selection cursor 19212 displayed on display 450, and a gesture including movement 19210 of contact 19208 (e.g., movement 19210-a of contact 19208 from location 19208-a in Figure 8A to location 19208-b in Figures 8B-8D; movement 19210-a of contact 19208 from location 19208-a in Figure 8E to location 19208-b in Figures 8F, 8I-8J and 8Q; movement 19210-b of contact 19208 from location 19208-b in Figure 8B to location 19208-c in Figure 8K; movement 19210-b of contact 19208 from location 19208-b in Figure 8F to location 19208-c in Figure 8G; movement 19210-b of contact 19208 from location 19208-b in Figure 8R to location 19208-c in Figure 8S; and/or movement 19210-b of contact 19208 from location 19208-b in Figure 8T to location 19208-c in Figure 8U) are detected on touch-sensitive surface 451. Contact 19208 is detected at a position on touch-sensitive surface 451 corresponding to an area on display 450 occupied by focus cursor 19204 or selection cursor 19212 (e.g., contact 19208 corresponds to a focus selector on the display which is at or near a location of text 19202). In some embodiments, movement 19210 of contact 19208 on touch-sensitive surface 451 corresponds to movement of focus cursor 19204 or selection cursor 19212 on display 450. In some embodiments focus cursor 19204 and selection cursor 19212 are examples of displayed representations of a focus selector.

**[0187]** Figures 8A-8D illustrate an example of a beginning of a gesture where contact 19208 that is detected on touch-sensitive surface 451, corresponds to cursor 19204 displayed over text 19202 on display 450, and has an intensity below the selection intensity threshold (e.g., "IT<sub>D</sub>"). In accordance with movement 19210 of contact 19208 on touch-sensitive surface 451, text 19202 is scrolled, but not selected, because contact 19208 has an intensity below the selection intensity threshold (e.g., "IT<sub>D</sub>").

**[0188]** Figures 8A-8C illustrate various embodiments where text 19202 is scrolled, but not selected, in accordance with movement of focus cursor 19204. In some embodiments, as illustrated in Figure 8B, text 19202 is scrolled in the opposite direction as the movement of focus cursor 19204 on display 450. For example, in response to movement 19210 of contact 19208, corresponding to movement of focus cursor 19204 on display 450, downward from position 19208-a in Figure 8A to position 19208-b in Figure 8B on touch-sensitive surface 451, word 19202-58 of text 19202 moves upwards from position 19202-58-a in Figure 8A to position 19202-58-b in Figure 8B on display 450. In some embodiments, as

illustrated in Figure 8C, text 19202 is scrolled in the same direction as the movement of focus cursor 19204 on display 450. For example, in response to movement 19210 of contact 19208, corresponding to movement of focus cursor 19204 on display 450, downward from position 19208-a in Figure 8A to position 19208-b in Figure 8C on touch-sensitive surface 451, word 19202-58 of text 19202 moves downward from position 19202-58-a in Figure 8A to position 19202-58-c in Figure 8C on display 450.

**[0189]** The series of Figures 8A and 8D illustrates an embodiment where text 19202 scrolls on display 450 in accordance with movement 19210 of contact 19208 on touch-sensitive surface 451, however, focus cursor 19204 does not move. For example, in response to movement 19210 of contact 19208 downward from position 19208-a in Figure 8A to position 19208-b in Figure 8D on touch-sensitive surface 451, word 19202-58 of text 19202 moves upwards from position 19202-58-a in Figure 8A to position 19202-58-b in Figure 8D on display 450, but focus cursor 19204 does not move. As such, the relative position of focus cursor 19204 in text 19202 moves in accordance with movement 19210 of contact 19208 on touch-sensitive surface 451 without cursor 19204 moving on display 450.

**[0190]** Figures 8E-8J illustrate an example of a beginning of a gesture where contact 19208 that is detected on touch-sensitive surface 451, corresponds to selection cursor 19212 displayed over text 19202 on display 450, and has an intensity above the selection intensity threshold (e.g., " $IT_D$ "). In accordance with movement of selection cursor 19212 over text 19202, portion 19214 of text 19202 is selected because contact 19208 has an intensity above the selection intensity threshold (e.g., " $IT_D$ ").

**[0191]** Figures 8E-8G illustrate an embodiment where portion 19214 of text 19202 is selected, but text 19202 is not scrolled. For example, in accordance with the movement of selection cursor 19212 on display 450, corresponding to movement 19210 of contact 19208 from position 19208-a in Figure 8E, through position 19208-b in Figure 8F, to position 19208-c in Figure 8G on touch-sensitive surface 451, portion 19214 of text 19202 is selected because the intensity of contact 19208 is above the selection intensity threshold (e.g., " $IT_D$ "). During the selection, word 19202-58 does not move (e.g., is not scrolled) from position 19202-58-a in Figure 8E, despite movement of selection cursor 19212 downward on display 450.

**[0192]** Figures 8E-8H illustrate an embodiment where portion 19214 of text 19202 is selected, and text 19202 is scrolled when additional text is prompted to be displayed. For example, in accordance with movement of selection cursor 19212 on display 450, corresponding to movement 19210 of contact 19208 from position 19208-a in Figure 8E, through position 19208-b in Figure 8F, to position 19208-c in Figure 8G on touch-sensitive surface 451, portion 19214 of text 19202 is selected because the intensity of contact 19208 is above the selection intensity

threshold (e.g., " $IT_D$ "), but text 19202 is not scrolled on display 450. In response to selection cursor 19212 reaching an edge of displayed text 19202 in Figure 8G, text 19202 is scrolled upwards (e.g., word 19202-58 is

5 scrolled from position 19202-58-a in Figure 8G to position 19202-58-b in Figure 8H on display 450) so that additional text is displayed proximate to selection cursor 19212. In some embodiments, as illustrated in Figure 8H, when contact 19208 is maintained at an intensity above 10 the selection intensity threshold (e.g., " $IT_D$ ") at position 19208-c on touch-sensitive surface 451, corresponding to a position proximal to an edge of displayed text 19202, scrolling of text 19202 is continued despite the lack of movement of contact 19208. In some embodiments, the 15 portion of text that was selected (e.g., in Figure 8G) prior to scrolling the text continues to be selected even after the text is scrolled as shown in Figure 8H.

**[0193]** The series of Figures 8E and 8I illustrate an embodiment where portion 19214 of text 19202 is selected 20 while text 19202 is scrolled. For example, portion 19214 of text 19202 is selected in accordance with movement of selection cursor 19212 on display 450, corresponding to movement of contact 19208 from position 19208-a in Figure 8E to position 19208-b in Figure 8I, 25 because the intensity of contact 19208 is above the selection intensity threshold (e.g., " $IT_D$ "). During the selection, word 19202-58 moves (e.g., is scrolled) from position 19202-58-a in Figure 8E to position 19202-58-b in Figure 8I on display 450, in accordance with movement 30 of selection cursor 19212 downward on display 450.

**[0194]** The series of Figures 8E and 8J illustrate an embodiment where portion 19214 of text 19202 is selected 35 while text 19202 is scrolled, but selection cursor 19212 does not move on display 450. For example, text 19202 scrolls on display 450 in accordance with movement 19210 of contact 19208 from position 19208-a in Figure 8E to position 19208-b in Figure 8J on touch-sensitive surface 451 (e.g., word 19202-58 is scrolled from position 19202-58-a in Figure 8E to position 19202-58-b in Figure 40 8J on display 450). In accordance with the change (e.g., movement) of the relative position of selection cursor 19212 in text 19202, despite the lack of movement of selection cursor 19212 on display 450, portion 19214 of text 19202 is selected because contact 19208 has an 45 intensity above the selection intensity threshold (e.g., " $IT_D$ ").

**[0195]** The series of Figures 8A, 8B and 8K illustrate 50 an embodiment where text 19202 is initially scrolled, but not selected, in accordance with movement of focus cursor 19204, corresponding to movement of contact 19208 having an intensity below a selection intensity threshold (e.g., " $IT_D$ "). Following an increase in the intensity of contact 19208 to an intensity above the selection intensity threshold (e.g., " $IT_D$ "), scrolling of text 19202 is stopped 55 and portion 19214 of text 19202 is selected in accordance with subsequent movement of contact 19208. For example, when the intensity of contact 19208 is increased at position 19208-b in Figure 8B from an initial intensity be-

low a selection intensity threshold (e.g., " $IT_D$ ") to a subsequent intensity above the selection intensity threshold (e.g., as shown in Figure 8K), scrolling of text 19202 is stopped (e.g., word 19202-58 does not move from position 19202-58-b in Figure 8B despite movement of contact 19208 to position 19208-c in Figure 8K) and portion 19214 of text 19202 is selected in accordance with movement of contact 19208 from position 19208-b in Figure 8B to position 19208-c in Figure 8K on touch-sensitive surface 451.

**[0196]** Figures 8L-8Q illustrate various embodiments where, prior to selecting a portion 19214 of text 19202, preview 19216 of selection cursor 19212 is displayed at an area of display 450 proximate to focus cursor 19204. For example, as illustrated in Figures 8L-8N, in response to an increase of the intensity of contact 19208 on touch-sensitive surface 451, corresponding to focus cursor 19204 on display 450, from an initial intensity in Figure 8L to an intensity below the selection intensity threshold (e.g., " $IT_D$ ") but above a cursor-preview intensity threshold (e.g., light press intensity threshold " $IT_L$ ") in Figure 8N, preview 19216 of selection cursor 19212 is displayed as replacing focus cursor 19204 on display 450. In contrast, as illustrated by the series of Figure 8L-8M, in response to an increase of the intensity of contact 19208 on touch-sensitive surface 451, corresponding to focus cursor 19204 on display 450, from an initial intensity in Figure 8L that is just above a contact-detection intensity threshold (e.g., " $IT_0$ ") to an intensity that is below both the selection intensity threshold (e.g., " $IT_D$ ") and the cursor-preview intensity threshold (e.g., " $IT_L$ ") in Figure 8M, preview 19216 of selection cursor 19212 is not displayed.

**[0197]** The series of Figures 8L-8P illustrates an embodiment where selection cursor 19212 is placed in text 19202 when the intensity of contact 19208 is further increased. For example, while preview 19216 of selection cursor 19212 is displayed in Figure 8N, in response to a subsequent increase in the intensity of contact 19208 on touch-sensitive surface 451 shown in Figure 8N to an intensity above a cursor-insertion intensity threshold (e.g., deep press intensity threshold " $IT_D$ ") shown in Figure 8P, selection cursor 19212 is placed in text 19202 at a position on display 450 previously occupied by preview 19216 of selection cursor 19212.

**[0198]** The series of Figures 8L-8P illustrates an embodiment where an animation is shown during replacement of preview 19216 of selection cursor 19212 with selection cursor 19212. For example, while preview 19216 of selection cursor 19212 is displayed at size 19216-a on display 450 in Figure 8N, in response to a subsequent increase in the intensity of contact 19208 on touch-sensitive surface 451 shown in Figure 8N to a greater intensity that is still below the cursor-insertion intensity threshold (e.g., " $IT_D$ ") shown in Figure 8O, preview 19216 of selection cursor 19212 is shrunk to size 19216-b in Figure 8O. In response to a further increase in the intensity of contact 19208 on touch-sensitive surface 451 from an intensity below the cursor-insertion in-

tensity threshold (e.g., " $IT_D$ ") shown in Figure 8O to an intensity above the cursor-insertion intensity threshold (e.g., " $IT_D$ ") shown in Figure 8P, selection cursor 19212 is placed in text 19202 at a position on display 450 previously occupied by preview 19216 of selection cursor 19212, giving the impression that preview 19216 of selection cursor 19212 gradually "drops" into text 19202 in accordance with the increase in intensity of contact 19208 from Figure 8L to Figure 8P.

**[0199]** In some embodiments, while the intensity of a contact is between the cursor-preview intensity threshold (e.g.,  $IT_L$ ) and the cursor insertion intensity threshold (e.g.,  $IT_D$ ), the device responds to movement of the contact (e.g., contact 19208 in Figure 8O) by repositioning the cursor within displayed text without scrolling the text (e.g., the text is locked in place and movement of the contact moves the cursor relative to the text). For example, in Figure 8O, if the device detected movement of contact 19208 down and to the right on touch-sensitive surface 451, the device would move the cursor downward and to the right in the text in accordance with the movement of contact 19208 without scrolling the text.

**[0200]** In some embodiments, while the intensity of a contact is between the cursor-preview intensity threshold (e.g.,  $IT_L$ ) and the cursor insertion intensity threshold (e.g.,  $IT_D$ ), the device responds to movement of the contact (e.g., contact 19208 in Figure 8O) by scrolling the text without repositioning the cursor within displayed text (e.g., the cursor is locked in place in the text and movement of the contact moves the text and cursor together). For example, in Figure 8O, if the device detected movement of contact 19208 down and to the right on touch-sensitive surface 451, the device would scroll the text downward and to the right in accordance with the movement of contact 19208 while maintaining the location of the cursor between the words "that" and "all."

**[0201]** In some embodiments, while the intensity of a contact is between the cursor-preview intensity threshold (e.g.,  $IT_L$ ) and the cursor insertion intensity threshold (e.g.,  $IT_D$ ), the device responds to a component of movement of the contact (e.g., contact 19208 in Figure 8O) in a first direction (e.g., horizontally left to right) by repositioning the cursor within displayed text in the first direction without scrolling the text in the first direction and the device responds to a component of movement of the contact (e.g., contact 19208 in Figure 8O) in a second direction that is different from (e.g., perpendicular to) the first direction (e.g., vertically up or down) by scrolling the displayed text in the first direction without repositioning the cursor within the displayed text (e.g., the text is locked in place in a first direction but the cursor can move relative to the text in the first direction and the cursor is locked in place relative to the text in the second direction but the text is not locked in place in the second direction). For example, in Figure 8O, if the device detected movement of contact 19208 down and to the right on touch-sensitive surface 451, the device would scroll the text downward in accordance with the vertical component of movement

of contact 19208 and would move the cursor to the right within the text in accordance with the horizontal component of movement of contact 19208.

**[0202]** The series of Figures 8L-8Q illustrates an embodiment where selection of portion 19214 of text 19202 begins where selection cursor 19212 is placed into text 19212. For example, in response to an increase in the intensity of contact 19208 on touch-sensitive surface 451 from an intensity below the cursor-insertion intensity threshold (e.g., "IT<sub>D</sub>") shown in Figure 8L to an intensity above the cursor-insertion intensity threshold (e.g., "IT<sub>D</sub>") shown in Figure 8P, selection cursor 19212 is placed in text 19202. In accordance with subsequent movement 19210-a of contact 19208 from position 19208-a in Figure 8P to position 19208-b in Figure 8Q on touch-sensitive surface 451, portion 19214 of text 19202 is selected starting at the location where selection cursor 19212 was previously placed.

**[0203]** Figures 8Q-8U illustrate an example of a beginning of a gesture, including movement 19210-a of contact 19208 on touch-sensitive surface 451 from position 19208-a to position 19208-b, where contact 19208 corresponding to selection cursor 19212 displayed over text 19202 on display 450, has an initial intensity above the selection intensity threshold (e.g., "IT<sub>D</sub>"), resulting in selection of portion 19214 of text 19202.

**[0204]** Figures 8Q-8S illustrate an embodiment where, after selection of portion 19214 of text 19202, a decrease in the intensity of contact 19208 followed by subsequent movement of cursor 19212 results in adjustment of selected portion 19214 of text 19202. For example, in response to a decrease in the intensity of contact 19208 on touch-sensitive surface 451 from an intensity above the selection intensity threshold (e.g., "IT<sub>D</sub>") shown in Figure 8Q to an intensity below the selection intensity threshold (e.g., "IT<sub>D</sub>") but above a selection-adjustment intensity threshold (e.g., light press intensity threshold "IT<sub>L</sub>") shown in Figure 8R, in accordance with movement 19210-c of contact 19208 from position 19208-b in Figure 8R to position 19208-c in Figure 8S on touch-sensitive surface 451, selection 19214 of text 19202 is adjusted to include additional words. Thus, in some embodiments, even though the intensity of contact 19208 decreases below the selection intensity threshold (e.g., "IT<sub>D</sub>"), the device continues to select text in accordance with a text selection operation that was initiated when the contact had an intensity above the selection intensity threshold (e.g., "IT<sub>D</sub>") as long as the contact 19208 has an intensity above the selection-adjustment intensity threshold (e.g., "IT<sub>L</sub>").

**[0205]** The series of Figures 8Q, 8T and 8U illustrate an embodiment where, after selection of portion 19214 of text 19202, a decrease in the intensity of contact 19208 followed by subsequent movement of cursor 19212 does not result in adjustment of selected portion 19214 of text 19202. For example, in response to a decrease in the intensity of contact 19208 on touch-sensitive surface 451 from an intensity above the selection intensity threshold

(e.g., "IT<sub>D</sub>") shown in Figure 8Q to an intensity below the selection intensity threshold (e.g., "IT<sub>D</sub>") and below the selection-adjustment intensity threshold (e.g., "IT<sub>L</sub>") shown in Figure 8T, in accordance with movement 19210-c of contact 19208 from position 19208-b in Figure 8T to position 19208-c in Figure 8U on touch-sensitive surface 451, cursor 19212 moves on display 450, but selection 19214 of text 19202 is not adjusted to include additional words. Thus, in some embodiments, when the intensity of contact 19208 decreases below the selection-adjustment intensity threshold (e.g., "IT<sub>L</sub>"), the device ceases to select text in accordance with a text selection operation that was initiated when the contact had an intensity above the selection intensity threshold (e.g., "IT<sub>D</sub>").

**[0206]** The series of Figures 8Q, 8V and 8W illustrate an example of a beginning of a gesture where contact 19208 on touch-sensitive surface 451, corresponding to selection cursor 19212 displayed over text 19202 on display 450, has an intensity above the selection intensity threshold (e.g., "IT<sub>D</sub>"). In accordance with movement of cursor 19212 over text 19202, portion 19214 of text 19202 is selected because contact 19208 has an intensity above the selection intensity threshold (e.g., "IT<sub>D</sub>").

**[0207]** The series of Figures 8Q, 8V and 8W illustrate an embodiment where, while first contact 19208 corresponds to an activated selection cursor 19212 (e.g., movement of contact 19208 would cause text to be selected), a second gesture results in scrolling of text 19202 and continuation of selecting portion 19214 of text 19202. For example, in Figure 8V, movement of initial contact 19208 on touch-sensitive surface 451, corresponding to selection cursor 19212 on display 450, is stopped and the device detects a gesture including movement 19220 of subsequent contact 19218 on touch sensitive surface 451. In response to detecting movement of contact 19218 in Figures 8V-8W, the device scrolls of text 19202 in accordance with movement 19220-a of contact 19218 from position 19218-a in Figure 8V to position 19218-b in Figure 8W (e.g., word 19202-58 is scrolled from position 19202-58-a in Figure 8V to position 19202-58-b in Figure 8W on display 450). In response, additional text is added to selected portion 19214 of text 19202 in accordance with the movement of the text under the selection cursor 19212 while contact 19208 has an intensity above the selection intensity threshold (e.g., "IT<sub>D</sub>").

**[0208]** Figures 8X-8AA illustrate a contact 19222 that is detected on touch-sensitive surface 451 and corresponds to selection cursor 19212 displayed on display 450. The device detects a gesture including movement 19224 of contact 19222 (e.g., movement 19224-a of contact 19222 from location 19222-a in Figure 8X to location 19208-b in Figure 8Y and/or movement 19224-a of contact 19222 from location 19222-a in Figure 8Z to location 19208-b in Figure 8AA) are detected on touch-sensitive surface 451. Contact 19222 is detected at a position on touch-sensitive surface 451 corresponding to an area on display 450 occupied by selection cursor 19212 (e.g.,

contact 19222 corresponds to a focus selector on the display which is at or near a location of text 19202). In some embodiments, movement 19224 of contact 19222 on touch-sensitive surface 451 corresponds to movement of selection cursor 19212 on display 450.

**[0209]** Figures 8X-8Y illustrate an example of a beginning of a gesture where contact 19222 that is detected on touch-sensitive surface 451, corresponds to selection cursor 19212 displayed near text 19202 on display 450, and has an intensity below an individual letter-selection intensity threshold (e.g., deep press intensity threshold " $IT_D$ "). In accordance with movement 19224 of contact 19222 on touch-sensitive surface 451, portion 19214 of text 19202 is adjusted by adding whole words to the portion. For example, in response to selection cursor 19212 moving over word 19202-2 (e.g., "score"), in accordance with movement 19224-a of contact 19222 from position 19222-a in Figure 8X to position 19222-b in Figure 8Y on touch-sensitive surface 451, selected portion 19214 of text 19202 is adjusted by the addition of the entire word 19202-2 (e.g., "score") because contact 19222 has an intensity below the individual letter-selection intensity threshold (e.g., " $IT_D$ ").

**[0210]** Figures 8Z-8AA illustrate an example of a beginning of a gesture where contact 19222 that is detected on touch-sensitive surface 451, corresponds to selection cursor 19212 displayed near text 19202 on display 450, and has an intensity above the individual letter-selection intensity threshold (e.g., " $IT_D$ "). In accordance with movement 19224 of contact 19222 on touch-sensitive surface 451, portion 19214 of text 19202 is adjusted by adding individual letters to the portion. For example, in response to selection cursor 19212 moving over the letter "s" in word 19202-2 (e.g., "score"), in accordance with movement 19224-a of contact 19222 from position 19222-a in Figure 8Z to position 19222-b in Figure 8AA on touch-sensitive surface 451, selected portion 19214 of text 19202 is adjusted by the addition of only the letter "s" of word 19202-2 (e.g., "score") because contact 19222 has an intensity above the individual letter-selection intensity threshold (e.g., " $IT_D$ ").

**[0211]** Figures 9A-9E are flow diagrams illustrating a method 19300 of determining whether to scroll or select content in accordance with some embodiments. The method 19300 is performed at an electronic device (e.g., device 300, Figure 3, or portable multifunction device 100, Figure 1A) with a display and a touch-sensitive surface. In some embodiments, the display is a touch screen display and the touch-sensitive surface is on the display. In some embodiments, the display is separate from the touch-sensitive surface. Some operations in method 19300 are, optionally, combined and/or the order of some operations is, optionally, changed.

**[0212]** As described below, the method 19300 provides an intuitive way to interact with user interface content. The method reduces the cognitive burden on a user when interacting with user interface content, thereby creating a more efficient human-machine interface. For bat-

tery-operated electronic devices, enabling a user to interact with user interface content faster and more efficiently conserves power and increases the time between battery charges.

**5** **[0213]** In some embodiments, the device displays (19302) content (e.g. text 19202 in Figures 8A-8AA) on a display (e.g., display 450). In some embodiments, the content includes text, one or more images and/or more or more tables. In some embodiments, the content is selectable content that is configured to be selected and once selected can be copied, deleted or modified in accordance with input from a user of the device (e.g., text in a word processing application window, numbers in a spreadsheet application window, document icons in a folder application window, images in photography application window, music file icons in an audio player application window, video file icons in a video player application window, application shortcut icons displayed on a desktop).

**10** **[0214]** In some embodiments, while a focus selector (e.g., focus cursor 19204 in Figures 8A-8D, and 8L-8M or selection cursor 19212 in Figures 8E-8K, and 8P-8AA) is over the content, the device detects (19304) a gesture on a touch-sensitive surface (e.g., touch-sensitive surface 451), the gesture including a first contact (e.g., contact 19208 in Figures 8A-8W or contact 19222 in Figures 8X-8AA) on (19306) the touch-sensitive surface and movement (e.g., movement 19210 of contact 19208 in Figures 8A-8W or movement 19224 of contact 19222 in Figures 8X-8AA) of the first contact across (19308) the touch-sensitive surface that corresponds to movement of the focus selector on the display (e.g., movement of the focus selector over at least a portion of the content).

**15** **[0215]** In some embodiments, in response (19310) to detecting the gesture: in accordance with a determination that the first contact has an intensity below a selection intensity threshold (e.g., " $IT_D$ " in Figures 8A-8D), the device scrolls (19312) the content on the display (e.g., display 450) in accordance with movement of the focus selector on the display without selecting the content. In some embodiments, the selection intensity threshold is an intensity threshold that is higher than an input-detection intensity threshold (e.g., " $IT_0$ ") at which the first contact is initially detected. In some embodiments, scrolling

**20** the content in accordance with movement of the focus selector includes scrolling the content so that it moves in a same direction as movement of the focus selector on the display (e.g., display 450) and/or movement of the contact on the touch-sensitive surface (e.g., touch-sensitive surface 451), as shown in Figures 8A and 8C. In some embodiments, scrolling the content in accordance with movement of the focus selector includes scrolling the content so that it moves in an opposite direction from movement of the focus selector on the display (e.g., display 450) and/or movement of the contact on the touch-sensitive surface (e.g., touch-sensitive surface 451), as shown in Figures 8A-8B.

**25** **[0216]** In response (19310) to detecting the gesture:

in accordance with a determination that the first contact has an intensity above the selection intensity threshold (e.g., contact 19208 has an intensity above " $IT_D$ ," as shown in Figures 8E-8K, 8Q and 8V-8W), the device selects (19314) at least a portion (e.g., portion 19214 in Figures 8F-8K, 8Q-8W, 8Y and 8AA) of the content (e.g., text 19202 in Figures 8A-8AA) in accordance with the movement of the focus selector over the content (e.g., selecting a portion of the content for cutting, copying, or other editing).

**[0217]** In some embodiments, selecting the portion (e.g., portion 19214) of the content (e.g., text 19202) in accordance with the movement of the focus selector (e.g., selection cursor 19212) over the content includes selecting (19316) the portion of the content without scrolling the content. For example, when the contact reaches the selection intensity threshold (e.g., " $IT_D$ "), the device stops scrolling the content in accordance with movement of the focus selector and begins selecting content in accordance with movement of the focus selector, as shown in Figures 8F-8G.

**[0218]** In some embodiments, the device scrolls (19318) the content (e.g., text 19202) while selecting the portion (e.g., portion 19214 of text 19202) of the content in accordance with the movement of the focus selector (e.g., selection cursor 19212) over the content. For example, even if the device stopped scrolling the content when the contact reached the selection intensity threshold, when the focus selector reaches an edge of a displayed portion of the content or the first contact reaches an edge of the touch-sensitive surface, the device scrolls the content so that additional content is displayed proximate to the first contact (e.g., by scrolling the content up if the first contact is near a bottom edge of the displayed content or scrolling the content down if the first contact is near a top edge of the displayed content), as shown in Figures 8G-8H.

**[0219]** In some embodiments, prior (19320) to detecting the contact, the device detects (19322) an increase in intensity of the first contact to a first intensity that is lower than the selection intensity threshold (e.g., an intensity that is lower than intensity threshold " $IT_D$ ," as illustrated in Figures 8M-8O). In some embodiments, the intensity of the first contact increases to the first intensity from a nominal intensity that corresponds to a minimum detectable intensity (e.g., " $IT_0$ ") that, when exceeded, indicates that a first contact is in contact with the touch-sensitive surface. In some embodiments, in response (19324) to detecting the increase in intensity of the first contact to the intensity below the selection intensity threshold (e.g., " $IT_D$ "): in accordance with a determination that the first intensity is above a cursor-preview intensity threshold (e.g. " $IT_L$ "), the device displays (19326) a preview of a cursor (e.g., preview 19216 of selection cursor 19212 in Figures 8N-8O) in the content (e.g., text 19202) at a respective location proximate to the focus selector (e.g., focus cursor 19204 in Figure 8L). In some embodiments, the focus selector (e.g., focus cursor

19204 in Figure 8L) is replaced by the preview of a cursor (e.g., preview 19216 of selection cursor 19212 replaces focus cursor 19204 in Figures 8N-8O).

**[0220]** In some embodiments, while displaying the preview of the cursor (e.g., preview 19216 of selection cursor 19212) in the content, the device detects (19328) an increase in intensity of the first contact (e.g., contact 19208 or contact 19222) from the first intensity (e.g., an intensity between " $IT_L$ " and " $IT_D$ ") to a second intensity (e.g., an intensity above " $IT_D$ "). In some embodiments, in response (19330) to detecting the increase in intensity of the first contact from the first intensity to the second intensity: in accordance with a determination that the second intensity is above a cursor-insertion intensity threshold (e.g. " $IT_D$ "), the device inserts (19332) a cursor (e.g., selection cursor 19212) in the content (e.g., as illustrated in Figure 8P). In some embodiments, in response (19330) to detecting the increase in intensity of the first contact from the first intensity to the second intensity: in accordance with a determination that the second intensity is below the cursor-insertion intensity threshold (e.g. " $IT_D$ "), the device continues (19334) to display the preview of the cursor without inserting the cursor in the content (e.g., as illustrated in Figure 8O)

**[0221]** In some embodiments, inserting the cursor (e.g., selection cursor 19212) in the content includes (19336) displaying an animation of the preview of the cursor (e.g., preview 19216 of selection cursor 19212) being replaced with the cursor. In some embodiments, the animation progresses in accordance with a change in intensity of the first contact. For example, the cursor fades in and shrinks in size, appearing to "drop" into the content at a rate by an amount corresponding to the intensity of the first contact. For example in Figures 8N-8P, the device displays an animation of preview 19216 gradually dropping into text 19202 as the intensity of contact 19208 increases.

**[0222]** In response (19324) to detecting the increase in intensity of the first contact: in accordance with a determination that the first intensity is below the cursor-preview intensity threshold (e.g., " $IT_L$ "), the device continues (19338) to display the content (e.g., text 19202) without displaying the preview of the cursor (e.g., as illustrated in Figure 8M).

**[0223]** In some embodiments, selecting the portion of the content (e.g., portion 19214 of text 19202) in accordance with movement of the focus selector (e.g., selection cursor 19212) over the content includes (19340) starting the selecting at a location in the content that corresponds to a location of the cursor. For example, in Figure 8P-8Q, selection of portion 19214 of text 19202 starts at the location of selection cursor 19212 that was placed in text 19202 in response to the increase in intensity described above with reference to Figures 8L-8O.

**[0224]** In some embodiments, selecting (19314) the portion of the content in accordance with the movement of the focus selector over the content includes (19342): determining (19344) an intensity of the first contact, se-

lecting (19346) a respective content subunit type of a plurality of content subunit types (e.g., characters, words, sentences or paragraphs) in accordance with the intensity of the first contact and adjusting (19348) the selection by adding whole content subunits of the respective sub-unit type to the selection in accordance with movement of the first contact. For example, when the contact has a lower intensity (e.g., an intensity below " $IT_D$ ," as illustrated in Figures 8X-8Y), the word type subunits are selected and the device adds to the selection by selecting whole words of the content, whereas when the contact has a higher intensity (e.g., an intensity above " $IT_D$ ," as illustrated in Figures 8Z-8AA), the character type subunits are selected and the device adds to the selection by selecting individual characters of the content, or vice versa.

**[0225]** In some embodiments, while selecting (19314) the portion of the content (e.g., portion 19214 of text 19202), the device detects (19352) a second contact (e.g., contact 19218 in Figures 8V-8W) on the touch-sensitive surface and the device detects movement (e.g., movement 19220-a in Figures 8V-8W) of the second contact across the touch-sensitive surface (e.g., touch-sensitive surface 451). In some embodiments, in response to detecting the movement of the second contact (e.g., contact 19218 in Figures 8V-8W) across the touch-sensitive surface, the device scrolls (19354) the content in accordance with the movement of the second contact (e.g., movement 19220-a of contact 19218 in Figures 8V-8W), while continuing to select the content in accordance with movement of the content relative to the focus selector on the display. For example, as shown in Figure 8W, the device continues to add to selection 19214 as content 19202 scrolls under selection cursor 19212.

**[0226]** In some embodiments, after (19356) selecting the portion of the content: the device detects (19358) a decrease in intensity of the first contact (e.g., contact 19208 or contact 19222) below the selection intensity threshold (e.g., " $IT_D$ "). For example in both Figure 8R and Figure 8T, contact 19208 decreases in intensity from an intensity above the selection intensity threshold (e.g., " $IT_D$ ") to an intensity below the selection intensity threshold (e.g., " $IT_D$ "). In some embodiments, in response (19360) to detecting the decrease in intensity of the first contact below the selection intensity threshold (e.g., " $IT_D$ "): in accordance with a determination that the intensity of the first contact is above a selection-adjustment intensity threshold (e.g., " $IT_L$ "), the device adjusts (19362) the selection (e.g., by adding and/or removing content from the selection) in accordance with subsequent movement of the first contact (e.g., contact 19208 or contact 19222) on the touch-sensitive surface (e.g., as illustrated in Figures 8R-8S). In contrast, in some embodiments, in response (19360) to detecting the decrease in intensity of the first contact below the selection intensity threshold: in accordance with a determination that the intensity of the first contact is below the selection-adjustment intensity threshold (e.g., " $IT_L$ "), the device forgoes (19364) adjustment of the selection (e.g., as illus-

trated in Figures 8T-8U). In some embodiments, ceasing to adjust the selection includes cancelling the selection. In some embodiments, ceasing to adjust the selection includes displaying an indication of the content that is selected and ceasing to adjust the content in accordance with movement of the first contact on the touch-sensitive surface (e.g., displaying a selection box around content, where the selection box is no longer adjusted in accordance with movement of the first contact).

**[0227]** It should be understood that the particular order in which the operations in Figures 9A-9E have been described is merely exemplary and is not intended to indicate that the described order is the only order in which the operations could be performed. One of ordinary skill in the art would recognize various ways to reorder the operations described herein. Additionally, it should be noted that details of other processes described herein with respect to other methods described herein (e.g., those listed in paragraph [0038]) are also applicable in an analogous manner to method 19300 described above with respect to Figures 9A-9E. For example, the contacts, gestures, user interface objects, intensity thresholds, focus selectors and animations described above with reference to method 19300 optionally have one or more of the characteristics of the contacts, gestures, user interface objects, intensity thresholds, focus selectors and animations described herein with reference to other methods described herein (e.g., those listed in paragraph [0038]). For brevity, these details are not repeated here.

**[0228]** In accordance with some embodiments, Figure 10 shows a functional block diagram of an electronic device 19400 configured in accordance with the principles of the various described embodiments. The functional blocks of the device are, optionally, implemented by hardware, software, or a combination of hardware and software to carry out the principles of the various described embodiments. It is understood by persons of skill in the art that the functional blocks described in Figure 10 are, optionally, combined or separated into sub-blocks to implement the principles of the various described embodiments. Therefore, the description herein optionally supports any possible combination or separation or further definition of the functional blocks described herein.

**[0229]** As shown in Figure 10, an electronic device 19400 includes a display unit 19402 configured to display content, a touch-sensitive surface unit 19404 configured to receive user contacts, one or more sensor units 19406 configured to detect intensity of contacts with the touch-sensitive surface unit 19404; and a processing unit 19408 coupled to the display unit 19402, the touch-sensitive surface unit 19404 and the one or more sensor units 19406. In some embodiments, the processing unit 19408 includes a display enabling unit 19410, a detecting unit 19412, a scrolling unit 19414, a selecting unit 19416, an inserting unit 19418 and an adjusting unit 19420.

**[0230]** In some embodiments, the processing unit 19408 is configured to enable display (e.g., with the display enabling unit 19410) of content on display unit

19402. In some embodiments, the processing unit 19408 is further configured, while a focus selector is over the content, to detect a gesture on the touch-sensitive surface unit 19404 (e.g., with the detecting unit 19412), the gesture including: a first contact on the touch-sensitive surface unit 19404; and movement of the first contact across the touch-sensitive surface unit 19404 that corresponds to movement of the focus selector on the display unit 19402; and in response to detecting the gesture: in accordance with a determination that the first contact has an intensity below a selection intensity threshold, the processing unit 19408 is configured to scroll the content on the display unit 19402 (e.g., with scrolling unit 19414) in accordance with movement of the focus selector on the display unit 19402 without selecting the content; and in accordance with a determination that the first contact has an intensity above the selection intensity threshold, the processing unit 19408 is configured to select at least a portion of the content (e.g., with the selecting unit 19416) in accordance with the movement of the focus selector over the content.

**[0231]** In some embodiments, the processing unit 19408 is configured to select the portion of the content (e.g., with the selecting unit 19416) without scrolling the content.

**[0232]** In some embodiments, the processing unit 19408 is configured to scroll the content (e.g., with the scrolling unit 19414) while selecting the portion of the content (e.g., with the selecting unit 19416) in accordance with the movement of the focus selector over the content.

**[0233]** In some embodiments, the processing unit 19408 is configured to, prior to selecting the portion of the content (e.g., with the selecting unit 19416), detect an increase in intensity of the first contact (e.g., with the detecting unit 19412) to a first intensity that is lower than the selection intensity threshold; and in response to detecting the increase in intensity of the first contact: in accordance with a determination that the first intensity is above a cursor-preview intensity threshold, the processing unit 19408 is configured to enable display of a preview of a cursor in the content at a respective location proximate to the focus selector (e.g., with the display enabling unit 19410); and in accordance with a determination that the first intensity is below the cursor-preview intensity threshold, the processing unit 19408 is configured to continue to enable display of the content without displaying the preview of the cursor (e.g., with the display enabling unit 19410).

**[0234]** In some embodiments, the processing unit 19408 is configured to, while displaying the preview of the cursor in the content (e.g., with the display enabling unit 19410), to detect an increase in intensity of the first contact from the first intensity to a second intensity (e.g., with the detecting unit 19412); and in response to detecting the increase in intensity of the first contact from the first intensity to the second intensity: in accordance with a determination that the second intensity is above a cursor-insertion intensity threshold, insert a cursor in the content (e.g., with the inserting unit 19418); and in accordance with a determination that the second intensity is below the cursor-insertion intensity threshold, continue to enable display of the preview of the cursor (e.g., with the display enabling unit 19410) without inserting the cursor in the content.

**[0235]** In some embodiments, the processing unit 19408 is configured to, while inserting the cursor in the content (e.g., with the inserting unit 19418), enable display of an animation of the preview of the cursor being replaced with the cursor (e.g., with the display enabling unit 19410).

**[0236]** In some embodiments, the processing unit 19408 is configured to start the selecting the portion of the content (e.g., with selecting unit 19416) at a location in the content that corresponds to a location of the cursor.

**[0237]** In some embodiments, the processing unit 19408 is configured to, after selecting the portion of the content (e.g., with selecting unit 19416), detect a decrease in intensity of the first contact below the selection intensity threshold (e.g., with the detecting unit 19412); and in response to detecting the decrease in intensity of the first contact below the selection intensity threshold: in accordance with a determination that the intensity of the first contact is above a selection-adjustment intensity threshold, the processing unit 19408 is configured to adjust the selection (e.g., with the adjusting unit 19420) in accordance with movement of the first contact on the touch-sensitive surface unit; and in accordance with a determination that the intensity of the first contact is below the selection-adjustment intensity threshold, the processing unit 19408 is configured to forgo adjustment of the selection.

**[0238]** In some embodiments, the processing unit is configured to, while selecting the portion of the content, detect a second contact on the touch-sensitive surface unit 19404 (e.g., with the detecting unit 19412) and detect movement of the second contact across the touch-sensitive surface unit 19404 (e.g., with the detecting unit 19412); and in response to detecting the movement of the second contact across the touch-sensitive surface unit 19404, the processing unit is configured to scroll the content (e.g., with the scrolling unit 19414) in accordance with the movement of the second contact, while continuing to select the content (e.g., with the selecting unit 19416) in accordance with movement of the content relative to the focus selector on the display unit 19402.

**[0239]** In some embodiments, the processing unit 19408 is configured to: determine an intensity of the first contact (e.g., with sensor(s) 19406); select a respective content subunit type of a plurality of content subunit types in accordance with the intensity of the first contact (e.g., with the selecting unit 19416); and adjust the selection by adding whole content subunits of the respective subunit type to the selection (e.g., with the adjusting unit 19420) in accordance with movement of the first contact.

**[0240]** The operations in the information processing

methods described above are, optionally implemented by running one or more functional modules in information processing apparatus such as general purpose processors (e.g., as described above with respect to Figures 1A and 3) or application specific chips.

**[0241]** The operations described above with reference to Figures 9A-9E are, optionally, implemented by components depicted in Figures 1A-1B or Figure 10. For example, detection operations 19304, 19322, 19328, 19352 and 19358, scrolling operations 19312, 19318 and 19354, selecting operations 19314 and 19346, inserting operation 19332, and adjusting operations 19348 and 19362 are, optionally, implemented by event sorter 170, event recognizer 180, and eventhandler 190. Event monitor 171 in event sorter 170 detects a contact on touch-sensitive display 112, and event dispatcher module 174 delivers the event information to application 136-1. A respective event recognizer 180 of application 136-1 compares the event information to respective event definitions 186, and determines whether a first contact at a first location on the touch-sensitive surface corresponds to a predefined event or sub-event, such as selection of an object on a user interface. When a respective predefined event or sub-event is detected, event recognizer 180 activates an event handler 190 associated with the detection of the event or sub-event. Event handler 190 optionally utilizes or calls data updater 176 or object updater 177 to update the application internal state 192. In some embodiments, event handler 190 accesses a respective GUI updater 178 to update what is displayed by the application. Similarly, it would be clear to a person having ordinary skill in the art how other processes can be implemented based on the components depicted in Figures 1A-1B.

#### Determining whether to Scroll or Enlarge Content

**[0242]** Many electronic devices have graphical user interfaces that display content (e.g., text, images, tables, document icons and/or application shortcut icons) upon which multiple operations are, optionally, performed with the same type of gesture. For example, a word processing application window, optionally, displays editable text that is, optionally, scrolled and/or magnified by a user moving a contact, e.g., on a touch sensitive surface. When this gesture overloading happens within the same application, the different operations (e.g., scrolling and magnifying) are, in some circumstances, associated with different modes of operation. Given the complexity of a user interface environment where a single gesture, optionally, corresponds to multiple operations, there is a need to provide methods and user interfaces that enable the user to more efficiently and conveniently navigate through the user interface environment.

**[0243]** The examples described below provide improved methods and user interfaces for interacting with user interface content when navigating a complex user interface environment. More specifically, these methods

and user interfaces simplify the process of switching between content scrolling and magnifying modes of operation. According to some examples described below, a content scrolling and/or magnifying mode of operation is initiated upon the detection of a gesture including a contact on a touch-sensitive surface and movement of the contact across the touch-sensitive surface corresponding to movement of a focus selector over the content. The user controls whether the gesture initiates the content scrolling and/or magnifying mode of operation through the intensity of the contact. For example, in one embodiment, a user presses down lightly (e.g., with a light press intensity) on the touch-sensitive surface to initiate a scrolling mode of operation and presses down heavily (e.g., with a deep press intensity) on the touch-sensitive surface to initiate a magnifying mode of operation, or vice versa. In some methods, the user switches modes of operation, for example, by selecting a different mode from a menu of options or making a second contact in addition to the gesture for activating the operation. Advantageously, the methods and user interfaces described below simplify the process of switching between modes of operation associated with a same gesture (e.g., scrolling and/or magnifying text) by eliminating the need for additional inputs, such as going through a menu or making an additional contact.

**[0244]** Figures 11A-11Y illustrate exemplary user interfaces for determining whether to scroll or enlarge content in accordance with some examples. The user interfaces in these figures are used to illustrate the processes described below, including the processes in Figures 12A-12C. Figures 11A-11Y include intensity diagrams that show the current intensity of the contact on the touch-sensitive surface relative to a plurality of intensity thresholds including a magnification intensity threshold (e.g., light press intensity threshold "IT<sub>L</sub>") and a cursor-insertion intensity threshold (e.g., deep press intensity threshold "IT<sub>D</sub>"). These intensity diagrams are typically not part of the displayed user interface, but are provided to aid in the interpretation of the figures.

**[0245]** In some examples, the device is an electronic device with a separate display (e.g., display 450) and a separate touch-sensitive surface (e.g., touch-sensitive surface 451). In some examples, the device is portable multifunction device 100, the display is touch-sensitive display system 112, and the touch-sensitive surface includes tactile output generators 167 on the display (Figure 1A). For convenience of explanation, the examples described with reference to Figures 11A-11Y and Figures 12A-12C will be discussed with reference to display 450 and a separate touch-sensitive surface 451, however analogous operations are, optionally, performed on a device with a touch-sensitive display system 112 in response to detecting the contacts described in Figures 11A-11Y on the touch-sensitive display system 112 while displaying the user interfaces shown in Figures 11A-11Y on the touch-sensitive display system 112; in such examples, the focus selector is, optionally: a respective

contact, a representative point corresponding to a contact (e.g., a centroid of a respective contact or a point associated with a respective contact), or a centroid of two or more contacts detected on the touch-sensitive display system 112, in place of focus cursor 19504 or editing cursor 19512.

**[0246]** Figure 11A illustrates exemplary user interface 19506 displaying text 19502 and cursor 19504. In Figure 11A, user interface 19506 is displayed on display 450 of an electronic device that also includes touch-sensitive surface 451 and one or more sensors for detecting intensity of contacts with touch-sensitive surface. In some examples, touch-sensitive surface 451 is a touch screen display that is optionally display 450 or a separate display.

**[0247]** Figures 11A-11Y illustrate various examples where cursor 19504, controlled by contact 19508 on touch-sensitive surface 451 and movement 19510 thereof, moves over at least a portion of text 19502. In response, depending on the intensity of contact 19502 detected on touch-sensitive surface 451, at least a portion of text 19502 is scrolled and/or magnified. For example, when the intensity of contact 19508 exceeds a magnification intensity threshold (e.g., light press intensity threshold "IT<sub>L</sub>"), the portion of text 19502 is magnified (e.g., a magnification loupe that includes an enlarged copy the portion of text 19502 is displayed). In contrast, when the intensity of contact 19508 does not exceed the magnification intensity threshold (e.g., "IT<sub>L</sub>"), text 19502 is scrolled without magnifying the portion of text 19502.

**[0248]** Figures 11A-11Y illustrate detection of a contact 19508, that corresponds to focus cursor 19504 or editing cursor 19512 displayed on display 450, and detection of a gesture including movement 19510 of contact 19508 (e.g., movement 19510-a of contact 19508 from location 19508-a in Figure 11A to location 19508-b in Figures 11B-11D and 11N; movement 19510-a of contact 19508 from location 19508-a in Figure 11E to location 19508-b in Figures 11F-11J; movement 19510-b of contact 19508 from location 19508-b in Figure 11G to location 19508-c in Figure 11K; and/or movement 19510-c of contact 19508 from location 19508-b in Figure 11N to location 19508-d in Figures 11O and 11V) touch-sensitive surface 451. Contact 19508 is detected at a position on touch-sensitive surface 451 corresponding to an area on display 450 occupied by focus cursor 19504 or editing cursor 19512 (e.g., contact 19508 corresponds to a focus selector on the display which is at or near a location of text 19502). In some examples, movement 19510 of contact 19508 on touch-sensitive surface 451 corresponds to movement of focus cursor 19504 or editing cursor 19512 on display 450.

**[0249]** Figures 11A-11D illustrate an example of a beginning of a gesture where contact 19508 detected on touch-sensitive surface 451, corresponds to focus cursor 19504 displayed over text 19502 on display 450, and has an intensity below the magnification intensity threshold (e.g., "IT<sub>L</sub>"). In accordance with movement 19510 of con-

tact 19508 on touch-sensitive surface 451, text 19502 is scrolled, but not magnified, because contact 19508 has an intensity below the magnification intensity threshold (e.g., "IT<sub>L</sub>").

**[0250]** Figures 11A-11C illustrate various examples where text 19502 is scrolled, but not magnified, in accordance with movement of focus cursor 19504. In some examples, as illustrated in Figure 11B, text 19502 is scrolled in the opposite direction as the movement of focus cursor 19504 on display 450. For example, in response to movement 19510 of contact 19508, corresponding to movement of focus cursor 19504 on display 450, downward from position 19508-a in Figure 11A to position 19508-b in Figure 11B on touch-sensitive surface 451, word 19502-58 of text 19502 moves upwards from position 19502-58-a in Figure 11A to position 19502-58-b in Figure 11B on display 450. In some examples, as illustrated in Figure 11C, text 19502 is scrolled in the same direction as the movement of focus cursor 19504 on display 450. For example, in response to movement 19510 of contact 19508, corresponding to movement of focus cursor 19504 on display 450, downward from position 19508-a in Figure 11A to position 19508-b in Figure 11C on touch-sensitive surface 451, word 19502-58 of text 19502 moves downward from position 19502-58-a in Figure 11A to position 19502-58-c in Figure 11C on display 450.

**[0251]** The series of Figures 11A and 11D illustrates an embodiment where text 19502 scrolls on display 450 in accordance with movement 19510 of contact 19508 on touch-sensitive surface 451, however, focus cursor 19504 does not move. For example, in response to movement 19510 of contact 19508 downward from position 19508-a in Figure 11A to position 19508-b in Figure 11D on touch-sensitive surface 451, word 19502-58 of text 19502 moves upwards from position 19502-58-a in Figure 11A to position 19502-58-b in Figure 11D on display 450, but focus cursor 19504 does not move. As such, the relative position of focus cursor 19504 in text 19502 moves in accordance with movement 19510 of contact 19508 on touch-sensitive surface 451 without cursor 19504 moving on display 450.

**[0252]** Figures 11E-11L illustrate an example of a beginning of a gesture where contact 19508 detected on touch-sensitive surface 451, corresponds to focus cursor 19504 displayed over text 19502 on display 450, and has an intensity above the magnification intensity threshold (e.g., "IT<sub>L</sub>"). In accordance with movement of cursor 19504 over text 19502, a portion of text 19502 is displayed in enlarged representation 19514 (e.g., the portion of text is magnified on the display) because contact 19508 has an intensity above the magnification intensity threshold (e.g., "IT<sub>L</sub>"). In some examples, as illustrated in Figures 11E-11L, enlarged representation 19514 of the portion of text 19502 is displayed as or in a predefined shape (e.g., a rectangle). In some examples, an enlarged representation that is enclosed in a predefined shape is called a "magnification loupe." In some examples, the

enlarged representation 19514 is displayed when the intensity of contact 19508 increases to an intensity above the magnification intensity threshold (e.g., "IT<sub>L</sub>"), even when the contact is stationary on the touch-sensitive surface 451 (e.g., the magnification loupe is displayed in response to a stationary press input), as shown in Figure 11E.

**[0253]** Figures 11E-11K illustrate various examples where a portion of text 19502 is displayed in enlarged representation 19514 (e.g., the portion of text is magnified), but text 19502 is not scrolled. For example, in accordance with the movement of focus cursor 19504 on display 450, corresponding to movement 19510 of contact 19508 from position 19508-a in Figure 11E to position 19508-b in Figures 11E-11J on touch-sensitive surface 451, a portion of text 19502 is displayed in enlarged representation 19514 (e.g., the portion of text is magnified) because the intensity of contact 19508 is above the magnification threshold (e.g., "IT<sub>L</sub>"). During the selection, word 19502-58 does not move (e.g., is not scrolled) from position 19502-58-a in Figure 11E, despite movement of focus cursor 19504 downward on display 450.

**[0254]** Figure 11F illustrates an embodiment where enlarged representation 19514-1 of a portion of text 19502 includes a portion of at least the line of text 19502 that focus cursor 19504 is displayed over. For example, as illustrated in Figure 11F, while focus cursor 19504 is displayed over the word "portion" in text 19502, enlarged representation 19514-1 displays words preceding (e.g., "dedicate" and "a") and following (e.g., "of," "that" and "field") the word "portion." In Figure 11F, focus cursor 19504 has moved and thus the enlarged text within enlarged representation 19514-1 has changed to represent text at the location of focus cursor 19504 in Figure 11F.

**[0255]** Figures 11G-11H illustrate an embodiment where enlarged representation 19514 of a portion of text 19502 includes portions of at least three horizontal lines of text 19502 displayed concurrently. For example, as illustrated in Figure 11G, while focus cursor 19504 is displayed over the word "portion" in text 19502, enlarged representation 19514 displays words preceding (e.g., "dedicate" and "a") and following (e.g., "of," "that" and "field") the word "portion," as well as portions of the lines immediately above (e.g., "a great battle-field of that war.") and below (e.g., "ce for those who here gave th") the line of text 19502 in which "portion" is found.

**[0256]** Figure 11H illustrates an embodiment where enlarged representation 19514 of a portion of text 19502 is displayed over (e.g., covers) the portion of text 19502 magnified from the pre-contact display. For example, as illustrated in Figure 11G, text 19502 is displayed on display 450 at a first size. Upon magnification of a portion of text 19502 that includes the word "portion" at a second, larger, size (e.g., in enlarged representation 19514), the magnified portion of text 19502 displayed at the first, smaller, size is no longer visible. In contrast, Figure 11G illustrates an embodiment where enlarged representation 19514 of a portion of text 19502 is not displayed over

(e.g., is not covering) the portion of text 19502 magnified from the pre-contact display (e.g., the text shown in Figure 11A).

**[0257]** Figures 11F and 11I-11J illustrate various examples where the size of enlarged representation 19514 of a portion of text 19502 is determined based on the intensity of contact 19508. For example, as illustrated in Figure 11F, when contact 19508 on touch-sensitive surface 451, corresponding to focus cursor 19504 positioned over a portion of text 19502 on display 450, has an intensity above the magnification intensity threshold (e.g., "IT<sub>L</sub>"), enlarged representation 19514 includes a portion of the line of text 19502 over which focus cursor 19504 is positioned and is displayed at a magnified size 19514-1. In contrast, when contact 19508 in Figure 11I has a greater intensity than contact 19508 in Figure 11F, enlarged representation 19514 is displayed at a magnified size 19514-2 that is greater than magnified size 19514-1, as shown in Figure 11I (e.g., enlarging the magnification loupe includes increasing the size of the text that is included in the magnification loupe). In some examples, when contact 19508 in Figure 11J has a greater intensity than contact 19508 in Figure 11F, enlarged representation 19514 includes a portion of the line of text 19502 over which focus cursor 19504 is positioned, as well as portions of the lines immediately above and below the line of text 19502 over which focus cursor 19504 is positioned, as shown in Figure 11J (e.g., enlarging the magnification loupe includes expanding the quantity of text that is included in the magnification loupe).

**[0258]** The series of Figures 11E and 11M illustrate an embodiment where a portion of text 19502 is magnified while text 19502 is scrolled, but focus cursor 19504 does not move on display 450. For example, text 19502 scrolls on display 450 in accordance with movement 19510 of contact 19508 from position 19508-a in Figure 11E to position 19508-b in Figure 11M on touch-sensitive surface 451 (e.g., word 19502-58 is scrolled from position 19502-58-a in Figure 11E to position 19502-b in Figure 11M on display 450). In accordance with the change (e.g., movement) of the relative position of focus cursor 19504 in text 19502, despite the lack of movement of focus cursor 19504 on display 450, the portion of text 19502 is displayed in enlarged representation 19514 because contact 19508 has an intensity above the magnification intensity threshold (e.g., "IT<sub>L</sub>").

**[0259]** The series of Figures 11E and 11N illustrate an embodiment where a portion of text 19502 is magnified while text 19502 is scrolled. For example, a portion of text 19502 is displayed in enlarged representation 19514 in accordance with movement of focus cursor 19504 on display 450, corresponding to movement of contact 19508 from position 19508-a in Figure 11E to position 19508-b in Figure 11N, because the intensity of contact 19508 is above the magnification intensity threshold (e.g., "IT<sub>L</sub>"). During the magnification, word 19502-58 moves (e.g., is scrolled) from position 19502-58-a in Figure 11E to position 19502-b in Figure 11N on display

450, in accordance with movement of focus cursor 19504 downward on display 450.

**[0260]** The series of Figures 11E, 11G, 11K and 11L illustrate an embodiment where a portion of text 19502 is magnified, but text 19502 is only scrolled when additional text is prompted to be displayed. For example, in accordance with movement of focus cursor 19504 on display 450, corresponding to movement 19510 of contact 19508 from position 19508-a in Figure 11E, through position 19508-b in Figure 11G, to position 19508-c in Figure 11K on touch-sensitive surface 451, a portion of text 19502 is displayed in enlarged representation 19514 (e.g., is magnified) because the intensity of contact 19508 is above the magnification intensity threshold (e.g., " $IT_L$ "), but text 19502 is not scrolled on display 450. In response to focus cursor 19504 reaching an edge of displayed text 19502 in Figure 11K, text 19502 is scrolled upwards (e.g., word 19502-58 is scrolled from position 19502-58-a in Figure 11K to position 19502-b in Figure 11L on display 450) so that additional text is displayed proximate to focus cursor 19504. In some examples, as illustrated in Figure 11L, when contact 19508 is maintained at an intensity above the magnification intensity threshold (e.g., " $IT_L$ ") at position 19508-c on touch-sensitive surface 451, corresponding to a position proximal to an edge of displayed text 19502, scrolling of text 19502 is continued despite the lack of movement of contact 19508. In some examples, the speed at which text 19502 is scrolled is determined in accordance with an intensity of contact 19508 (e.g., as intensity of contact 19508 increases, the speed of scrolling text 19502 increases).

**[0261]** The series of Figures 11A-11B and 11N-11O illustrate an embodiment where text 19502 is initially scrolled, but not magnified, in accordance with movement of focus cursor 19504, corresponding to movement of contact 19508 having an intensity below a magnification intensity threshold (e.g., " $IT_L$ "), as shown in Figures 11A-11B. Following an increase in the intensity of contact 19508 to an intensity above the magnification intensity threshold (e.g., " $IT_L$ "), scrolling of text 19502 is stopped and a portion of text 19502 is displayed in enlarged representation 19514 (e.g., is magnified) in accordance with subsequent movement of contact 19508. For example, when the intensity of contact 19508 is increased at position 19508-b from an initial intensity below a magnification intensity threshold (e.g., " $IT_L$ ") in Figure 11B to a subsequent intensity above the magnification intensity threshold (e.g., " $IT_L$ ") in Figure 11N, scrolling of text 19502 is stopped (e.g., word 19502-58 does not move from position 19502-58-b in Figures 11N-11O, despite continued movement of contact 19508 to position 19508-c in Figure 11O) and a portion of text 19502 is displayed in enlarged representation 19514 in accordance with movement of contact 19508 from position 19508-b in Figure 11N to position 19508-c in Figure 11O on touch-sensitive surface 451.

**[0262]** Figures 11O-11R illustrate various examples where, in response to detecting an increase in the inten-

sity of the contact, an editing cursor 19512 is placed in text 19502 at a location corresponding to the location of focus cursor 19504. For example, in response to detecting an increase of the intensity of contact 19508 on touch-sensitive surface 451, corresponding to focus cursor 19504 on display 450, from an intensity below a cursor-insertion intensity threshold (e.g., deep press intensity threshold " $IT_D$ "), as illustrated in Figure 11O, to an intensity above the cursor-insertion intensity threshold (e.g., " $IT_D$ "), as illustrated in Figure 11P, editing cursor 19512 is placed in the text displayed within enlarged representation 19514 at location 19512-2 on display 450, corresponding to location 19504-1 of focus cursor 19504 in text 19502 (e.g., between the letters "h" and "e" in the word "The"). Figure 11Q illustrates an embodiment, where focus cursor 19504 is replaced with an editing cursor 19512 at location 19512-1 on display 450, corresponding to location 19504-1 of focus cursor 19504 in text 19502 (e.g., between the letters "h" and "e" in the word "The") in Figure 11Q. In contrast, Figure 11R illustrates an embodiment where, in response to an increase of the intensity of contact 19508 on touch-sensitive surface 451, corresponding to focus cursor 19504 on display 450, from an intensity below a cursor-insertion intensity threshold (" $IT_D$ "), as illustrated in Figure 11O, to a greater intensity that is still below cursor-insertion intensity threshold (e.g., " $IT_D$ "), as illustrated in Figure 11R, a editing cursor is not placed in the text.

**[0263]** Figures 11S-11T illustrate various examples where, prior to placing an editing cursor into the enlarged representation 19514 of text 19502, preview 19516 of an editing cursor 19512 is displayed. For example, in response to an increase of the intensity of contact 19508 on touch-sensitive surface 451, corresponding to focus cursor 19504 on display 450, from an intensity below the cursor-insertion intensity threshold (e.g., " $IT_D$ "), as illustrated in Figure 11O, to a greater intensity that is still below cursor-insertion intensity threshold (e.g., " $IT_D$ "), as illustrated in Figure 11S, preview 19516 of editing cursor 19512 is placed in the text displayed within enlarged representation 19514 at a location corresponding to location 19504-1 of focus cursor 19504 in text 19502 (e.g., between the letters "h" and "e" in the word "The").

**[0264]** The series of Figures 11O, 11S and 11P illustrates an embodiment where editing cursor 19512 is placed in enlarged representation 19514 of text 19502 when the intensity of contact 19508 is further increased. For example, while preview 19516 of editing cursor 19512 is displayed in Figure 11S, in response to a subsequent increase in the intensity of contact 19508 on touch-sensitive surface 451 to an intensity above a cursor-insertion intensity threshold (e.g., " $IT_D$ "), as illustrated in Figure 11P, editing cursor 19512 is placed in enlarged representation 19514 of text 19502 at a position on display 450 previously occupied by preview 19516 of editing cursor 19512.

**[0265]** The series of Figures 11O, 11S, 11T and 11P illustrates an embodiment where an animation is shown

during replacement of preview 19516 of editing cursor 19512 with editing cursor 19512. For example, while preview 19516 of editing cursor 19512 is displayed at size 19516-1 on display 450 in Figure 11S, in response to a subsequent increase in the intensity of contact 19508 on touch-sensitive surface 451 to a greater intensity that is still below the cursor-insertion intensity threshold (e.g., " $IT_D$ "), as illustrated in Figure 11T, preview 19516 of editing cursor 19512 is shrunk to size 19516-2. In response to a further increase in the intensity of contact 19508 on touch-sensitive surface 451 to an intensity above the cursor-insertion intensity threshold (e.g., " $IT_L$ "), as illustrated in Figure 11P, editing cursor 19512 is placed in enlarged representation 19514 of text 19502 at a position on display 450 previously occupied by preview 19516 of editing cursor 19512, giving the impression that preview 19516 of editing cursor 19512 gradually "drops" into representation 19514 of text 19502 in accordance with the increase in intensity of contact 19508 from Figure 11O to Figure 11P.

**[0266]** Figures 11U-11Y illustrate various examples where user interface 19506 is conditionally activated for adjustment of displayed text 19502 upon liftoff of contact 19508 from touch-sensitive surface 451. For example, in response to detection of liftoff of contact 19508 from touch-sensitive surface 451, user interface 19506 is activated to perform one of a plurality of adjustment functionalities, dependent upon the movement intensity profile of contact 19508 prior to liftoff (e.g., immediately prior to detecting liftoff of the contact or at a predefined time prior to detecting liftoff of the contact).

**[0267]** The series of Figures 11E, 11N, 11O and 11U illustrates an embodiment where in response to liftoff of contact 19508, where contact 19508 had a maximum intensity prior to liftoff below the cursor-insertion intensity threshold (e.g., " $IT_D$ "), text 19502 is displayed on display 450 without placing an editing cursor into the text. For example, in response to detecting liftoff of a gesture including contact 19508, movement 19510-a from position 19508-a in Figure 11E to position 19508-b in Figure 11N and movement 19510-c from position 19508-b in Figure 11N to position 19508-d in Figure 11O, corresponding to movement of focus cursor 19504 over text 19502 on display 450, having a maximum intensity above the magnification intensity threshold (e.g., " $IT_L$ ") and below the cursor-insertion intensity threshold (e.g., " $IT_D$ "), display of text 19502 on display 450 is continued without inserting an editing cursor into text 19502, as illustrated in Figure 11U.

**[0268]** The series of Figures 11E, 11N, 11V and 11W illustrates an embodiment where in response to liftoff of contact 19508, where contact 19508 had a maximum intensity prior to liftoff above the cursor-insertion intensity threshold (e.g., " $IT_D$ "), editing cursor 19512 is placed in text 19502. For example, in response to detecting liftoff of a gesture including contact 19508, movement 19510-a from position 19508-a in Figure 11E to position 19508-b in Figure 11N and movement 19510-c from position

19508-b in Figure 11N to position 19508-d in Figure 11V, corresponding to movement of focus cursor 19504 over text 19502 on display 450, having a maximum intensity above the magnification intensity threshold (e.g., " $IT_L$ ") and above the cursor-insertion intensity threshold (e.g., " $IT_D$ ") as shown in Figure 11V, editing cursor 19512 is placed in text 19502 at a position on display 450 previously occupied by focus cursor 19504, as illustrated in Figure 11W.

**[0269]** The series of Figures 11E, 11N, 11O and 11X illustrates an embodiment where in response to liftoff of contact 19508, where contact 19508 had a maximum intensity prior to liftoff below the cursor-insertion intensity threshold (e.g., " $IT_D$ "), portion 19518 of text 19502 is selected. For example, in response to detecting liftoff of a gesture including contact 19508, movement 19510-a from position 19508-a in Figure 11E to position 19508-b in Figure 11N and movement 19510-c from position 19508-b in Figure 11N to position 19508-d in Figure 11O, corresponding to movement of focus cursor 19504 over text 19502 on display 450, having a maximum intensity above the magnification intensity threshold (e.g., " $IT_L$ ") and below the cursor-insertion intensity threshold (e.g., " $IT_D$ "), portion 19518 of text 19502 is selected, as illustrated in Figure 11X. Figure 11X illustrates an embodiment where, in response to liftoff of contact 19508, a keyboard input element is not displayed. Figure 11X also illustrates an embodiment where, in response to liftoff of contact 19508, user interface menu 19520, including selectable affordances for cutting, copying and pasting text, is displayed on display 450. In some examples user interface menu 19520 enables the user to cut or copy the selected text or replace the selected text with pasted text from a virtual clipboard by activating virtual buttons on the menu (e.g., performing tap inputs or press inputs while a focus selector is over virtual buttons on the menu).

**[0270]** The series of Figures 11E, 11N, 11V and 11Y illustrates an embodiment where in response to liftoff of contact 19508, where contact 19508 had a maximum intensity prior to liftoff above the cursor-insertion intensity threshold (e.g., " $IT_D$ "), editing cursor 19512 is placed in text 19502 and keyboard input element 19522 is displayed. For example, in response to detecting liftoff of a gesture including contact 19508, movement 19510-a from position 19508-a in Figure 11E to position 19508-b in Figure 11N and movement 19510-c from position 19508-b in Figure 11N to position 19508-d in Figure 11V, corresponding to movement of focus cursor 19504 over text 19502 on display 450, having a maximum intensity above the magnification intensity threshold (e.g., " $IT_L$ ") and above the cursor-insertion intensity threshold (e.g., " $IT_D$ ") as shown in Figure 11V, editing cursor 19512 is placed in text 19502 at a position on display 450 previously occupied by focus cursor 19504 and keyboard input element 19522 is displayed on display 450, as illustrated in Figure 11Y. In some examples keyboard input element 19522 enables the user to type out text and/or delete text at the location of editing cursor 19512 by activating virtual

buttons/keys on the keyboard (e.g., performing tap inputs or press inputs while a focus selector is over virtual buttons/keys on the keyboard).

**[0271]** In some examples, the enlarged representation of the portion of the text (e.g., the "magnification loupe") is displayed in accordance with an enlarged-representation mode, where: when the enlarged-representation mode (e.g., "loupe-display mode") is enabled, the enlarged representation of the portion of the text is displayed without regard to a current intensity of the contact; and when the enlarged-representation mode is not enabled, the enlarged representation of the portion of the text is not displayed or is displayed only when the current intensity of the contact is above a enlarged-representation display intensity threshold (e.g.,  $IT_L$ ). For example, when not in the enlarged-representation mode, if the user reduces the intensity of the contact corresponding to the enlarged representation below the enlarged-representation display intensity threshold (e.g.,  $IT_L$ ), or lifts the contact off of the touch-sensitive surface, and the device will cease to display the enlarged representation of the portion of the text (e.g., as shown in Figures 11T and 11U where enlarged representation 19514 ceases to be displayed after detecting liftoff of contact 19508). In contrast, when in the enlarged-representation mode, even if the user reduces the intensity of the contact corresponding to the enlarged-representation below the enlarged-representation display intensity threshold (e.g.,  $IT_L$ ), or lifts the contact off of the touch-sensitive surface, the device will continue to display the enlarged representation of the portion of the text (e.g., if the device were in the enlarged-representation mode, in Figures 11T enlarged representation 19514 would continue to be displayed on display 450 even if the intensity of contact 19508 decreased below  $IT_L$  or was lifted off of touch-sensitive surface 451). Thus, in some situations the device displays an enlarged representation and enters the enlarged-representation mode in response to detecting an increase in intensity of a first contact (e.g., above a mode-change intensity threshold such as  $IT_D$ ) and then, after ceasing to detect the first contact, detects a second contact corresponding to a focus selector at or near the location of the enlarged representation and subsequently moves the enlarged representation (e.g., that was displayed in response to the increase in intensity of the first contact) in accordance with movement of the second contact on the touch-sensitive surface.

**[0272]** In some examples, the enlarged representation is displayed when the intensity of a contact increases over a enlarged-representation display intensity threshold (e.g.,  $IT_L$ ), as shown in Figures 11A and 11E, without enabling the enlarged-representation mode and while the enlarged representation continues to be displayed, the device detects an increase in intensity of the contact over a mode-change intensity threshold (e.g.,  $IT_D$ ) that is higher than the enlarged-representation display intensity threshold (e.g.,  $IT_L$ ) and enters the enlarged-representation mode in response to detecting the increase in

intensity of the contact over the mode-change intensity threshold (e.g.,  $IT_D$ ). In some examples a size of the enlarged representation gradually increases as the intensity of the contact increases from the enlarged-representation display intensity threshold (e.g.,  $IT_L$ ) to the mode-change intensity threshold (e.g.,  $IT_D$ ). In some examples, the enlarged-representation display intensity threshold is different from (and lower than) the mode-change intensity threshold, as described above. In some examples, the enlarged-representation display intensity threshold is the same as (or substantially the same as) the mode-change intensity threshold. Thus, in some examples, the enlarged representation is displayed and the enlarged-representation mode is enabled in response to detecting an increase in intensity of a contact above a same intensity threshold (e.g., a combined intensity threshold such as either  $IT_L$  or  $IT_D$ ).

**[0273]** Thus, in some examples, the device enters the enlarged-representation mode in response to detecting a first press input including an increase in intensity of a contact from an intensity below a mode-change intensity threshold (e.g.,  $IT_D$ ) to an intensity above the mode-change intensity threshold. In some examples, the device exits the enlarged-representation mode in response to detecting a second press input corresponding to a focus selector at or near a location of the enlarged representation on the display, where the second press input includes an increase in intensity of a contact from an intensity below the mode-change intensity threshold to an intensity above the mode-change intensity threshold (e.g.,  $IT_D$ ). For example, a user of the device can request semi-permanent display of a magnification loupe by performing a deep press input (e.g., increasing the intensity of a contact above  $IT_D$ ) and can move the magnification loupe on the display by moving one or more contacts, with an intensity below the mode-change intensity threshold (e.g.,  $IT_D$ ), on the touch-sensitive surface that have an intensity below the mode-change intensity threshold (e.g.,  $IT_D$ ). In this example, when the user performs a second deep press input (e.g., with the same contact or a different contact from the contact that was used to perform the first press input) corresponding to a focus selector at or near a location of the enlarged representation on the display, the device exits the enlarged-representation mode and, when a contact drops below an enlarged-representation display intensity threshold (e.g.,  $IT_L$ ), the device ceases to display the enlarged representation.

**[0274]** Figures 12A-12C are flow diagrams illustrating a method 19600 of determining whether to scroll or enlarge content in accordance with some examples. The method 19600 is performed at an electronic device (e.g., device 300, Figure 3, or portable multifunction device 100, Figure 1A) with a display and a touch-sensitive surface. In some examples, the display is a touch screen display and the touch-sensitive surface is on the display. In some examples, the display is separate from the touch-sensitive surface. Some operations in method 19600 are,

optionally, combined and/or the order of some operations is, optionally, changed.

**[0275]** As described below, the method 19600 provides an intuitive way to interact with user interface content. The method reduces the cognitive burden on a user when determining whether to scroll or enlarge content, thereby creating a more efficient human-machine interface. For battery-operated electronic devices, enabling a user to interact with user interface content faster and more efficiently conserves power and increases the time between battery charges.

**[0276]** In some examples, the device displays (19602), on a display (e.g., display 450), content at a first size (e.g. text 19502 in Figures 11A-11Y). In some examples, the content includes text, one or more images and/or more or more tables. In some examples, the content is selectable content that is configured to be selected and once selected can be copied, deleted or modified in accordance with input from a user of the device (e.g., text in a word processing application window, numbers in a spreadsheet application window, document icons in a folder application window, images in photography application window, music file icons in an audio player application window, video file icons in a video player application window, application shortcut icons displayed on a desktop).

**[0277]** In some examples, while a focus selector (e.g., focus cursor 19504 in Figures 11A-11P and 11R-11V or editing cursor 19512 in Figures 11Q, 11W and 11Y) is over the content, the device detects (19604) a gesture on a touch-sensitive surface (e.g., touch-sensitive surface 451), the gesture including a contact (e.g., contact 19508 in Figures 11A-11Y) on the touch-sensitive surface (19606) and movement (e.g., movement 19510 of contact 19508 in Figures 11A-11Y) of the contact across the touch-sensitive surface that corresponds to movement of the focus selector over the content on the display (19608) (e.g., movement of the focus selector over at least a portion of the content).

**[0278]** In some examples, in response (19610) to detecting the gesture: in accordance with a determination that the contact has an intensity below a first intensity threshold (e.g., light press intensity threshold "IT<sub>L</sub>" in Figures 11A-11D), the device scrolls (19612) the content on the display (e.g., display 450) in accordance with movement of the focus selector on the display while maintaining display of the content at the first size, as shown in Figures 11A-11D. In some examples, the first intensity threshold is an intensity threshold that is higher than an input-detection intensity threshold (e.g., contact-detection intensity threshold IT<sub>0</sub>) at which the contact is initially detected. In some examples, scrolling the content in accordance with movement of the focus selector includes scrolling the content so that it moves in a same direction as movement of the focus selector on the display (e.g., display 450) and/or movement of the contact on the touch-sensitive surface (e.g., touch-sensitive surface 451) as shown in Figures 11A and 11C. In some exam-

5 ples, scrolling the content in accordance with movement of the focus selector includes scrolling the content so that it moves in an opposite direction from movement of the focus selector on the display (e.g., display 450) and/or movement of the contact on the touch-sensitive surface (e.g., touch-sensitive surface 451) as shown in Figures 11A-11B.

**[0279]** In response (19610) to detecting the gesture: in accordance with a determination that the contact has an intensity above the first intensity threshold (e.g., light press intensity threshold "IT<sub>L</sub>" in Figures 11E-11T and 11V), the device displays (19614) an enlarged representation (e.g., enlarged representation 19514 in Figures 11E-11T and 11V) of a portion of the content (e.g., text 19502) corresponding to a location of the focus selector in the content, where the enlarged representation is displayed at a second size larger than the first size. In some examples, the content is text, the first size is a first font size and the second size is a second font size that is larger than the first font size. In some examples, the enlarged representation of the portion of the content (e.g., enlarged representation 19514 of portions of text 19502) is displayed (19616) in a predefined shape (e.g., in a virtual loupe shaped like a rectangle, square, oval or circle), as shown in Figure 11E. In some examples, the enlarged representation of the portion of the content (e.g., enlarged representation 19514 of portions of text 19502) includes (19618) portions of at least three horizontal lines of text displayed concurrently (e.g., as illustrated in Figures 11G-11H, 11J-11T and 11V).

**[0280]** In some examples, while displaying the enlarged representation of the portion of the content (e.g., enlarged representation 19514 of portions of text 19502), the device ceases (19620) to display the portion of the content at the first size (e.g., the virtual loupe covers the portion of the content, as illustrated in Figure 11H). In some examples, a size of the enlarged representation is determined (19622) based on the intensity of the contact (e.g., a harder press input increases a size of the virtual loupe). In some examples, as the size of the enlarged representation increases, the font size of the text increases along with the enlarged representation so that the text in the enlarged representation is larger (e.g., as illustrated in Figures 11F and 11I). In some examples, as the size of the enlarged representation increases, the font size of the text in the enlarged representation stays the same, so that the amount of text shown in the enlarged representation increases (e.g., more characters are displayed in the enlarged representation, as illustrated in Figures 11F and 11J).

**[0281]** In some examples, the device scrolls (19624) the content (e.g., text 19502) while displaying the enlarged representation (e.g., enlarged representation 19514) of a portion of the content. For example, when the focus selector reaches an edge of a displayed portion of the content or the first contact reaches an edge of the touch-sensitive surface, the device scrolls the content so that additional content is displayed proximate to the first

contact (e.g., by scrolling the content up if the first contact is near a bottom edge of the displayed content, as illustrated in the series of Figures 11K-11L, or scrolling the content down if the first contact is near a top edge of the displayed content).

**[0282]** In some examples, the device displays (19626) the enlarged representation of a portion of the content (e.g., enlarged representation 19514 of text 19502) without scrolling the content. For example, when the contact has an intensity above the first intensity threshold (e.g., " $IT_L$ "), the device stops scrolling the content in accordance with movement of the focus selector and begins displaying an enlarged portion of the content that changes in accordance with movement of the focus selector (e.g., as illustrated in the series of Figures 11A-11B and 11N-11O).

**[0283]** In some examples, the device detects (19628) an increase in intensity of the contact on the touch-sensitive surface. In some examples, in response (19630) to detecting the increase in intensity of the contact, in accordance with a determination that the contact has an intensity above a second intensity threshold (e.g., a cursor-insertion intensity threshold corresponding to deep press intensity threshold " $IT_D$ " in Figures 11P-11Q and 11V) higher than the first intensity threshold (e.g., magnification intensity threshold corresponding to light press intensity threshold " $IT_L$ "), the device places (19632) a cursor (e.g., editing cursor 19512 in Figures 11P-11Q, 11V-11W and 11Y) in the content at a location corresponding to the location of the focus selector (e.g., focus cursor 19504) in the content.

**[0284]** In some examples, prior to placing the cursor (e.g., editing cursor 19512 in Figures 11P-11Q, 11V-11W and 11Y) in the content, the device displays (19634) a preview of the cursor (e.g., preview 19516 of editing cursor 19512 in Figures 11S-11T) in the enlarged representation of the portion of the content (e.g., enlarged representation 19514 of a portion of text 19502). In some examples, the preview of the cursor is displayed when the contact has intensity between a cursor-preview intensity threshold (e.g., " $IT_L$ " or a hysteresis intensity threshold associated with and below  $IT_D$ ) and a cursor-insertion intensity threshold (e.g., " $IT_D$ ").

**[0285]** In some examples, in response (19630) to detecting the increase in intensity of the contact, in accordance with a determination that the contact has an intensity below the second intensity (e.g., cursor-insertion intensity " $IT_D$ "), the device continues (19636) to display the enlarged representation of the portion of the content (e.g., enlarged representation 19514 of a portion of text 19502) without placing the cursor in the content.

**[0286]** In some examples, the device detects (19638) liftoff of the contact (e.g., contact 19508 on touch-sensitive surface 451, as illustrated in Figures 11U and 11W-11Y). For example, in some examples, liftoff of the contact is detected after displaying a preview of a cursor (e.g., preview 19516 of editing cursor 19512) in the content (e.g., text 19502) or enlarged representation of the

portion of the content (e.g., enlarged representation 19514 of text 19502) on the display.

**[0287]** In some examples, in response (19640) to detecting liftoff of the contact (e.g., contact 19508), in accordance with a determination that the contact had a maximum intensity between the first intensity threshold (e.g., magnification intensity threshold " $IT_L$ " or a cursor-preview intensity threshold) and a second intensity threshold (e.g., cursor-insertion intensity threshold " $IT_D$ ") prior to detecting liftoff of the contact, the device continues (19642) to display the content (e.g., text 19502) without placing a cursor in the content, as shown in Figure 11U. In some examples, in response (19640) to detecting liftoff of the contact, in accordance with a determination that the contact had a maximum intensity between the first intensity threshold (e.g., magnification intensity threshold " $IT_L$ " or a cursor-preview intensity threshold) and the second intensity threshold (e.g., cursor-insertion intensity threshold " $IT_D$ ") prior to detecting liftoff of the contact, the device selects (19644) a portion of the content without displaying a keyboard input element (e.g., selects a word closest to the focus selector upon liftoff, such as word "The," selection 19518, and displays a cut/copy/paste user interface 19520, as illustrated in Figure 11X).

**[0288]** In response (19640) to detecting liftoff of the contact (e.g., contact 19508), in accordance with a determination that the contact had a maximum intensity above the second intensity threshold (e.g., cursor-insertion intensity threshold " $IT_D$ ") prior to detecting liftoff of the contact, the device places (19646) a cursor (e.g., editing cursor 19512) in the content at a location proximate to a location of the focus selector (e.g., focus cursor 19504) on the display (e.g., display 450). In some examples, in response (19640) to detecting liftoff of the contact, in accordance with a determination that the contact had a maximum intensity above the second intensity threshold (e.g., cursor-insertion intensity threshold " $IT_D$ ") prior to detecting liftoff of the contact, the device displays (19648) a keyboard input element (e.g., keyboard input element 19524 in Figure 11Y) enabling insertion and/or deletion of text at the location of the cursor (e.g., editing cursor 19512) in the content (e.g., text 19502).

**[0289]** It should be understood that the particular order in which the operations in Figures 12A-12C have been described is merely exemplary and is not intended to indicate that the described order is the only order in which the operations could be performed. One of ordinary skill in the art would recognize various ways to reorder the operations described herein. Additionally, it should be noted that details of other processes described herein with respect to other methods described herein (e.g., those listed in paragraph [0038]) are also applicable in an analogous manner to method 19600 described above with respect to Figures 12A-12C. For example the contacts, gestures, user interface objects, intensity thresholds, focus selectors and animations described above with reference to method 19600 optionally have one or

more of the characteristics of the contacts, gestures, user interface objects, intensity thresholds, focus selectors and animations described herein with reference to other methods described herein (e.g., those listed in paragraph [0038]). For brevity, these details are not repeated here.

**[0290]** In accordance with some examples, Figure 13 shows a functional block diagram of an electronic device 19700 configured in accordance with the principles of the various described examples. The functional blocks of the device are, optionally, implemented by hardware, software, or a combination of hardware and software to carry out the principles of the various described examples. It is understood by persons of skill in the art that the functional blocks described in Figure 13 are, optionally, combined or separated into sub-blocks to implement the principles of the various described examples. Therefore, the description herein optionally supports any possible combination or separation or further definition of the functional blocks described herein.

**[0291]** As shown in Figure 13, an electronic device 19700 includes a display unit 19702 configured to display content, a touch-sensitive surface unit 19704 configured to receive user contacts, one or more sensor units 19706 configured to detect intensity of contacts with the touch-sensitive surface unit 19704; and a processing unit 19708 coupled to the display unit 19702, the touch-sensitive surface unit 19704 and the one or more sensor units 19706. In some examples, the processing unit 19708 includes a display enabling unit 19710, a detecting unit 19712, a scrolling unit 19714, a selecting unit 19716, a placing unit 19718, and a ceasing unit 19720, and a determining unit 19722.

**[0292]** In some examples, the processing unit 19708 is configured to enable display (e.g., with the display enabling unit 19710) of content at a first size on the display unit 19702. In some examples, the processing unit 19708 is further configured, while a focus selector is over the content, to detect a gesture on a touch-sensitive surface unit 19704 (e.g., with the detecting unit 19712), the gesture including: a contact on the touch-sensitive surface unit 19704 and movement of the contact across the touch-sensitive surface unit 19704 that corresponds to movement of the focus selector over the content on the display unit 19702; and in response to detecting the gesture: in accordance with a determination (e.g., with the determining unit 19722) that the contact has an intensity below a first intensity threshold (e.g., "IT<sub>L</sub>"), the processing unit 19708 is configured to scroll the content on the display unit 19702 (e.g., with the scrolling unit 19714) in accordance with movement of the focus selector on the display unit 19702 while maintaining display of the content at the first size (e.g., with the display enabling unit 19710); and in accordance with a determination that the contact has an intensity above the first intensity threshold, the processing unit 19708 is configured to display an enlarged representation of a portion of the content corresponding to a location of the focus selector in the content (e.g., with the display enabling unit 19710),

where the enlarged representation is displayed at a second size larger than the first size.

**[0293]** In some examples, the processing unit 19708 is configured to enable display of the enlarged representation of the portion of the content in a predefined shape (e.g., with the display enabling unit 19710).

**[0294]** In some examples, the enlarged representation of the portion of the content includes portions of at least three horizontal lines of text displayed concurrently.

**[0295]** In some examples, the processing unit 19708 is configured to, while enabling display of the enlarged representation of the portion of the content (e.g., with the display enabling unit 19710), cease to enable display of the portion of the content at the first size (e.g., with the ceasing unit 19720).

**[0296]** In some examples, the processing unit 19708 is configured to determine a size of the enlarged representation based on the intensity of the contact (e.g., with the determining unit 19722).

**[0297]** In some examples, the processing unit 19708 is configured to scroll the content (e.g., with the scrolling unit 19714) while enabling display of the enlarged representation of a portion of the content (e.g., with the display enabling unit 19710).

**[0298]** In some examples, the processing unit 19708 is configured to enable display of the enlarged representation of a portion of the content (e.g., with the display enabling unit 19710) without scrolling the content.

**[0299]** In some examples, the processing unit is further configured to detect an increase in intensity of the contact (e.g., with the detecting unit 19712) on the touch-sensitive surface unit 19704; and in response to detecting the increase in intensity of the contact: in accordance with a determination (e.g., with the determining unit 19722) that the contact has an intensity above a second intensity threshold (e.g., "IT<sub>D</sub>") higher than the first intensity threshold, the processing unit 19708 is configured to place a cursor in the content at a location corresponding to the location of the focus selector in the content (e.g., with the placing unit 19718); and in accordance with a determination that the contact has an intensity below the second intensity, the processing unit is configured to continue enabling display of the enlarged representation of the portion of the content (e.g., with the display enabling unit 19710) without placing the cursor in the content.

**[0300]** In some examples, the processing unit 19708 is configured to, prior to placing the cursor in the content (e.g., with the placing unit 19718), enable display of a preview of the cursor in the enlarged representation of the portion of the content (e.g., with the display enabling unit).

**[0301]** In some examples, the processing unit 19708 is further configured to detect liftoff of the contact (e.g., with the detecting unit 19712) and in response to detecting liftoff of the contact: in accordance with a determination (e.g., with the determining unit 19722) that the contact had a maximum intensity between the first intensity threshold and a second intensity threshold prior to de-

etecting liftoff of the contact, the processing unit is configured to continue enabling display of the content without placing a cursor in the content (e.g., with the display enabling unit 19710); and in accordance with a determination that the contact had a maximum intensity above the second intensity threshold prior to detecting liftoff of the contact, the processing unit 19708 is configured to place a cursor in the content at a location proximate to a location of the focus selector on the display unit 19702 (e.g., with the placing unit 19718).

**[0302]** In some examples, in response to detecting liftoff of the contact (e.g., with the detecting unit 19712), in accordance with a determination (e.g., with the determining unit 19722) that the contact had a maximum intensity between the first intensity threshold and the second intensity threshold prior to detecting liftoff of the contact, the processing unit 19708 is configured to select a portion of the content without displaying a keyboard input element (e.g., with the selecting unit 19716).

**[0303]** In some examples, in response to detecting liftoff of the contact (e.g., with the detecting unit 19712), in accordance with a determination (e.g., with the determining unit 19722) that the contact had a maximum intensity above the second intensity threshold prior to detecting liftoff of the contact, the processing unit 19708 is configured to enable display of a keyboard input element (e.g., with the display enabling unit 19710) enabling insertion of text at the location of the cursor in the content.

**[0304]** The operations in the information processing methods described above are, optionally implemented by running one or more functional modules in information processing apparatus such as general purpose processors (e.g., as described above with respect to Figures 1A and 3) or application specific chips.

**[0305]** The operations described above with reference to Figures 12A-12C are, optionally, implemented by components depicted in Figures 1A-1B or Figure 13. For example, detecting operations 19604, 19628 and 19638, scrolling operations 19612 and 19624, ceasing operation 19620, placing operations 19632 and 19646 and selecting operation 19642 are, optionally, implemented by event sorter 170, event recognizer 180, and event handler 190. Event monitor 171 in event sorter 170 detects a contact on touch-sensitive display 112, and event dispatcher module 174 delivers the event information to application 136-1. A respective event recognizer 180 of application 136-1 compares the event information to respective event definitions 186, and determines whether a first contact at a first location on the touch-sensitive surface corresponds to a predefined event or sub-event, such as selection of an object on a user interface. When a respective predefined event or sub-event is detected, event recognizer 180 activates an event handler 190 associated with the detection of the event or sub-event. Event handler 190 optionally utilizes or calls data updater 176 or object updater 177 to update the application internal state 192. In some examples, event handler 190 accesses a respective GUI updater 178 to update what

is displayed by the application. Similarly, it would be clear to a person having ordinary skill in the art how other processes can be implemented based on the components depicted in Figures 1A-1B.

**[0306]** It should be understood that the particular order in which the operations have been described above is merely exemplary and is not intended to indicate that the described order is the only order in which the operations could be performed. One of ordinary skill in the art would recognize various ways to reorder the operations described herein. Additionally, it should be noted that the various processes separately described herein (e.g., those listed in paragraph [0038]) can be combined with each other in different arrangements. For example, the contacts, user interface objects, tactile sensations, intensity thresholds, and/or focus selectors described above with reference to any one of the various processes separately described herein (e.g., those listed in paragraph [0038]) optionally have one or more of the characteristics of the contacts, gestures, user interface objects, tactile sensations, intensity thresholds, and focus selectors described herein with reference to one or more of the other methods described herein (e.g., those listed in paragraph [0038]). For brevity, all of the various possible combinations are not specifically enumerated here, but it should be understood that the claims described above may be combined in any way that is not precluded by mutually exclusive claim features.

**[0307]** The foregoing description, for purpose of explanation, has been described with reference to specific embodiments. However, the illustrative discussions above are not intended to be exhaustive or to limit the various described embodiments to the precise forms disclosed. Many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described in order to best explain the principles of the various described embodiments and their practical applications, to thereby enable others skilled in the art to best utilize the various described embodiments with various modifications as are suited to the particular use contemplated.

## Claims

**1.** A method, comprising:  
at an electronic device (100) with a touch-sensitive surface and a display (112), wherein the device includes one or more sensors (165) to detect intensities of contacts with the touch-sensitive surface (112):

displaying content on the display that includes a sequence of text characters (1902);  
while a focus selector (19212) is over the content, detecting a gesture on the touch-

sensitive surface, the gesture including:

a first contact on the touch-sensitive surface; and  
 first movement (19208-a - 19208-b) of  
 the first contact across the touch-sensitive surface that corresponds to first movement of the focus selector on the display; and  
 second movement (19208-b - 19208-c) of the first contact across the touch-sensitive surface that corresponds to second movement of the focus selector on the display; and  
 in response to detecting first movement of the first contact:

in accordance with a determination that the first contact has an intensity above a selection intensity threshold ( $IT_D$ ) at the start of the first movement, selecting a first range of text characters (19214) in the sequence of text characters that is selected in accordance with the first movement of the focus selector over the content; and,  
 in accordance with a determination that the first contact has an intensity below the selection intensity threshold and above a cursor preview threshold ( $IT_L$ ), at the start of the first movement, moving a selection cursor to a respective position in the sequence of text characters on the display by an amount that is determined in accordance with the first movement of the focus selector on the display without selecting the content

in accordance with a determination that the first contact has an intensity below the cursor preview threshold, at the start of the first movement,

scrolling the content by an amount that is determined in accordance with the first movement of the focus selector on the display, without displaying the selection cursor or selecting the content; and,

in response to detecting the second movement of the first contact:  
 in accordance with a determination that the first contact is at an intensity above the selection intensity threshold, and that the selection cursor has reached an edge of dis-

played text, selecting a second range of text characters in the sequence of text characters that is different from the first set of characters, and scrolling the text wherein the second range of text characters is selected in accordance with:  
 the second movement of the focus selector over the content;  
 the respective position where the selection cursor was placed in accordance with the first movement of the focus selector over the content; and  
 the scrolling of the text; and  
 in accordance with a determination that the first contact is at an intensity above the selection intensity threshold, and that the selection cursor has not reached an edge of displayed text, selecting a second range of text characters in the sequence of text characters that is different from the first set of characters, without scrolling the text wherein the second range of text characters is selected in accordance with:  
 the second movement of the focus selector over the content; and  
 the respective position where the selection cursor was placed in accordance with the first movement of the focus selector over the content.

2. The method of claim 1, including, prior to selecting the portion of the content:

detecting an increase in intensity of the first contact to a first intensity that is lower than the selection intensity threshold; and  
 in response to detecting the increase in intensity of the first contact:

in accordance with a determination that the first intensity is above the cursor-preview intensity threshold, displaying a preview of a cursor in the content at a respective location proximate to the focus selector; and  
 in accordance with a determination that the first intensity is below the cursor-preview intensity threshold, continuing to display the content without displaying the preview of the cursor.

3. The method of claim 2, including:

while displaying the preview of the cursor in the content, detecting an increase in intensity of the first contact from the first intensity to a second intensity; and  
 in response to detecting the increase in intensity of the first contact from the first intensity to the

second intensity:

in accordance with a determination that the second intensity is above a cursor-insertion intensity threshold, inserting a cursor in the content; and

in accordance with a determination that the second intensity is below the cursor-insertion intensity threshold, continuing to display the preview of the cursor without inserting the cursor in the content.

4. The method of claim 3, wherein inserting the cursor in the content includes displaying an animation of the preview of the cursor being replaced with the cursor.

5. The method of any of claims 1-4, including:

while selecting the portion of the content, detecting a second contact on the touch-sensitive surface and detecting movement of the second contact across the touch-sensitive surface; and in response to detecting the movement of the second contact across the touch-sensitive surface, scrolling the content in accordance with the movement of the second contact, while continuing to select the content in accordance with movement of the content relative to the focus selector on the display.

6. The method of any of claims 1-5, wherein selecting the portion of the content in accordance with the movement of the focus selector over the content includes:

determining an intensity of the first contact; selecting a respective content subunit type of a plurality of content subunit types in accordance with the intensity of the first contact; and adjusting the selection by adding whole content subunits of the respective subunit type to the selection in accordance with movement of the first contact.

7. An electronic device, (300, 100) comprising: a display (450, 112); a touch-sensitive surface (451, 112); one or more sensors (359, 165) to detect intensities of contacts with the touch-sensitive surface; one or more processors (120, 310); memory (102, 370); and one or more programs, wherein the one or more programs are stored in the memory and configured to be executed by the one or more processors, the one or more programs including instructions for performing any of the methods of claims 1-6.

8. A computer readable storage medium storing one or more programs, the one or more programs comprising instructions which, when executed by an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensities of contacts with the touch-sensitive surface, cause the electronic device to perform any of the methods of claims 1-6.

## Patentansprüche

1. Verfahren, umfassend:

an einer elektronischen Vorrichtung (100) mit einer berührungsempfindlichen Oberfläche und einer Anzeige (112), wobei die Vorrichtung einen oder mehrere Sensoren (165) zum Erfassen von Intensitäten von Kontakten mit der berührungsempfindlichen Oberfläche (112) beinhaltet:

Anzeigen von Inhalt auf der Anzeige, der eine Sequenz von Textzeichen (1902) beinhaltet; während ein Fokuswähler (19212) über dem Inhalt ist, Erfassen einer Geste auf der berührungsempfindlichen Oberfläche, wobei die Geste beinhaltet:

einen ersten Kontakt auf der berührungsempfindlichen Oberfläche; und erste Bewegung (19208-a - 19208-b) des ersten Kontakts über die berührungsempfindliche Oberfläche, die der ersten Bewegung des Fokuswählers auf der Anzeige entspricht; und

zweite Bewegung (19208-b - 19208-c) des ersten Kontakts über die berührungsempfindliche Oberfläche, die der zweiten Bewegung des Fokuswählers auf der Anzeige entspricht; und als Reaktion auf Erfassen der ersten Bewegung des ersten Kontakts:

gemäß einer Bestimmung, dass der erste Kontakt eine Intensität oberhalb eines Auswahlintensitätsschwellenwerts ( $IT_D$ ) zu Beginn der ersten Bewegung aufweist, Auswahl eines ersten Bereichs von Textzeichen (19214) in der Sequenz von Textzeichen, der gemäß der ersten Bewegung des Fokuswählers über den Inhalt ausgewählt wird; und,

gemäß einer Bestimmung, dass der erste Kontakt eine Intensität unterhalb des Auswahlintensitätsschwellenwerts und oberhalb eines Cur-

sorvorschauschwellenwerts ( $IT_L$ ) aufweist, zu Beginn der ersten Bewegung, Bewegen eines Auswahlcursors an eine entsprechende Position in der Folge von Textzeichen auf der Anzeige um einen Betrag, der gemäß der ersten Bewegung des Fokuswählers auf der Anzeige bestimmt wird, ohne den Inhalt auszuwählen; gemäß einer Bestimmung, dass der erste Kontakt eine Intensität unterhalb des Cursorvorschauschwellenwerts aufweist, zu Beginn der ersten Bewegung, Scrollen des Inhalts um einen Betrag, der gemäß der ersten Bewegung des Fokuswählers auf der Anzeige bestimmt wird, ohne den Auswahlcursor anzuzeigen oder den Inhalt auszuwählen; und, als Reaktion auf Erfassen der zweiten Bewegung des ersten Kontakts:

gemäß einer Bestimmung, dass der erste Kontakt mit einer Intensität oberhalb des Auswahlintensitätsschwellenwerts ist und dass der Auswahlcursor einen Rand des angezeigten Textes erreicht hat, Auswählen eines zweiten Bereichs von Textzeichen in der Folge von Textzeichen, die sich von dem ersten Satz von Zeichen unterscheidet, und Scrollen des Textes, wobei der zweite Bereich von Textzeichen ausgewählt wird gemäß: der zweiten Bewegung des Fokuswählers über den Inhalt; der jeweiligen Position, an der der Auswahlcursor gemäß der ersten Bewegung des Fokuswählers über den Inhalt positioniert wurde; und des Scrollens des Textes; und

gemäß einer Bestimmung, dass der erste Kontakt mit einer Intensität oberhalb des Auswahlintensitätsschwellenwerts ist und dass der Auswahlcursor keinen Rand des angezeigten Textes erreicht hat, Auswählen eines zweiten Bereichs von Textzeichen in der Reihenfolge der Textzeichen, die sich von dem ersten Satz von Zeichen unterscheidet, ohne den Text zu scrollen, wobei der zweite Bereich von Textzeichen ausgewählt ist gemäß:

der zweiten Bewegung des Fokuswählers über den Inhalt; und der jeweiligen Position, an der der Auswahlcursor gemäß der ersten Bewegung des Fokuswählers über den Inhalt positioniert wurde.

**2. Verfahren nach Anspruch 1, beinhaltend, vor dem Auswählen des Inhaltsabschnitts :**

Erfassen einer Zunahme der Intensität des ersten Kontakts auf eine erste Intensität, die niedriger ist als der Auswahlintensitätsschwellenwert; und

als Reaktion auf Erfassen der Zunahme der Intensität des ersten Kontakts: gemäß einer Bestimmung, dass die erste Intensität über dem Cursorvorschauintensitätsschwellenwert liegt, Anzeigen einer Vorschau eines Cursors im Inhalt an einer entsprechenden Stelle in der Nähe des Fokuswählers; und gemäß einer Bestimmung, dass die erste Intensität unterhalb des Cursorvorschauintensitätsschwellenwerts liegt, Fortsetzen des Anzeigens des Inhalts ohne Anzeigen der Cursorvorschau.

**3. Verfahren nach Anspruch 2, beinhaltend:**

Während die Cursorvorschau im Inhalt angezeigt wird, Erfassen einer Zunahme der Intensität des ersten Kontakts von der ersten Intensität auf eine zweite Intensität; und als Reaktion auf Erfassen der Zunahme der Intensität des ersten Kontakts von der ersten Intensität zur zweiten Intensität:

gemäß einer Bestimmung, dass die zweite Intensität über einem Cursoreinfügeintensitätsschwellenwert liegt, Einfügen eines Cursors in den Inhalt; und gemäß einer Bestimmung, dass die zweite Intensität unter dem Cursoreinfügeintensitätsschwellenwert liegt, Fortsetzen des Anzeigens der Cursorvorschau, ohne den Cursor in den Inhalt einzusetzen.

**4. Verfahren nach Anspruch 3, wobei Einfügen des Cursors in den Inhalt Anzeigen einer Animation der Vorschau des zu ersetzenen Cursors durch den Cursor beinhaltet.**

**5. Verfahren nach einem der Ansprüche 1-4, beinhaltend:**

Während der Inhaltsabschnitt ausgewählt wird, Erfassen, eines zweiten Kontakts auf der berührungsempfindlichen Oberfläche und Erfassen der Bewegung des zweiten Kontakts über die berührungsempfindliche Oberfläche; und als Reaktion auf Erfassen der Bewegung des zweiten Kontakts über die berührungsempfindliche Oberfläche, Scrollen des Inhalts gemäß der Bewegung des zweiten Kontakts, während der Inhalt gemäß der Bewegung des Inhalts in Bezug auf den Fokuswähler auf der Anzeige weiterhin ausgewählt wird.

**6. Verfahren nach einem der Ansprüche 1-5, wobei**

Auswählen des Inhaltsabschnitts gemäß der Bewegung des Fokuswählers über den Inhalt beinhaltet:

Bestimmen einer Intensität des ersten Kontakts;  
Auswählen eines jeweiligen Inhaltsuntereinheitstyps einer Vielzahl von Inhaltsuntereinheitstypen gemäß der Intensität des ersten Kontakts; und  
Anpassen der Auswahl durch Hinzufügen ganzer Inhaltsuntereinheiten des jeweiligen Unter-einheitstyps zur Auswahl gemäß der Bewegung des ersten Kontakts.

7. Elektronische Vorrichtung (300, 100), umfassend:

eine Anzeige (450, 112);  
eine berührungsempfindliche Oberfläche (451, 112);  
einen oder mehrere Sensoren (359, 165) zum Erfassen der Intensitäten von Kontakten mit der berührungsempfindlichen Oberfläche;  
einen oder mehrere Prozessoren (120, 310);  
Speicher (102, 370); und  
ein oder mehrere Programme, wobei das eine oder die mehreren Programme im Speicher gespeichert und konfiguriert sind, um von einem oder mehreren Prozessoren ausgeführt zu werden, wobei das eine oder die mehreren Programme Anweisungen zum Ausführen eines der Verfahren nach Anspruch 1-6 beinhalten.

8. Computerlesbares Speichermedium, das ein oder mehrere Programme speichert, wobei das eine oder die mehreren Programme Anweisungen umfassen, die, wenn sie von einer elektronischen Vorrichtung mit einer Anzeige, einer berührungsempfindlichen Oberfläche und einem oder mehreren Sensoren zum Erfassen der Intensitäten von Kontakten mit der berührungsempfindlichen Oberfläche ausgeführt werden, die elektronische Vorrichtung dazu veranlassen, eines der Verfahren nach Anspruch 1-6 auszuführen.

**Revendications**

1. Un procédé, comprenant :  
sur un dispositif électronique (100) avec une surface sensible au toucher et un afficheur (112), le dispositif comprenant un ou plusieurs capteurs (165) destinés à détecter des intensités de contacts avec la surface sensible au toucher (112) :

l'affichage sur l'afficheur d'un contenu qui inclut une séquence de caractères de texte (1902) ; lorsqu'un sélecteur de pointage (19212) est au-dessus du contenu, la détection d'un geste sur la surface sensible au toucher, le geste

comportant :

un premier contact sur la surface sensible au toucher ; et  
un premier déplacement (19208-a - 19208-b) du premier contact sur la surface sensible au toucher, qui correspond à un premier déplacement du sélecteur de pointage sur l'afficheur ; et  
un second déplacement (19208-b - 19208-c) du premier contact sur la surface sensible au toucher, qui correspond à un second déplacement du sélecteur de pointage sur l'afficheur ; et

en réponse à la détection du premier déplacement du premier contact :

suivant une détermination que le premier contact présente une intensité supérieure à un seuil d'intensité de sélection ( $IT_D$ ) au début du premier déplacement, la sélection dans la séquence de caractères de texte d'une première plage de caractères de texte (19214) qui est sélectionnée en fonction du premier déplacement du sélecteur de pointage au-dessus du contenu ; et  
suivant une détermination que le premier contact présente une intensité inférieure au seuil d'intensité de sélection et supérieure à un seuil d'aperçu de curseur ( $IT_L$ ) au début du premier déplacement, le déplacement d'un curseur de sélection vers une position respective dans la séquence de caractères de texte sur l'afficheur, d'une quantité qui est déterminée en fonction du premier déplacement du sélecteur de pointage sur l'afficheur sans sélection du contenu,  
suivant une détermination que le premier contact présente une intensité inférieure au seuil d'aperçu de curseur au début du premier déplacement, le défilement du contenu, d'une quantité qui est déterminée en fonction du premier déplacement du sélecteur de pointage sur l'afficheur, sans affichage du curseur de sélection ou sélection du contenu ; et

en réponse à la détection du second déplacement du premier contact :

suivant une détermination que le premier contact est à une intensité supérieure au seuil d'intensité de sélection et que le curseur de sélection a atteint un bord du texte affiché, la sélection dans la séquence de caractères de texte d'une seconde plage de caractères de texte qui est différente du pre-

- mier ensemble de caractères, et le défilement du texte, la seconde plage de caractères de texte étant sélectionnée en fonction : 5
- du second déplacement du sélecteur de pointage au-dessus du contenu ; de la position respective où avait été placé le curseur de sélection en fonction du premier déplacement du sélecteur de pointage au-dessus du contenu ; et 10 du défilement du texte ; et
- suivant une détermination que le premier contact est à une intensité supérieure au seuil d'intensité de sélection et que le curseur de sélection n'a pas atteint un bord du texte affiché, la sélection dans la séquence de caractères de texte d'une seconde plage de caractères de texte qui est différente du premier ensemble de caractères, sans défilement du texte, la seconde plage de caractères de texte étant sélectionnée en fonction : 15
- du second déplacement du sélecteur de pointage au-dessus du contenu ; et de la position respective où avait été placé le curseur de sélection en fonction du premier déplacement du sélecteur de pointage au-dessus du contenu. 20
2. Le procédé de la revendication 1, comprenant, avant la sélection de la partie du contenu : 25
- la détection d'une augmentation d'intensité du premier contact à une première intensité qui est inférieure au seuil d'intensité de sélection ; et en réponse à la détection de l'augmentation d'intensité du premier contact : 30
- suivant une détermination que la première intensité est au-dessus du seuil d'intensité d'aperçu de curseur, l'affichage d'un aperçu d'un curseur dans le contenu en un emplacement respectif proche du sélecteur de pointage ; et 35
- suivant une détermination que la première intensité est inférieure au seuil d'intensité d'aperçu de curseur, la poursuite de l'affichage du contenu sans affichage de l'aperçu du curseur. 40
3. Le procédé de la revendication 2, comprenant : pendant l'affichage de l'aperçu du curseur dans
- le contenu, la détection d'une augmentation d'intensité du premier contact de la première intensité à une seconde intensité ; et en réponse à la détection de l'augmentation d'intensité du premier contact de la première intensité à la seconde intensité : 45
- suivant une détermination que la seconde intensité est supérieure à un seuil d'intensité d'insertion de curseur, l'insertion d'un curseur dans le contenu ; et suivant une détermination que la seconde intensité est inférieure au seuil d'intensité d'insertion de curseur, la poursuite de l'affichage de l'aperçu du curseur sans insertion du curseur dans le contenu. 50
4. Le procédé de la revendication 3, dans lequel l'insertion du curseur dans le contenu comprend l'affichage d'une animation de l'aperçu du curseur remplaçant le curseur. 55
5. Le procédé de l'une des revendications 1 à 4, comprenant :
- pendant la sélection de la partie du contenu, la détection d'un second contact sur la surface sensible au toucher et la détection d'un déplacement du second contact sur la surface sensible au toucher ; et en réponse à la détection du déplacement du second contact sur la surface sensible au toucher, le défilement du contenu en fonction du déplacement du second contact, tout en continuant à sélectionner le contenu en fonction du déplacement du contenu par rapport au sélecteur de pointage sur l'affichage. 60
6. Le procédé de l'une des revendications 1 à 5, dans lequel la sélection de la partie du contenu en fonction du déplacement du sélecteur de pointage au-dessus du contenu comprend :
- la détermination d'une intensité du premier contact ; la sélection d'un type de sous-unité de contenu respectif d'une pluralité de types de sous-unité de contenu en fonction de l'intensité du premier contact ; et l'ajustement de la sélection par ajout de sous-unité de contenu complet du type de sous-unité respectif à la sélection en fonction du déplacement du premier contact. 65
7. Un dispositif électronique (300, 100), comprenant :
- un afficheur (450, 112) ; une surface sensible au toucher (451, 112) ;

un ou plusieurs capteurs (359, 165) destinés à détecter des intensités de contacts avec la surface sensible au toucher ;  
un ou plusieurs processeurs (120, 310) ;  
une mémoire (102, 370) ; et  
un ou plusieurs programmes, les un ou plusieurs programmes étant stockés dans la mémoire et étant configurés pour être exécutés par les un ou plusieurs processeurs, les un ou plusieurs programmes comprenant des instructions pour mettre en oeuvre l'un des procédés des revendications 1 à 6. 5 10

8. Un support de stockage lisible par calculateur stockant un ou plusieurs programmes, les un ou plusieurs programmes comprenant des instructions qui, lorsqu'elles sont exécutées par un dispositif électronique avec un afficheur, une surface sensible au toucher et un ou plusieurs capteurs destinés à détecter des intensités de contact avec la surface sensible au toucher, font en sorte que le dispositif électronique mette en oeuvre l'un des procédés des revendications 1 à 6. 15 20

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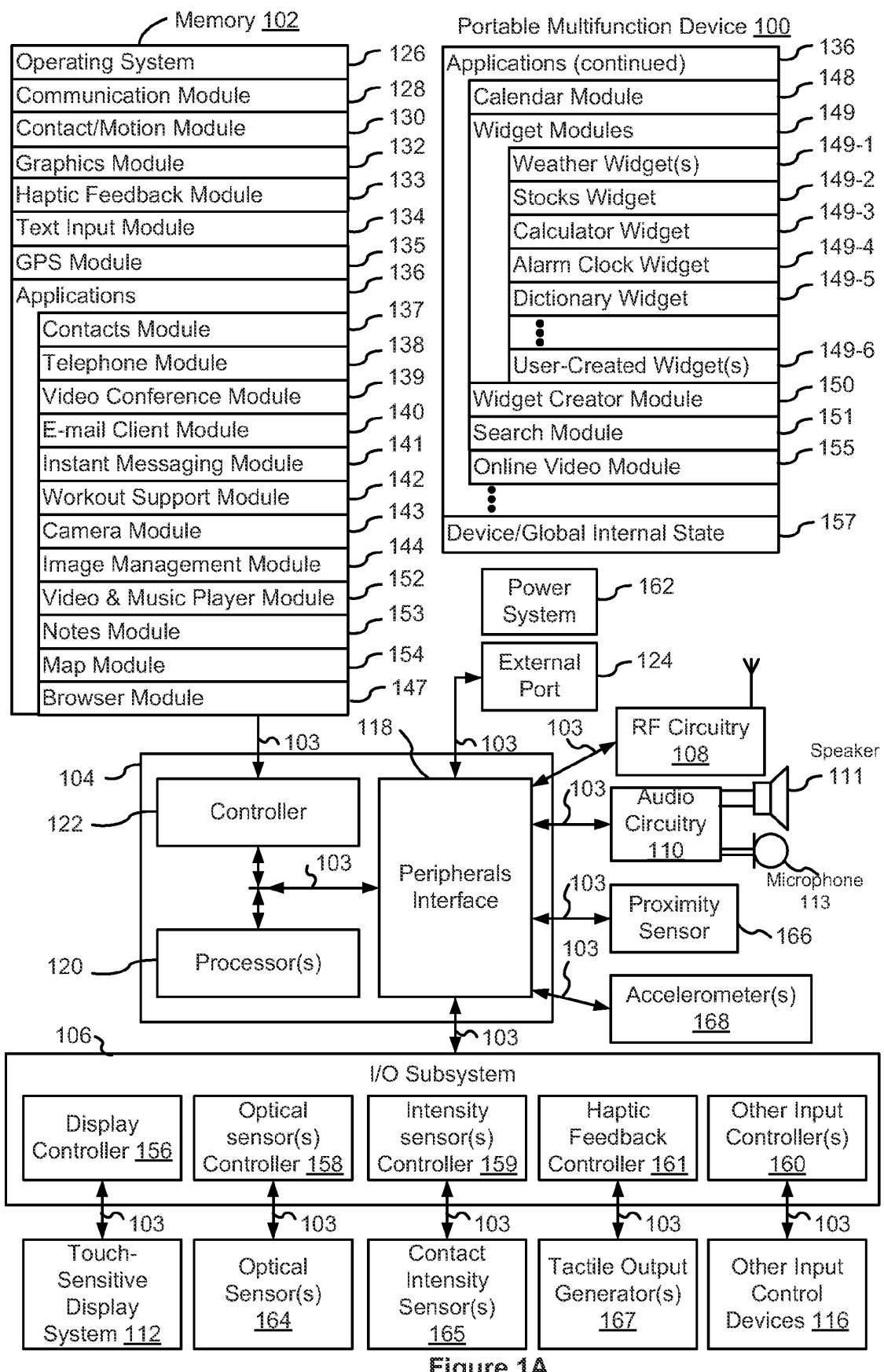
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**Figure 1A**

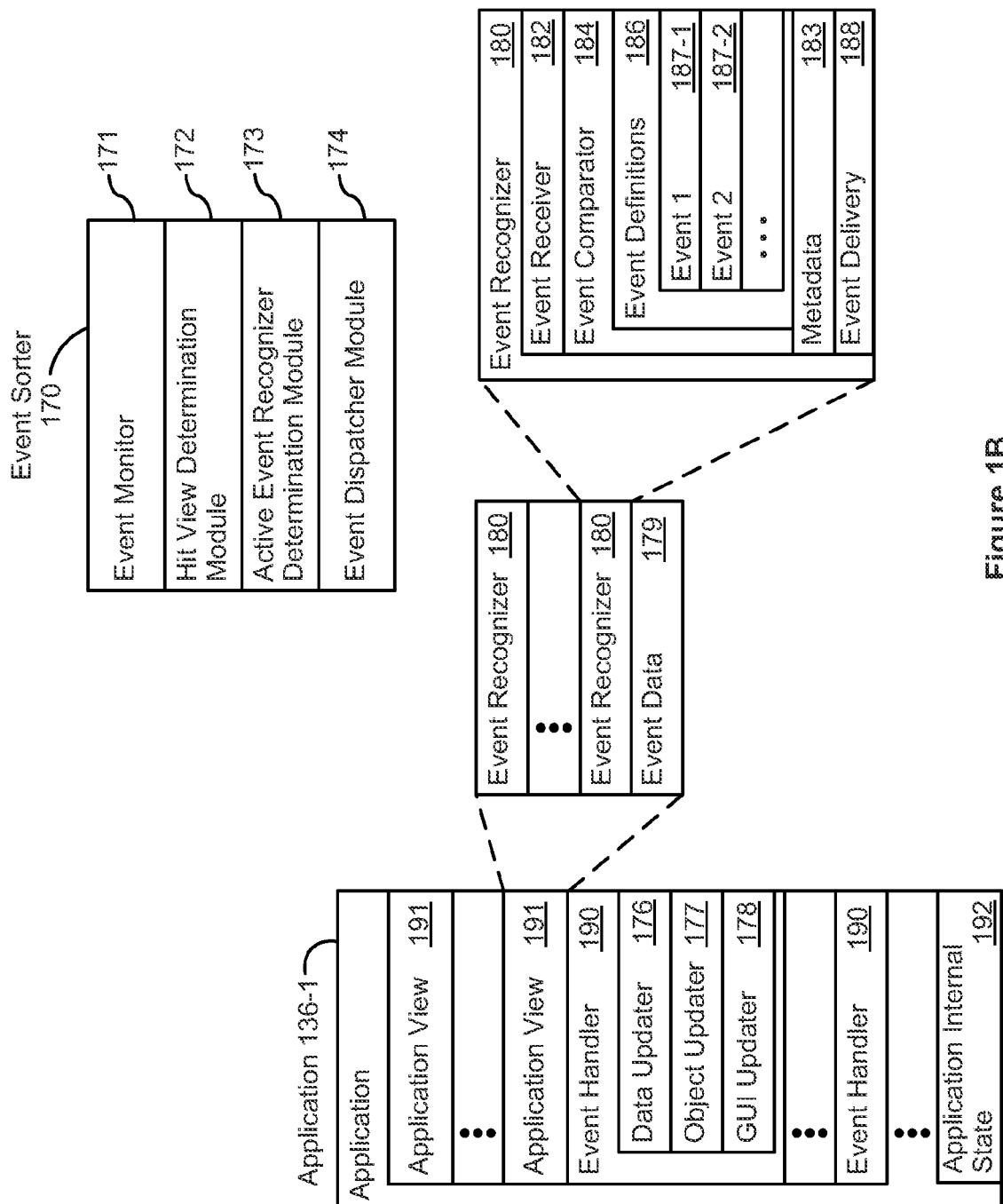


Figure 1B

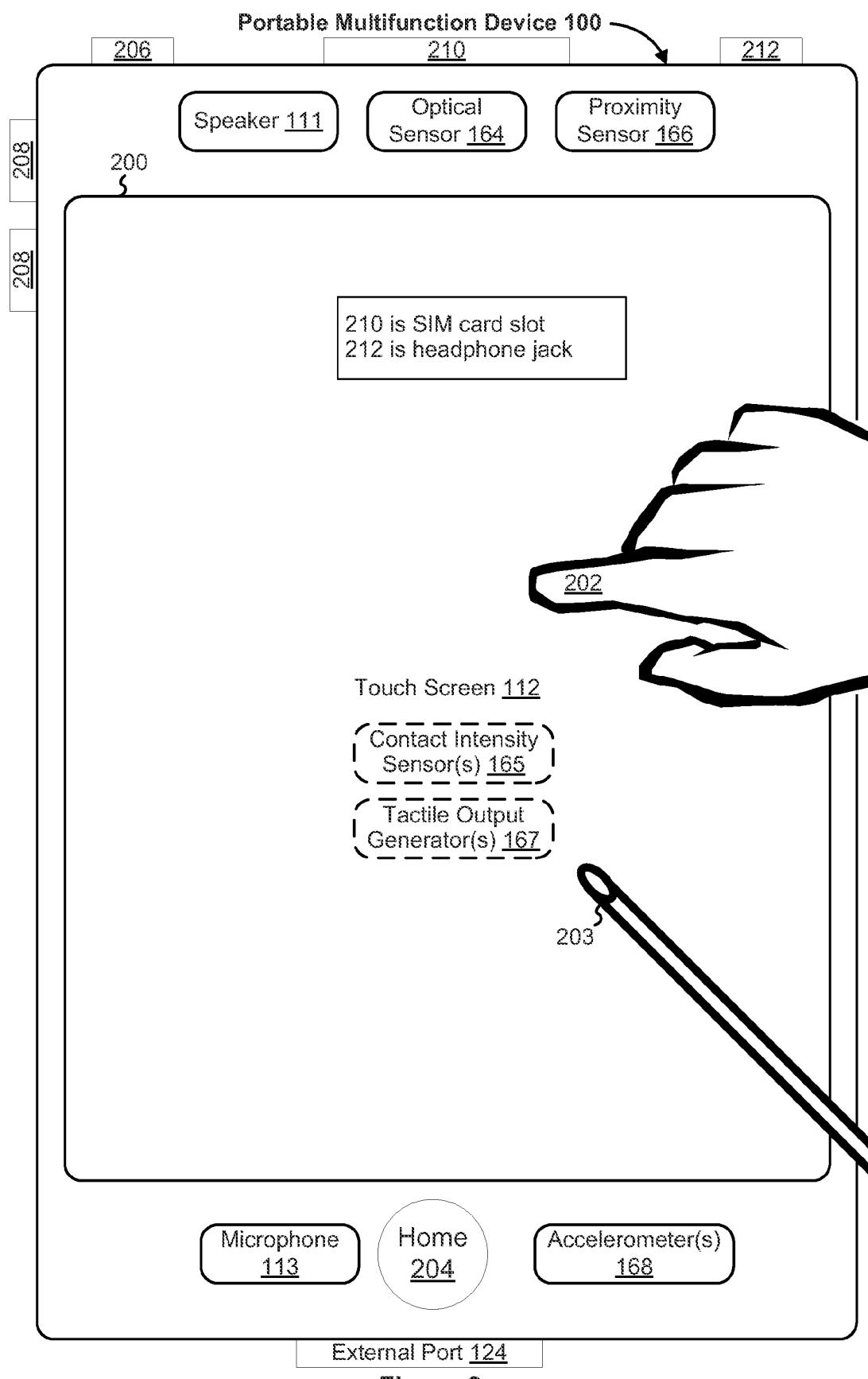


Figure 2

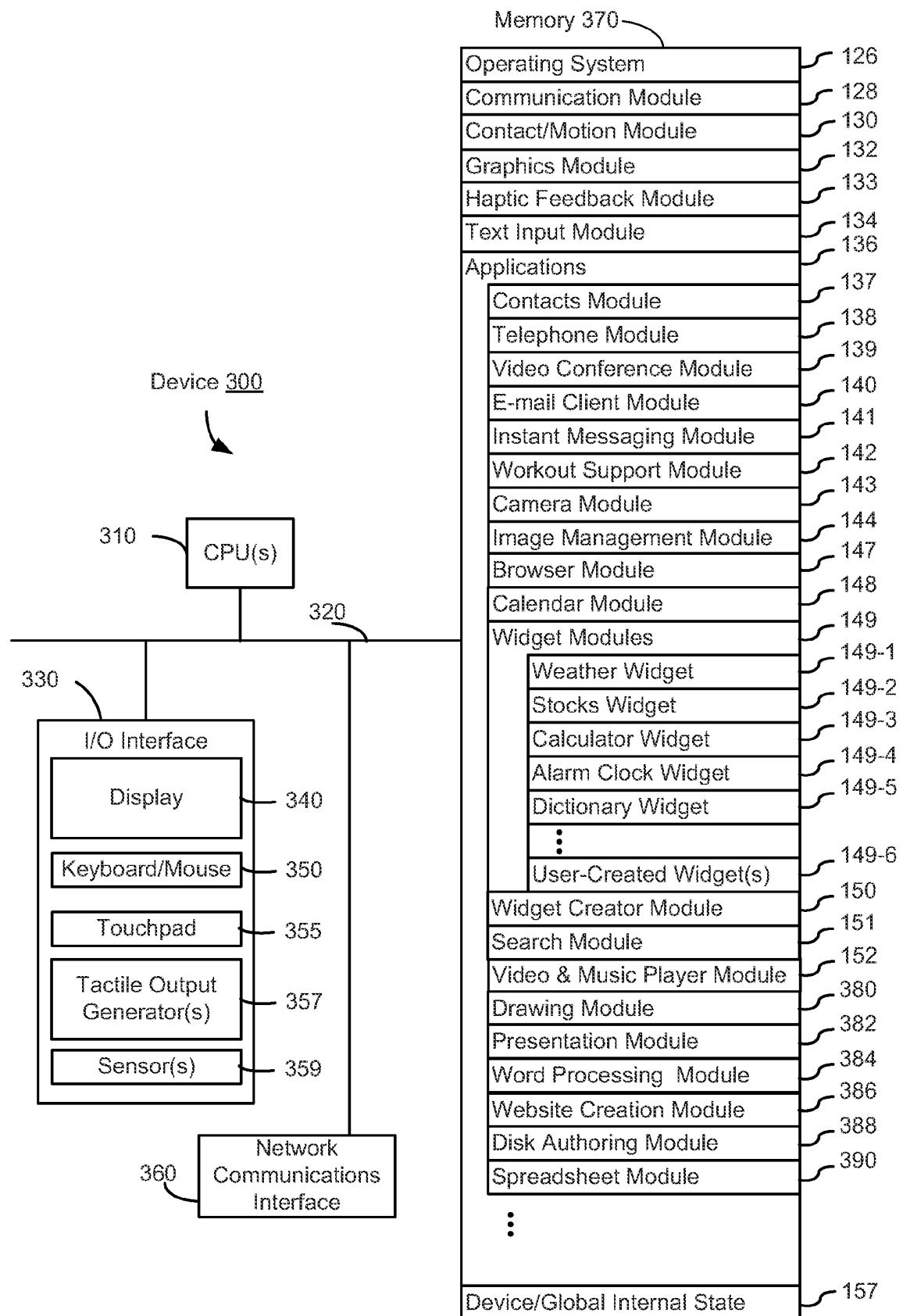


Figure 3

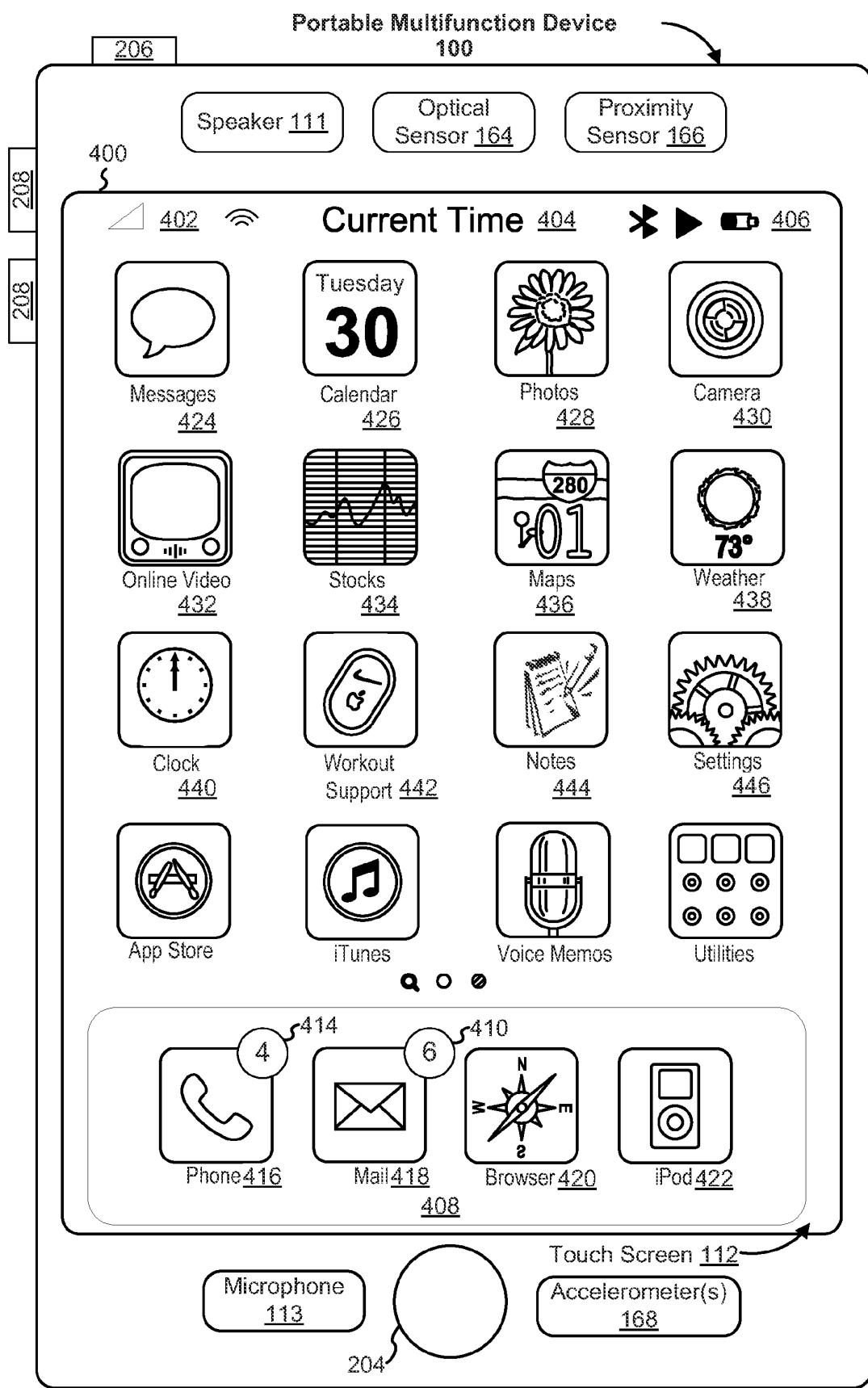


Figure 4A

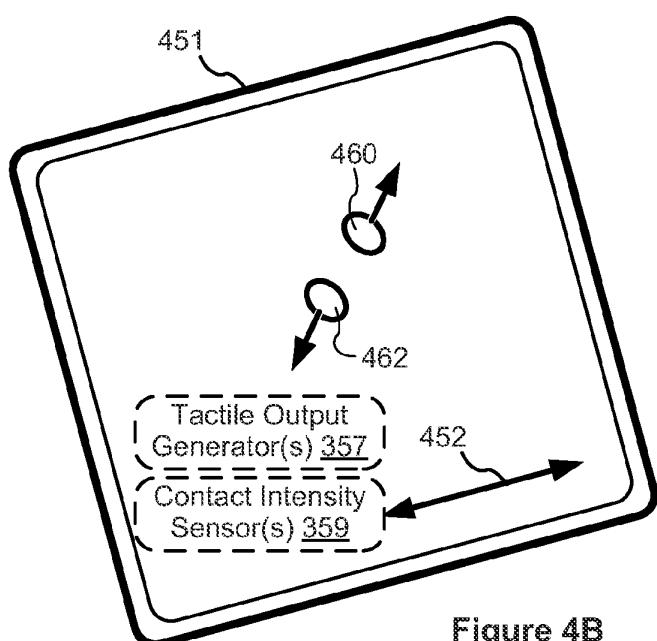
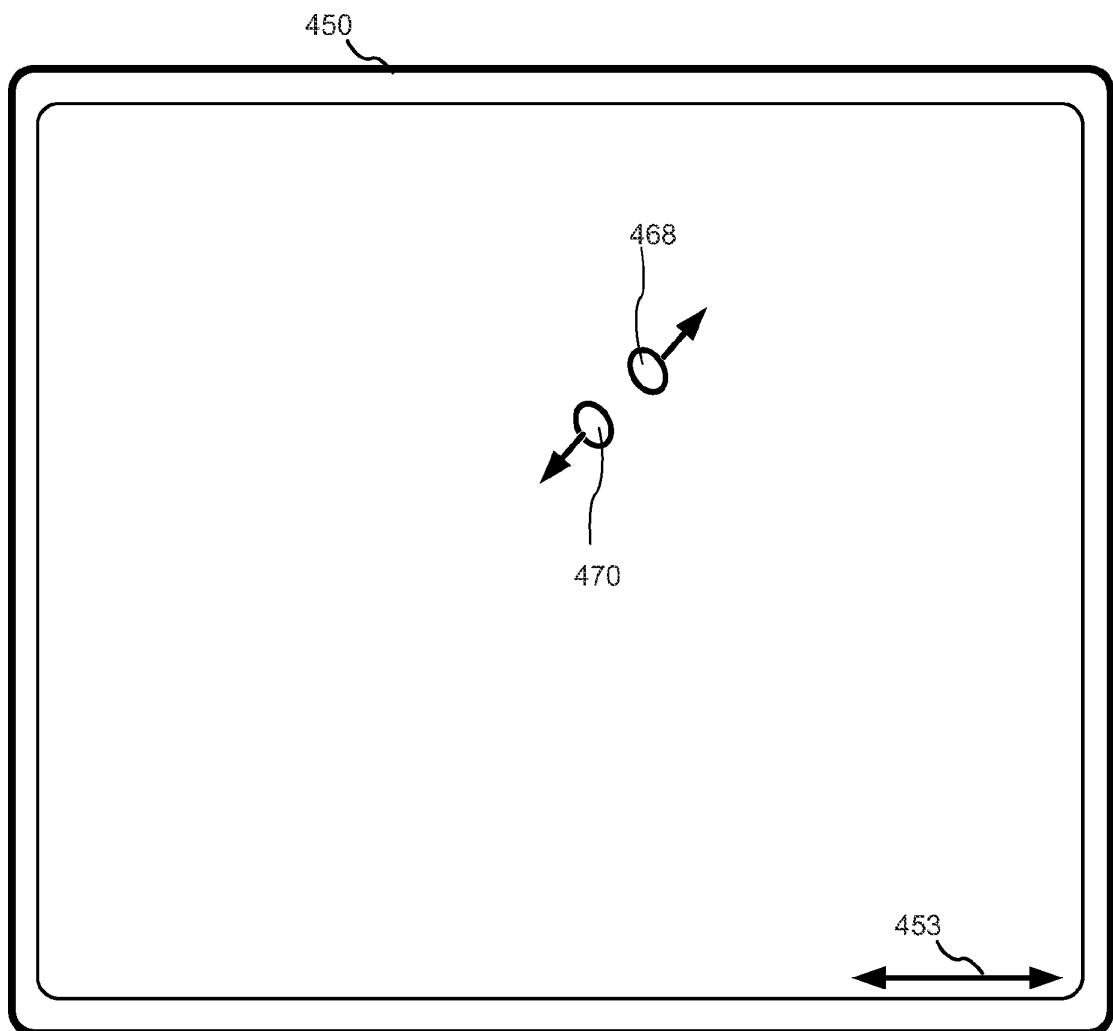


Figure 4B

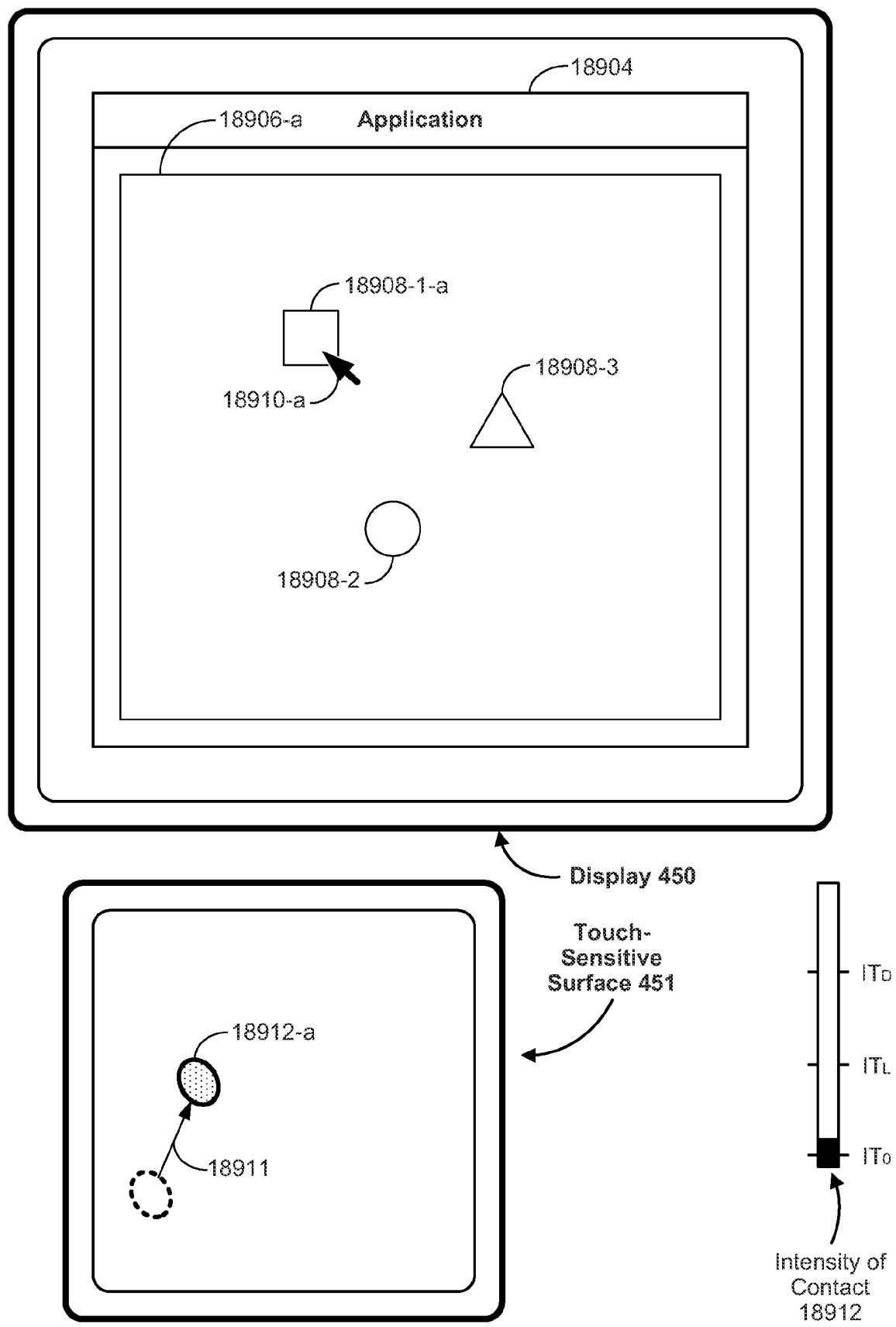


Figure 5A

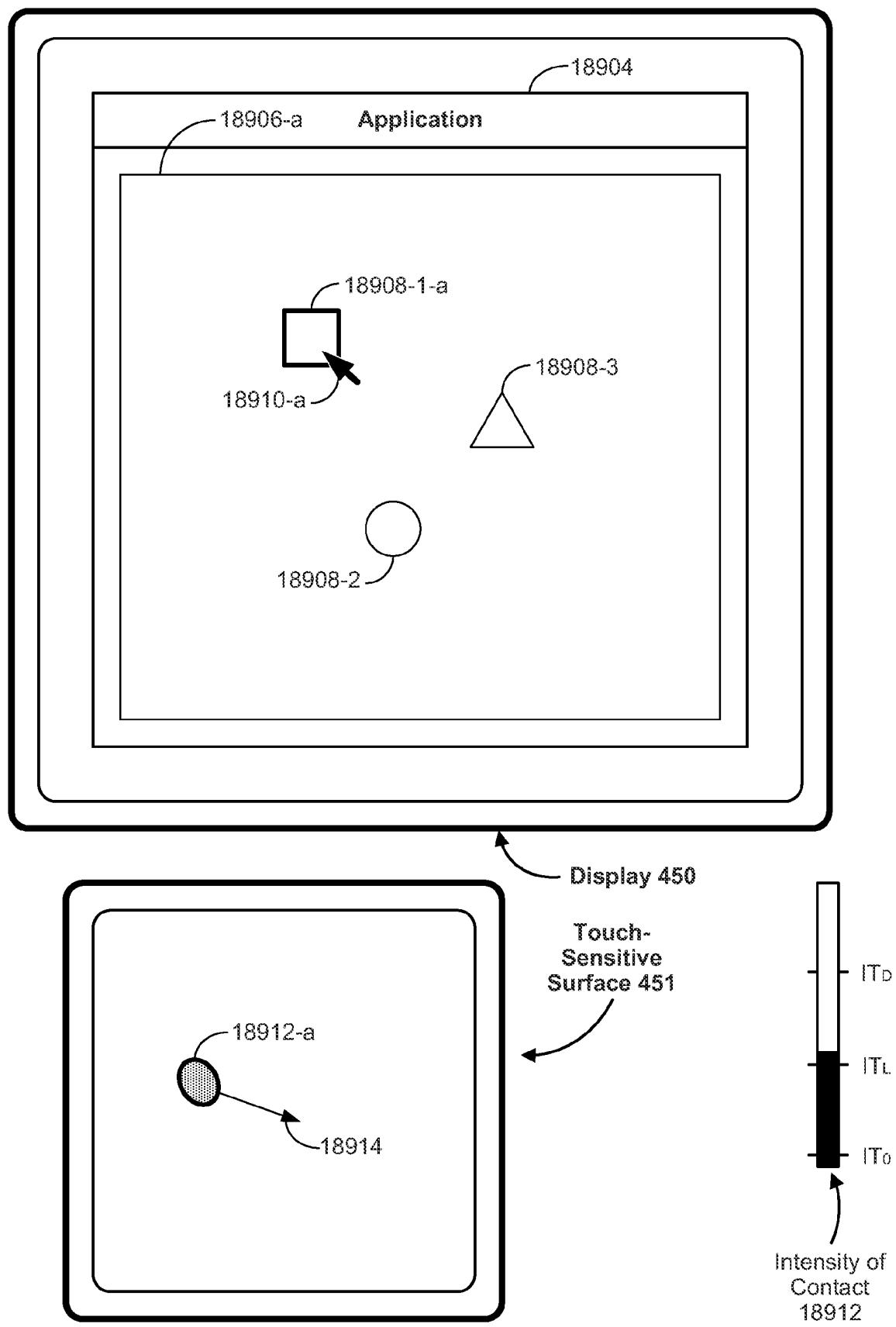


Figure 5B

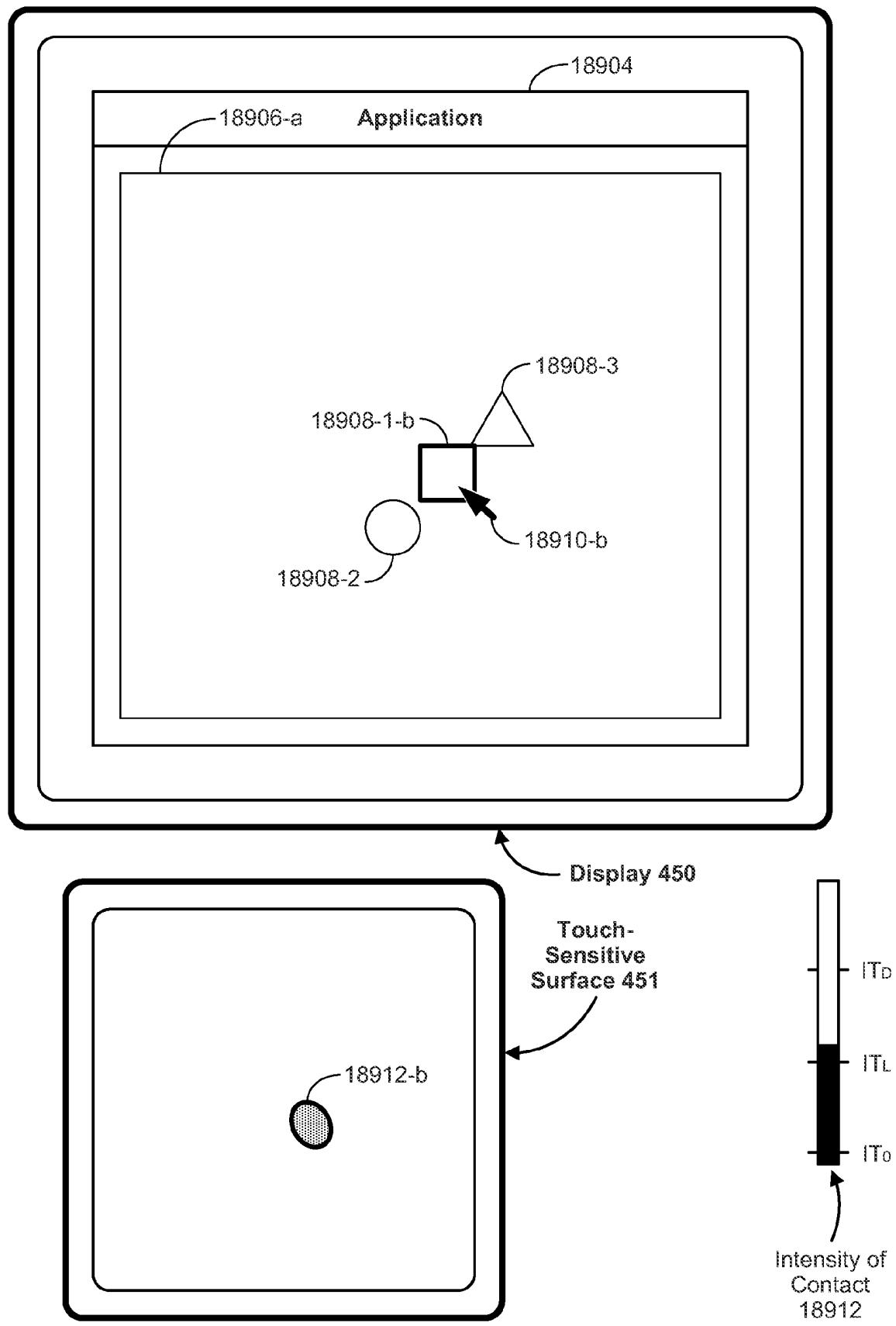


Figure 5C

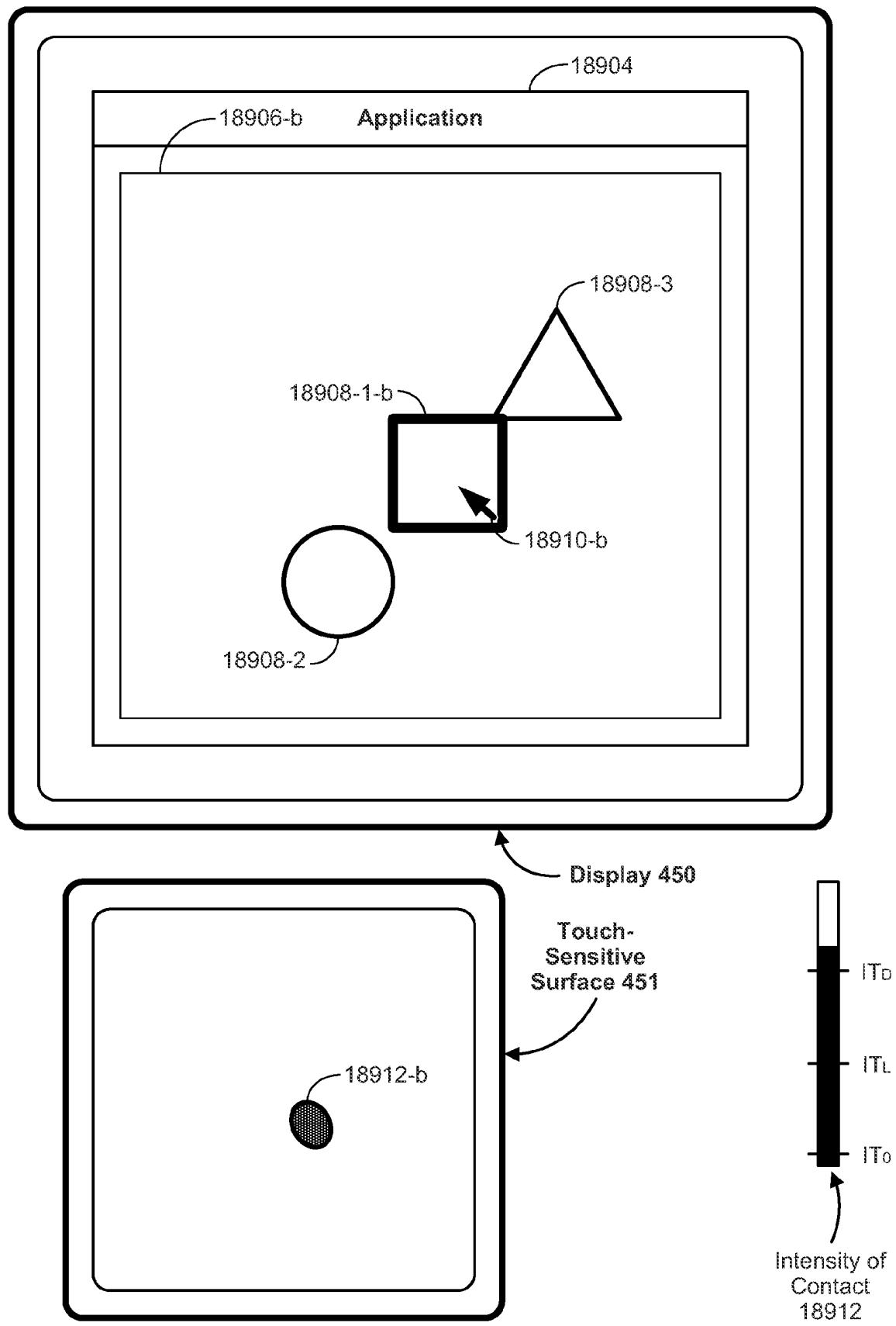


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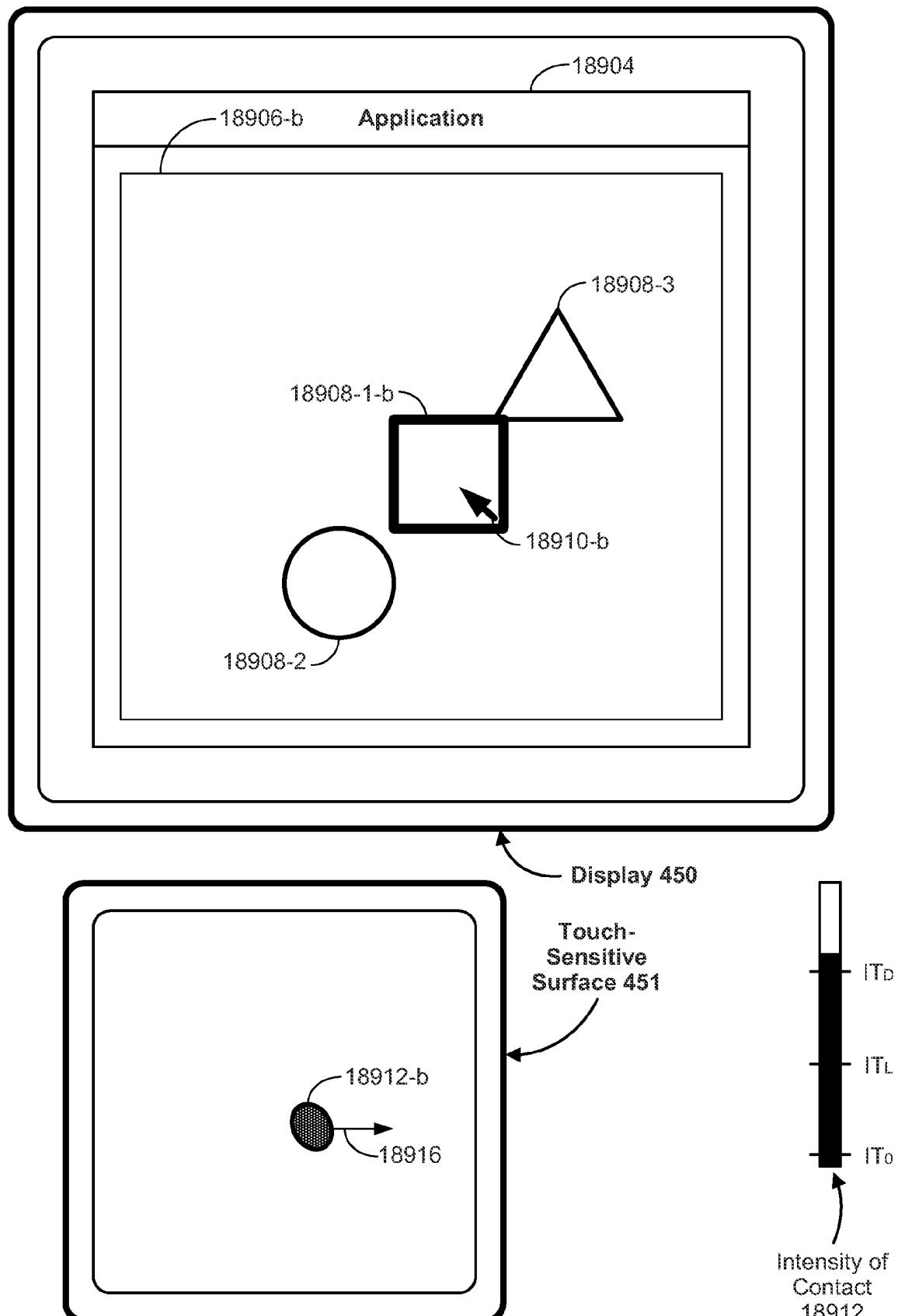


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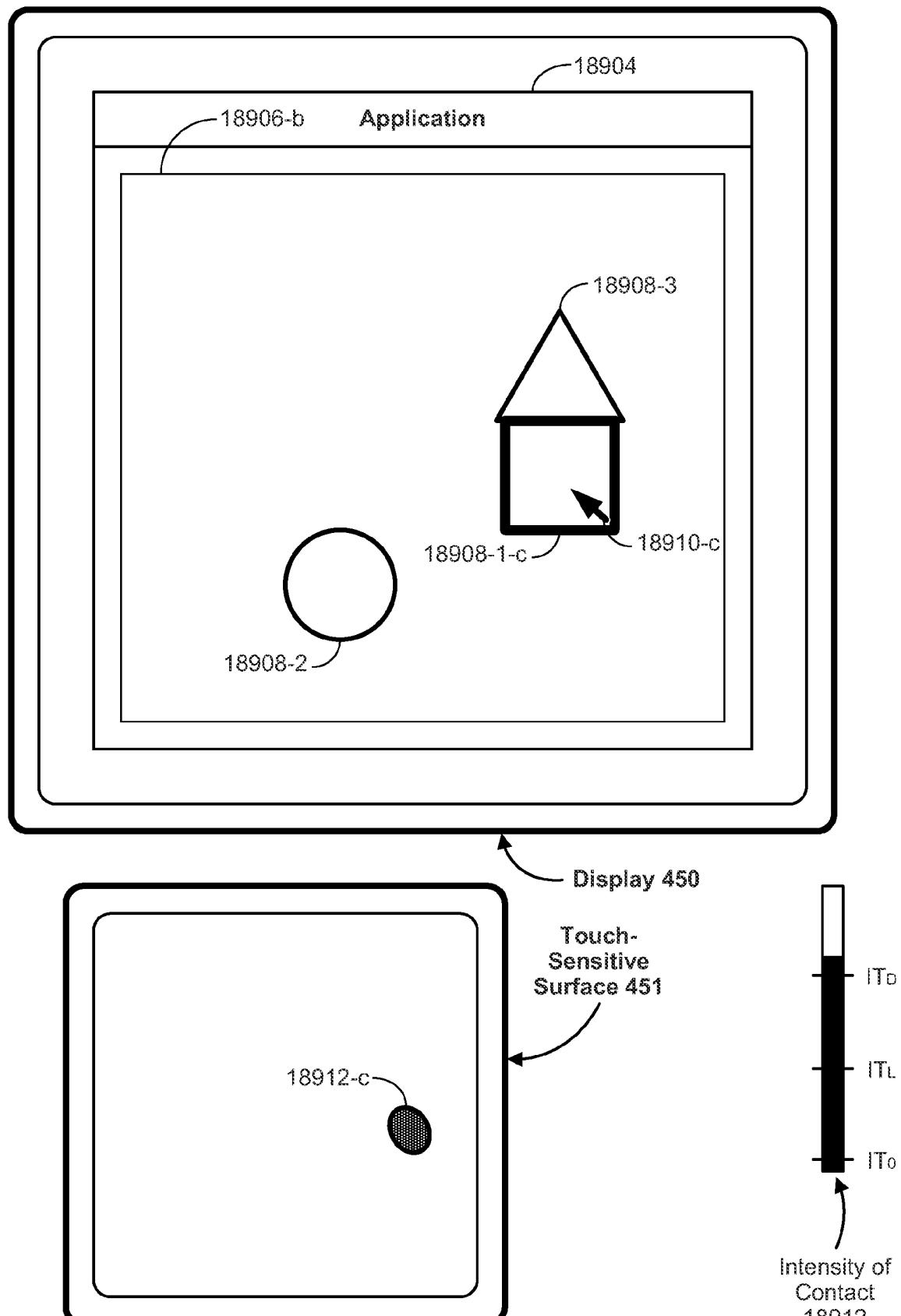


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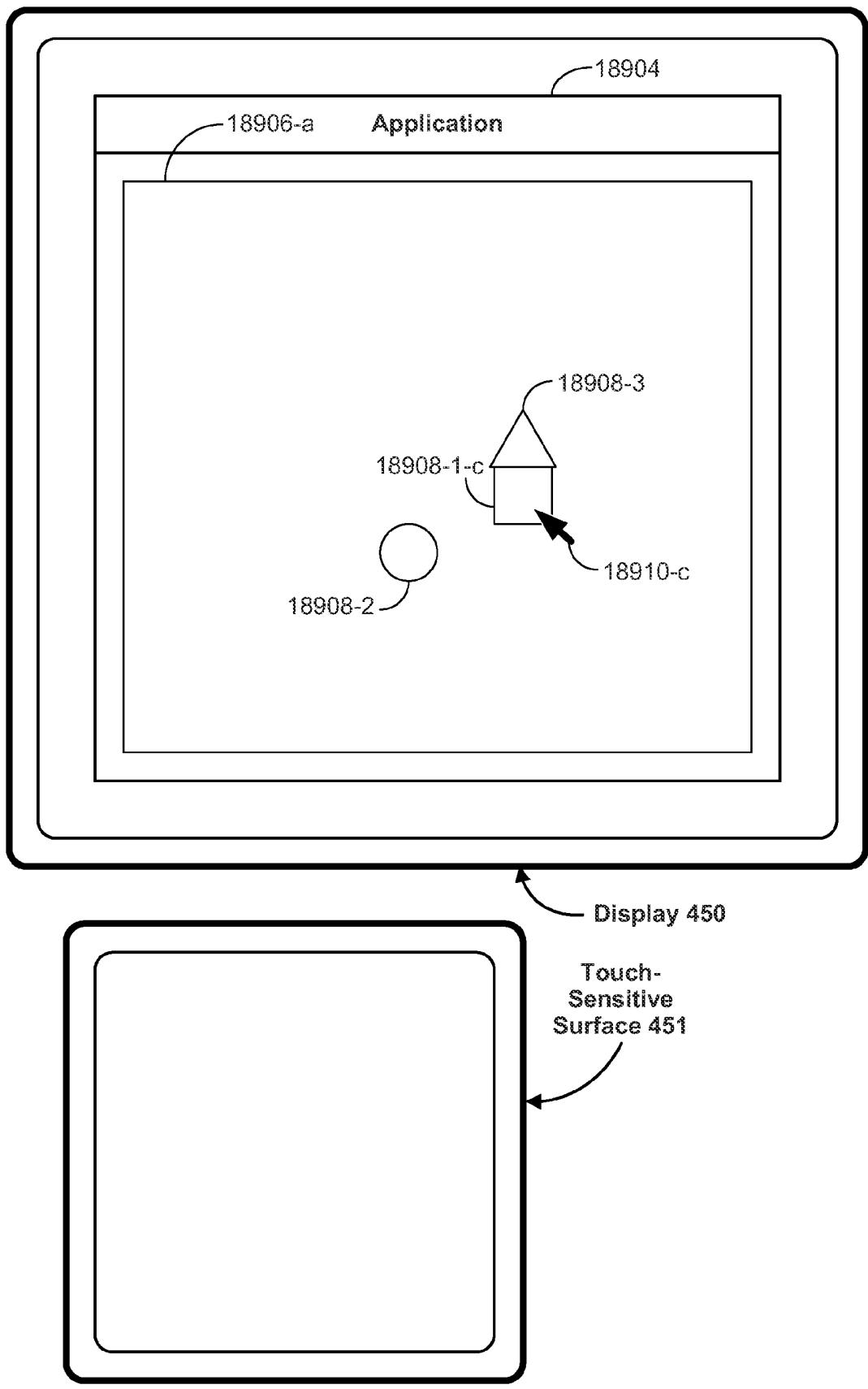


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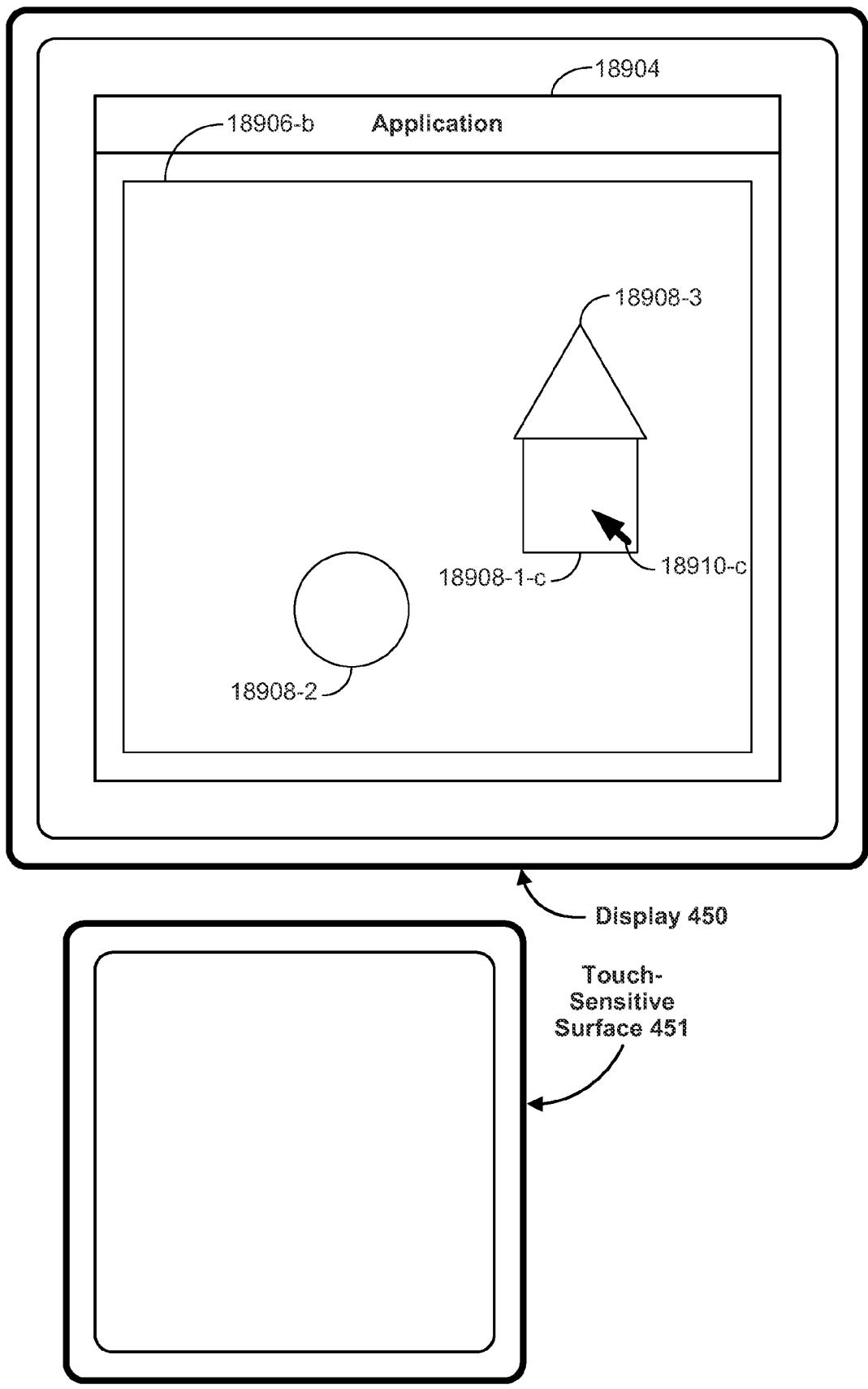


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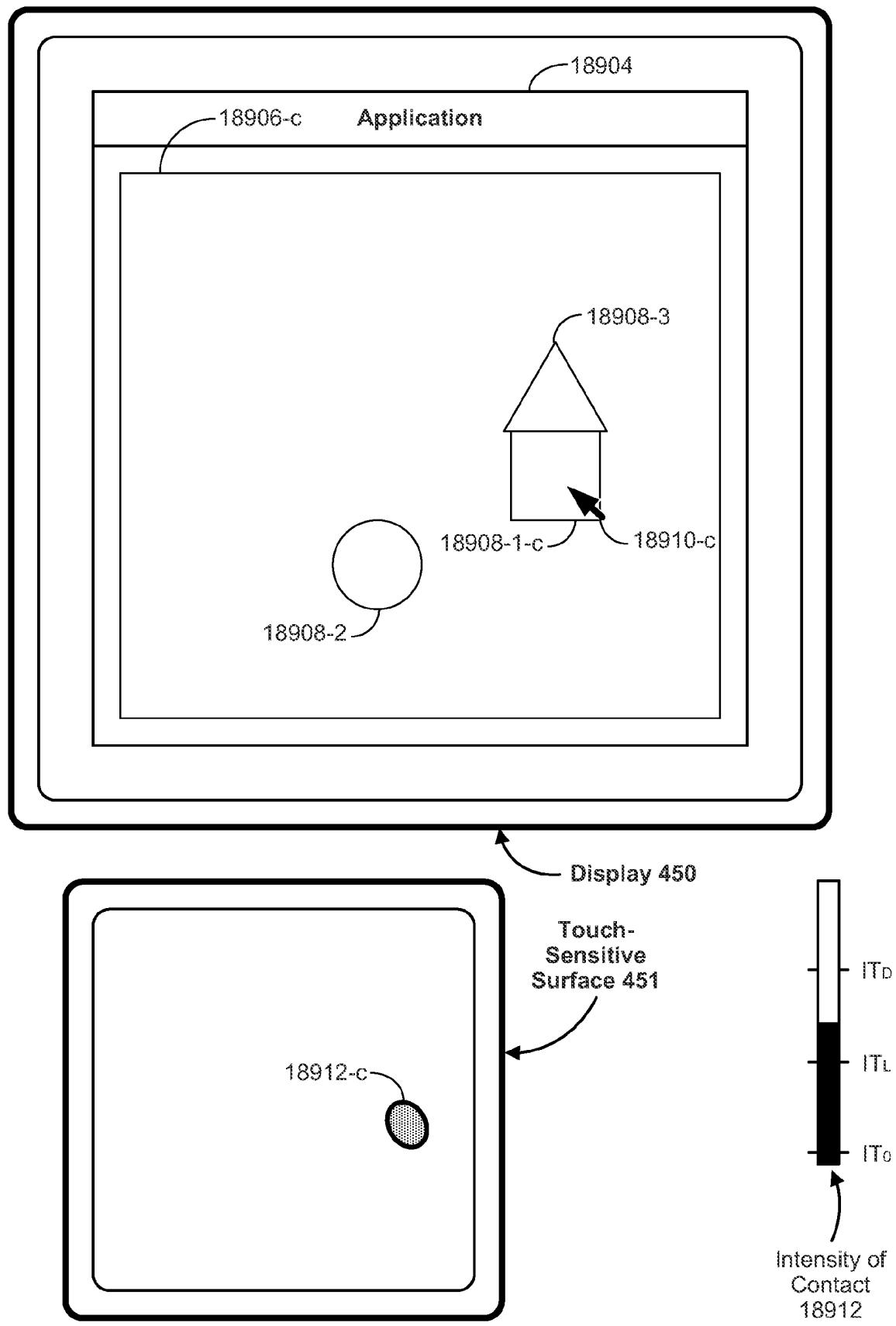


Figure 5

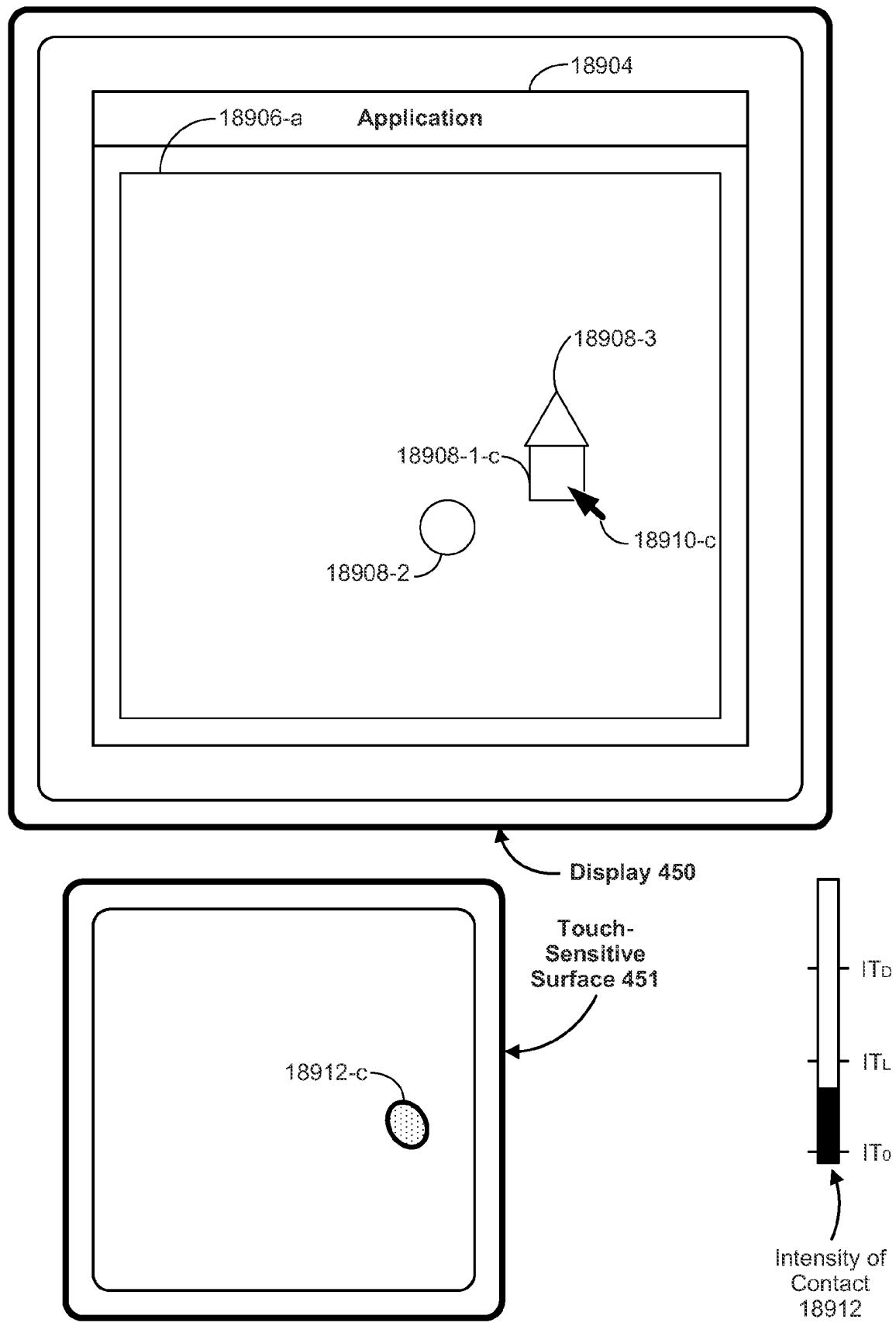


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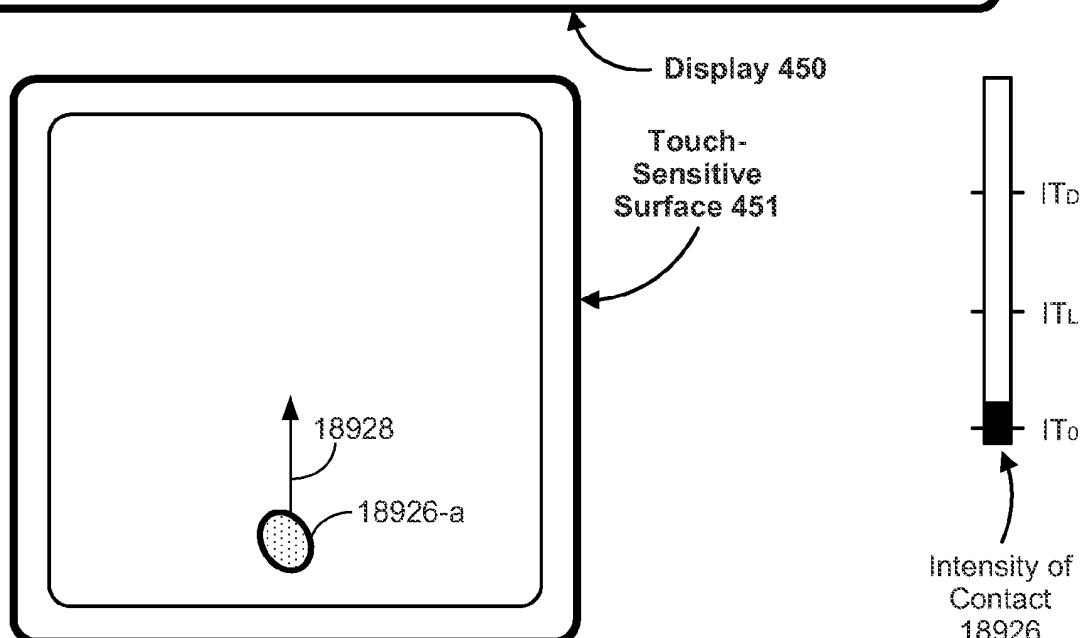
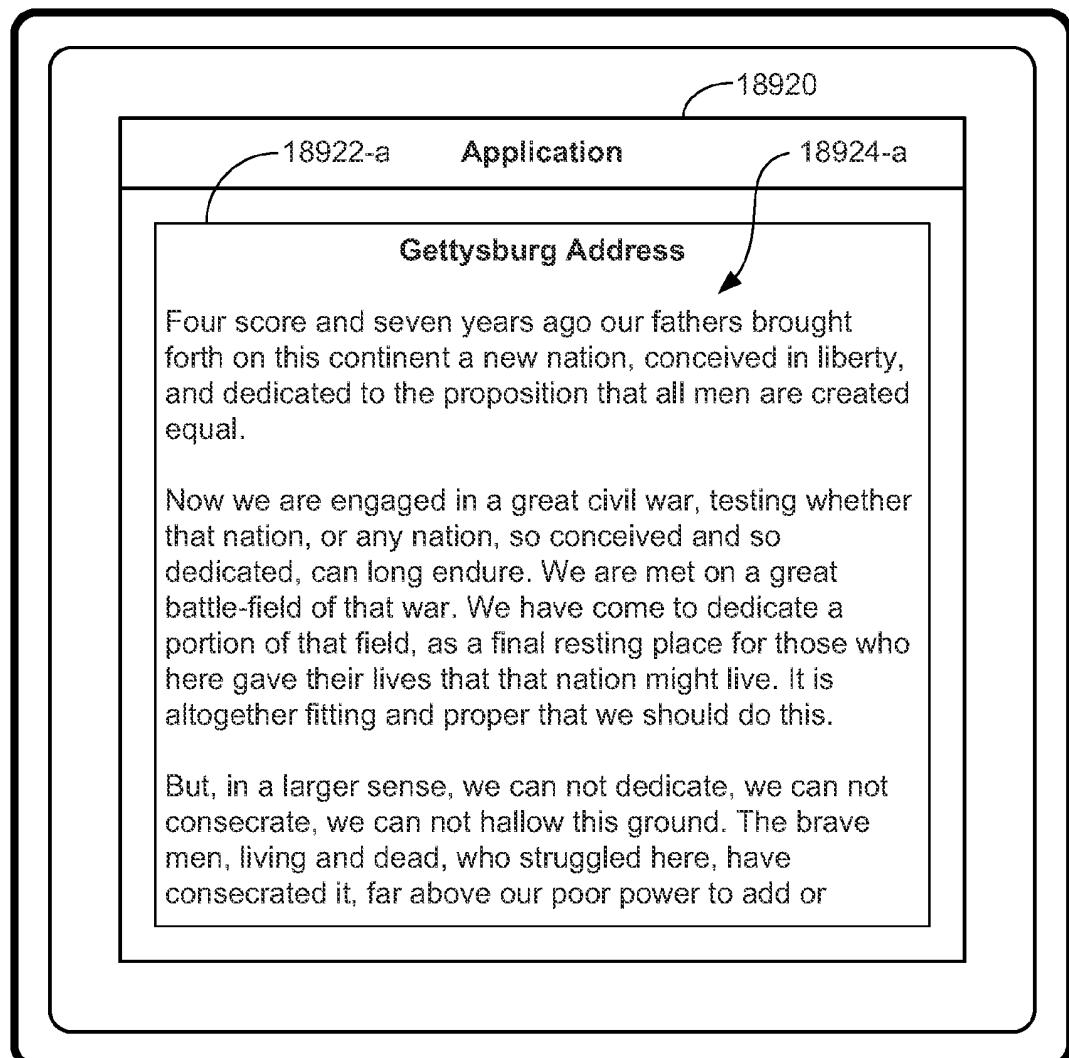


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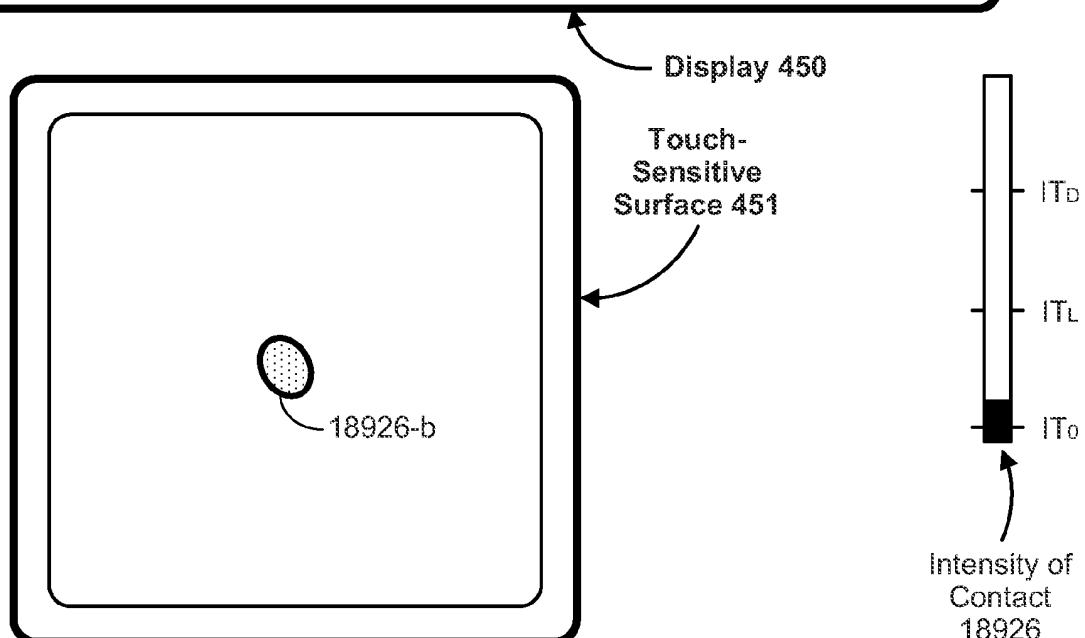
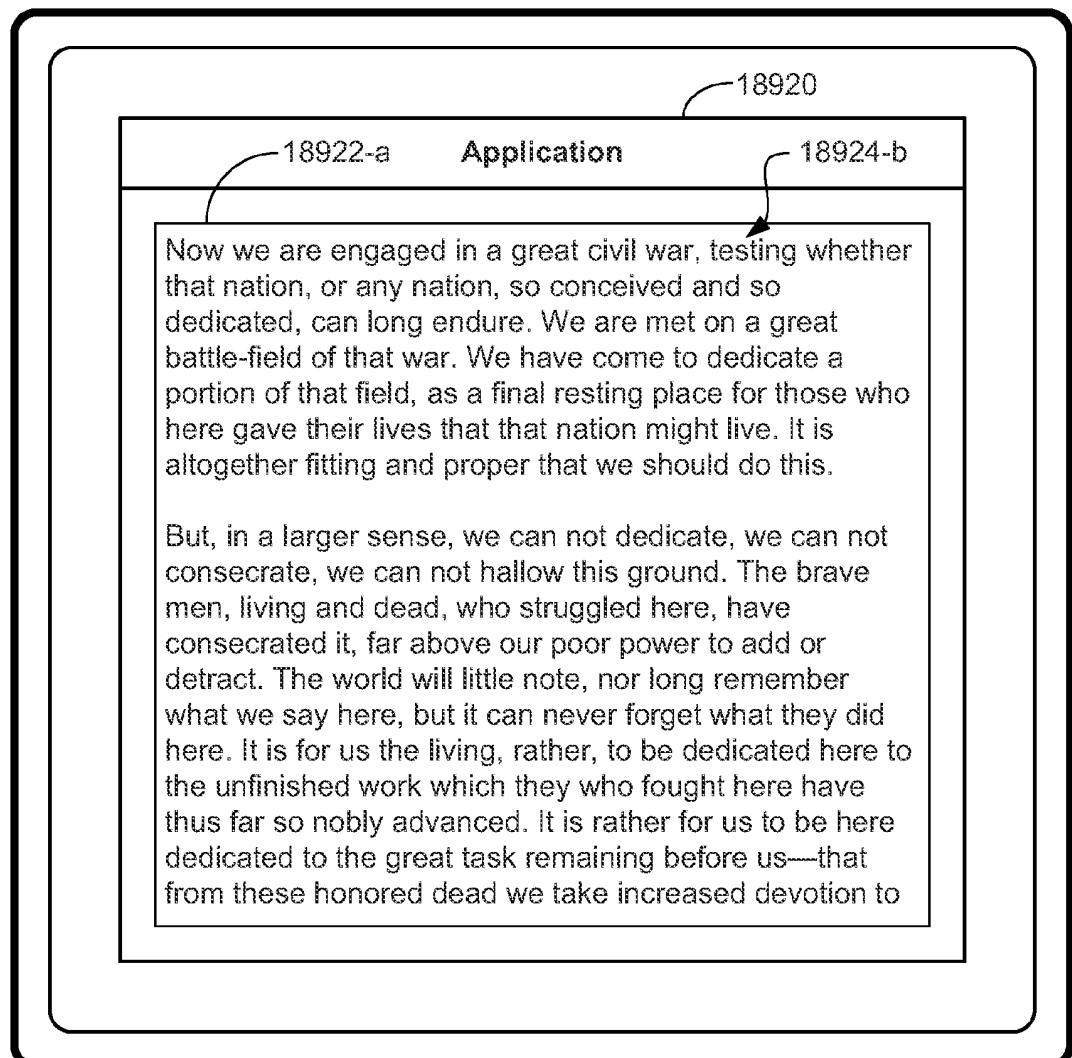


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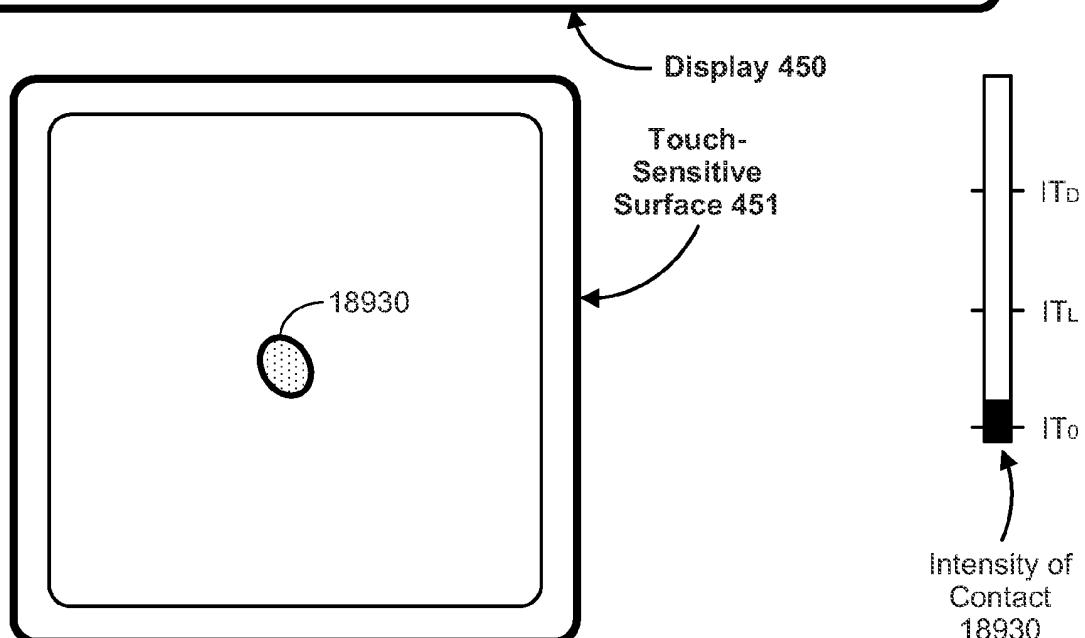
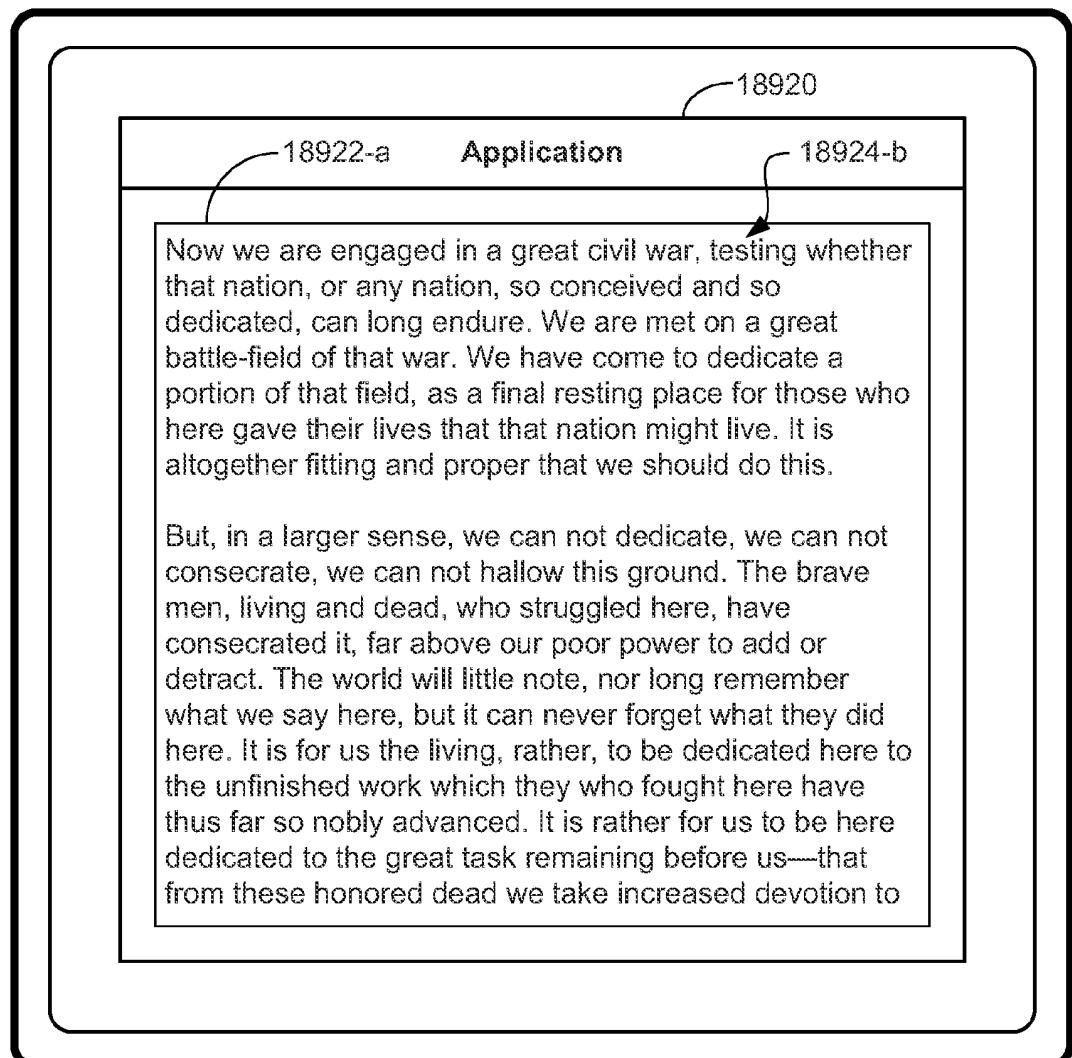


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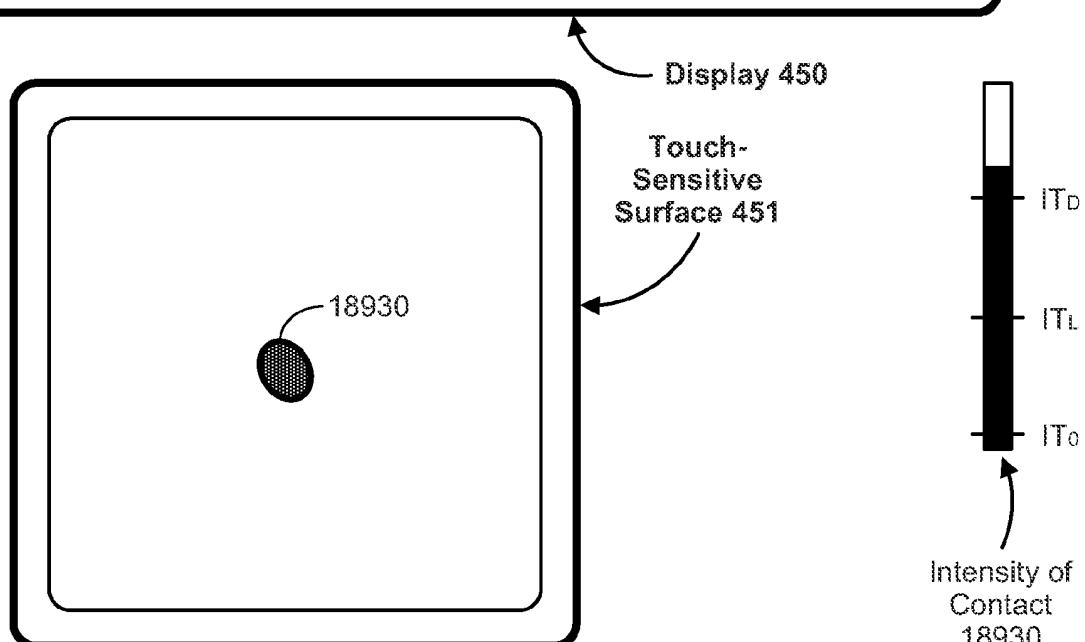
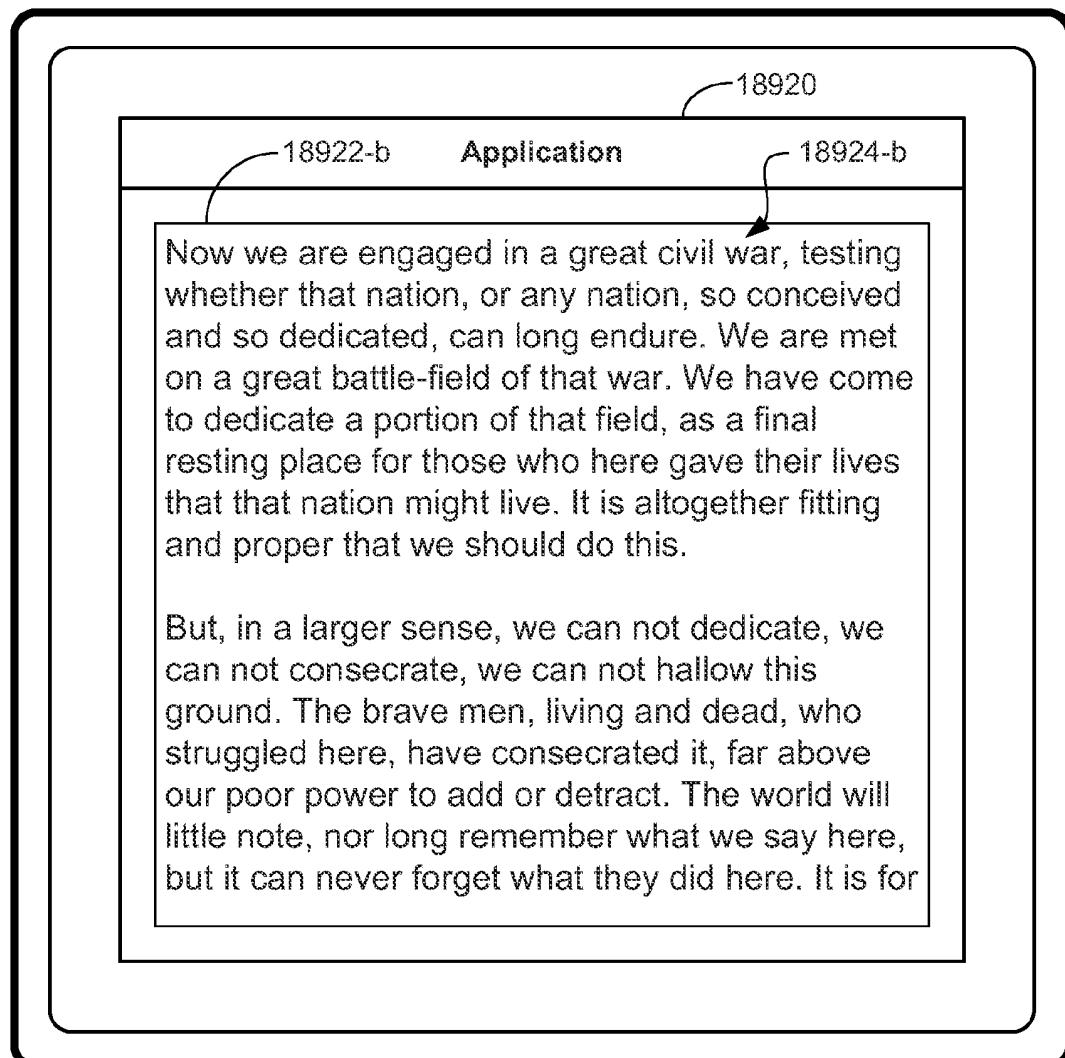


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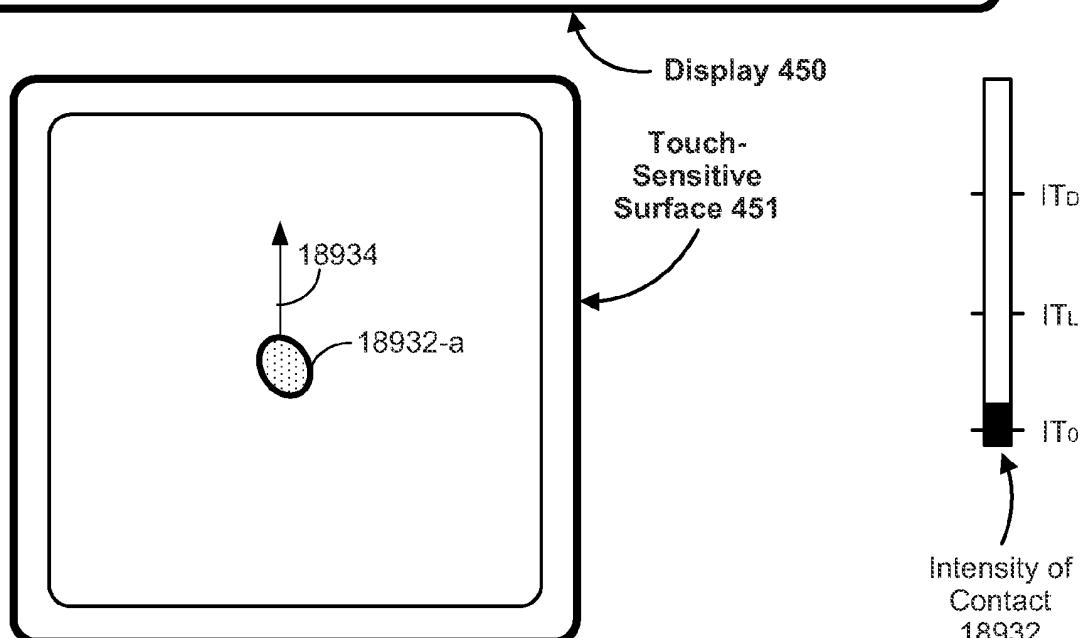
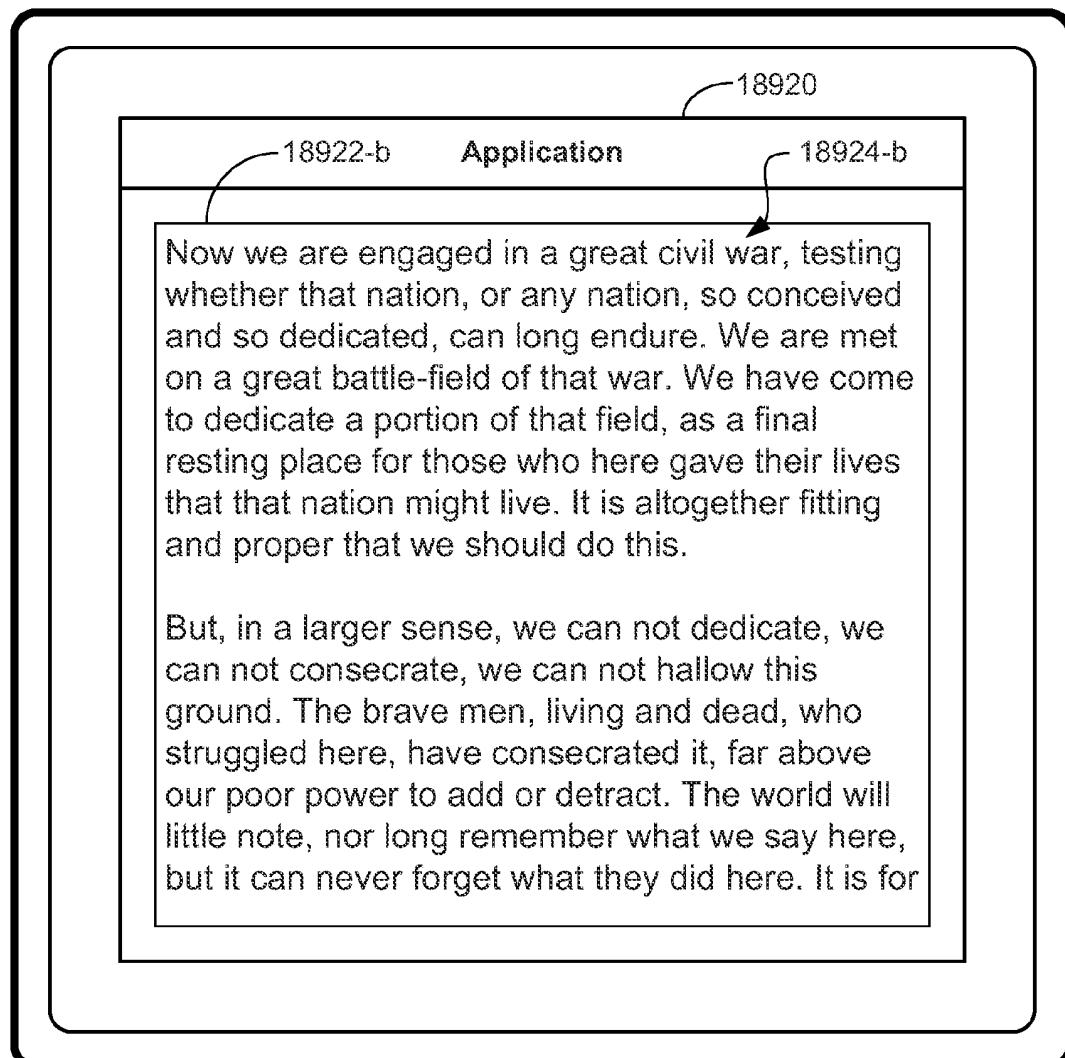


Figure 50

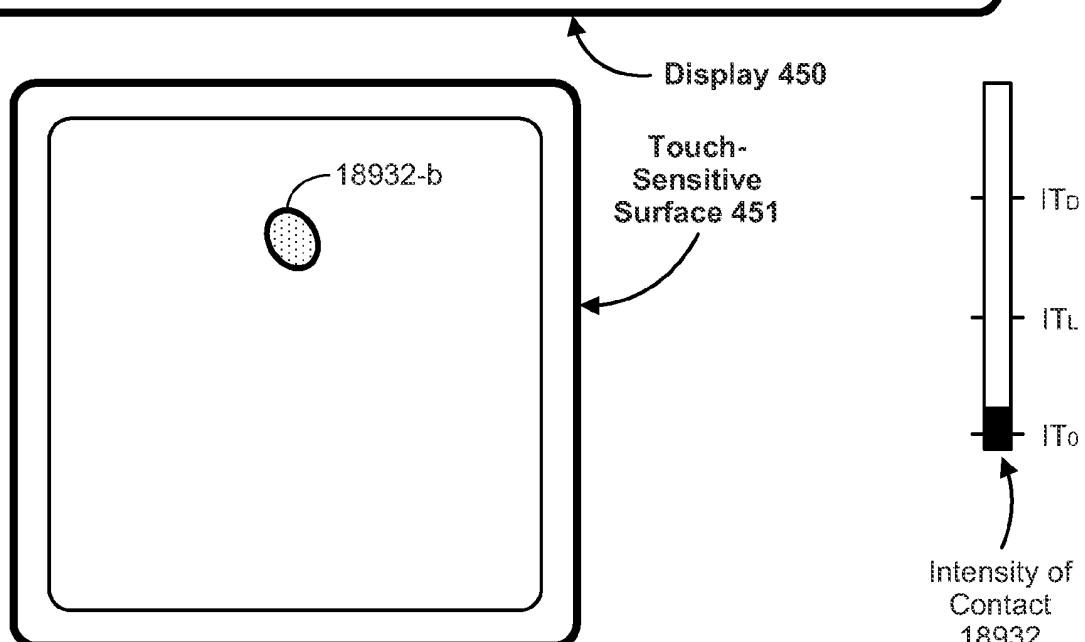
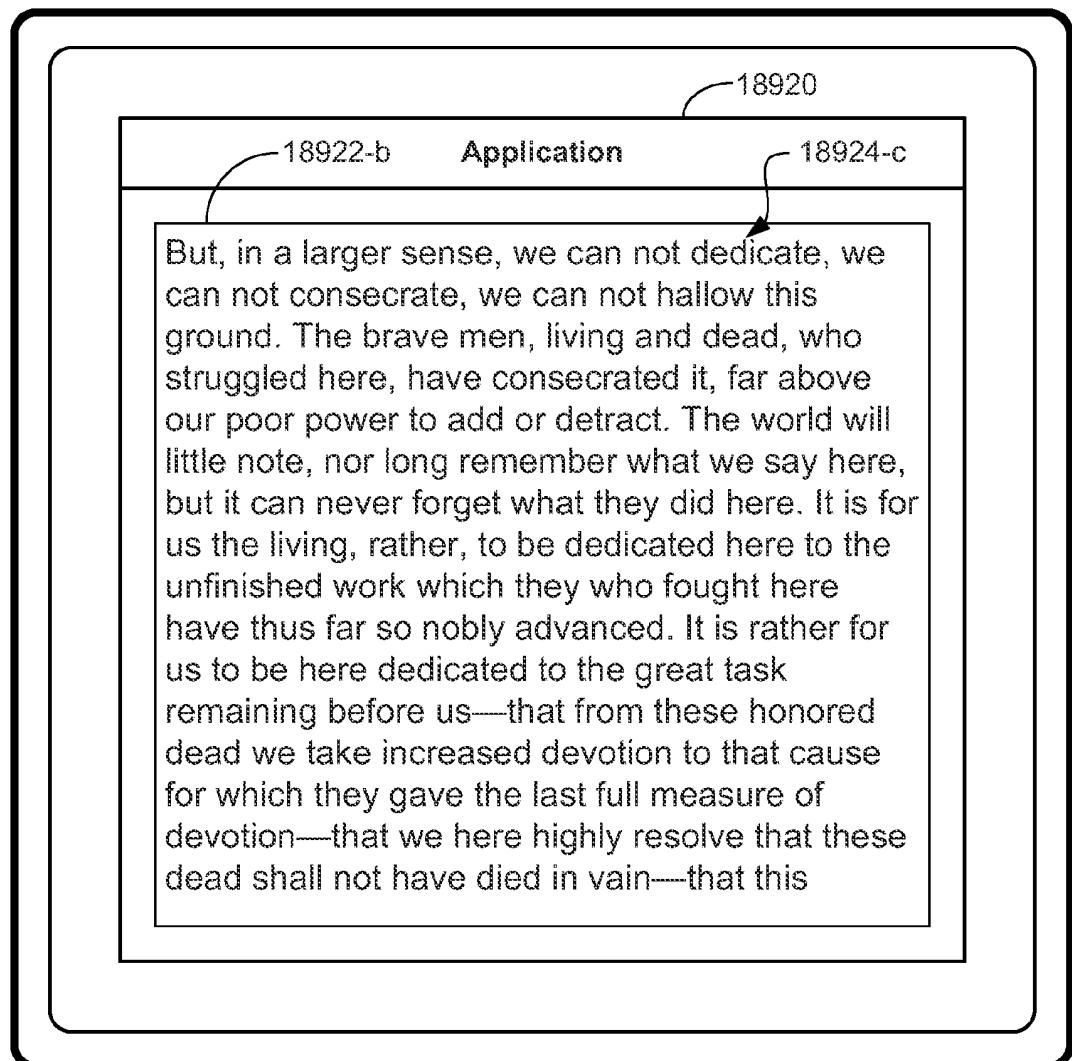


Figure 5P

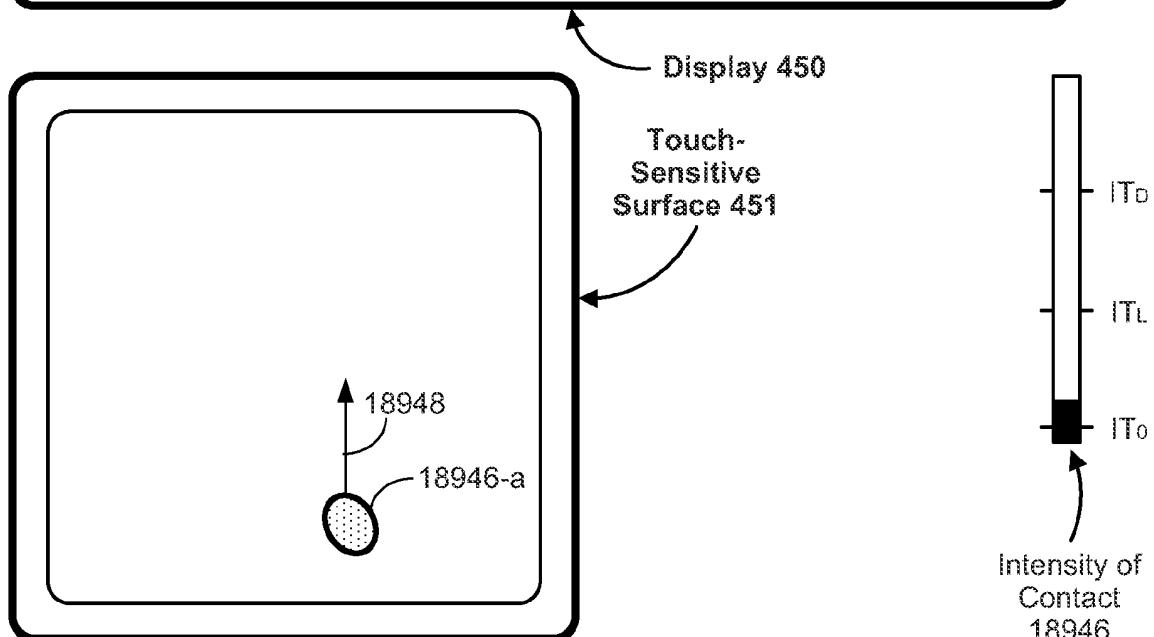
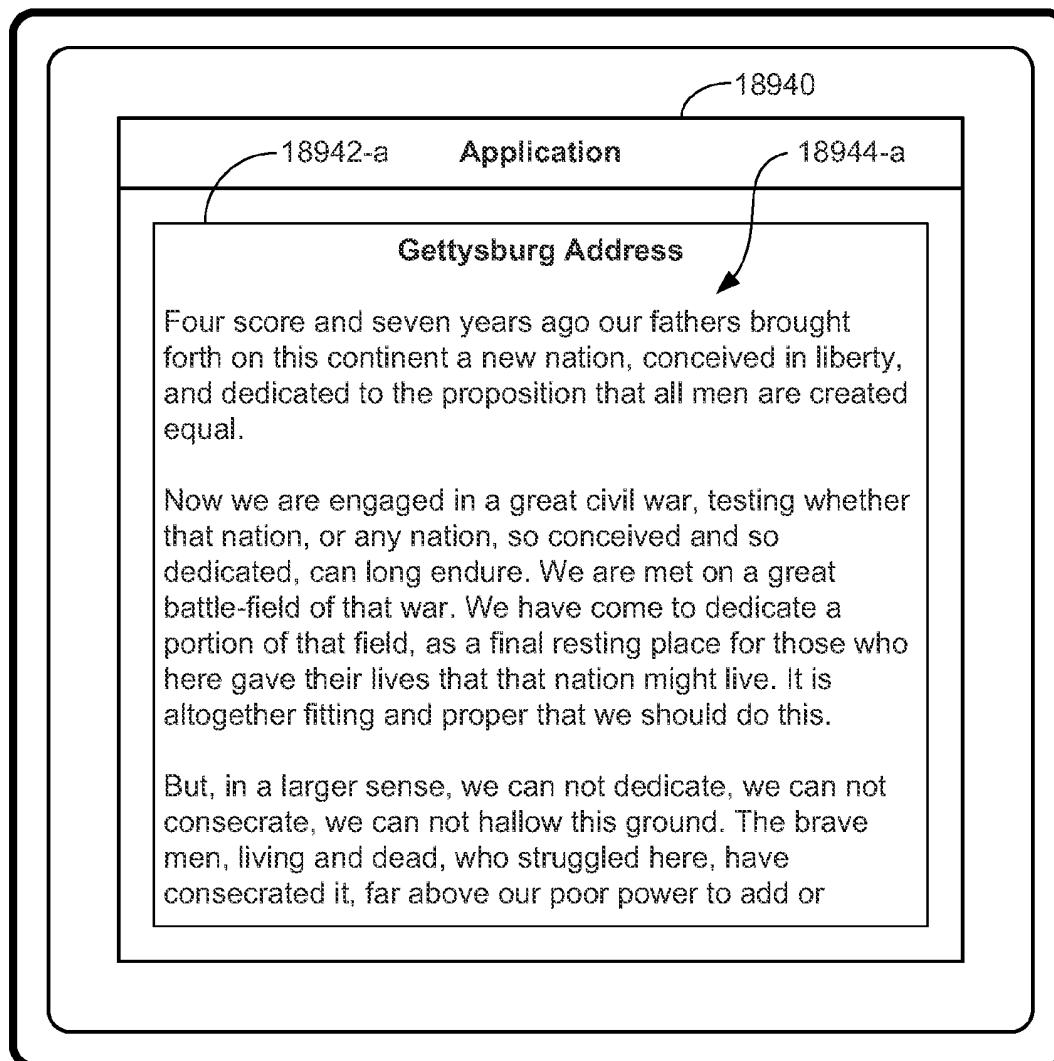


Figure 5Q

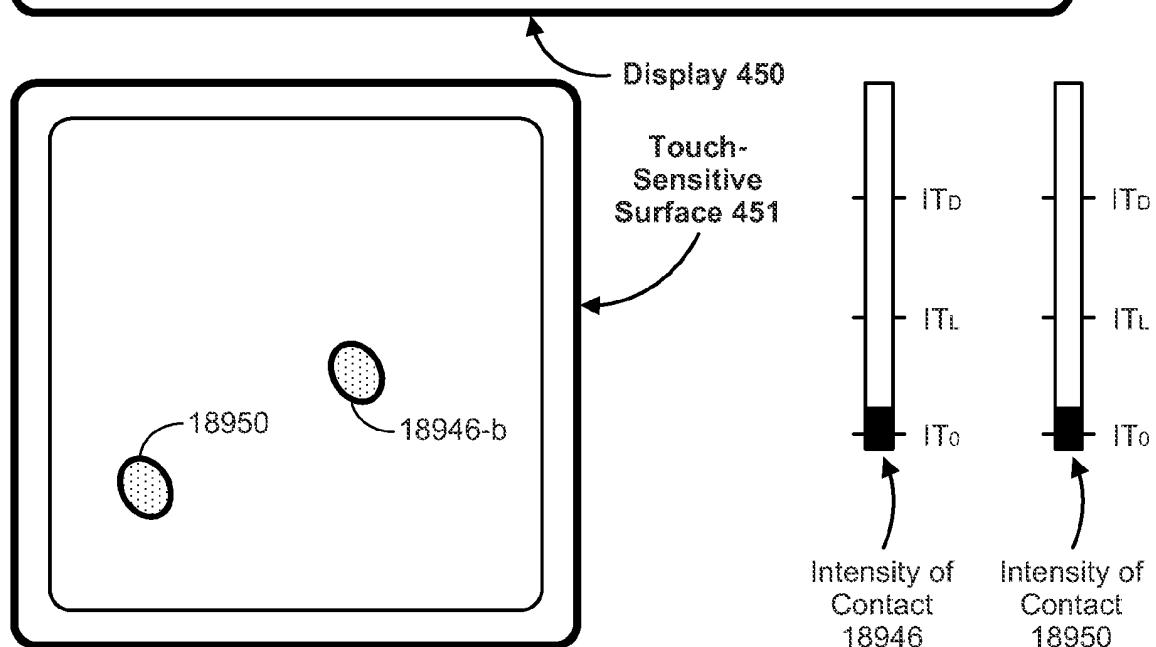
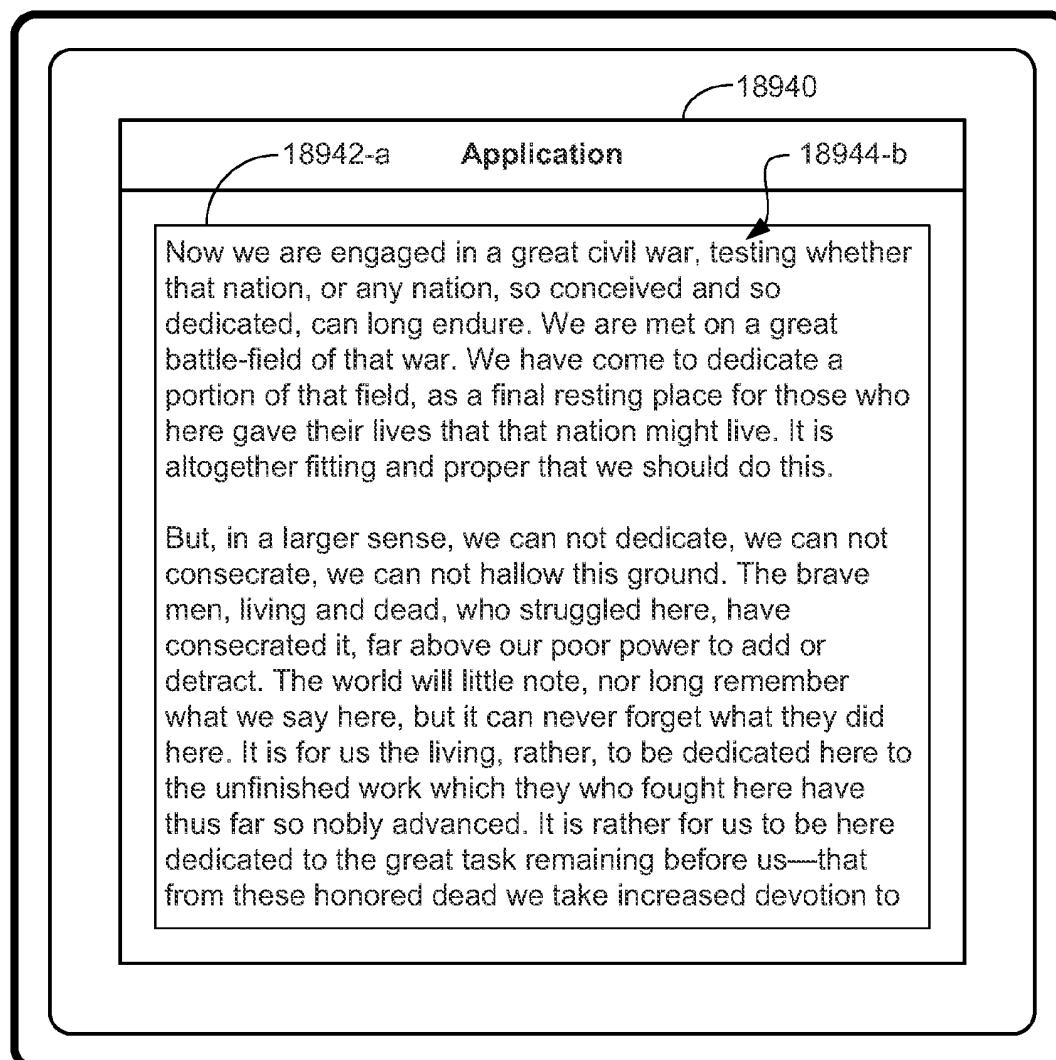


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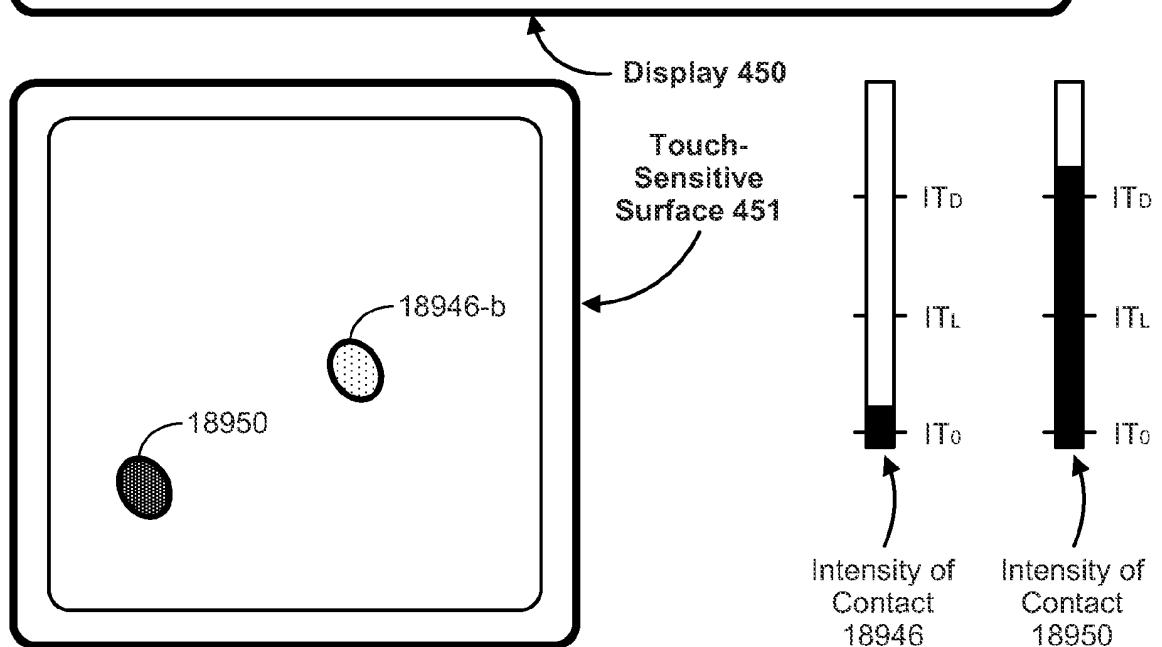
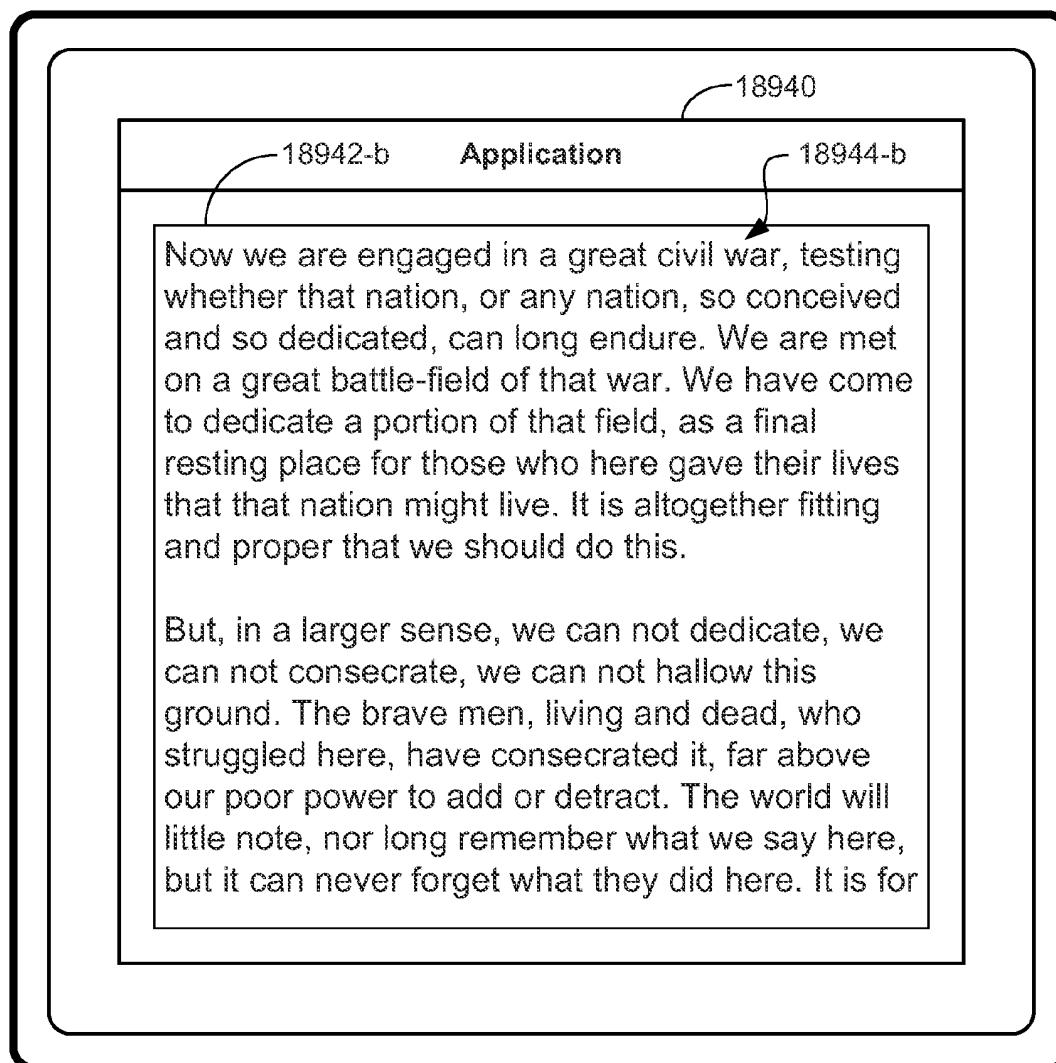


Figure 5S

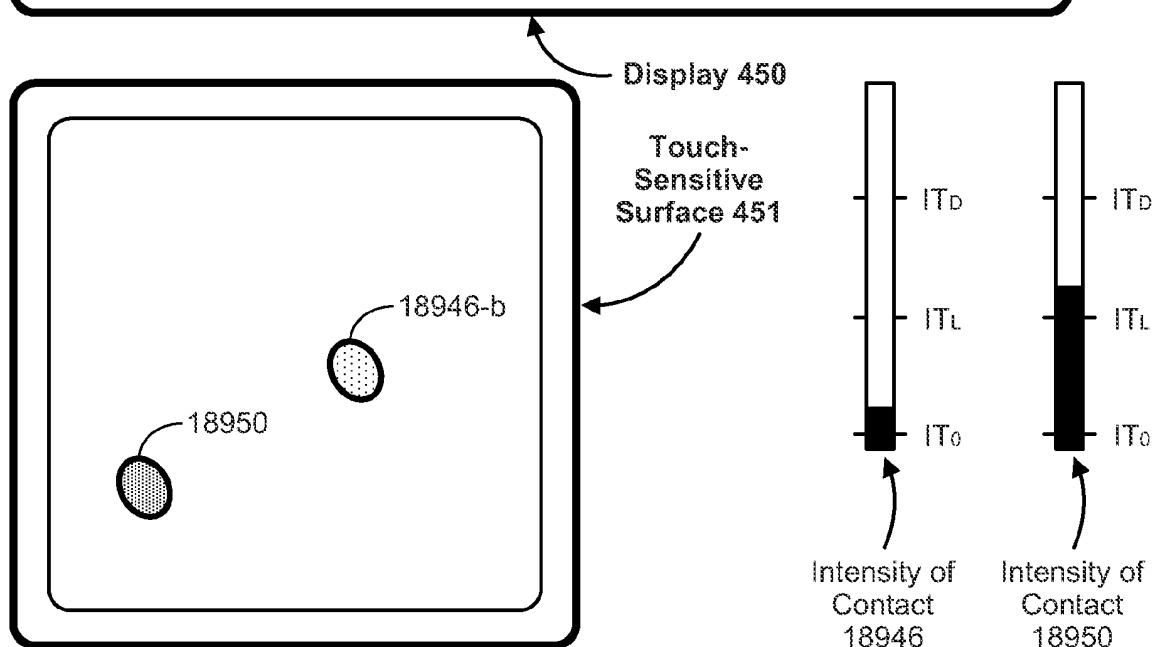
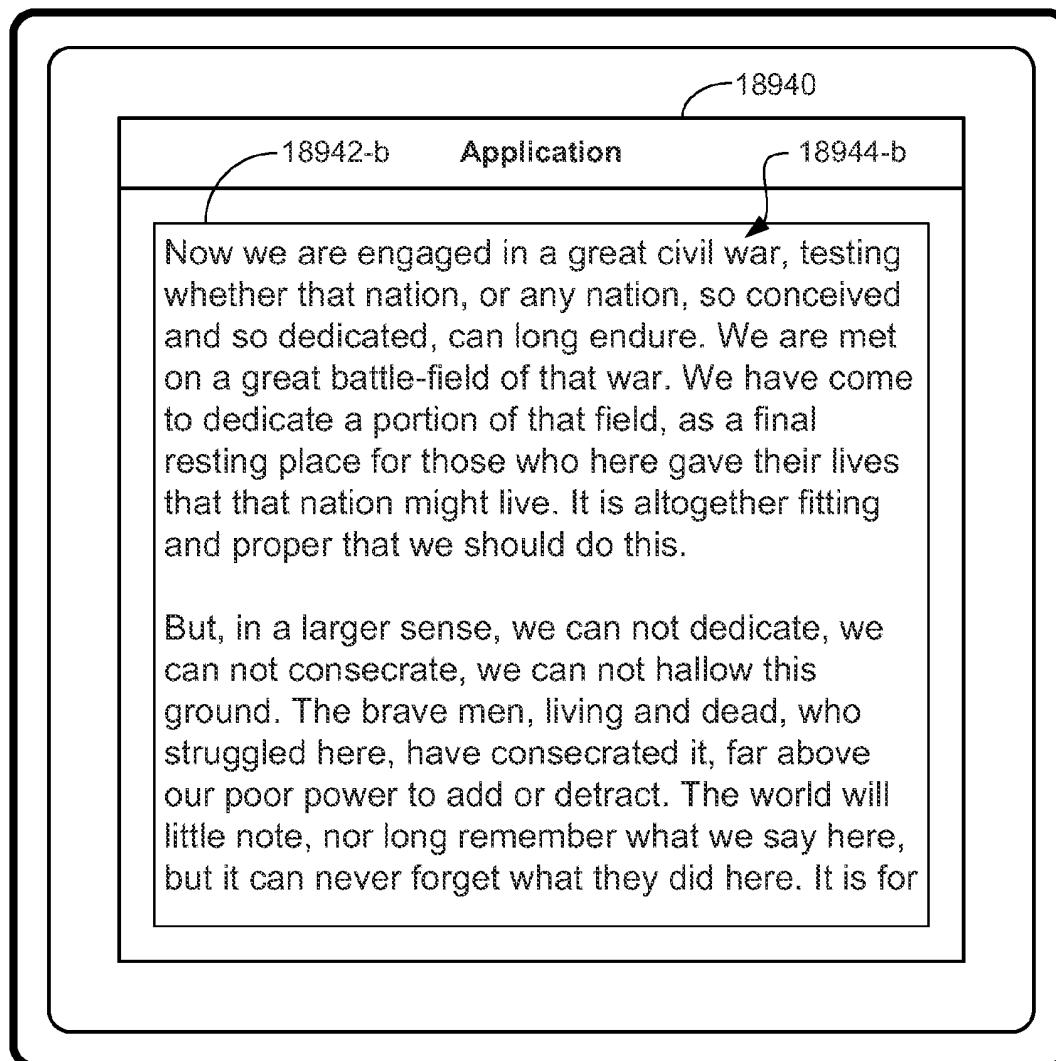


Figure 5T

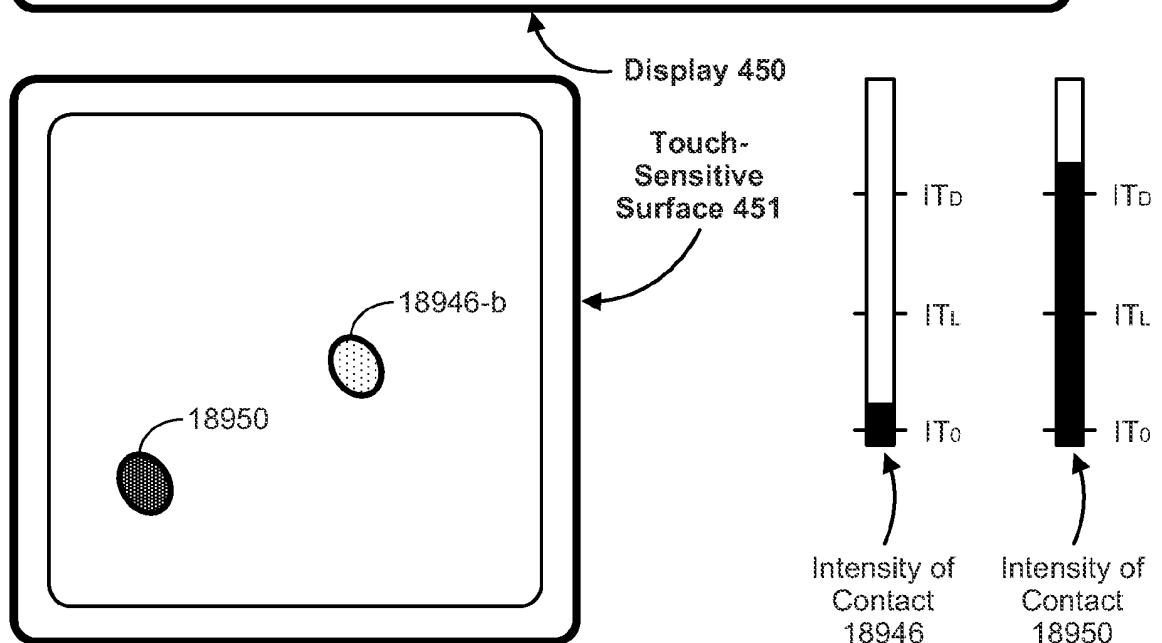
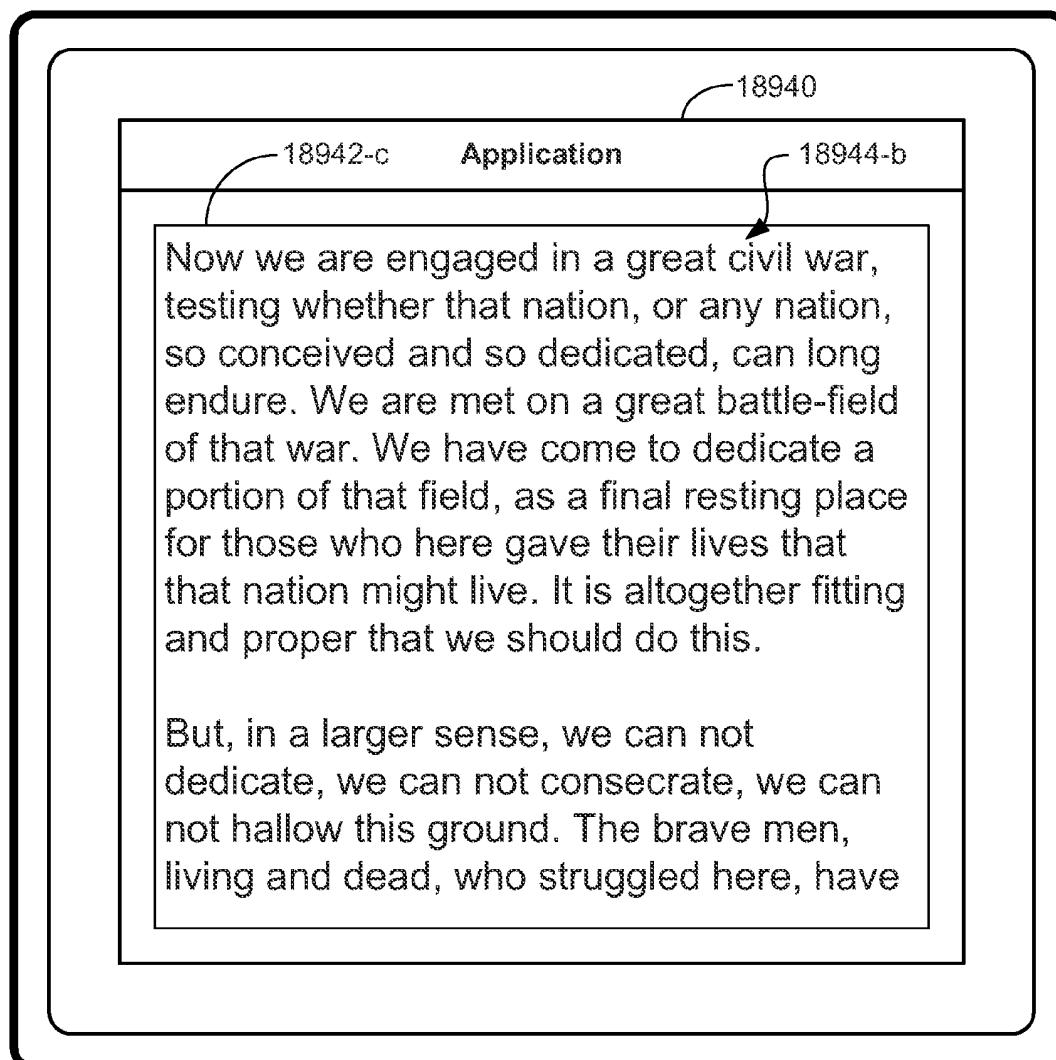


Figure 5U

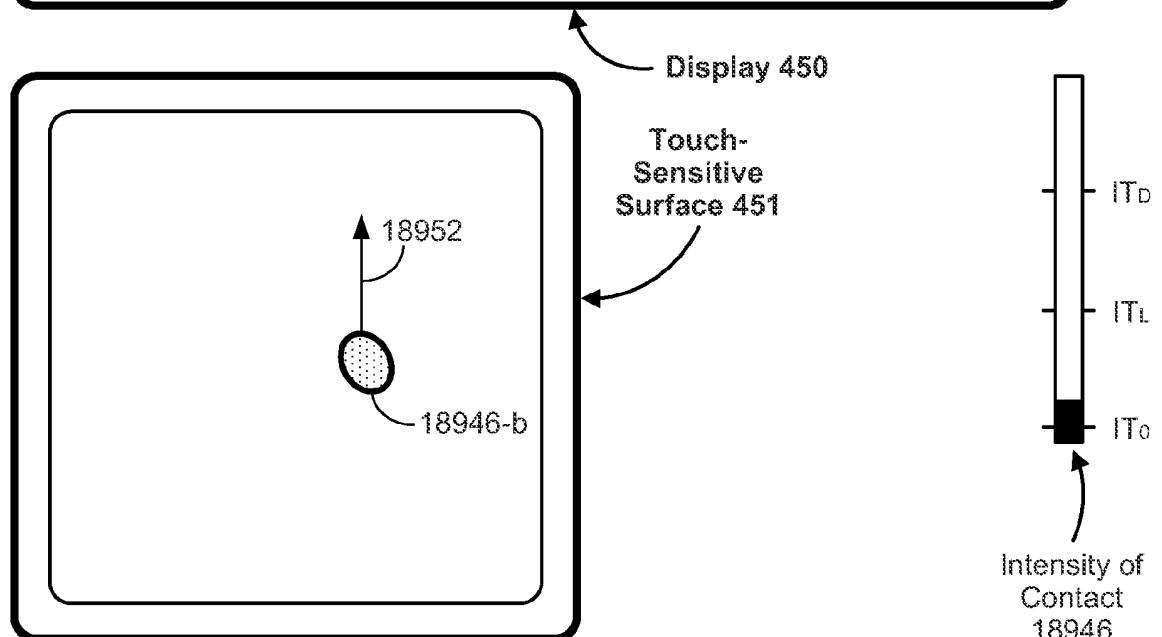
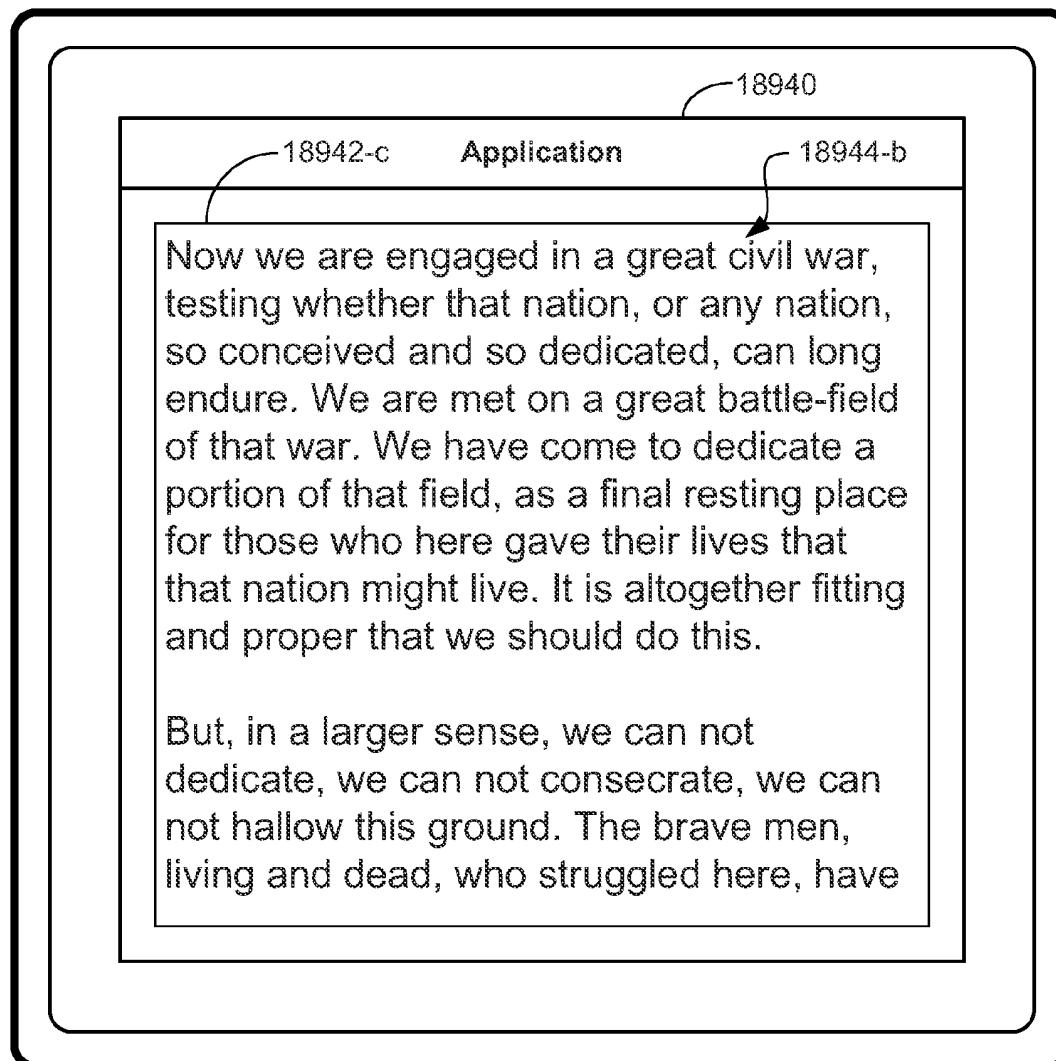


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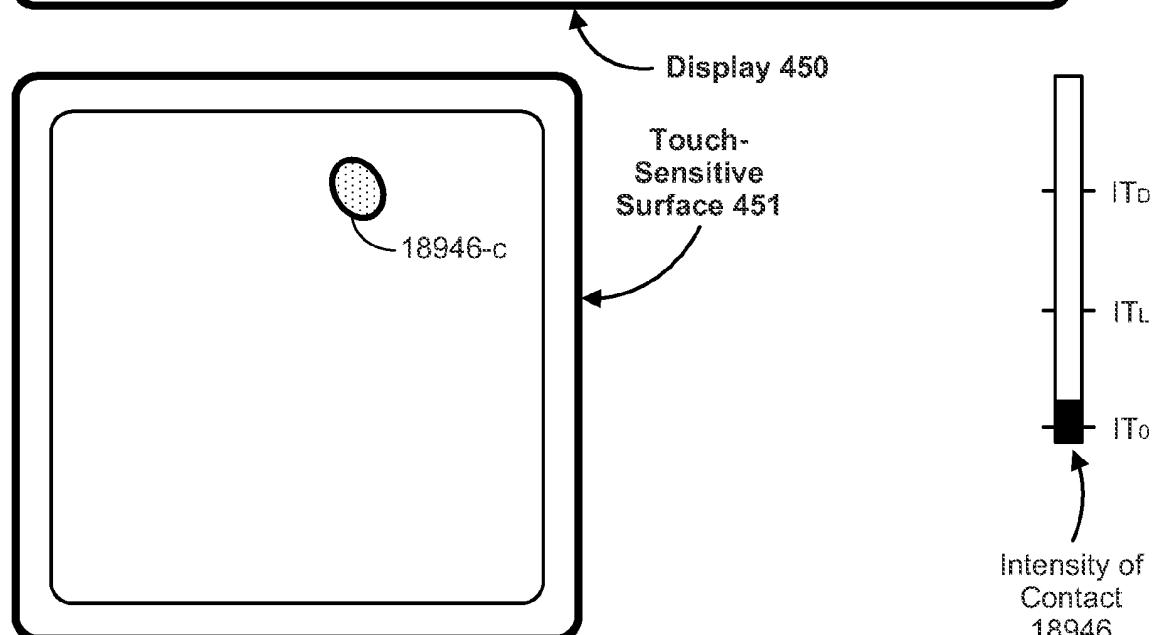
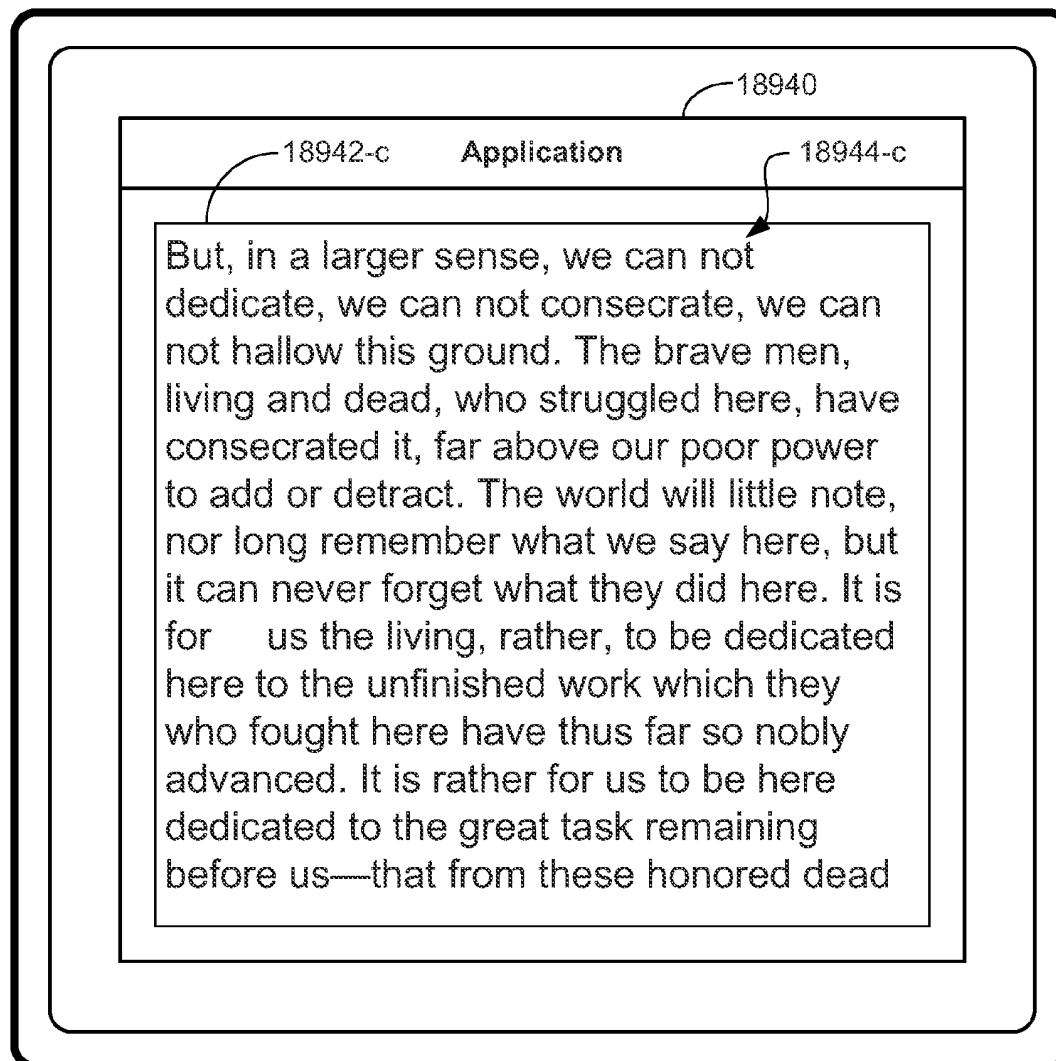


Figure 5W

19000

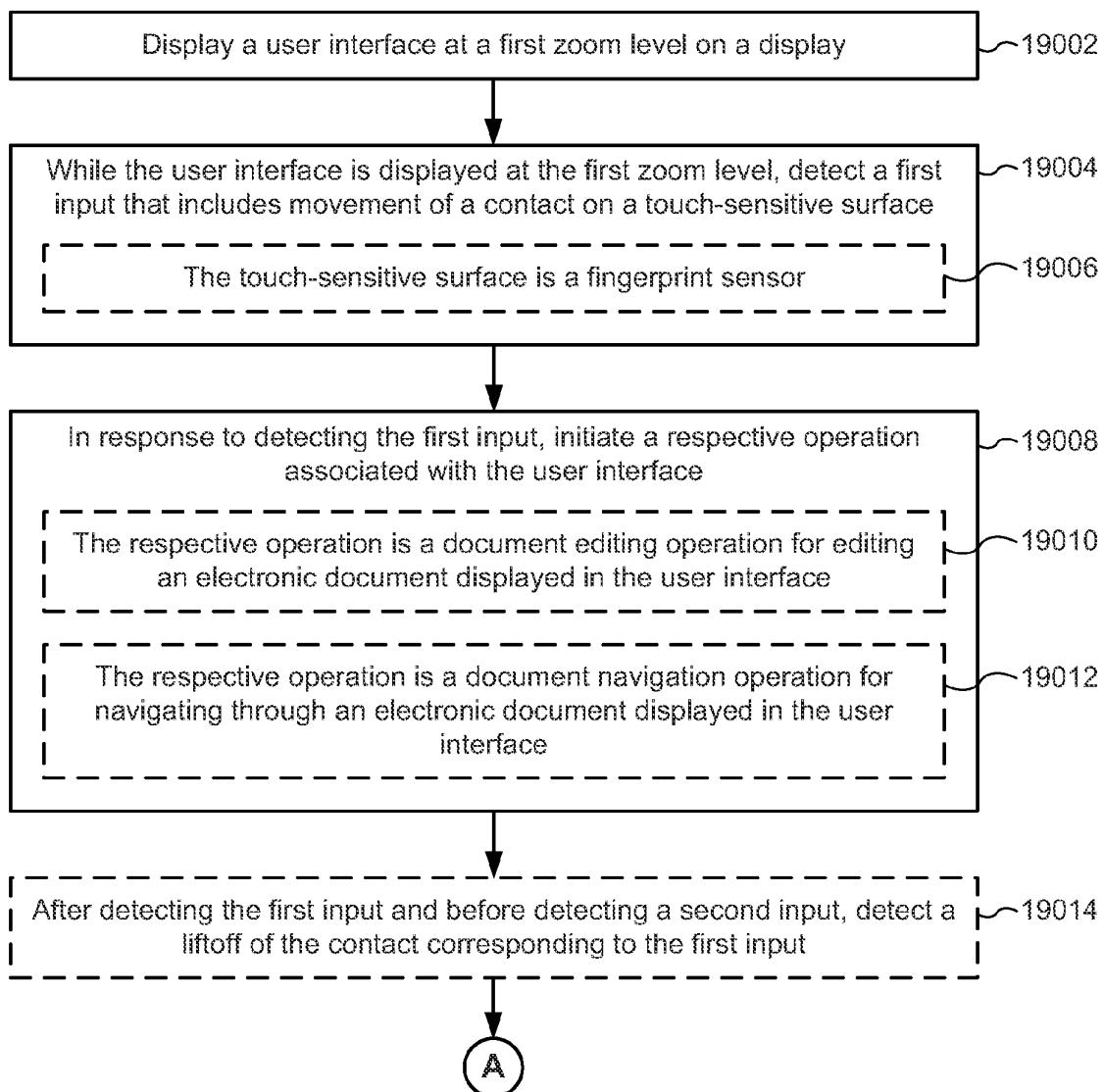


Figure 6A

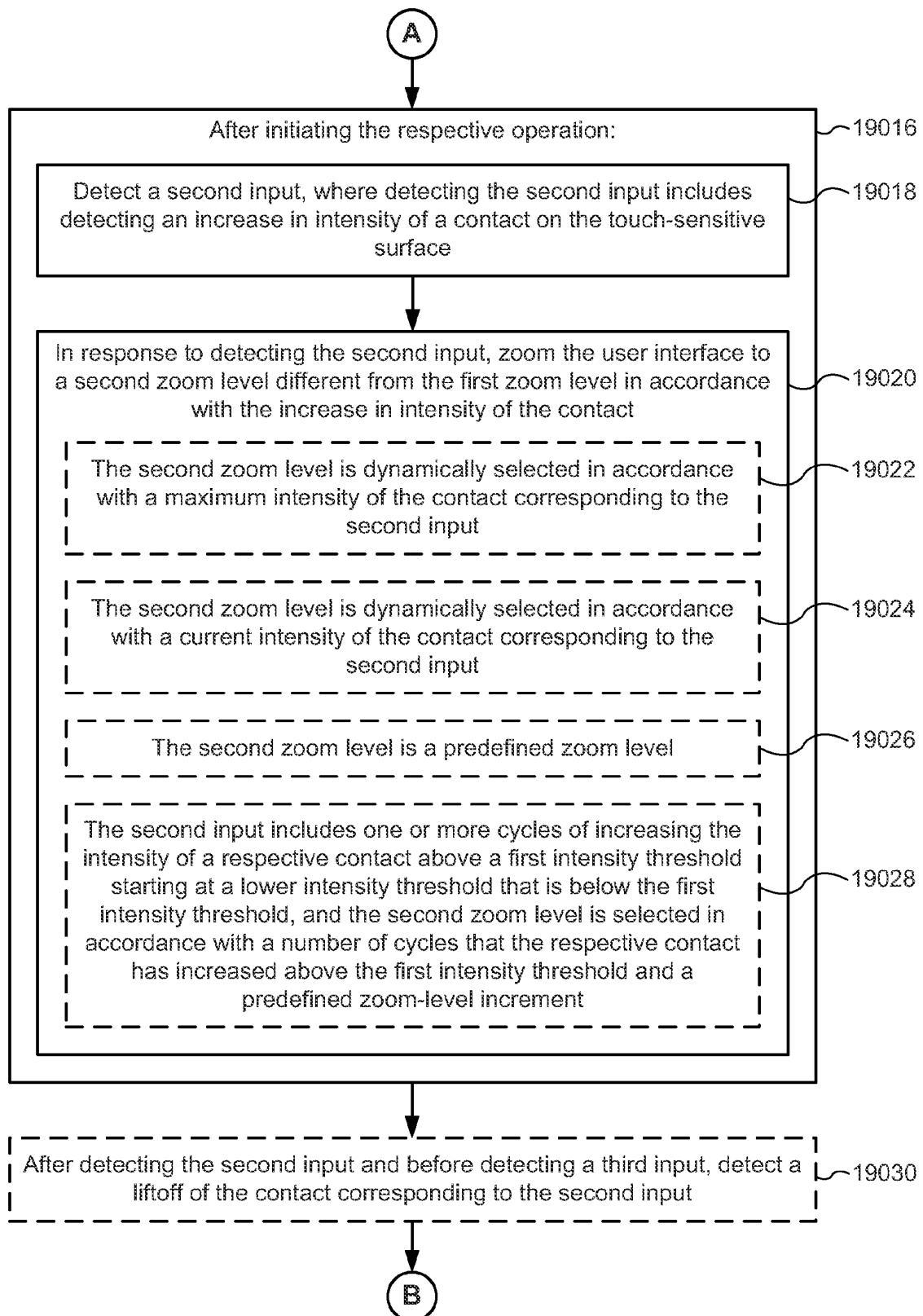


Figure 6B

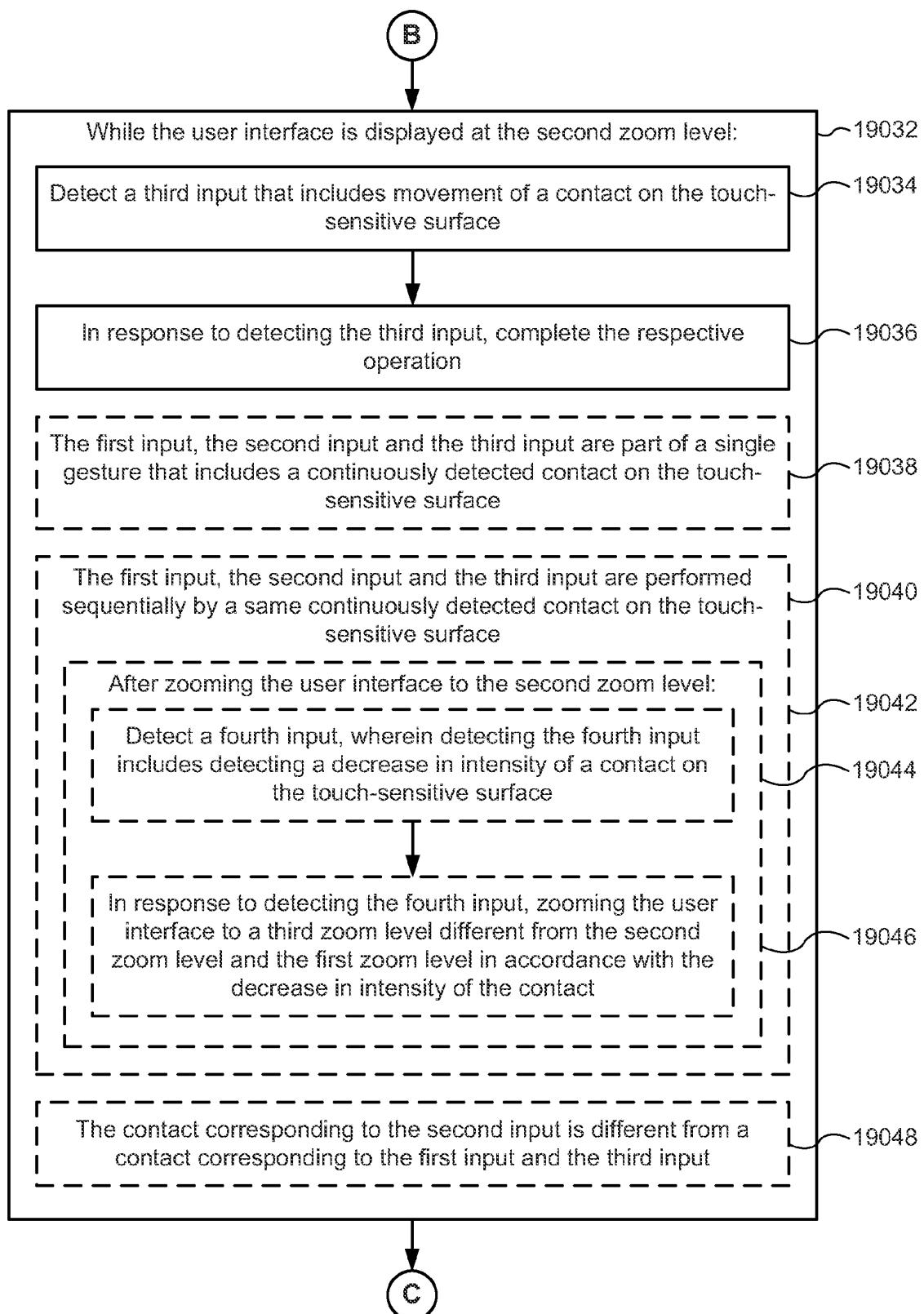


Figure 6C

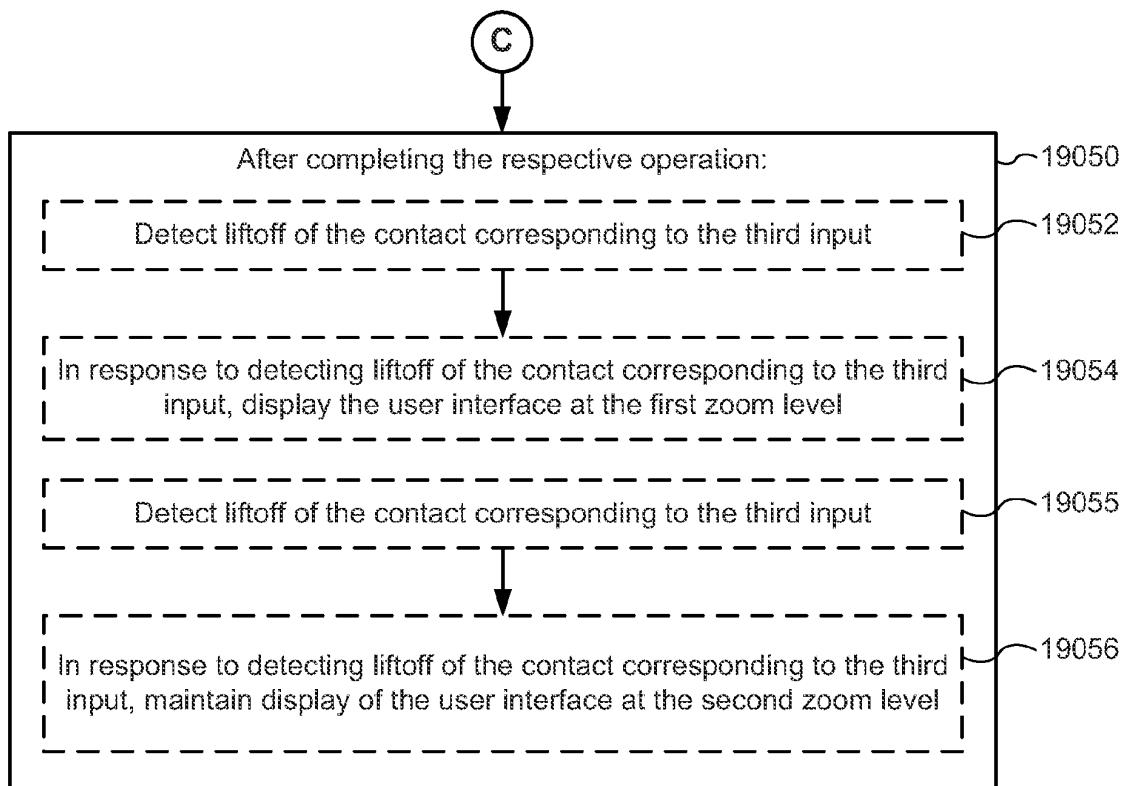


Figure 6D

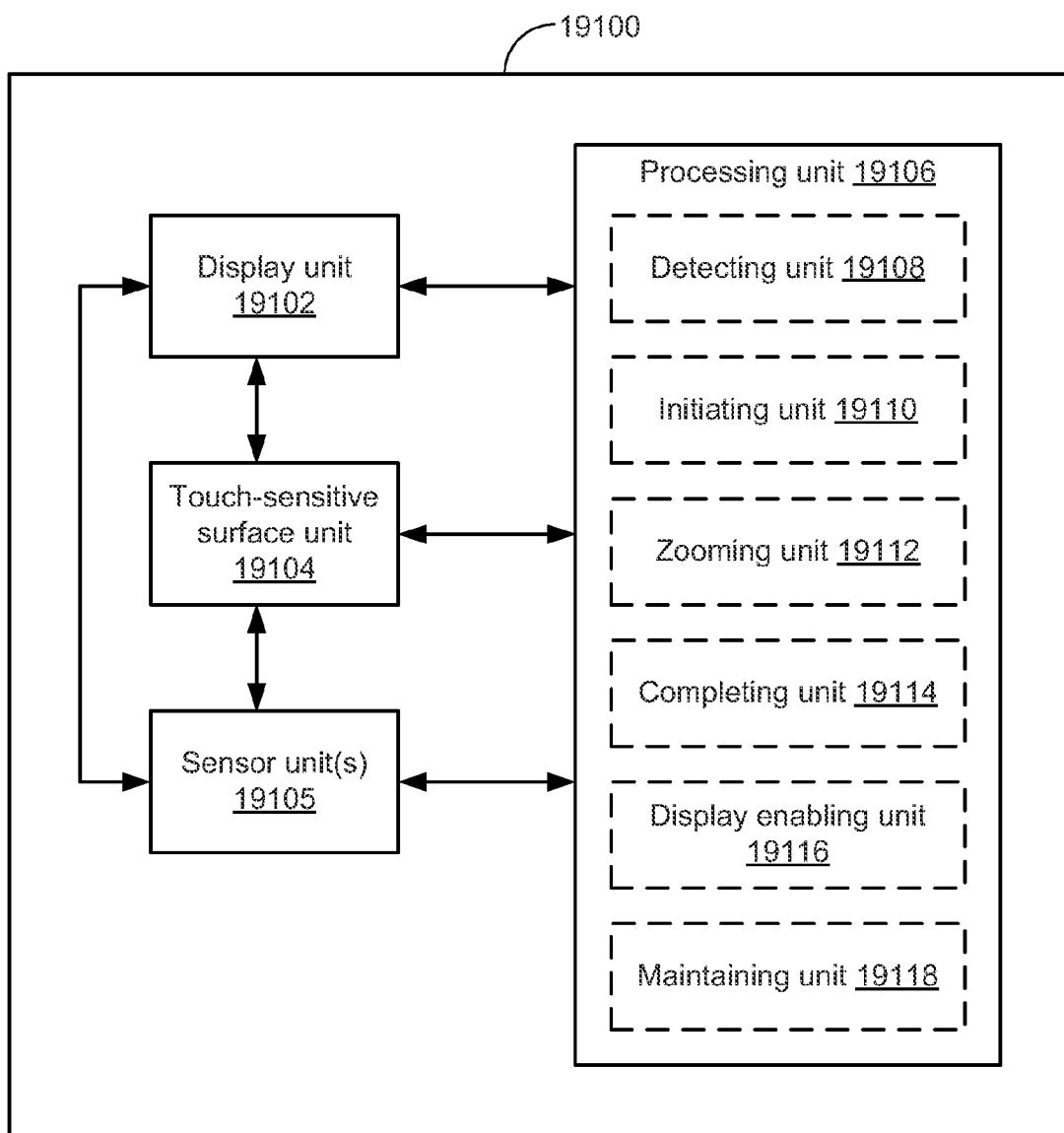


Figure 7

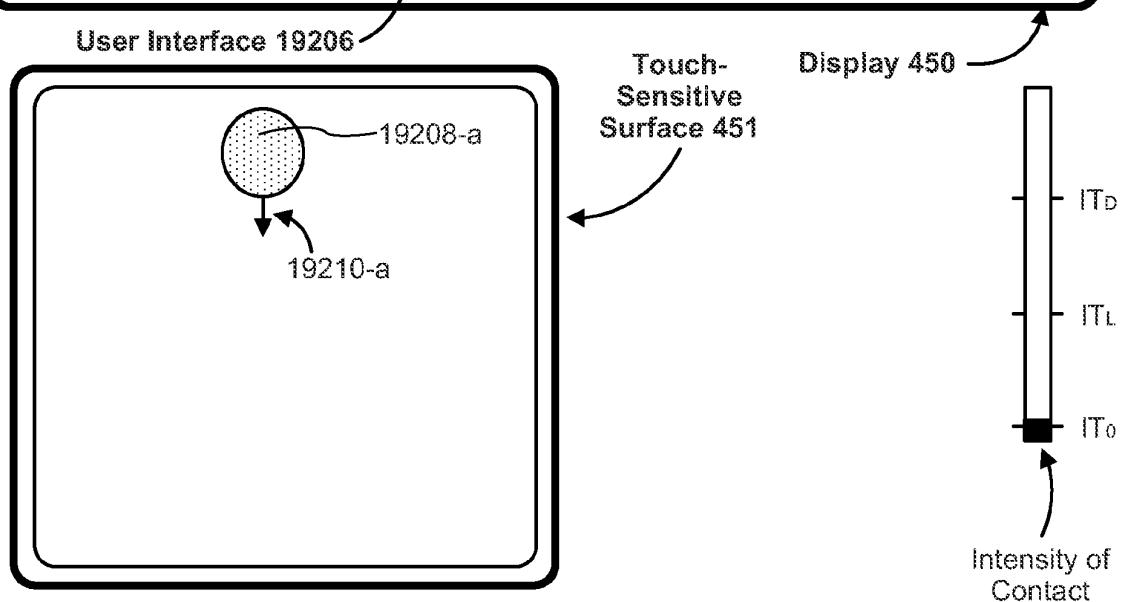
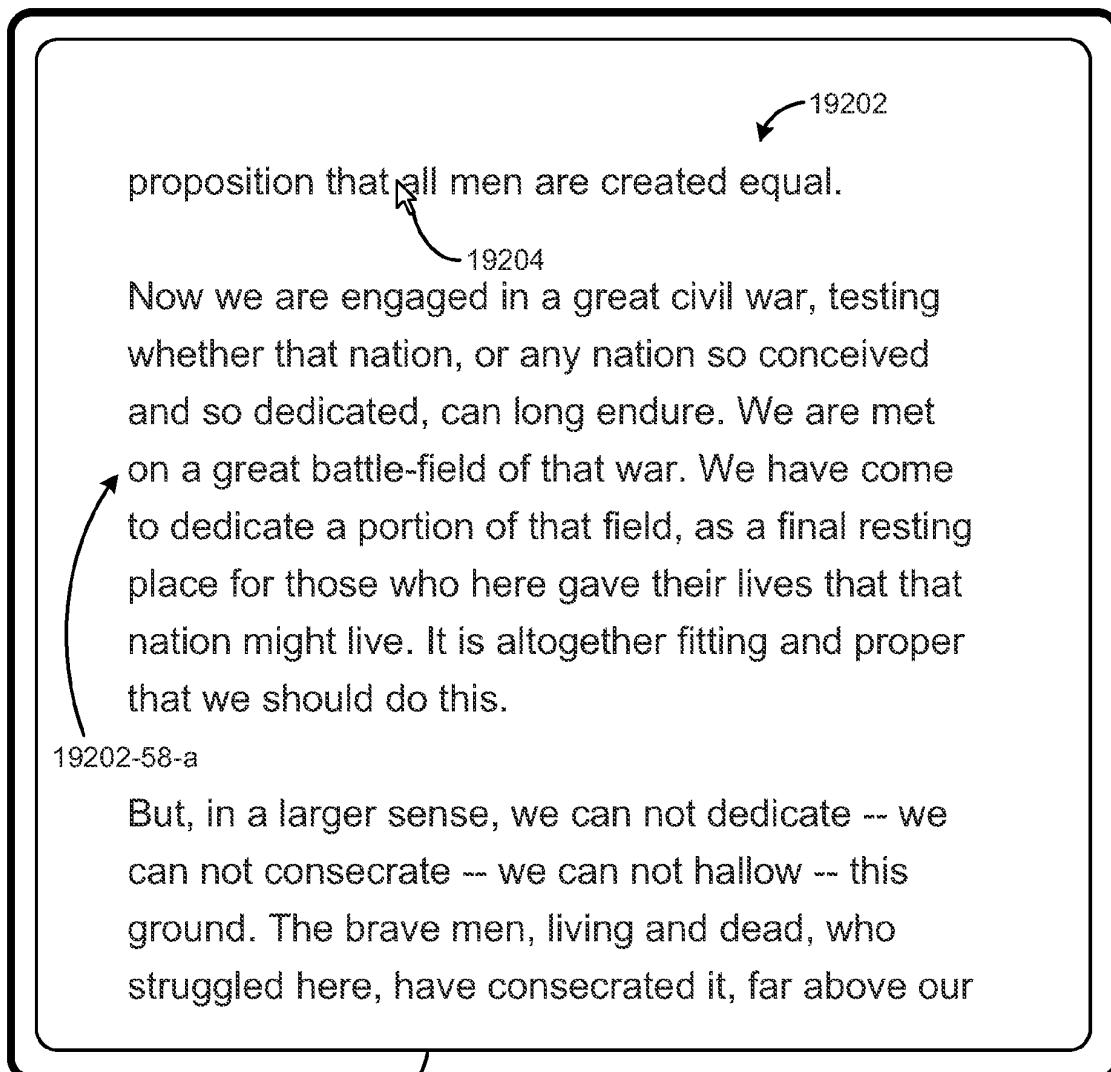


Figure 8A

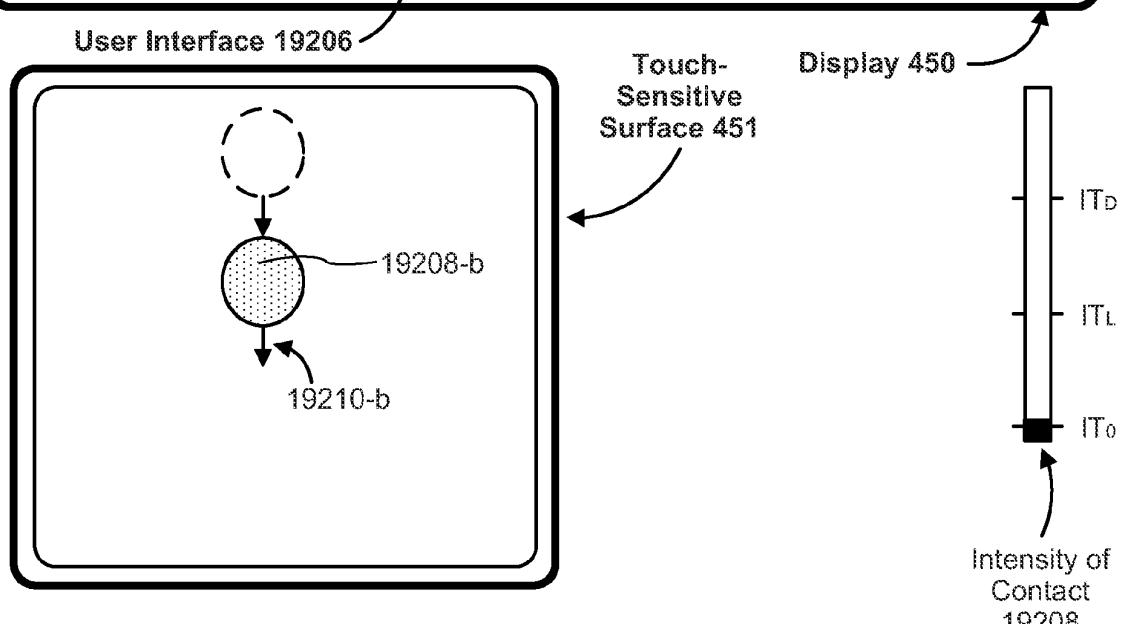
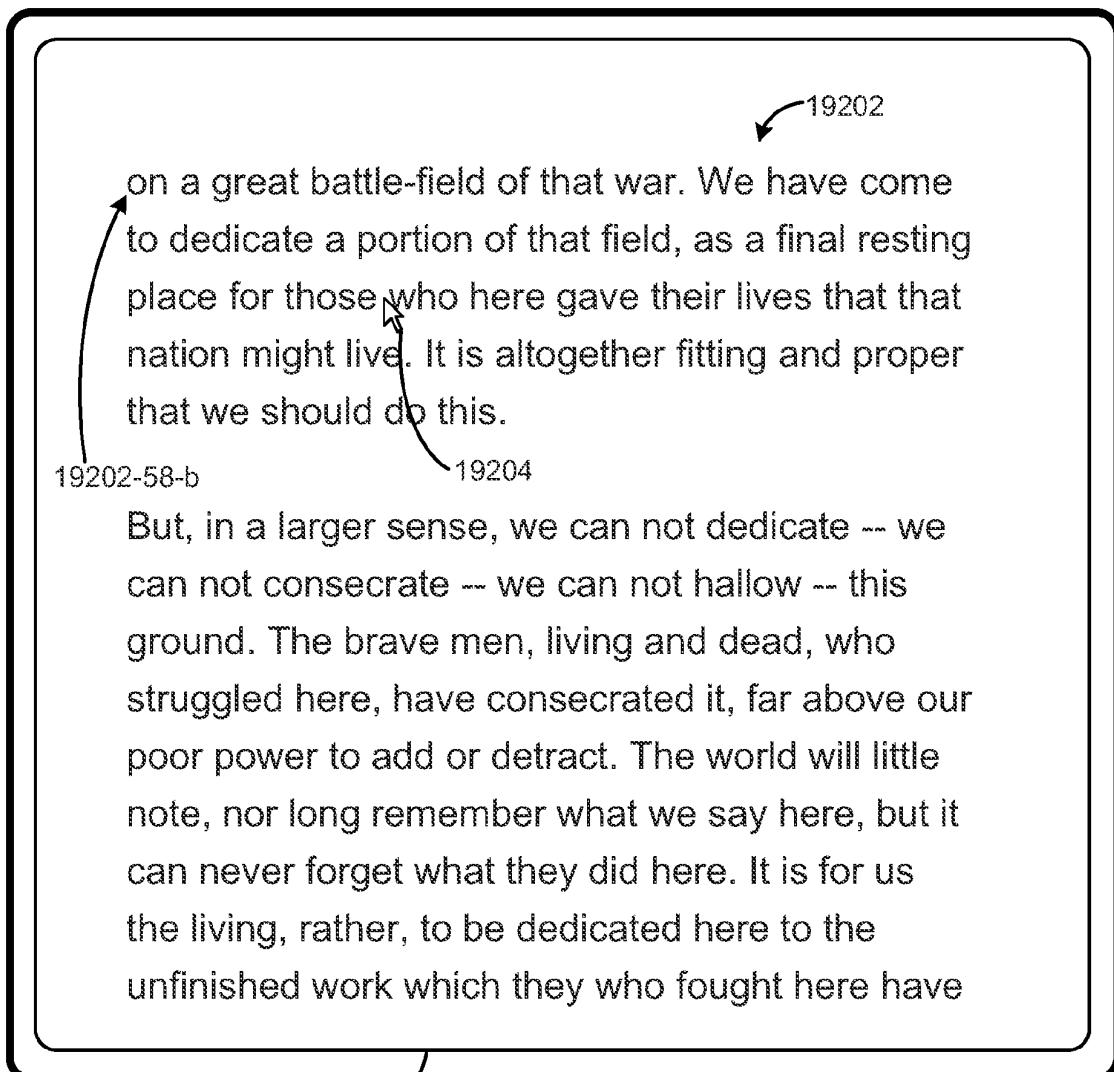


Figure 8B

Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met, on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19202-58-c

But, in a larger sense, we can not dedicate -- we

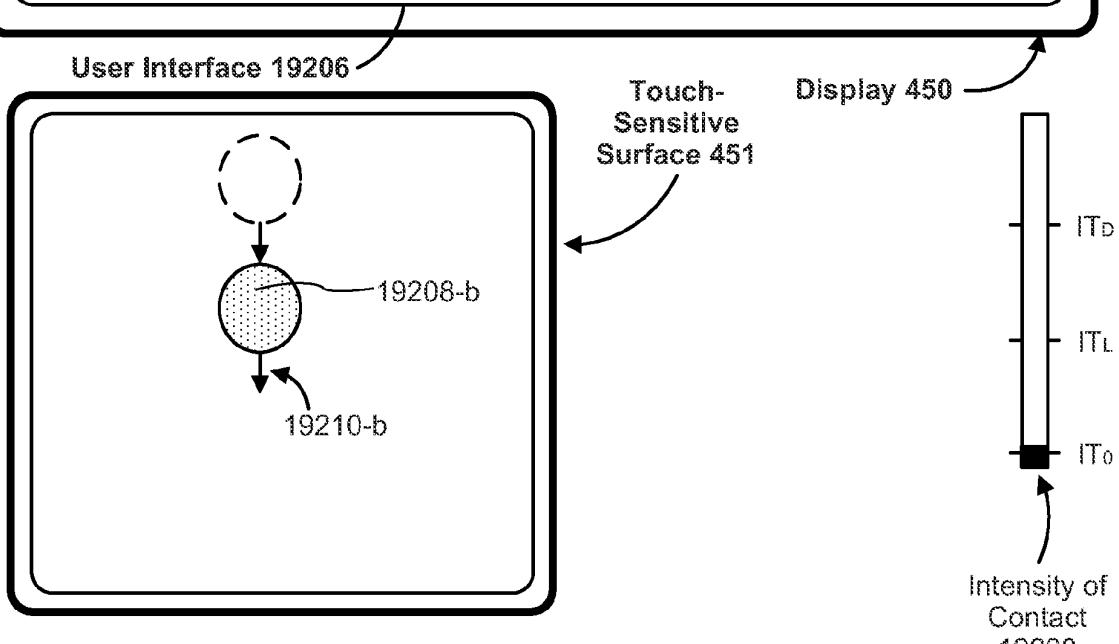


Figure 8C

19202

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19202-58-b 19204

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have

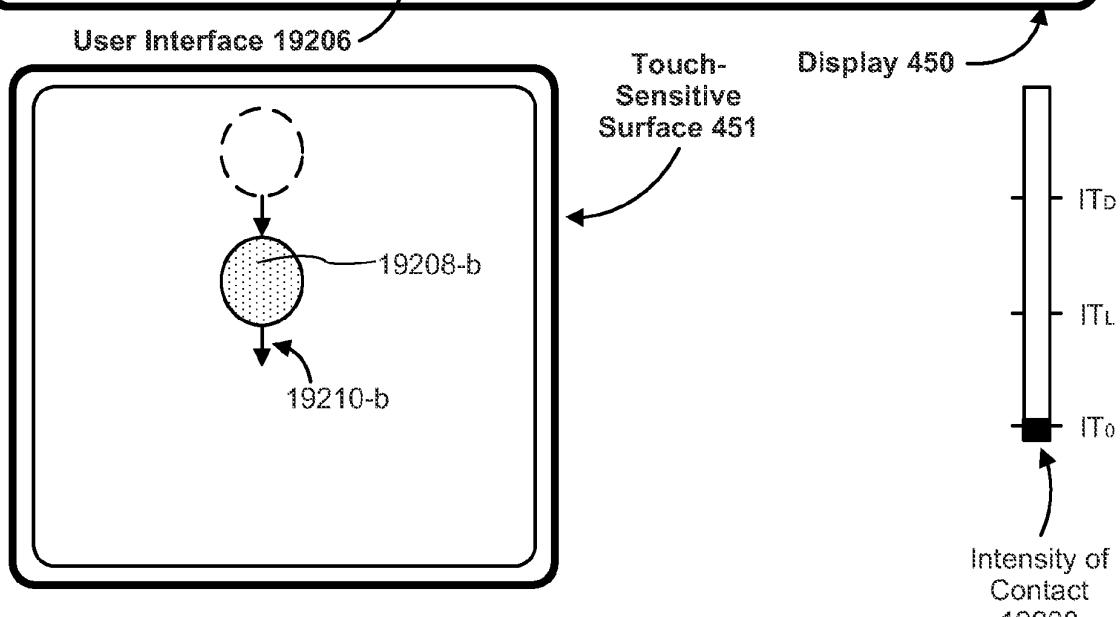


Figure 8D

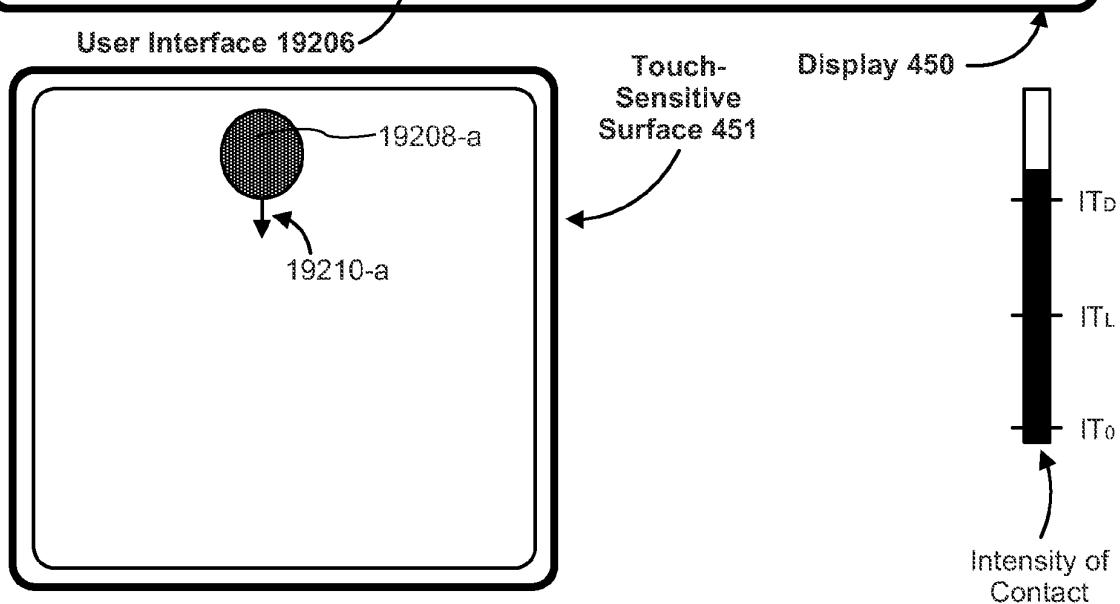
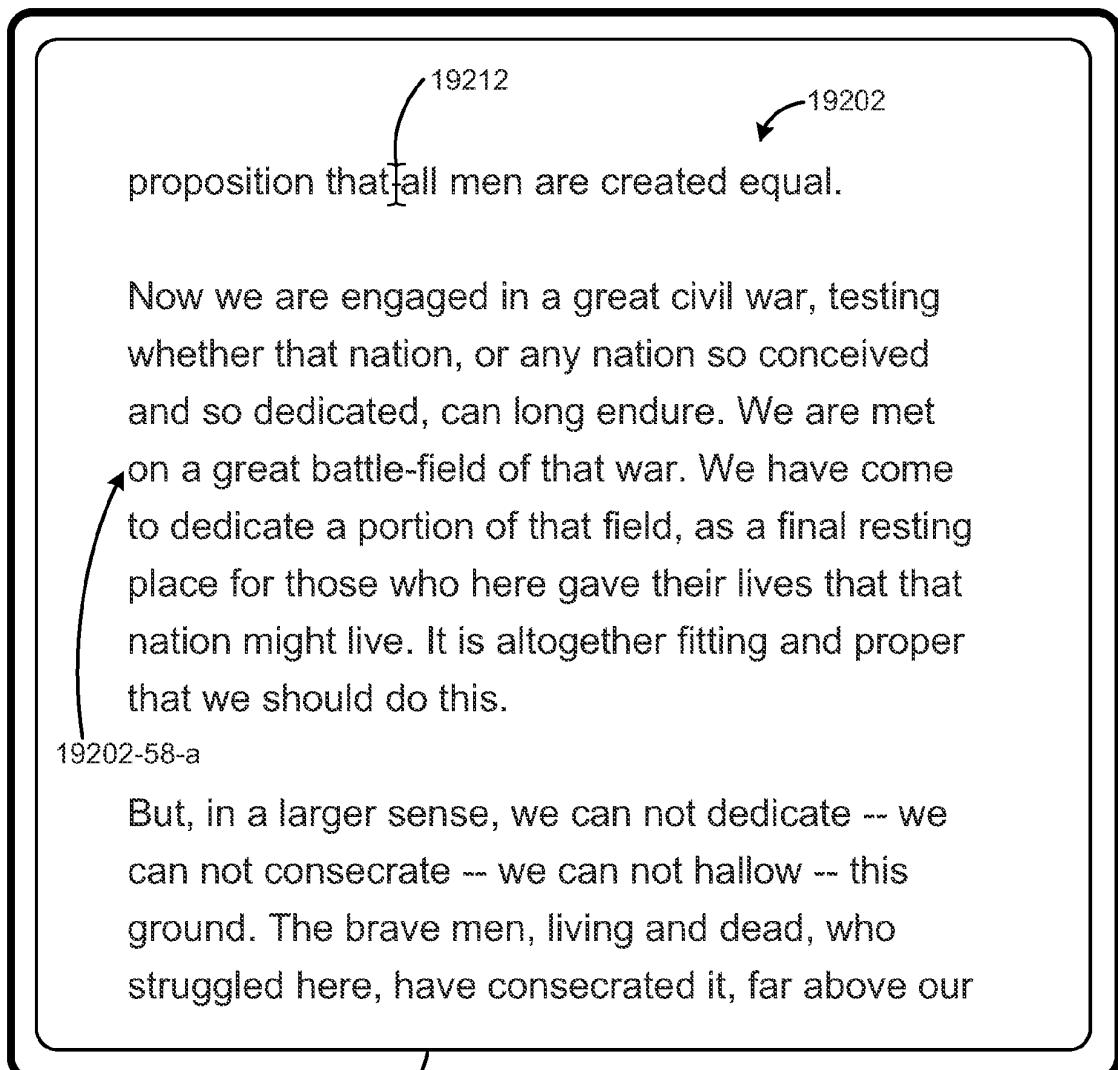


Figure 8E

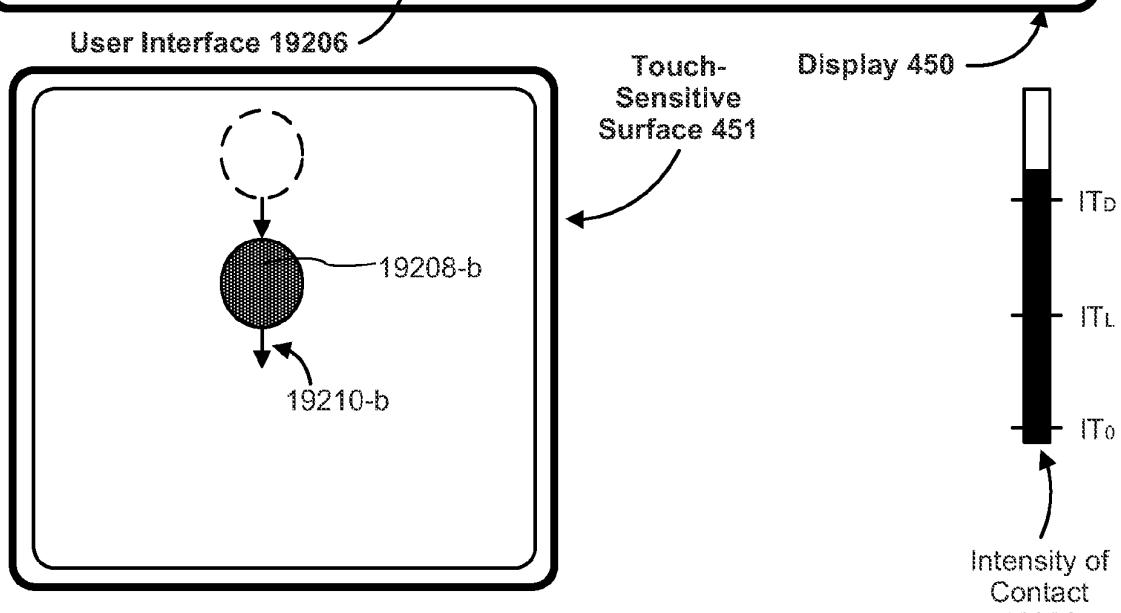
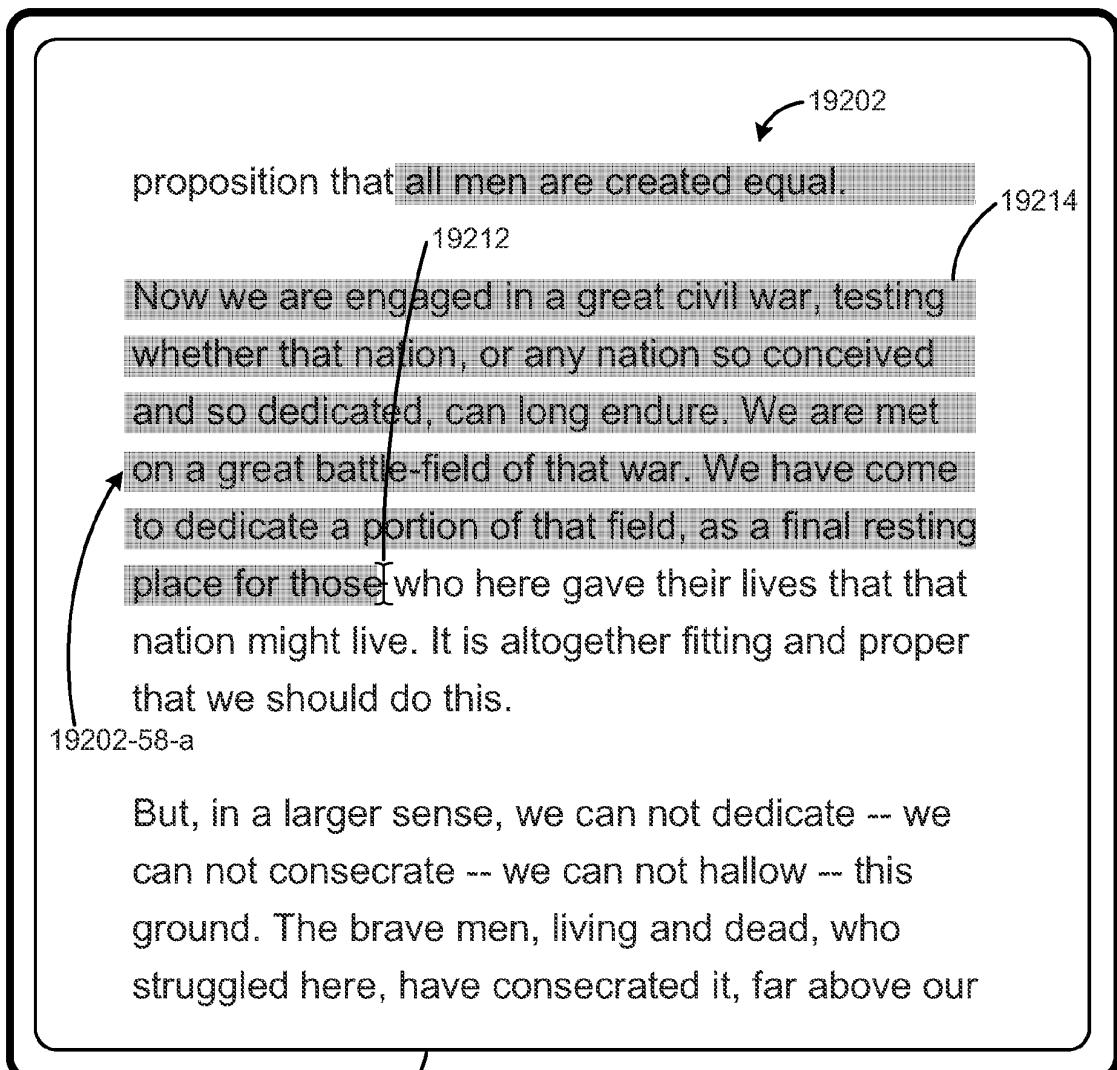


Figure 8F

19202

proposition that all men are created equal. 19214

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19202-58-a 19212

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our

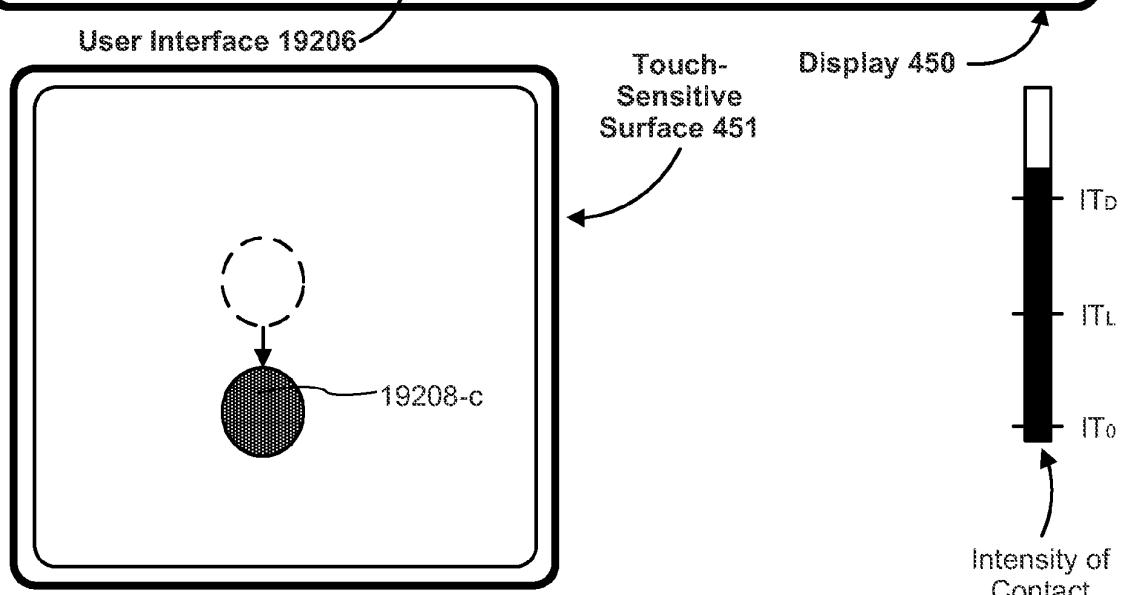


Figure 8G

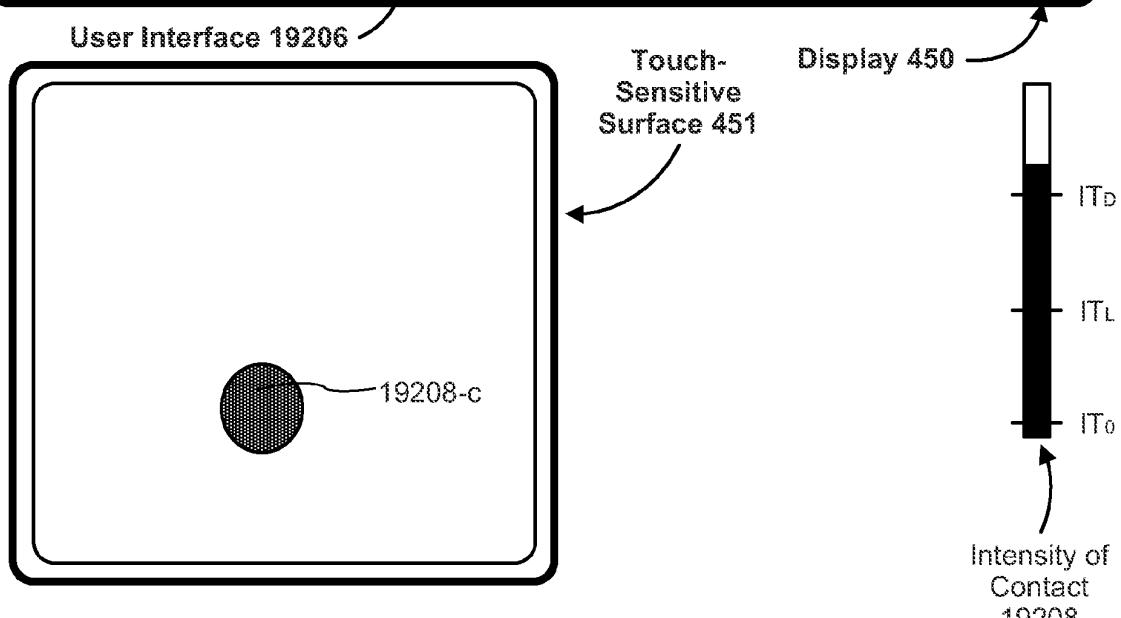
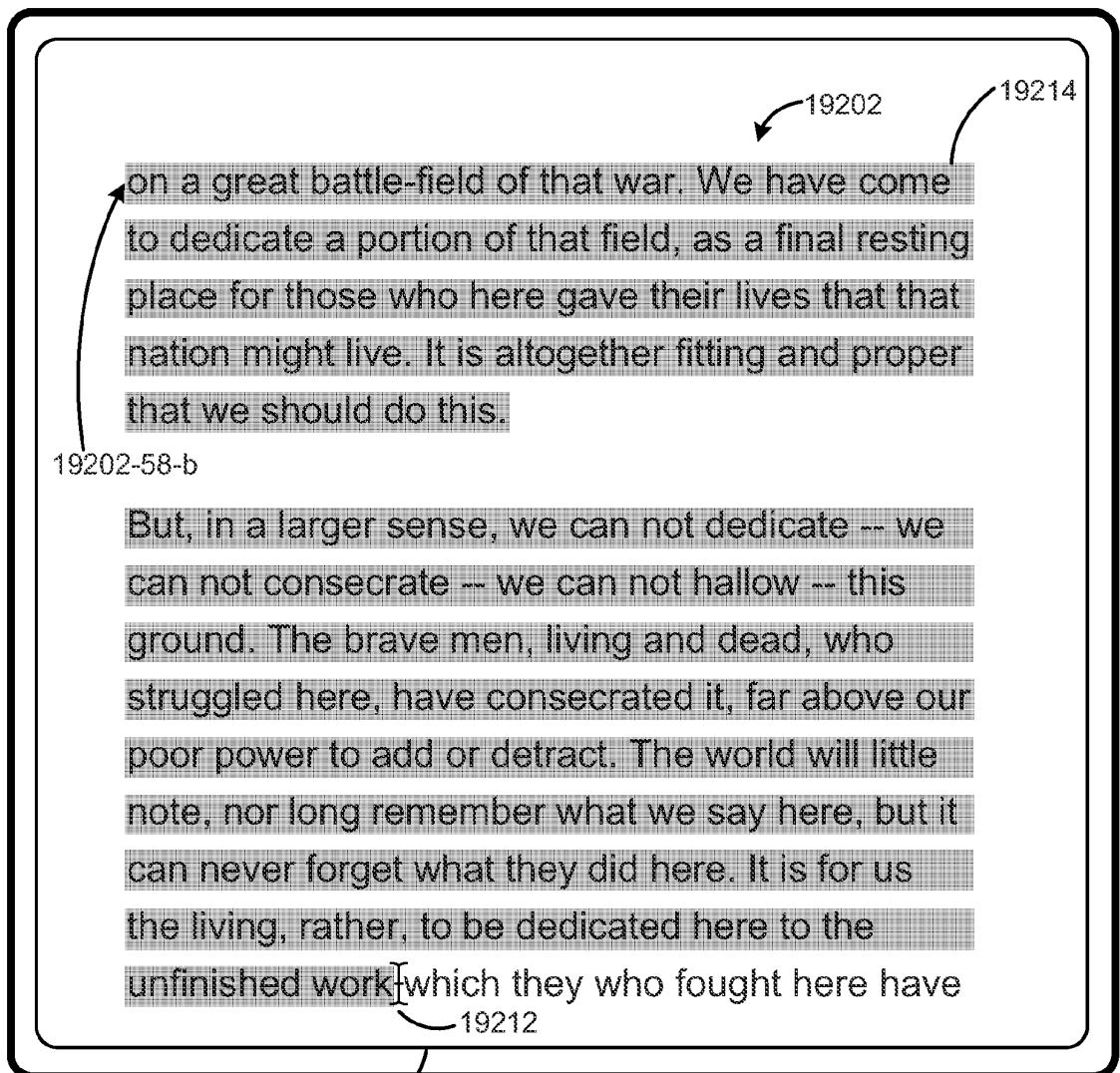


Figure 8H

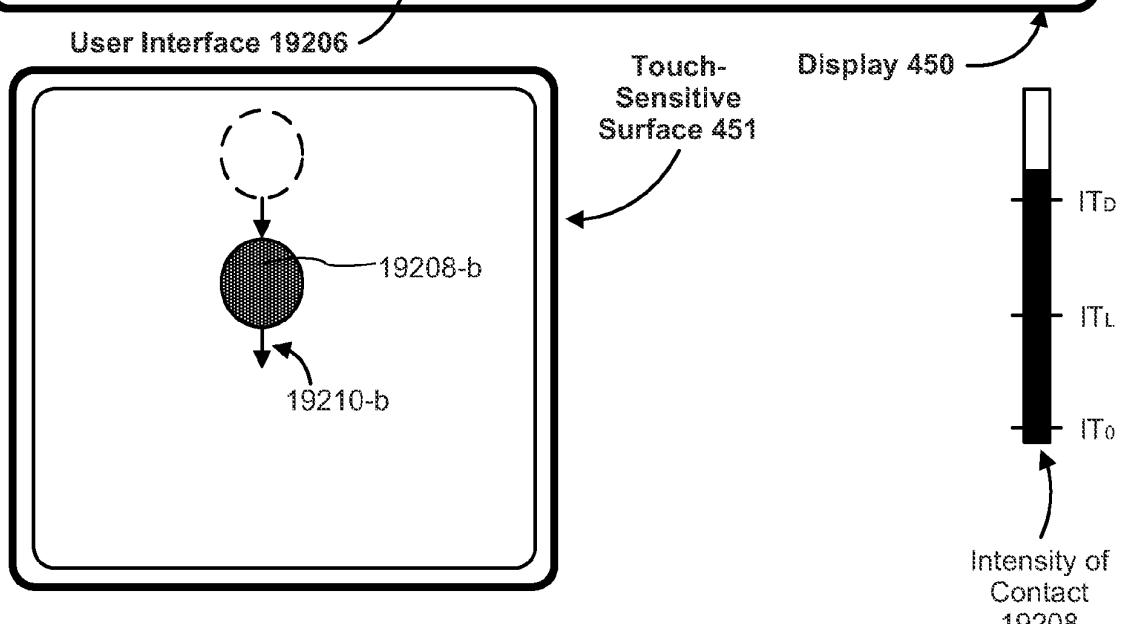
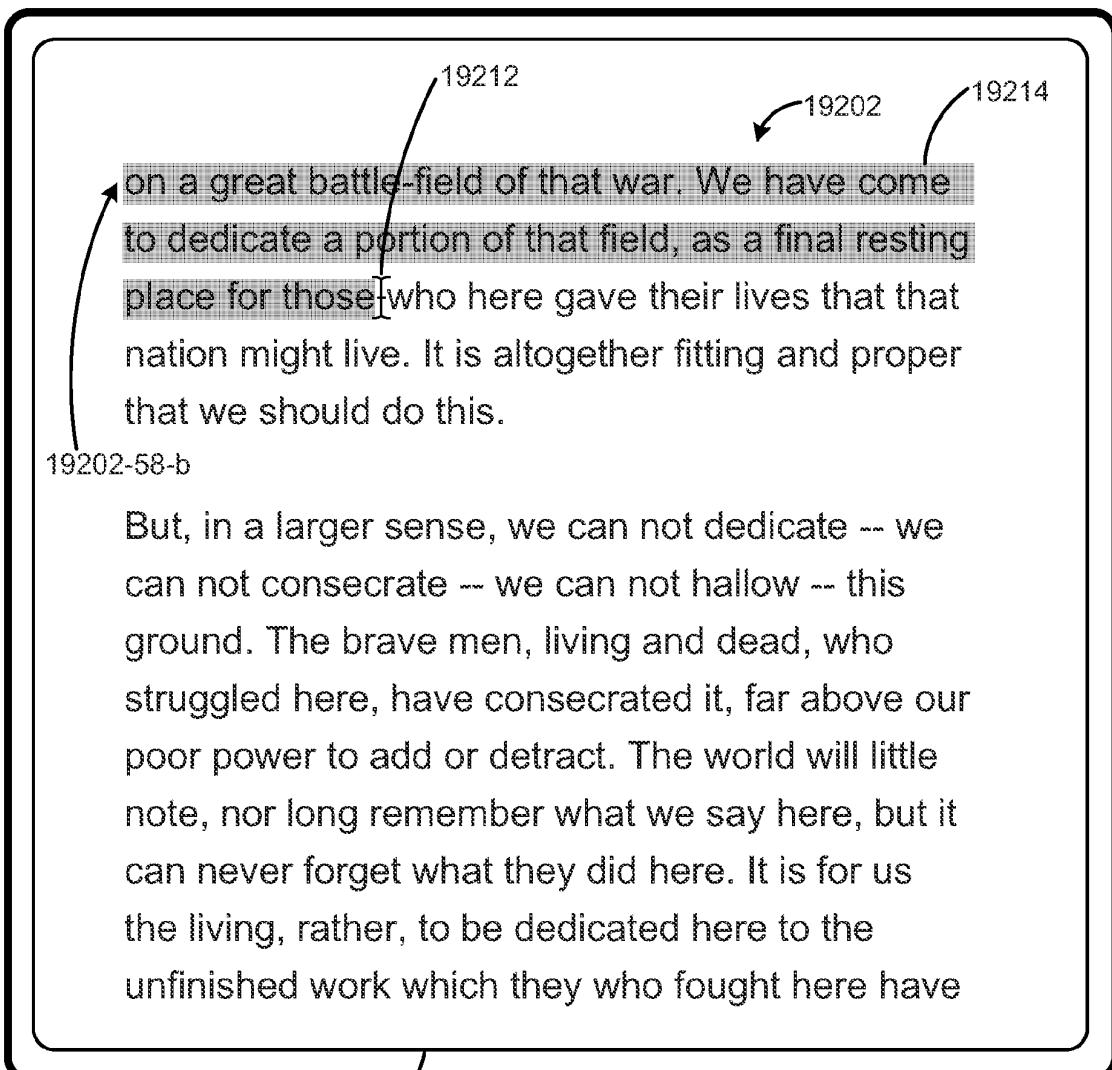


Figure 81

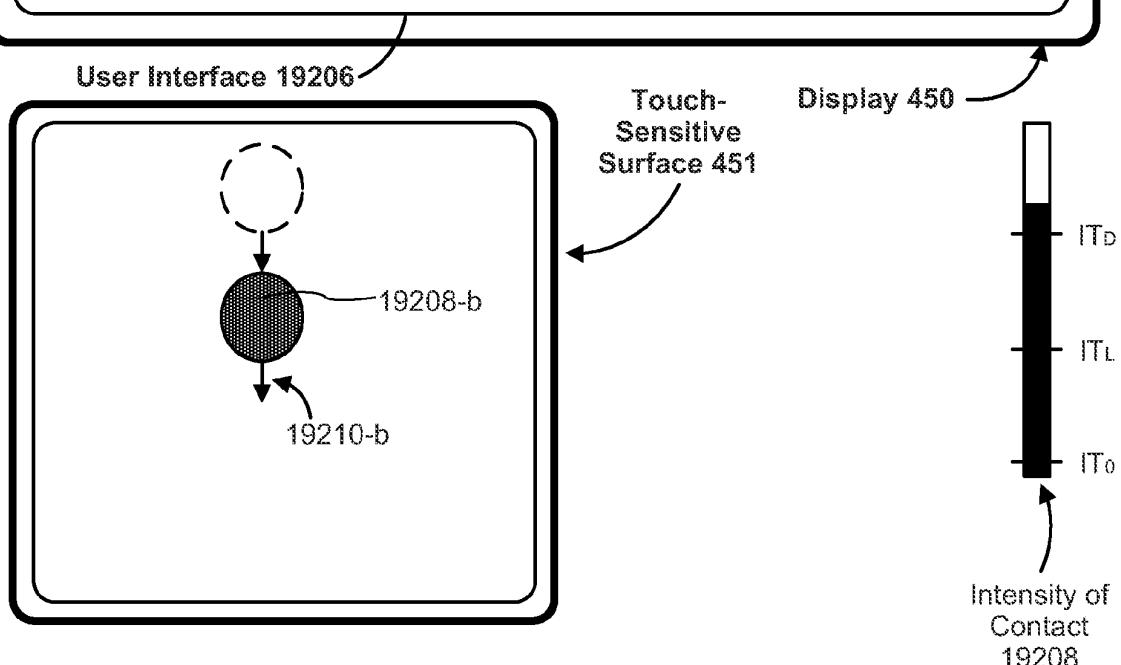
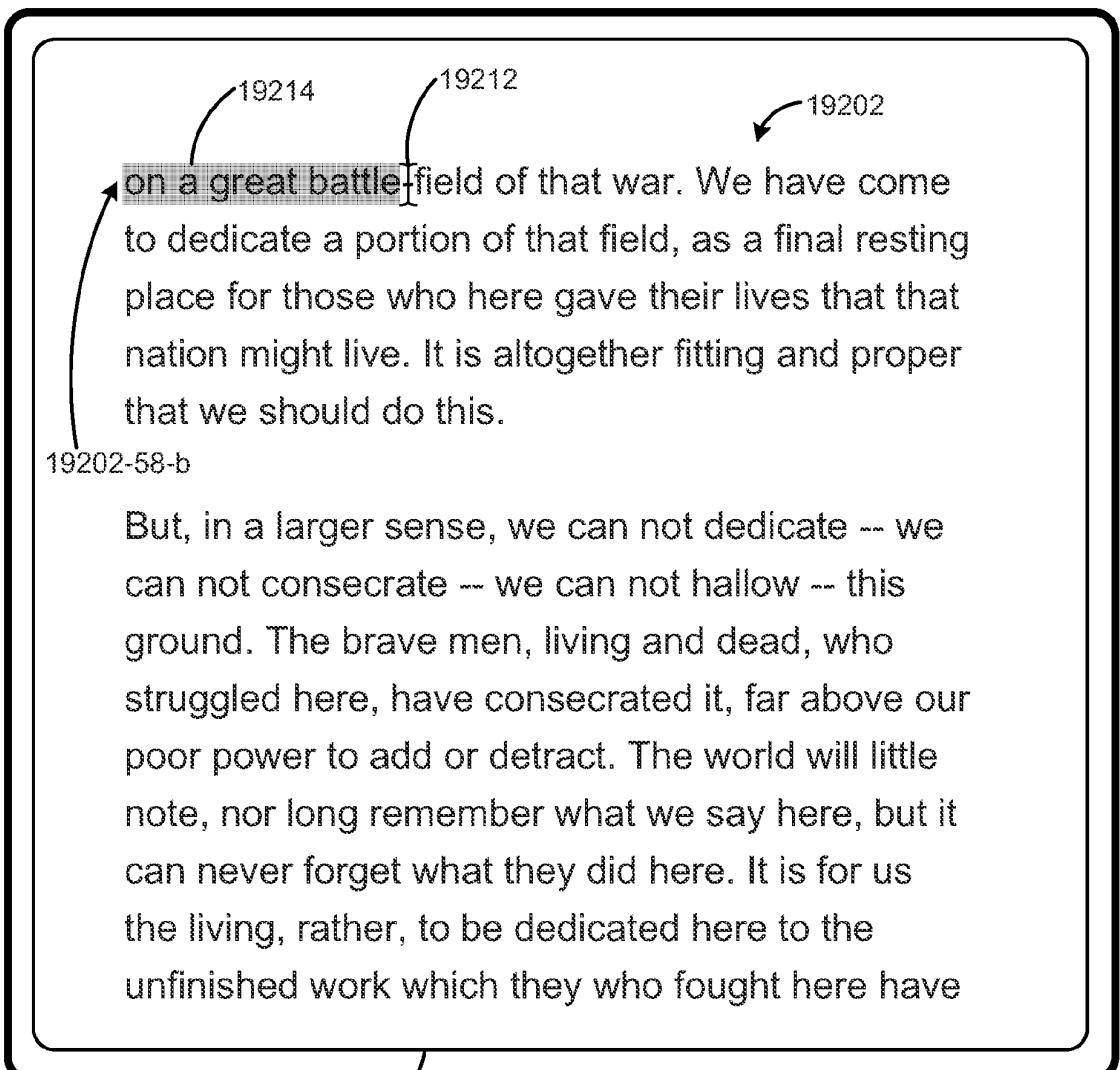


Figure 8J

19202

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19202-58-b

19214

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have

19212

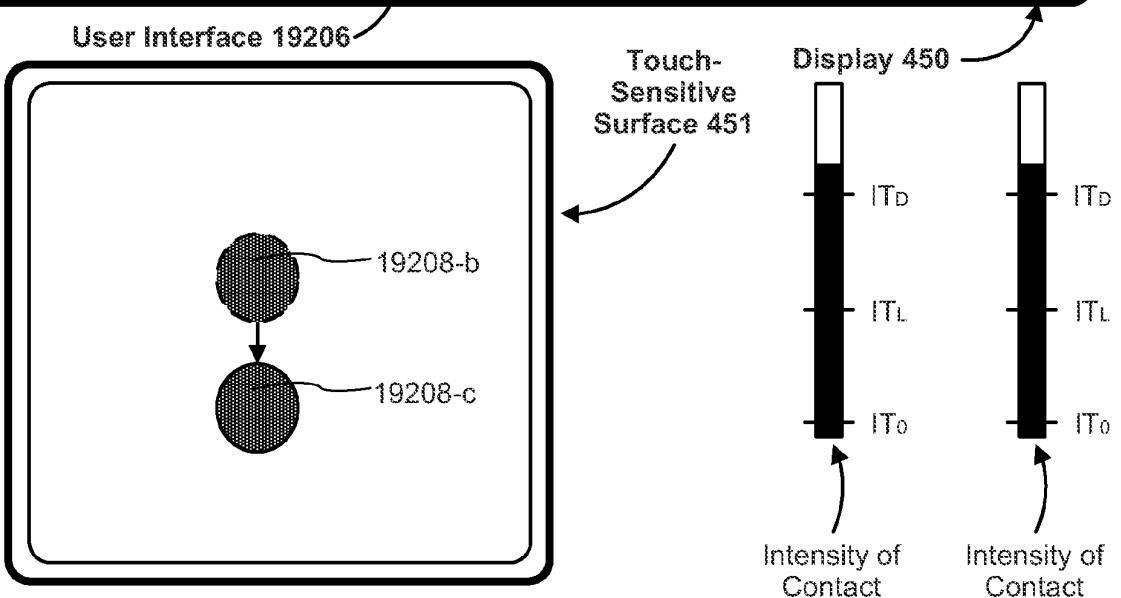


Figure 8K

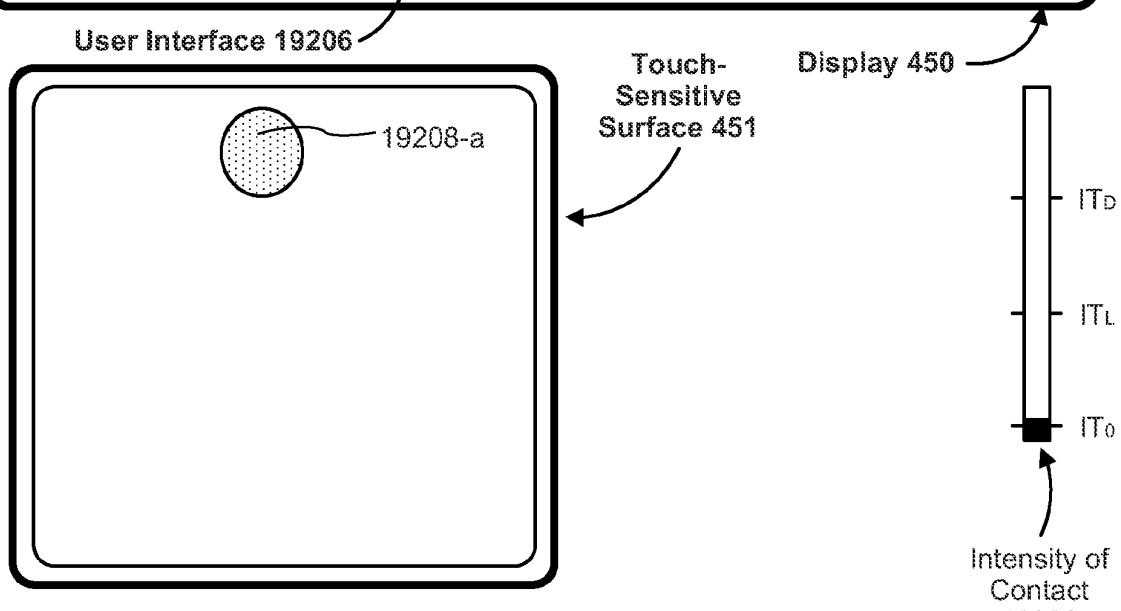
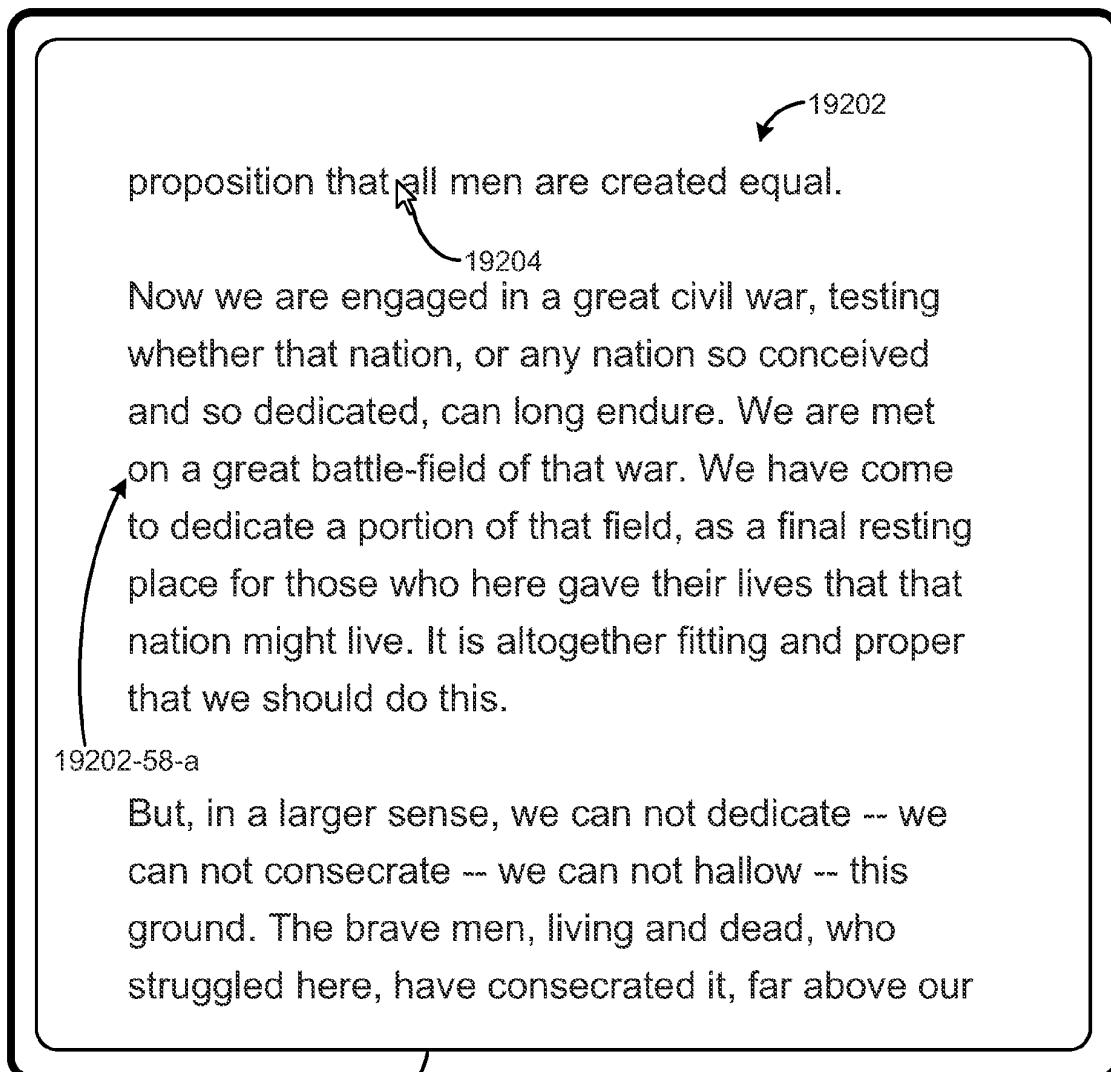


Figure 8L

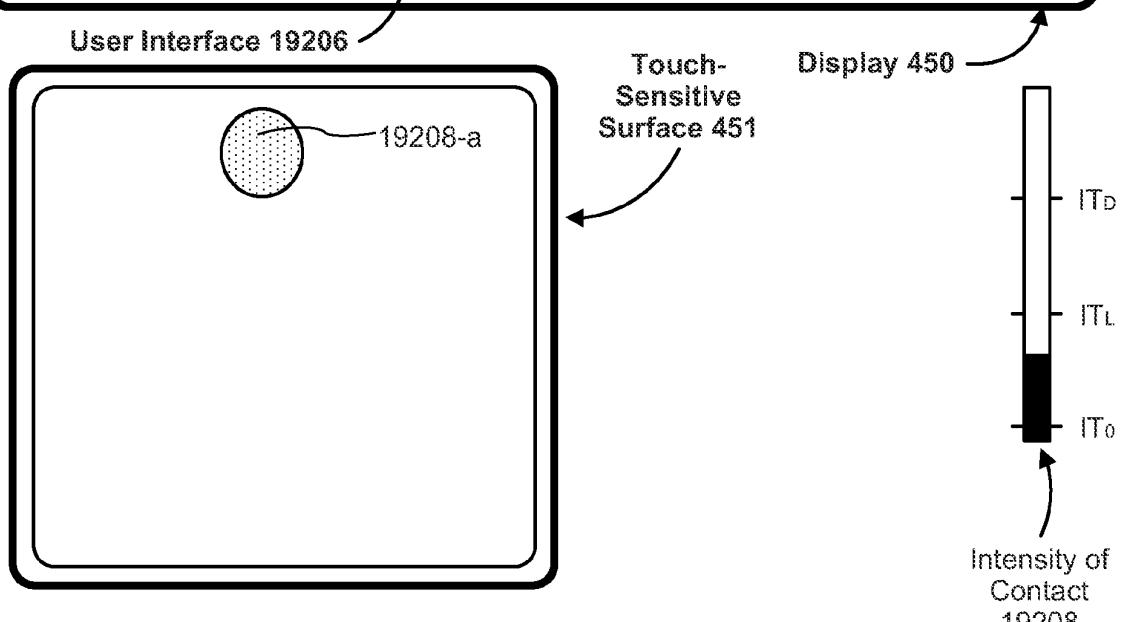
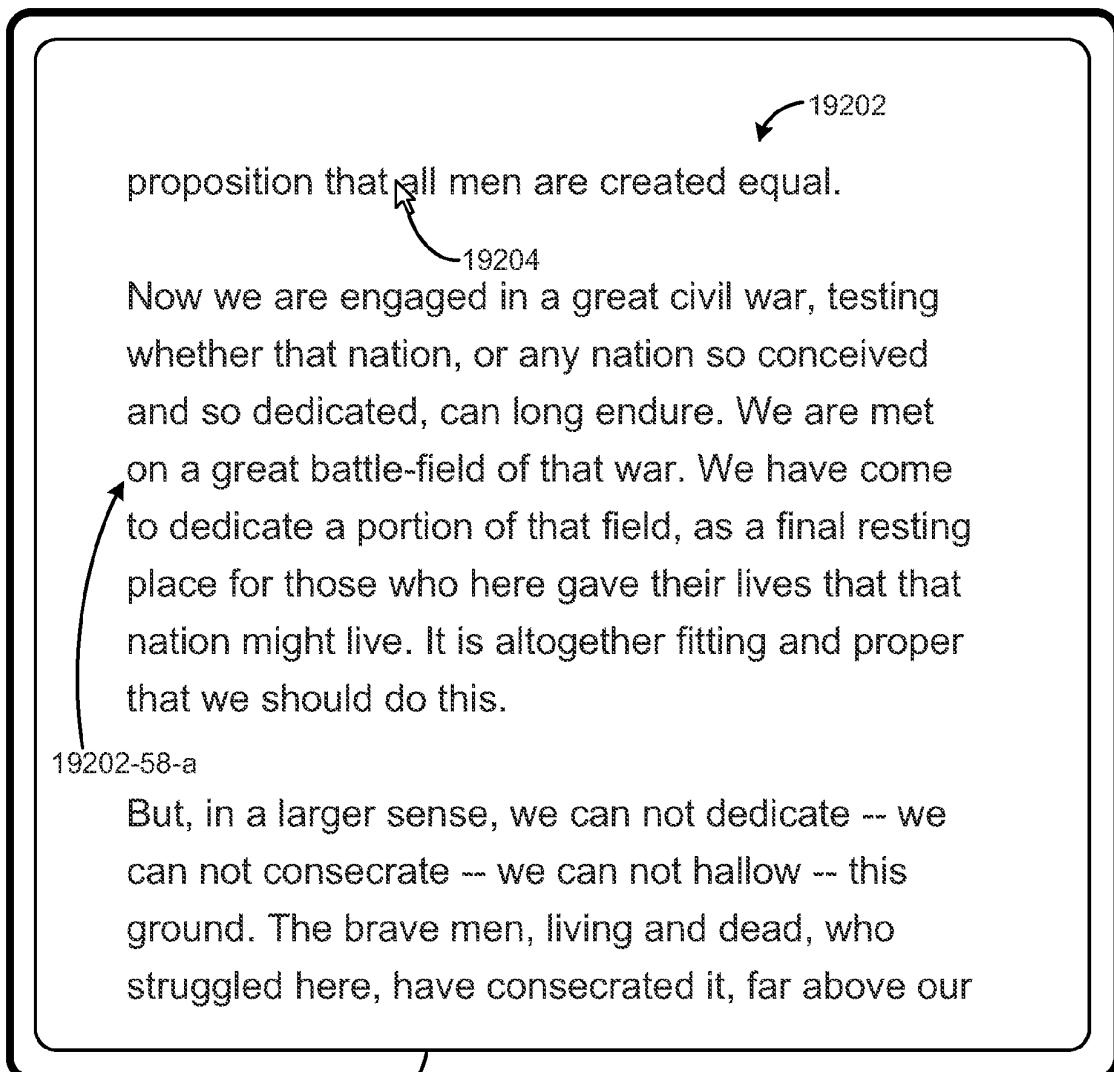


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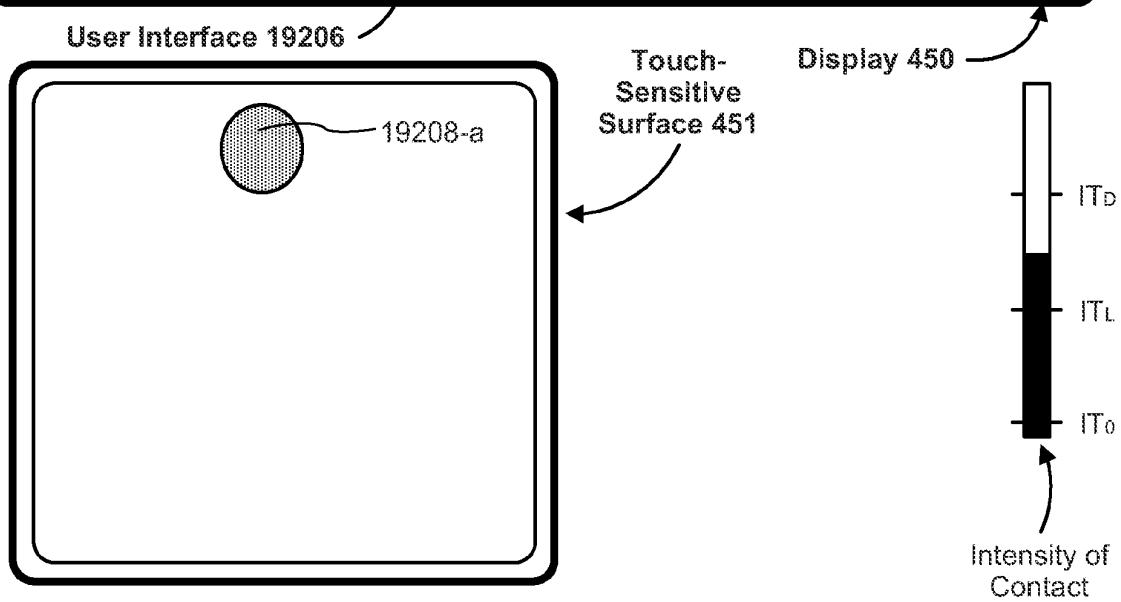
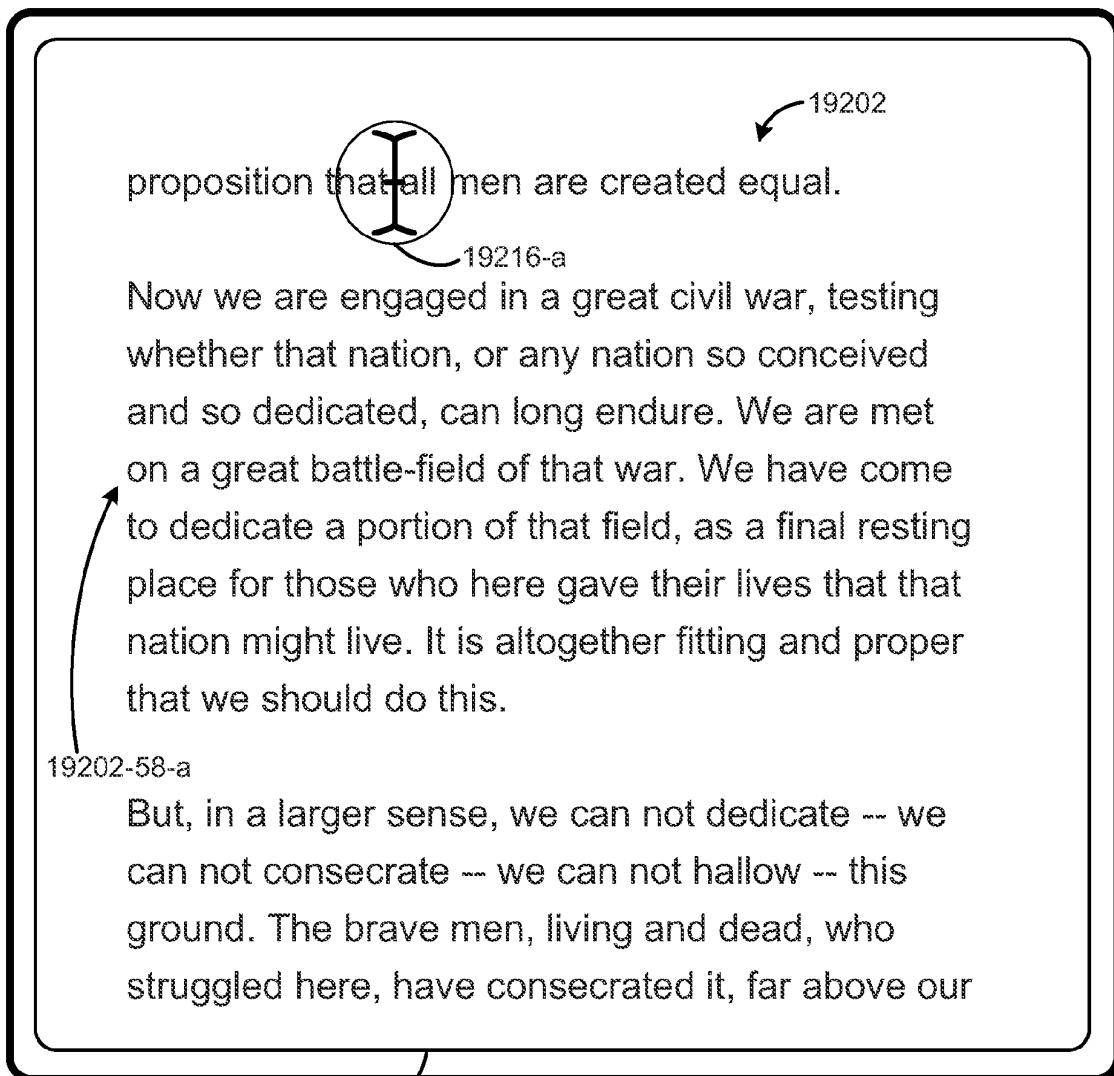


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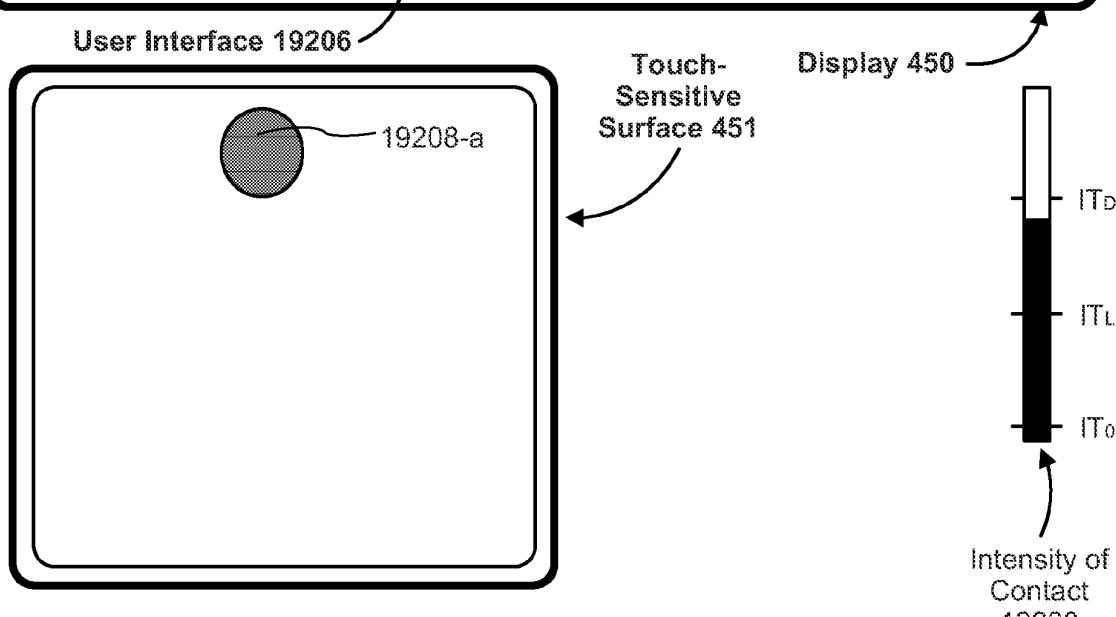
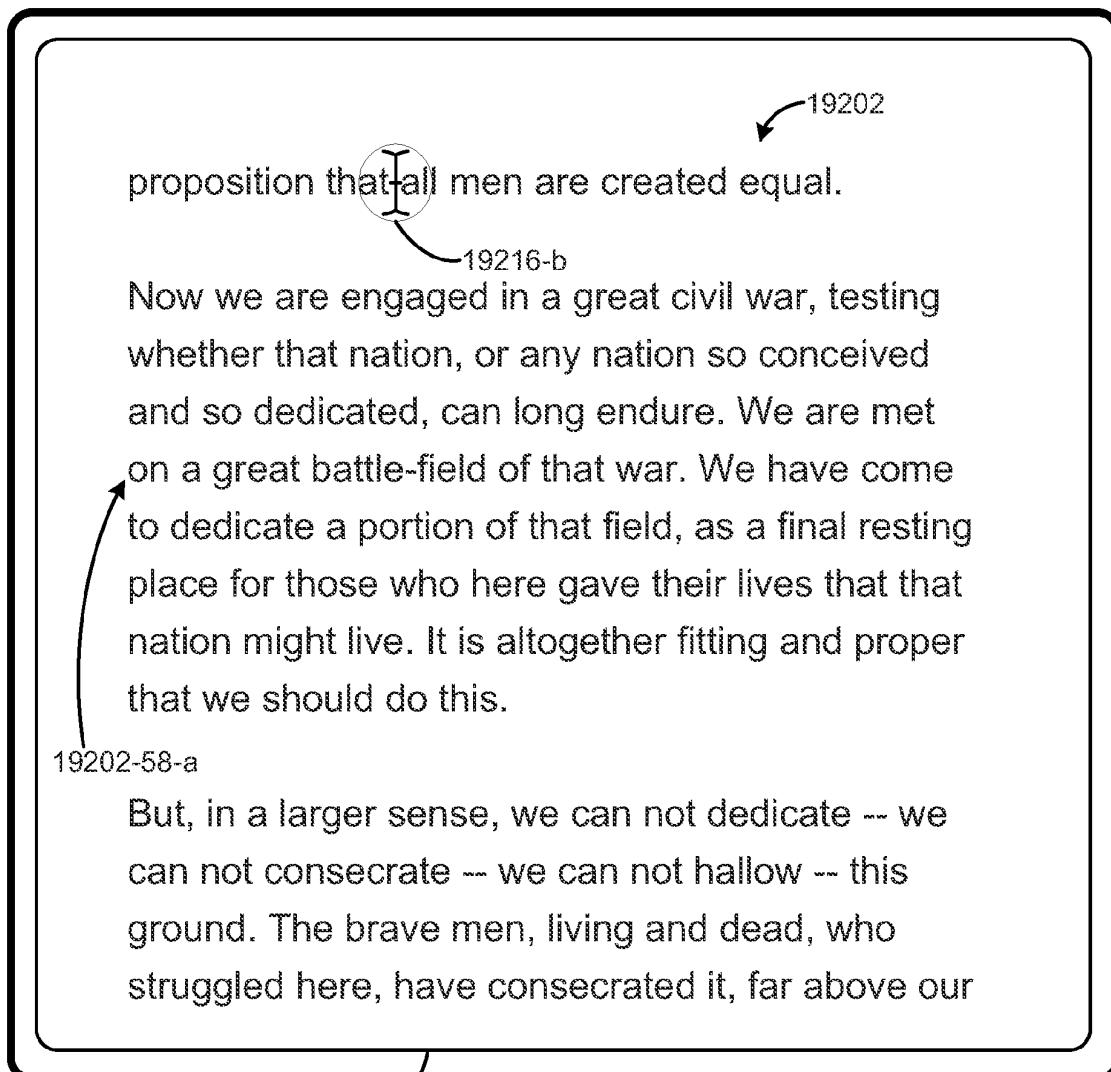


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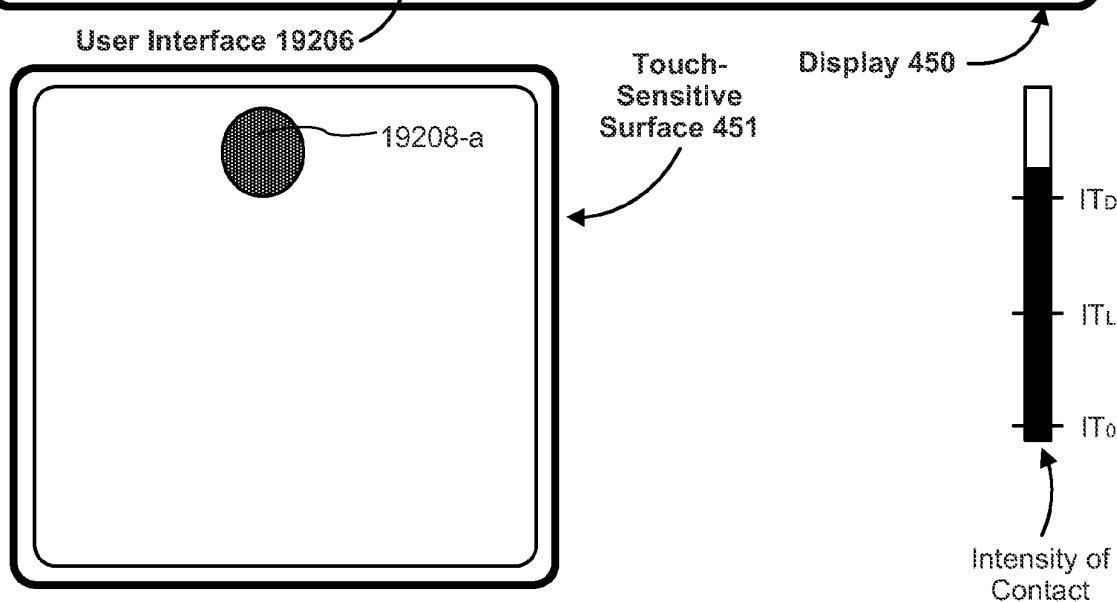
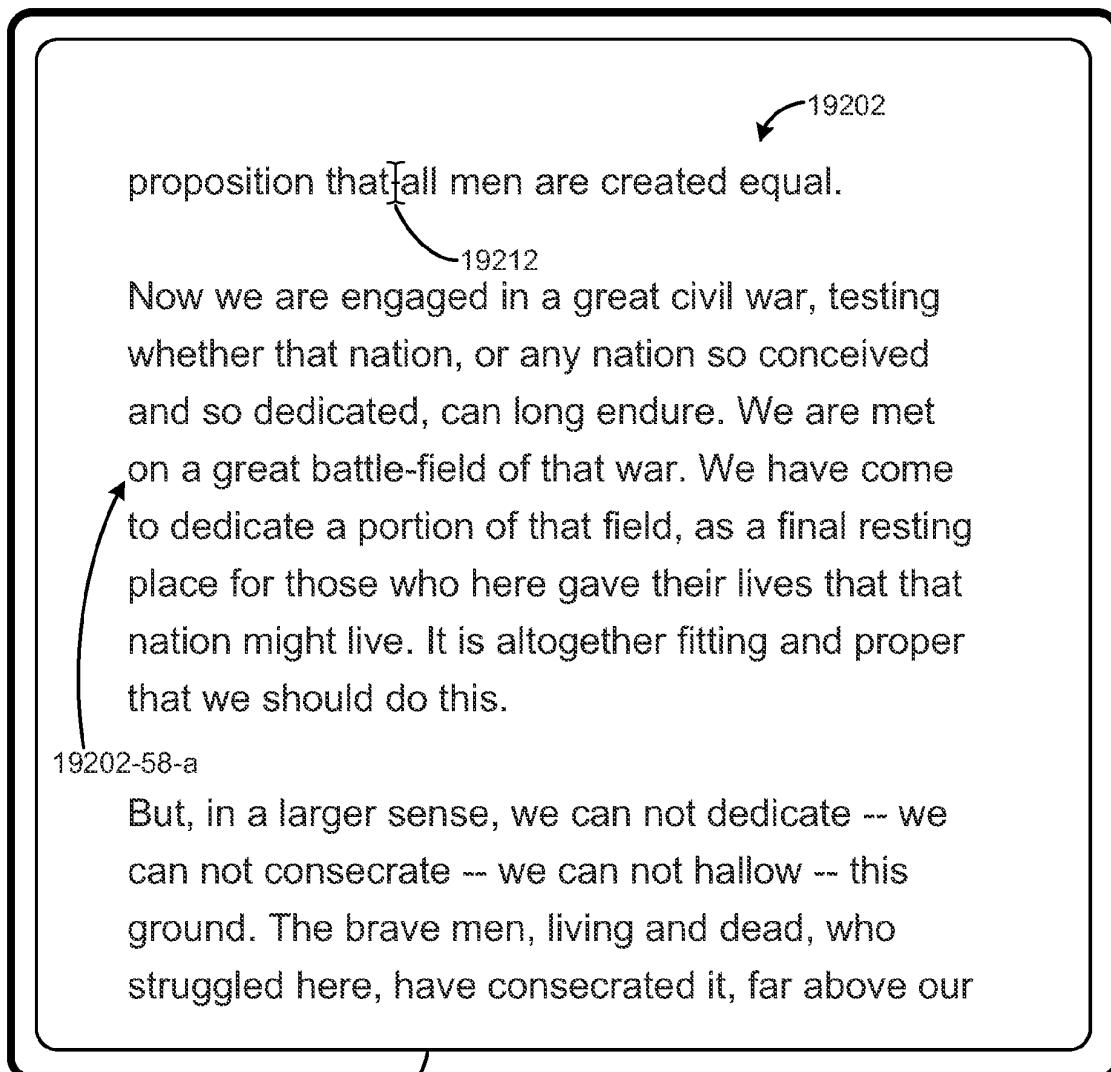


Figure 8P

19202

proposition that all men are created equal.

19212

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19202-58-a

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our

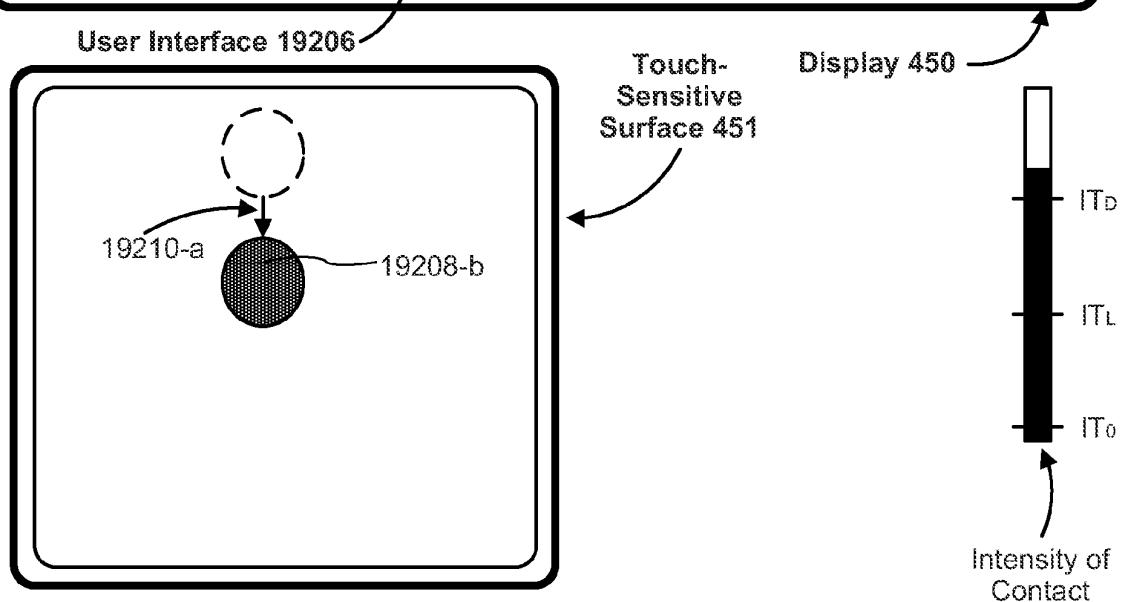


Figure 8Q

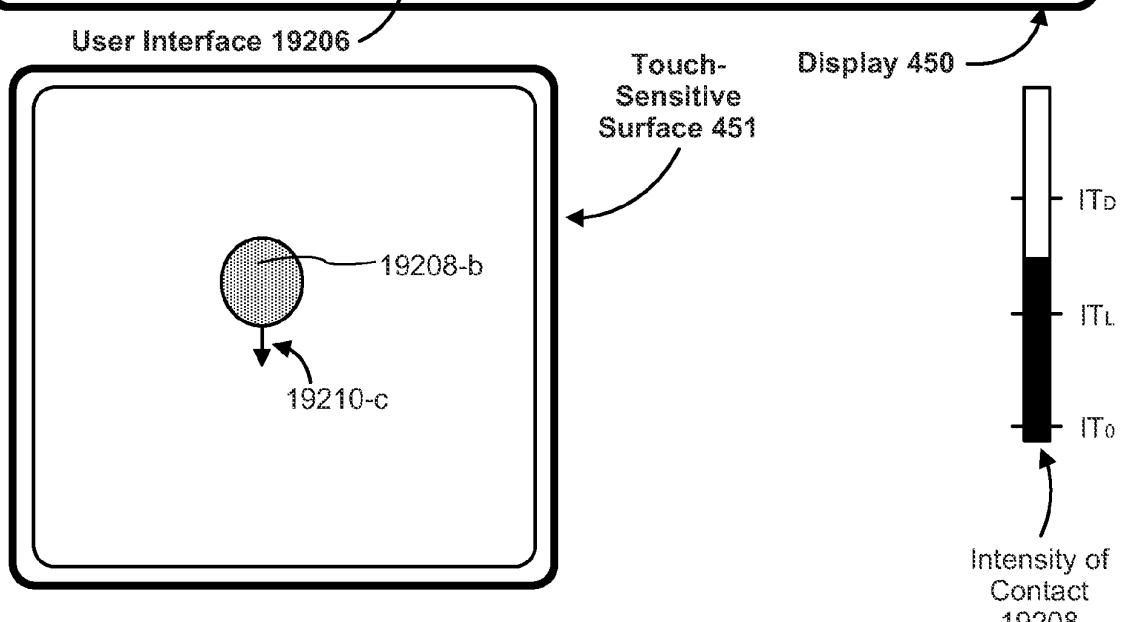
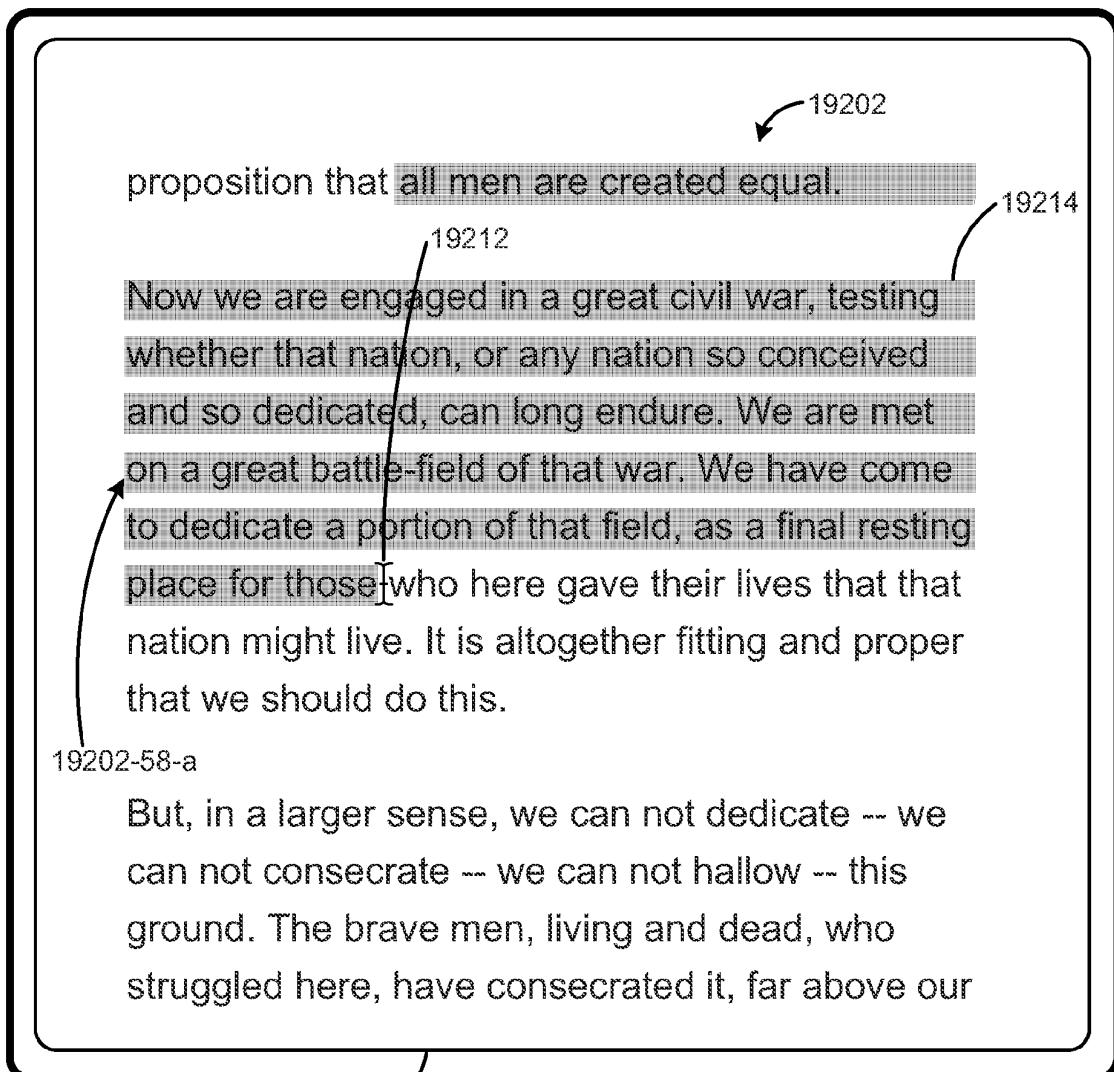


Figure 8R

19202  
proposition that all men are created equal.

19214

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19202-58-a 19212

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our

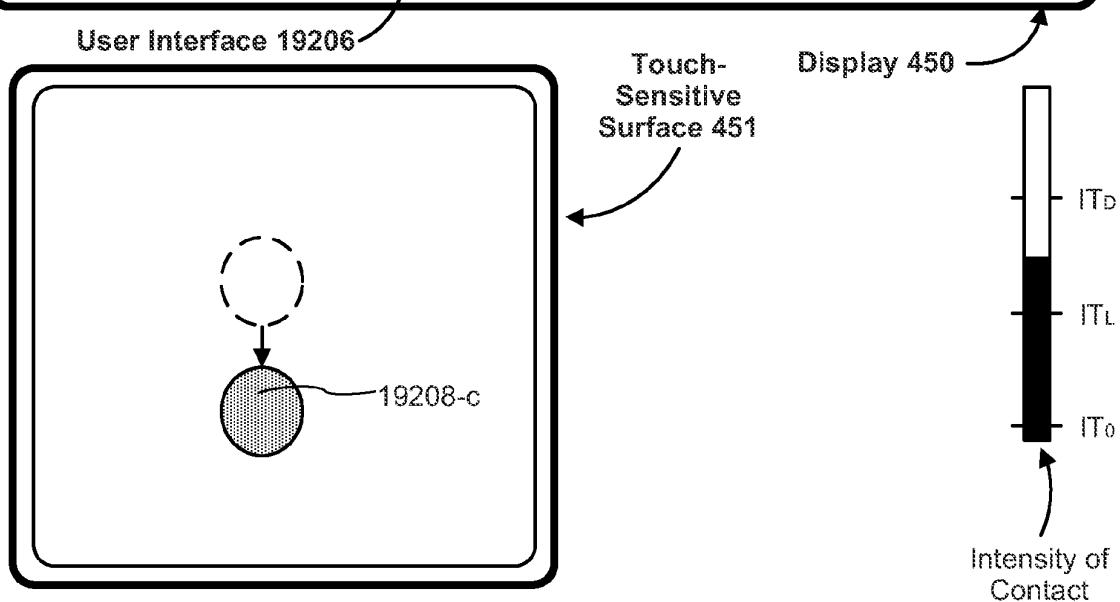


Figure 8S

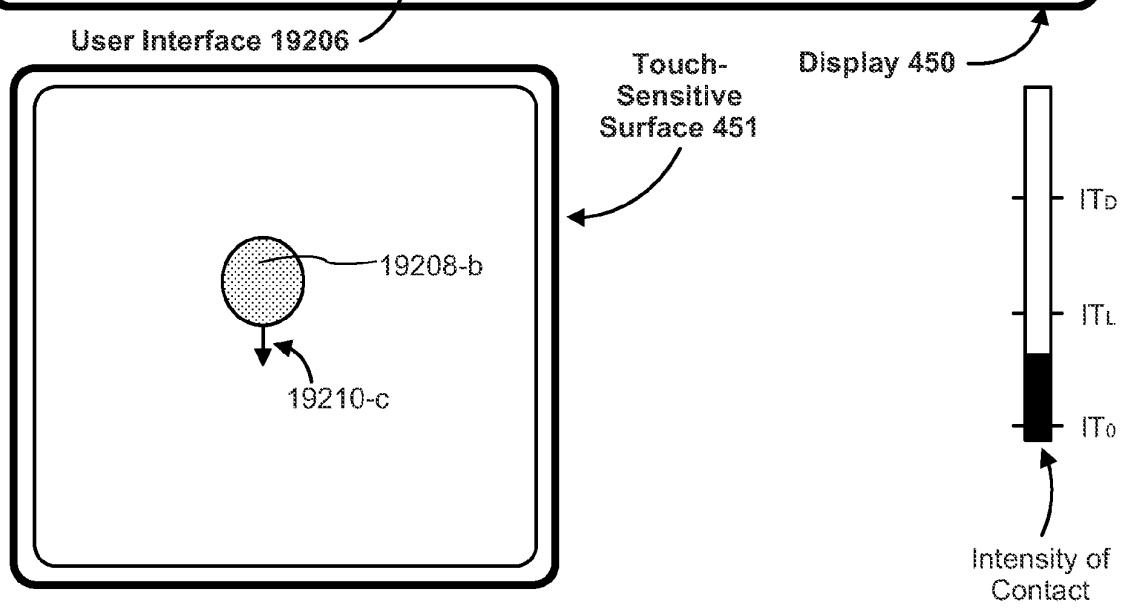
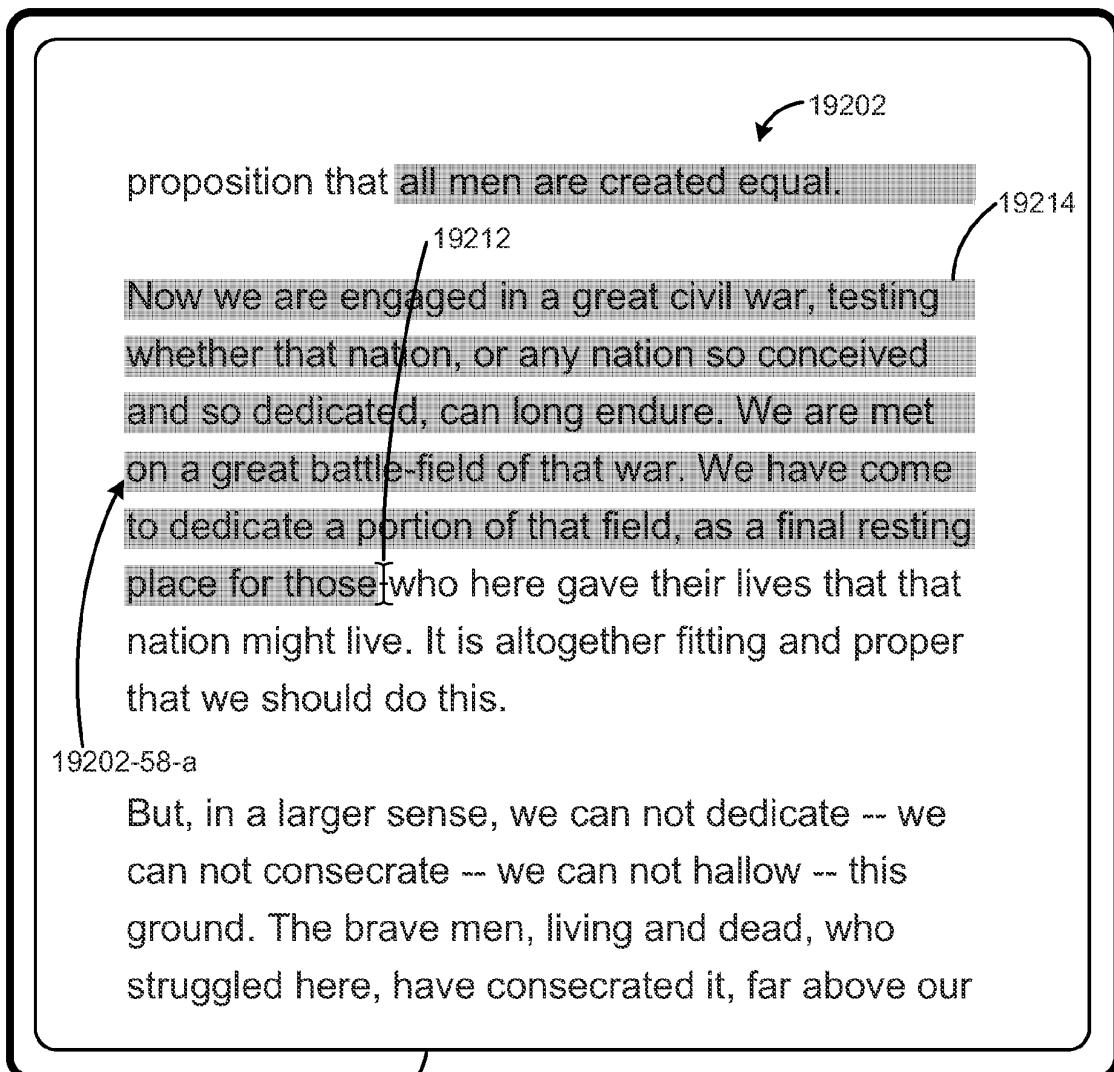


Figure 8T

19202

proposition that all men are created equal. 19214

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this. 19212

19202-58-a

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our

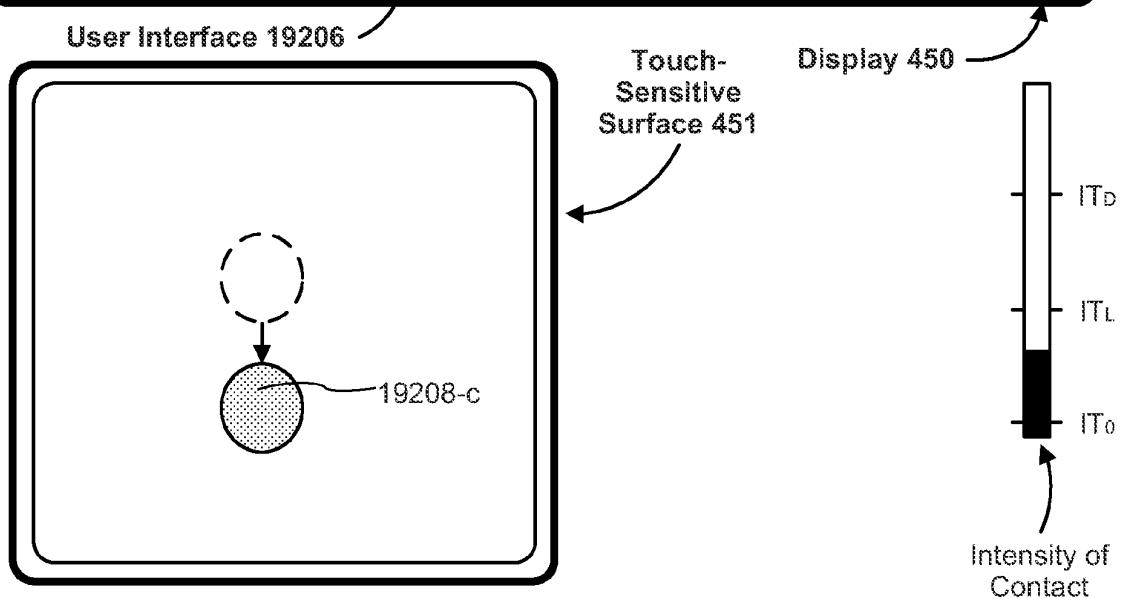


Figure 8U

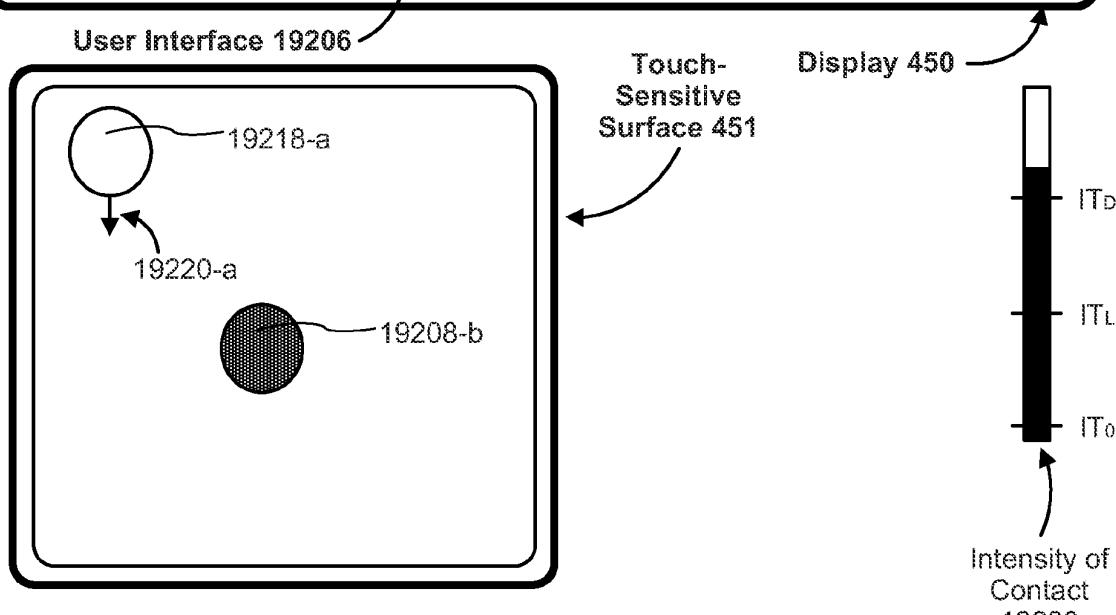
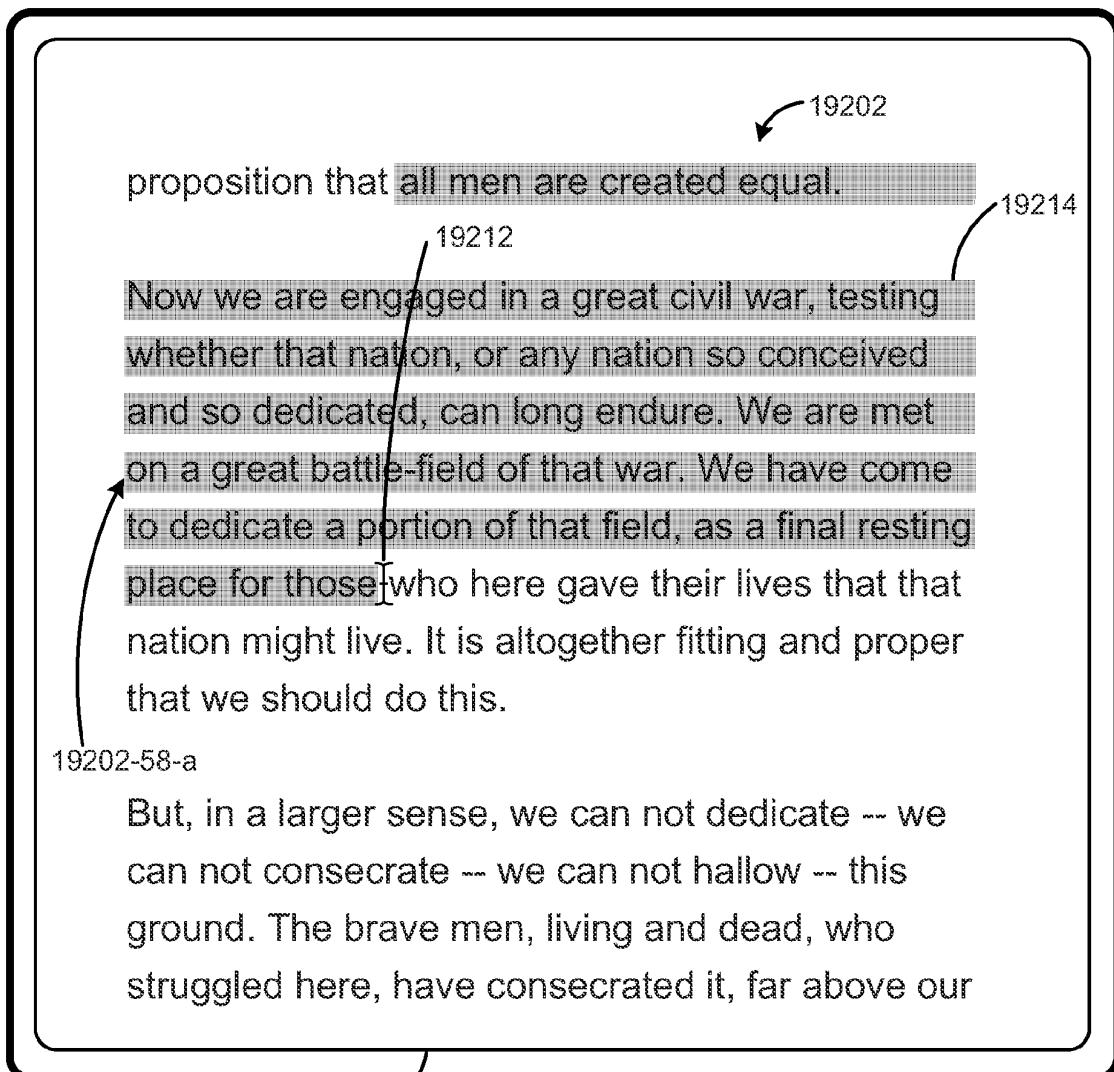


Figure 8V

19202 19214  
 on a great battle-field of that war. We have come  
 to dedicate a portion of that field, as a final resting  
 place for those who here gave their lives that that  
 nation might live. It is altogether fitting and proper  
 that we should do this.

19202-58-b 19212  
 But, in a larger sense, we can not dedicate -- we  
 can not consecrate -- we can not hallow -- this  
 ground. The brave men, living and dead, who  
 struggled here, have consecrated it, far above our  
 poor power to add or detract. The world will little  
 note, nor long remember what we say here, but it  
 can never forget what they did here. It is for us  
 the living, rather, to be dedicated here to the  
 unfinished work which they who fought here have

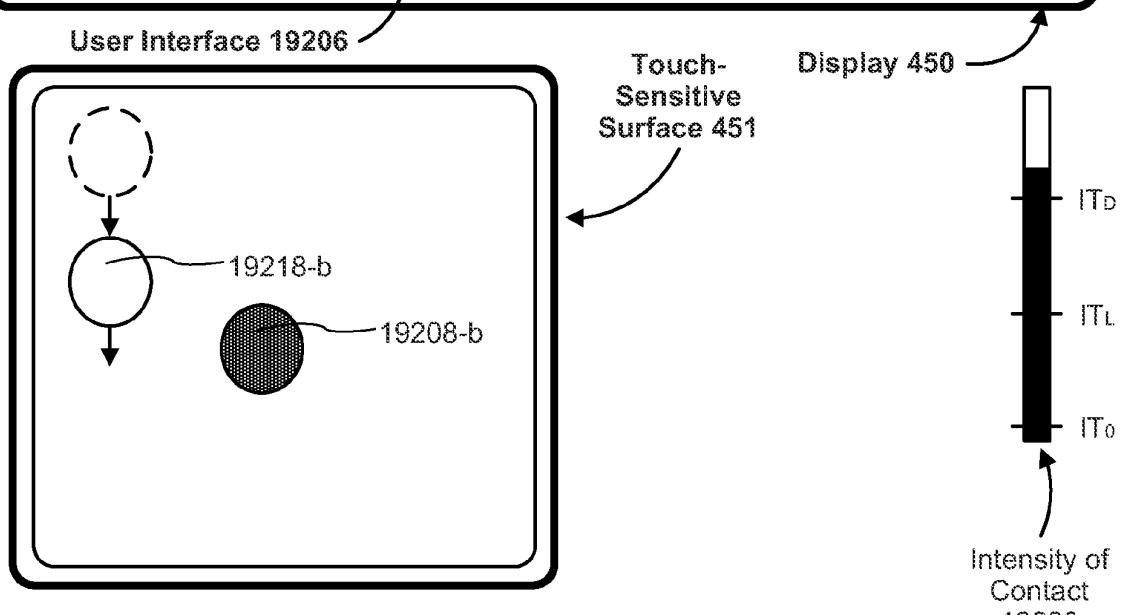


Figure 8W

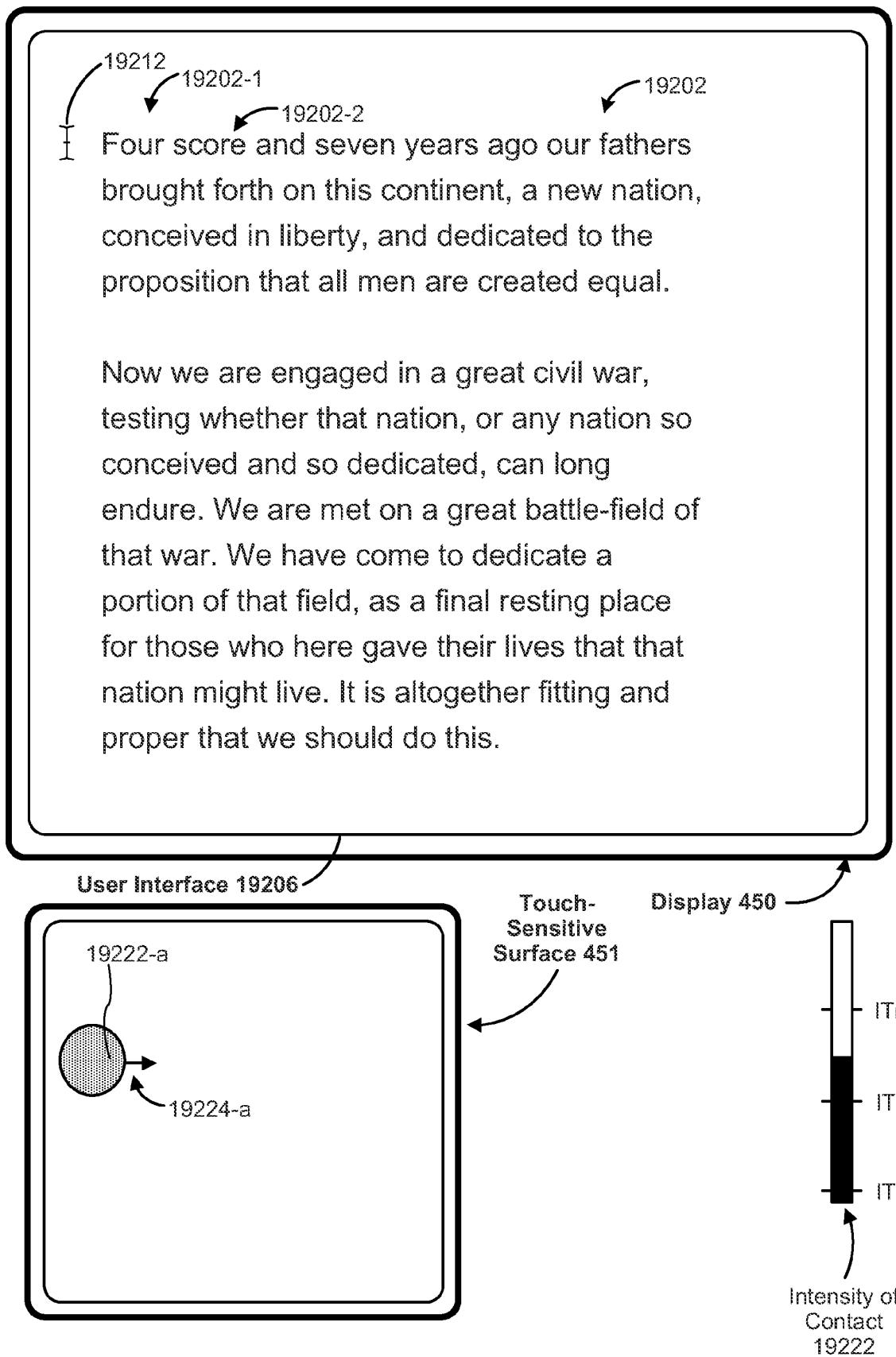


Figure 8X

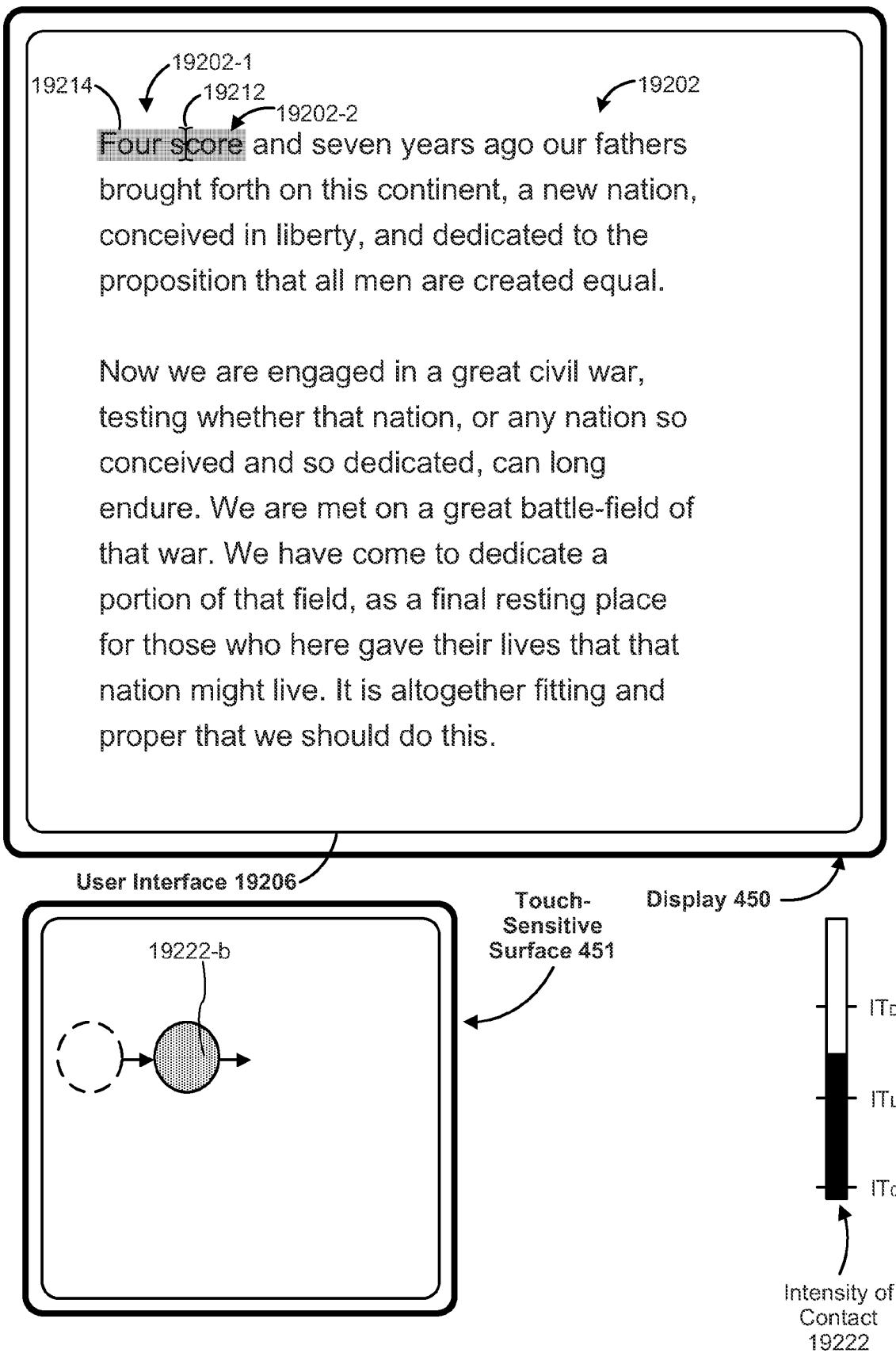


Figure 8Y

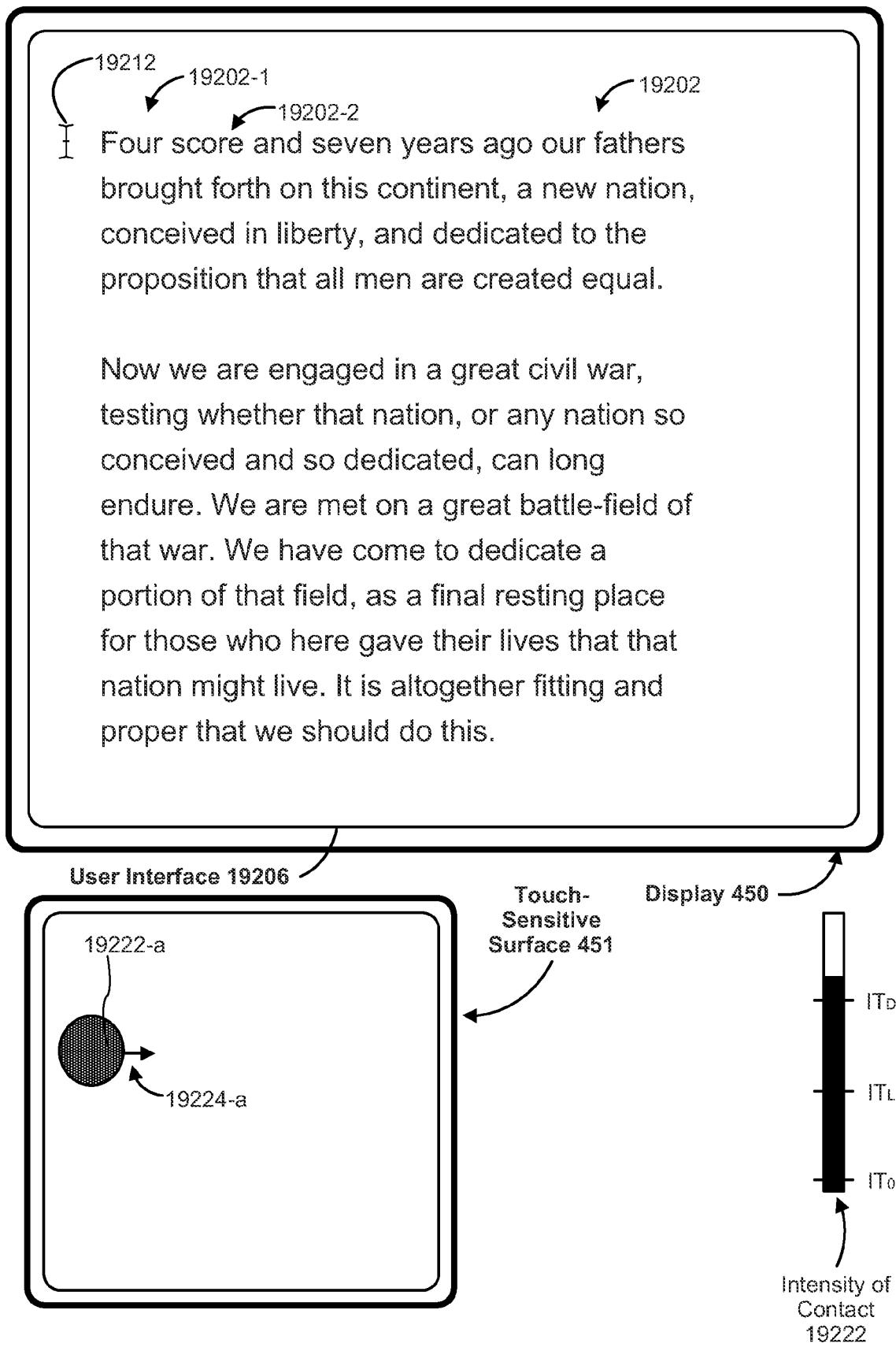


Figure 8Z

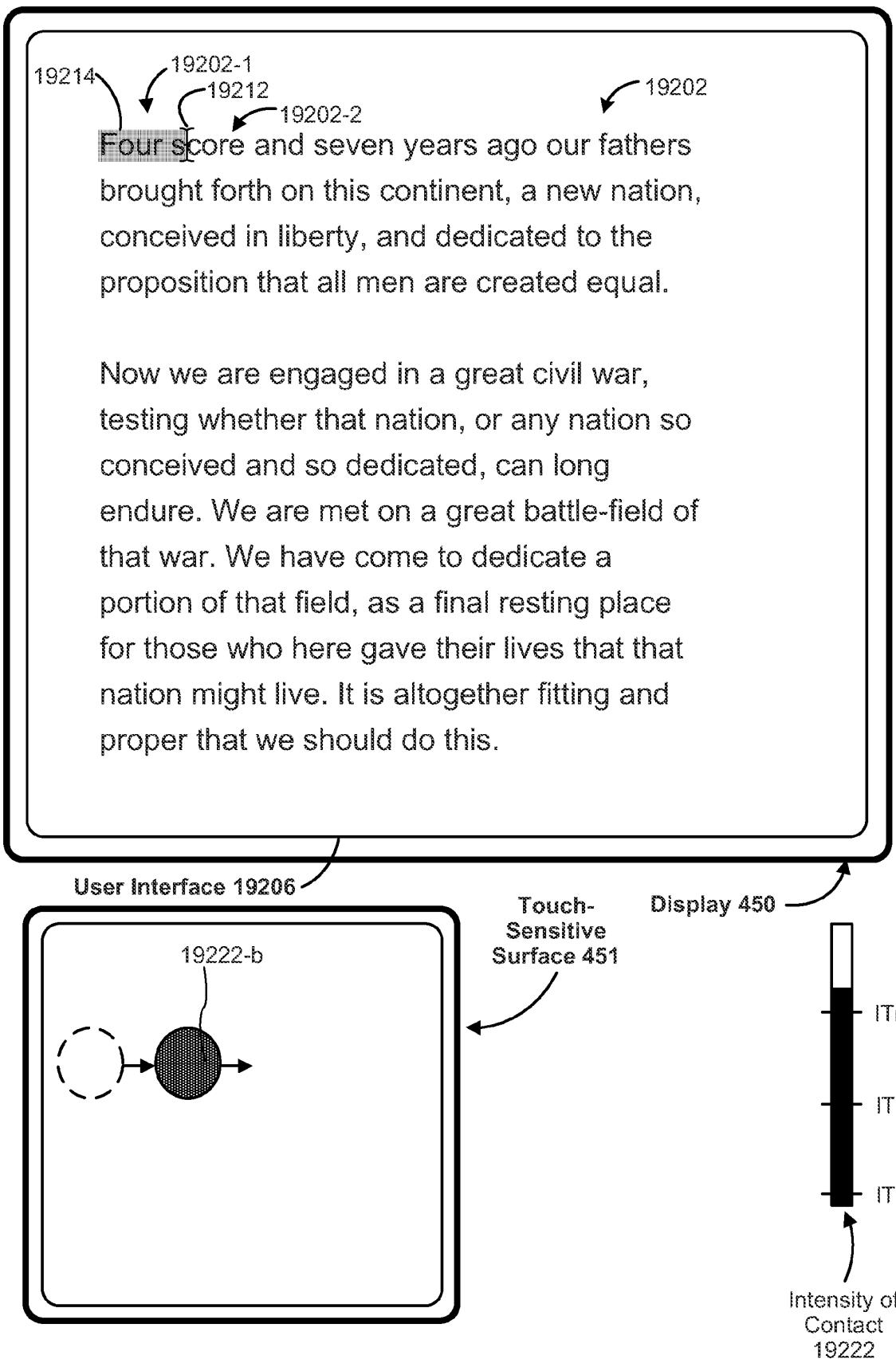


Figure 8AA

19300

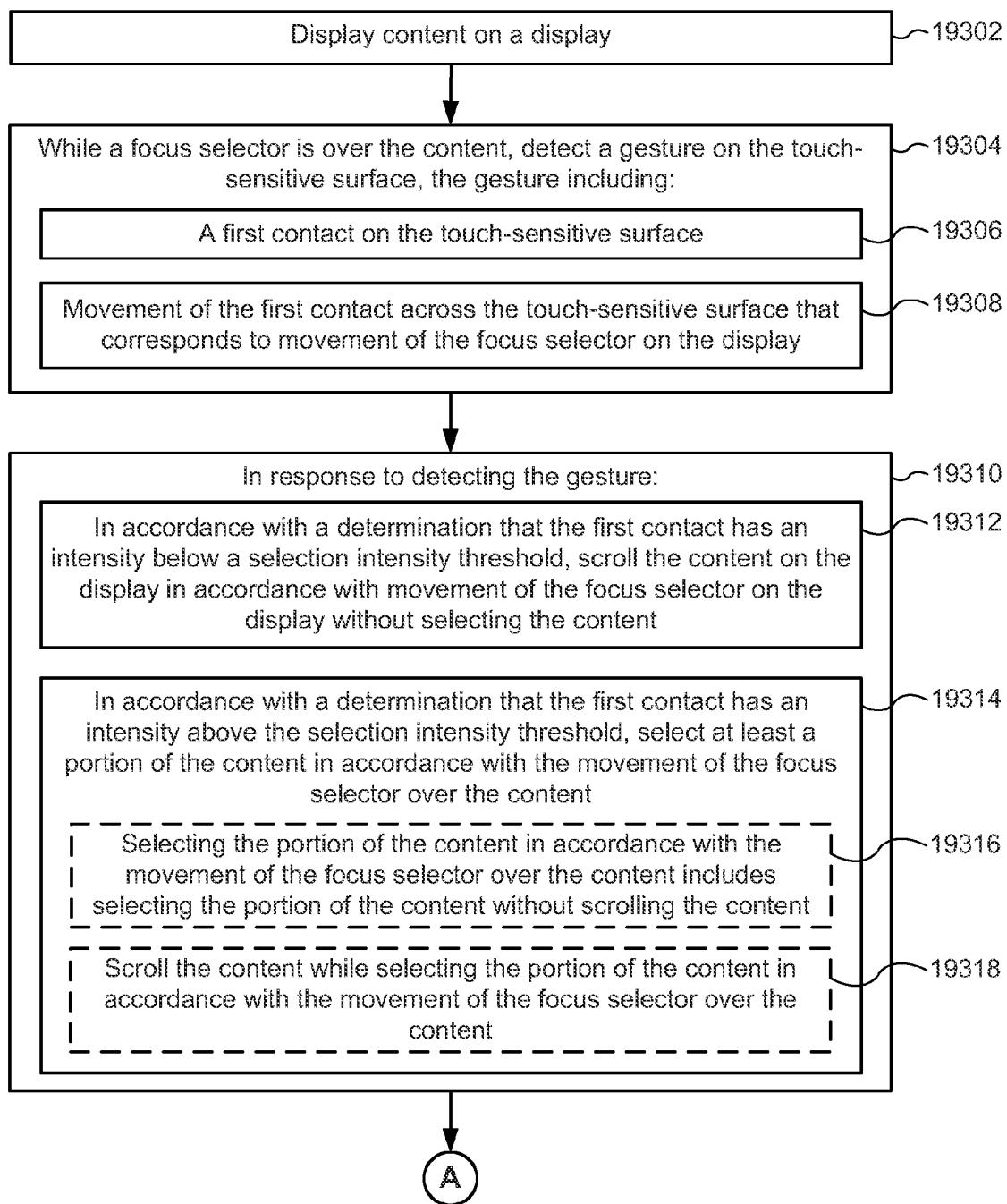


Figure 9A

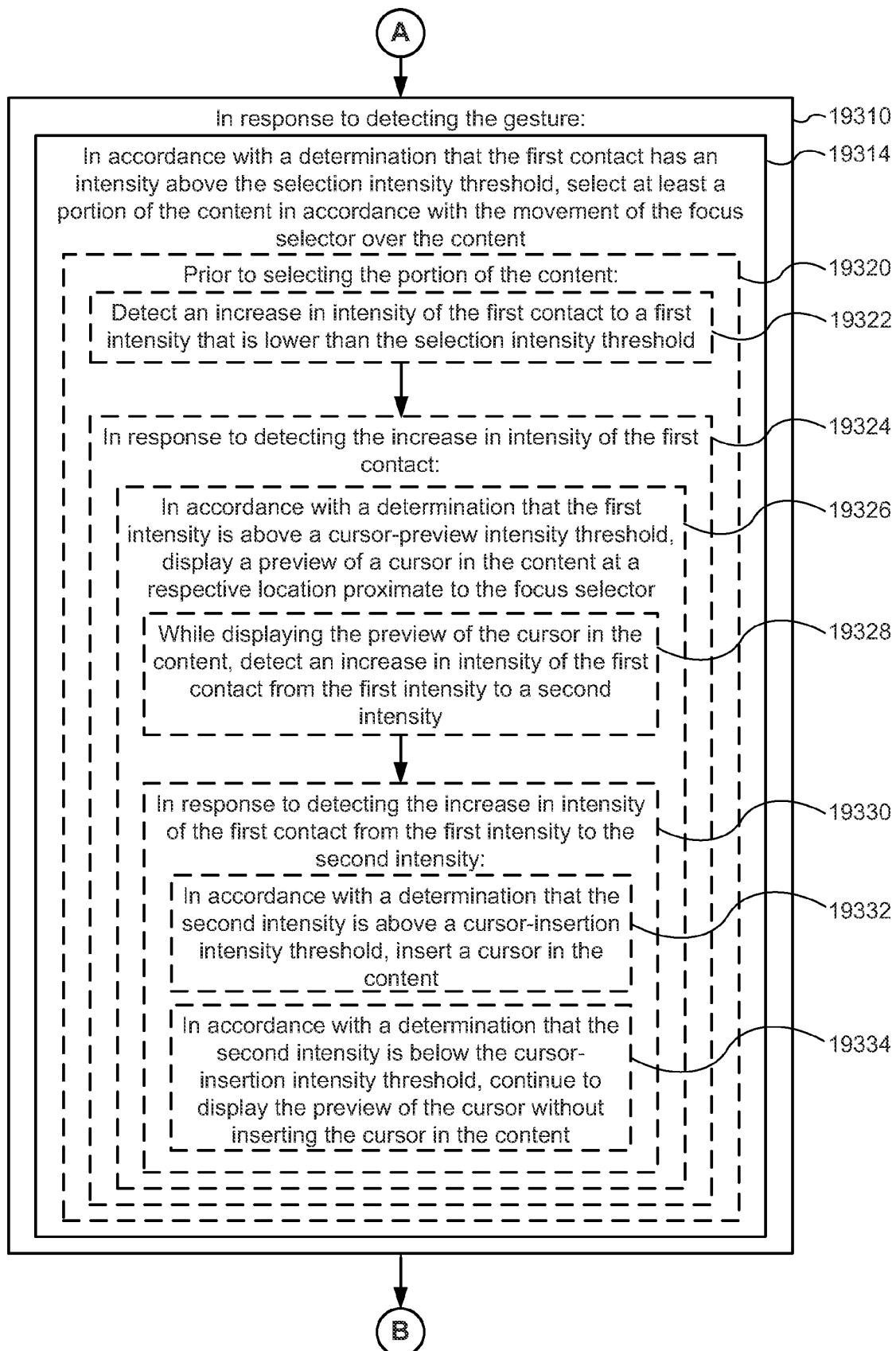


Figure 9B

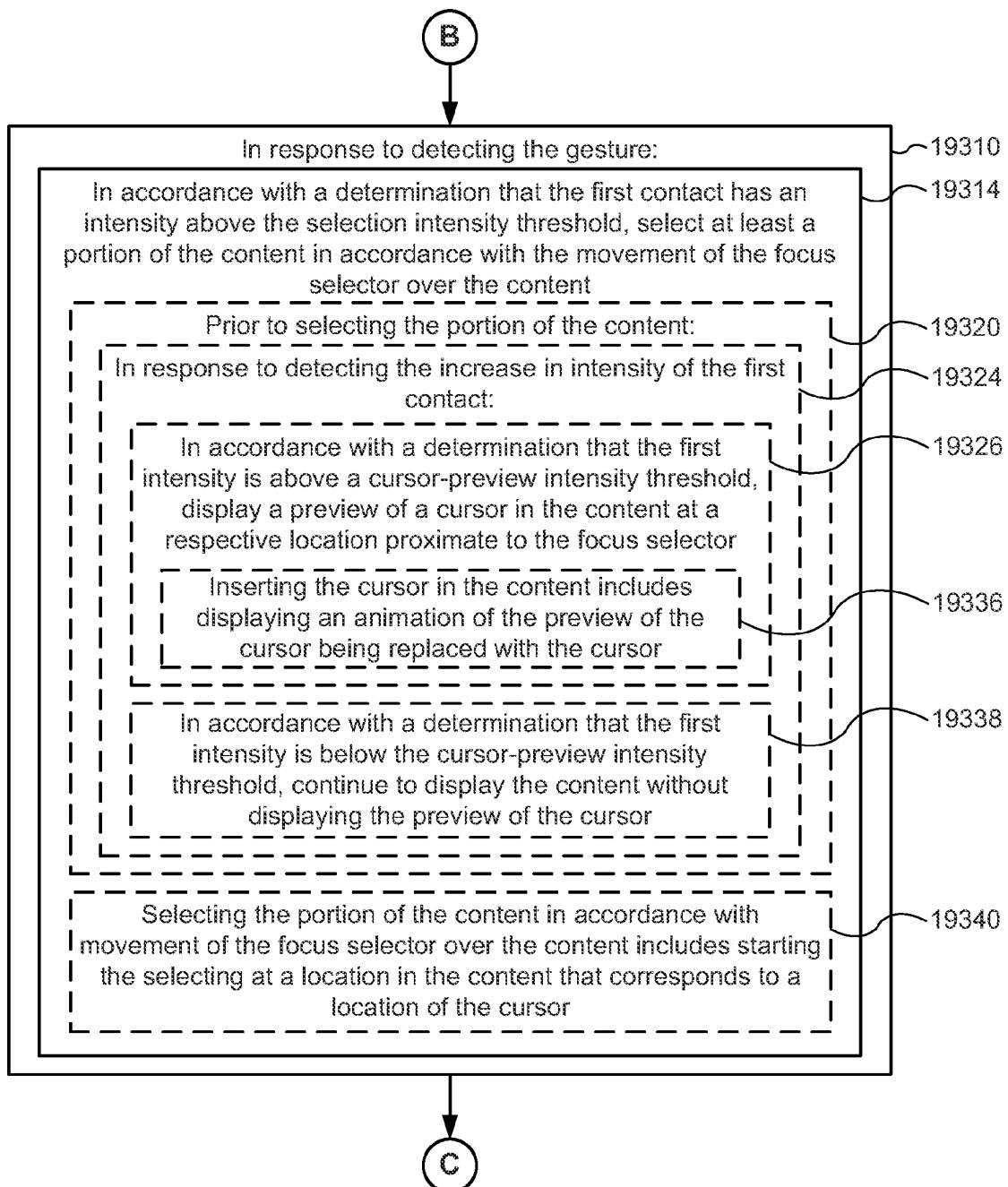


Figure 9C

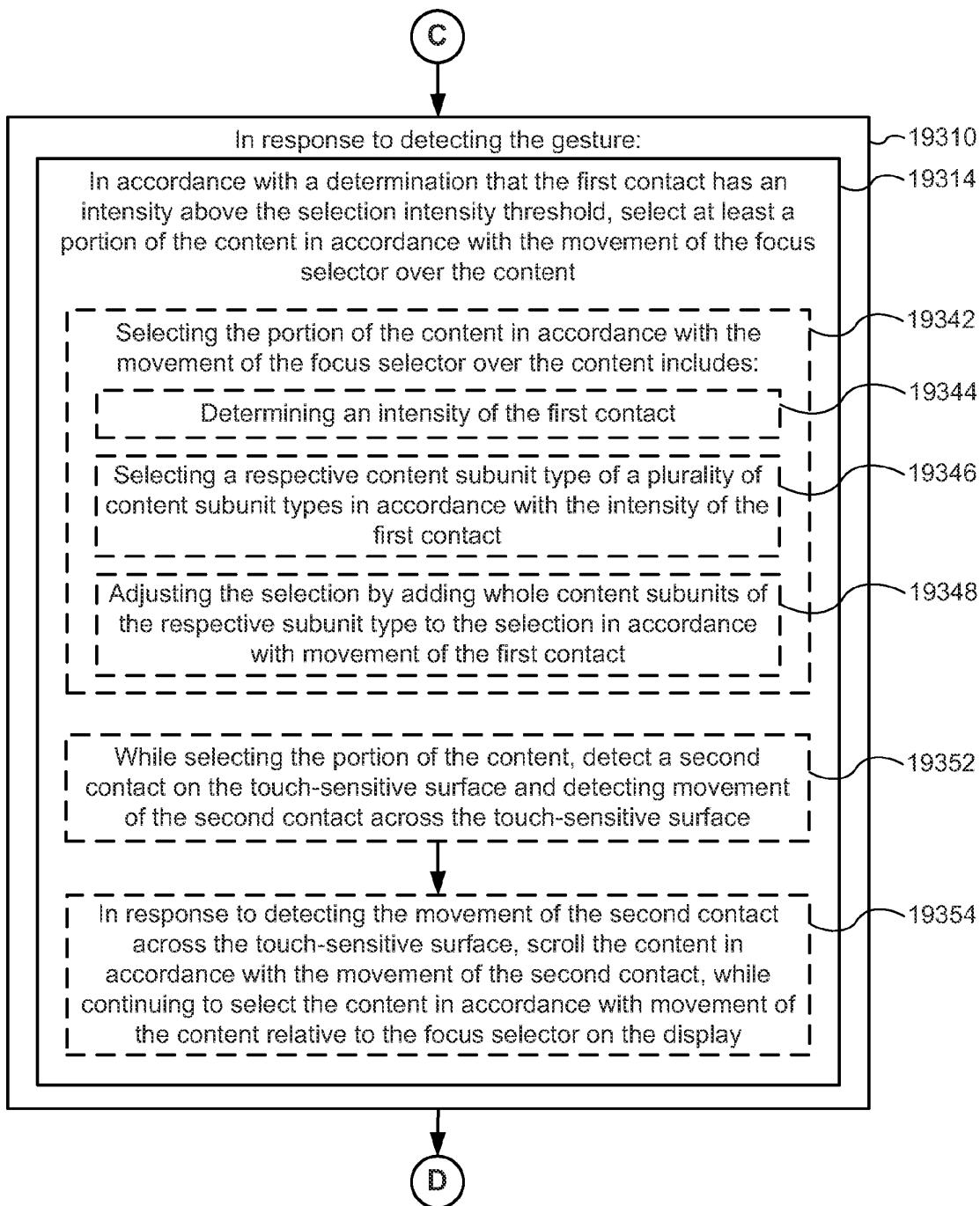


Figure 9D

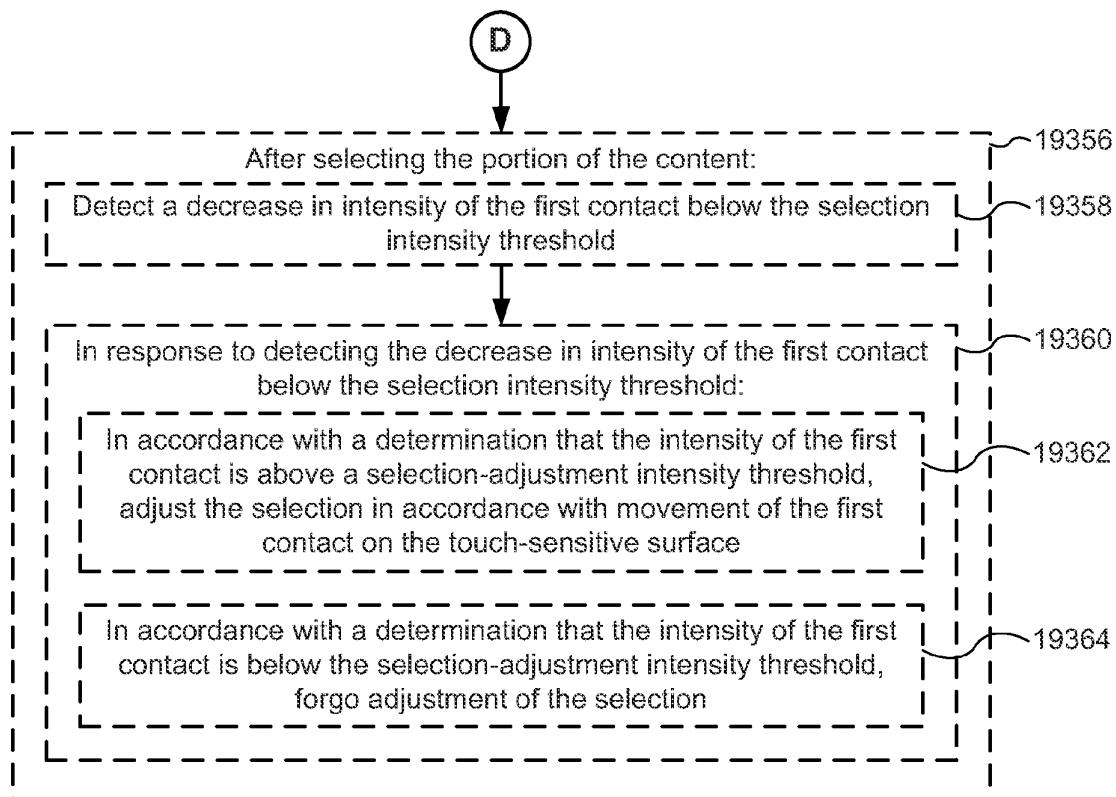


Figure 9E

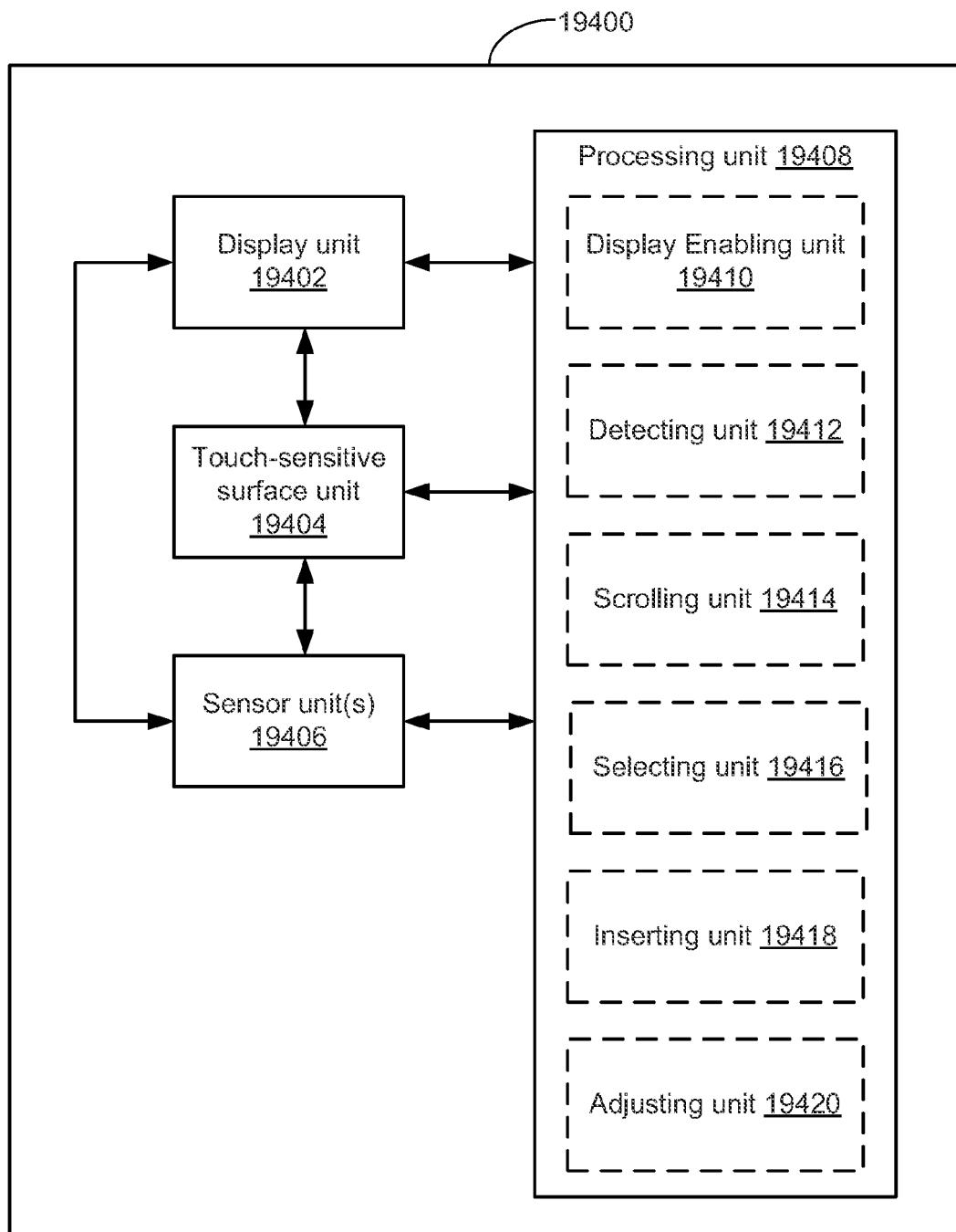


Figure 10

19502  
 proposition that all men are created equal.

19504  
 Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19502-58-a  
 But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our

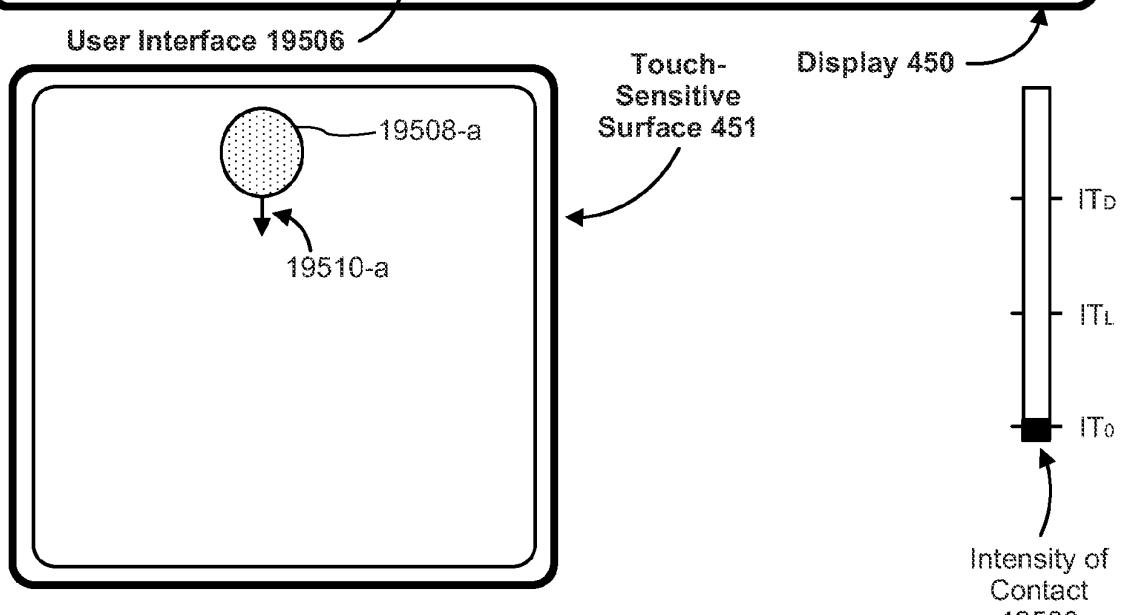


Figure 11A

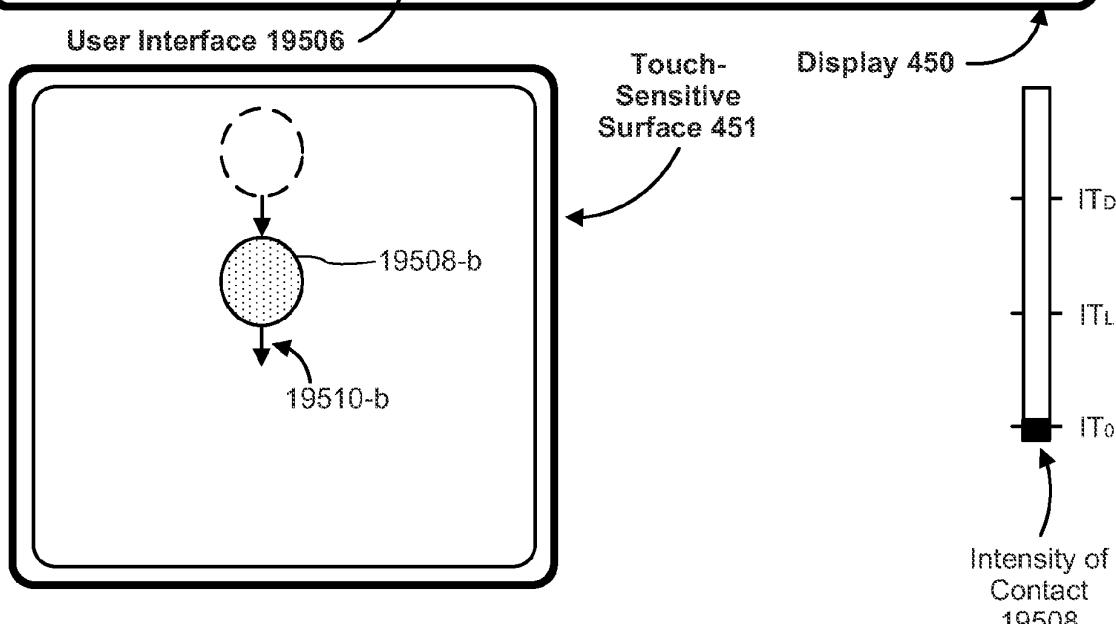
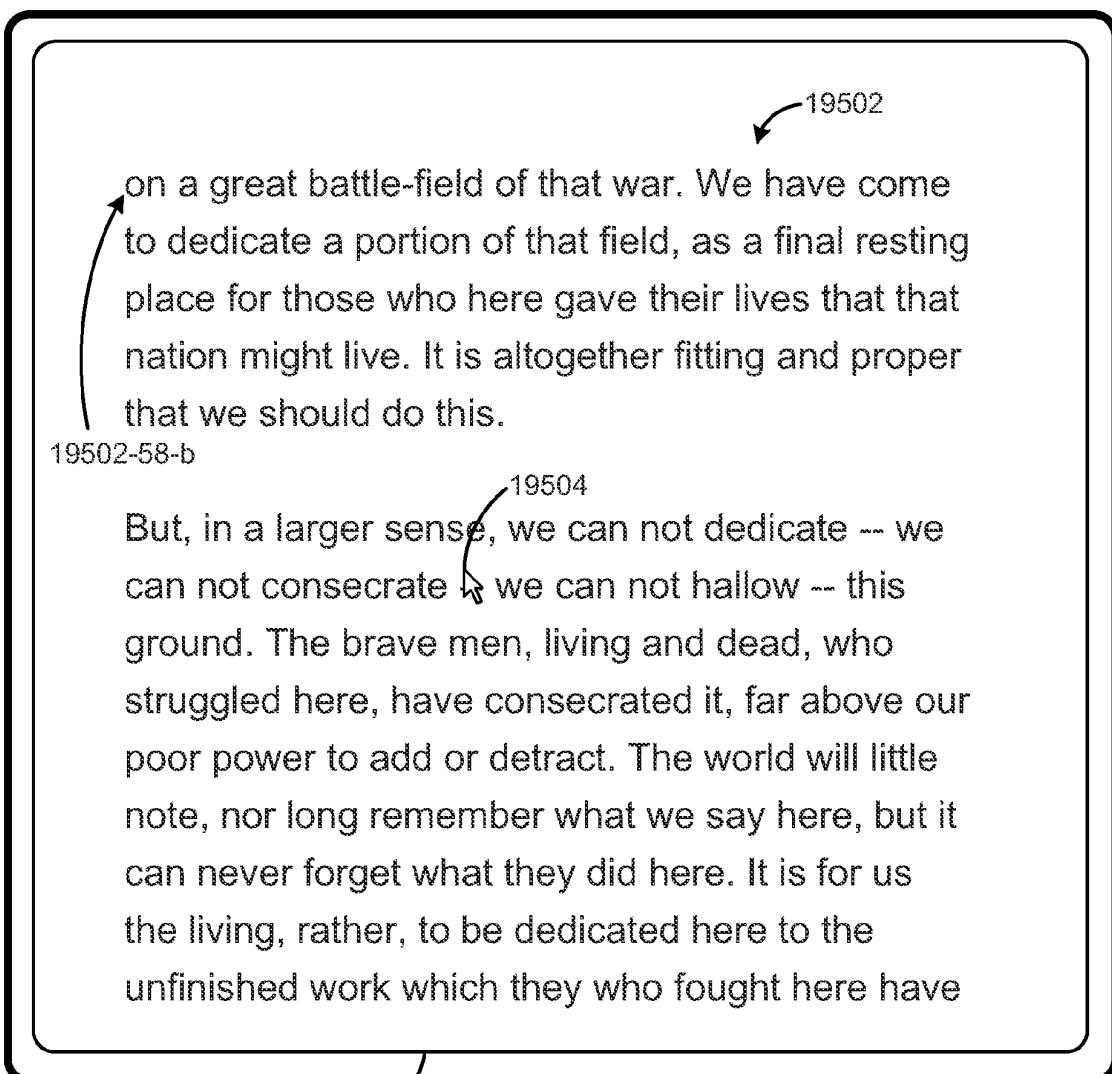


Figure 11B

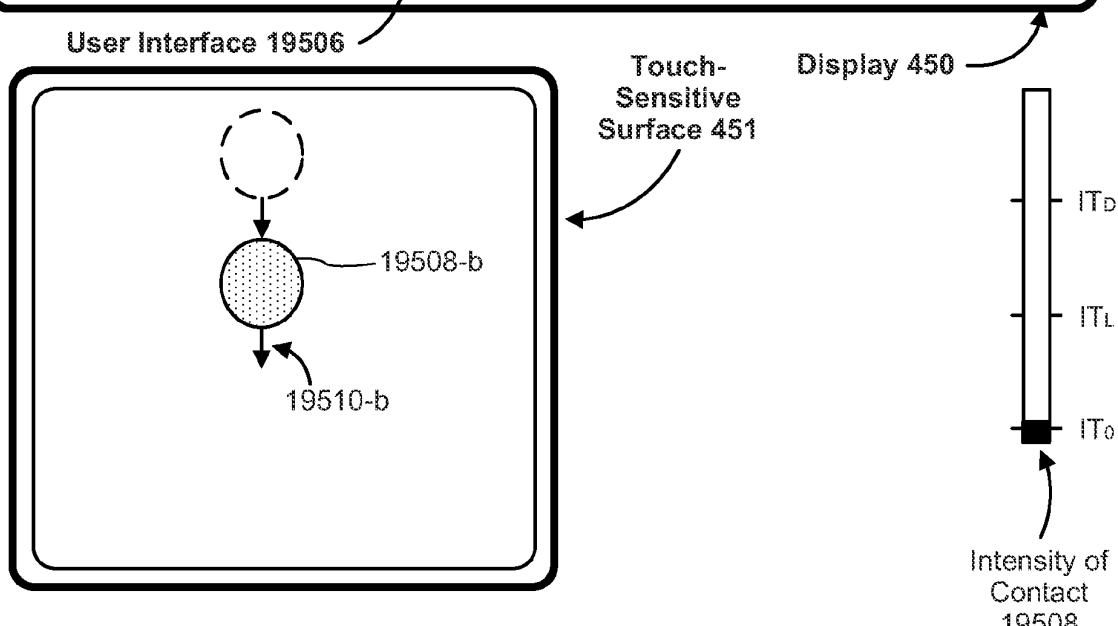
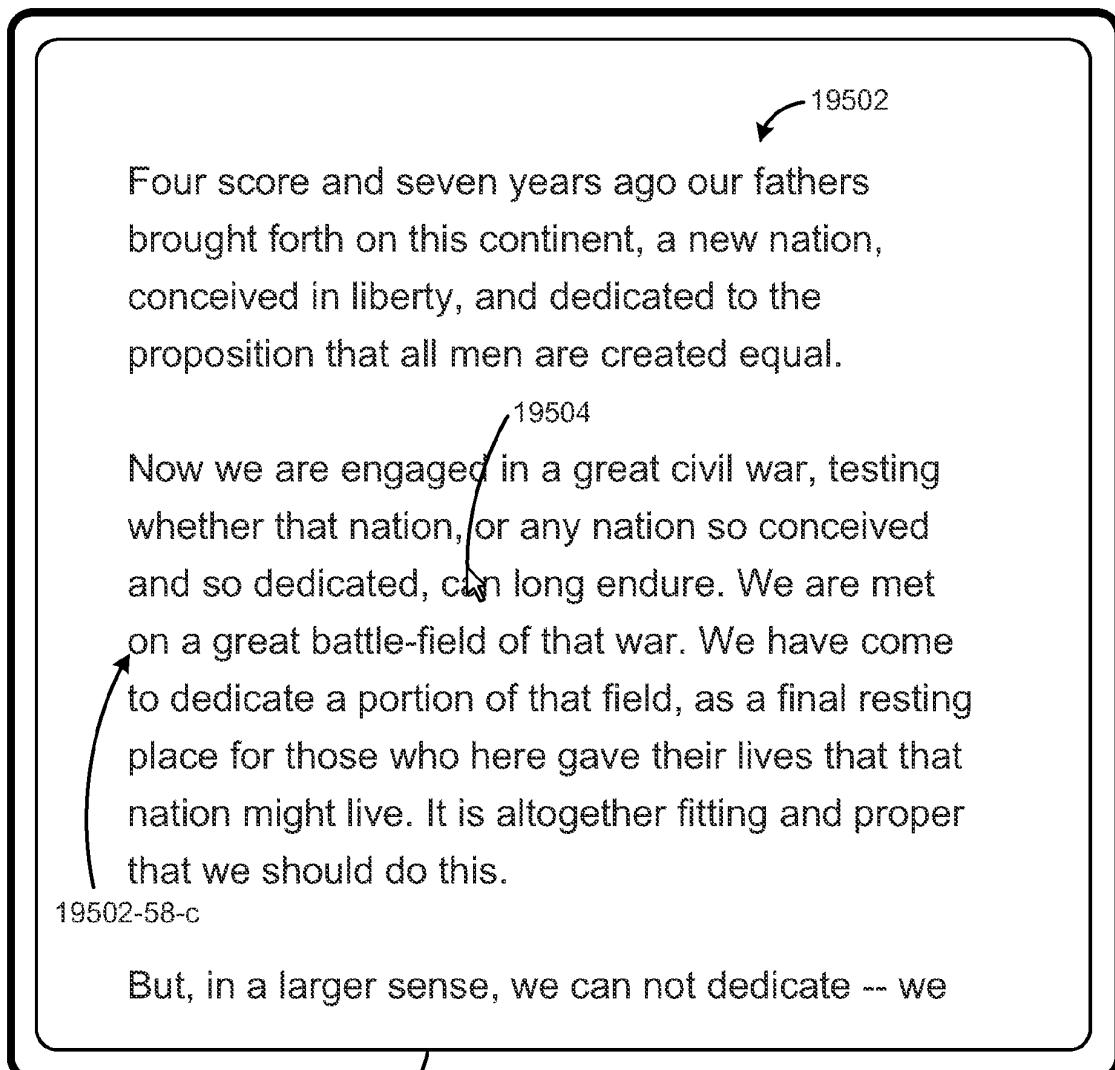


Figure 11C

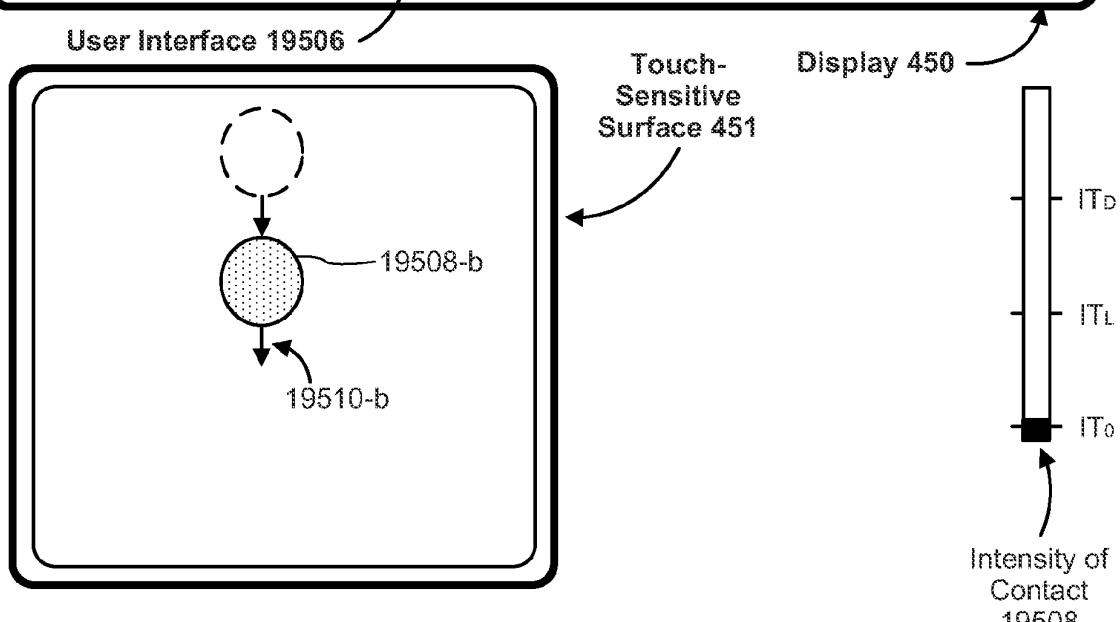
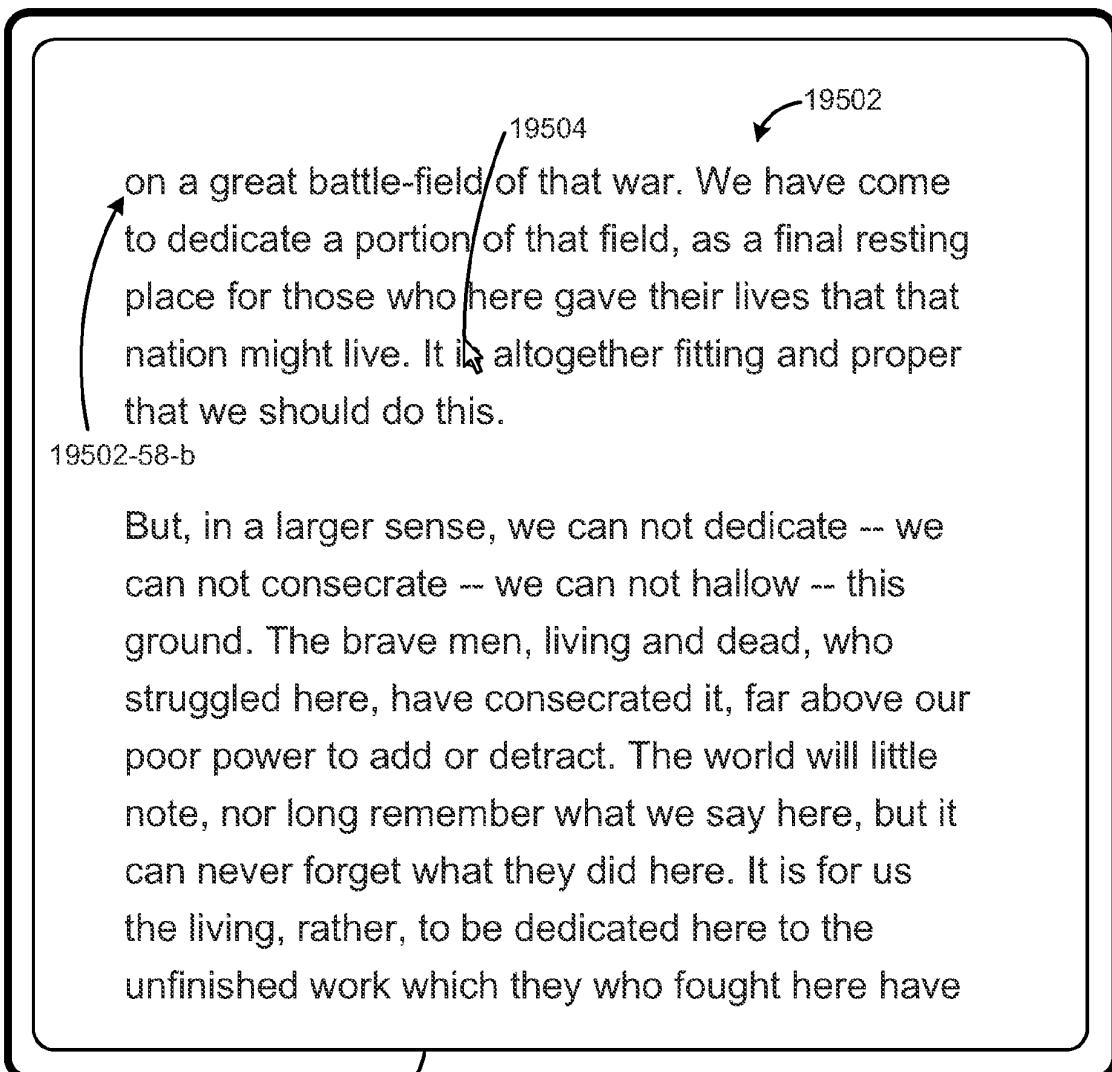


Figure 11D

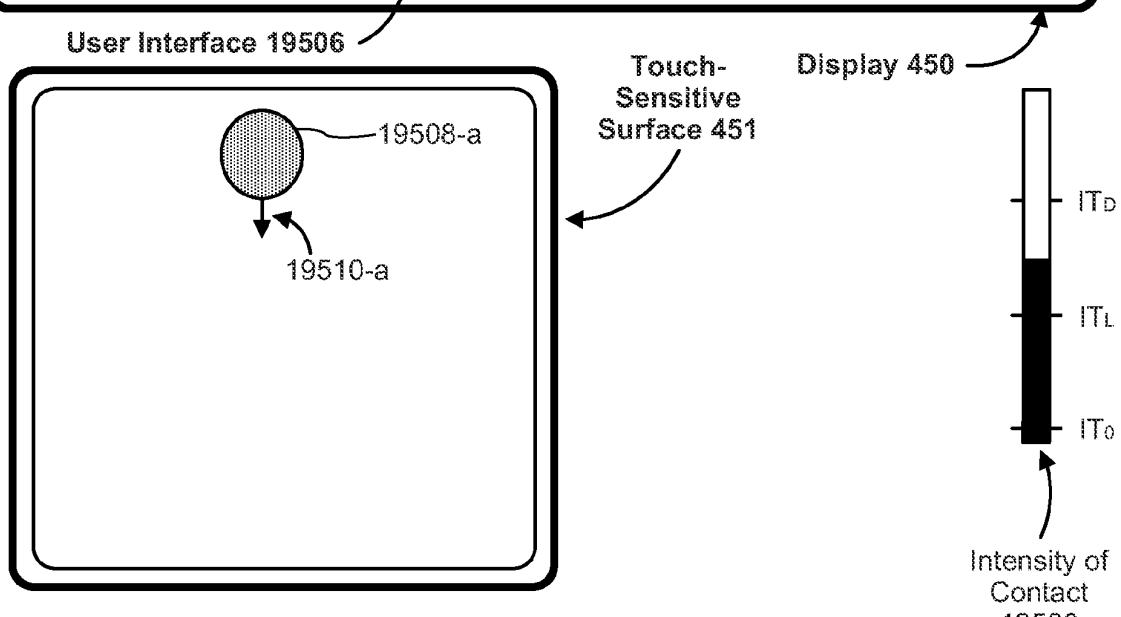
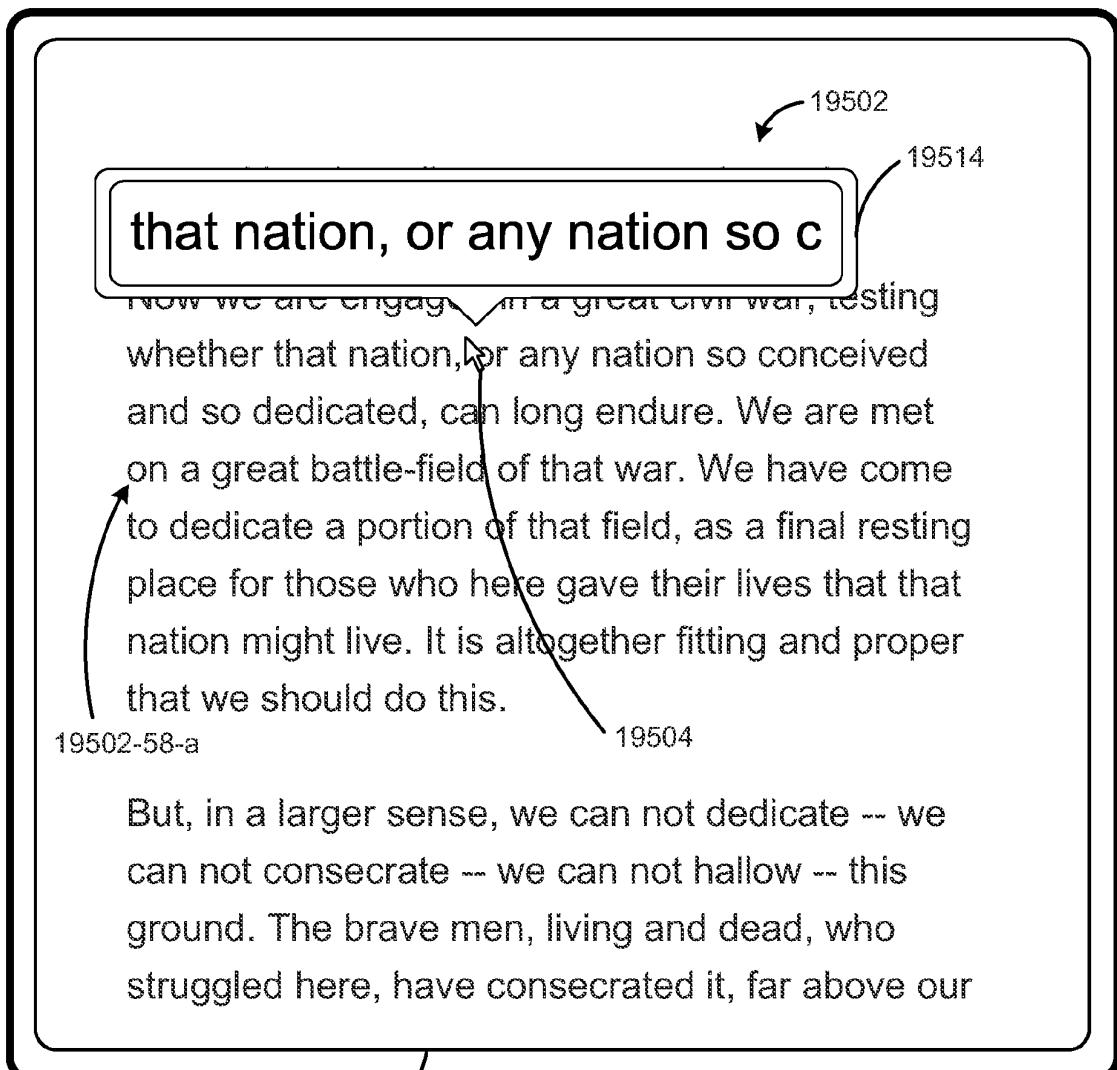


Figure 11E

proposition that all men are created equal.

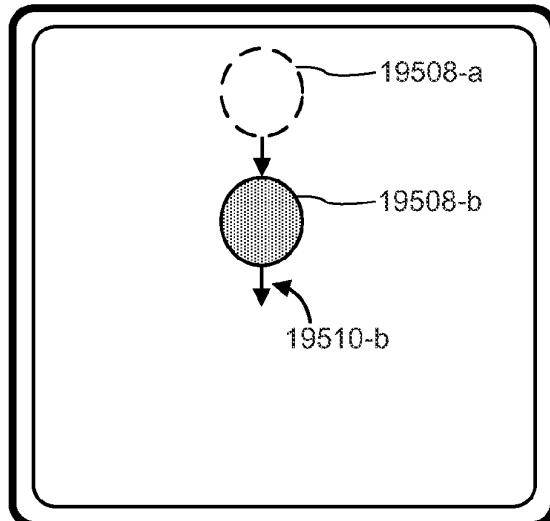
Now we are engaged in a great civil war, testing

dedicate a portion of that field

on a great battle-field of that war, we have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

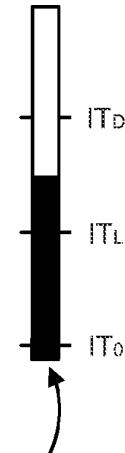
But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our

User Interface 19506



## Touch-Sensitive Surface 451

### Display 450



Intensity of  
Contact  
19508

Figure 11F

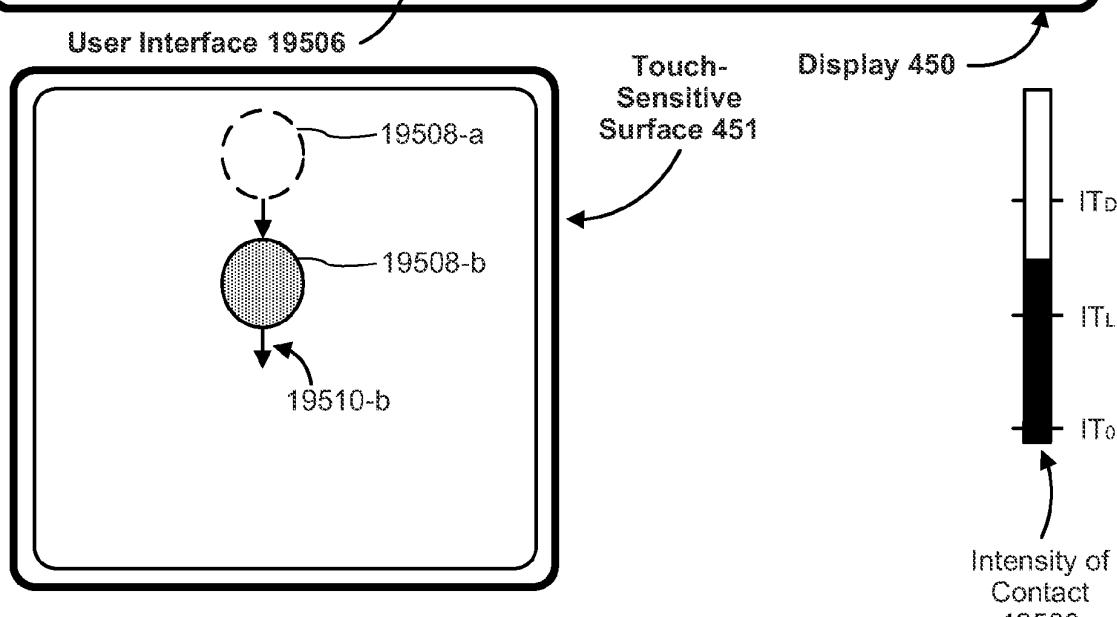
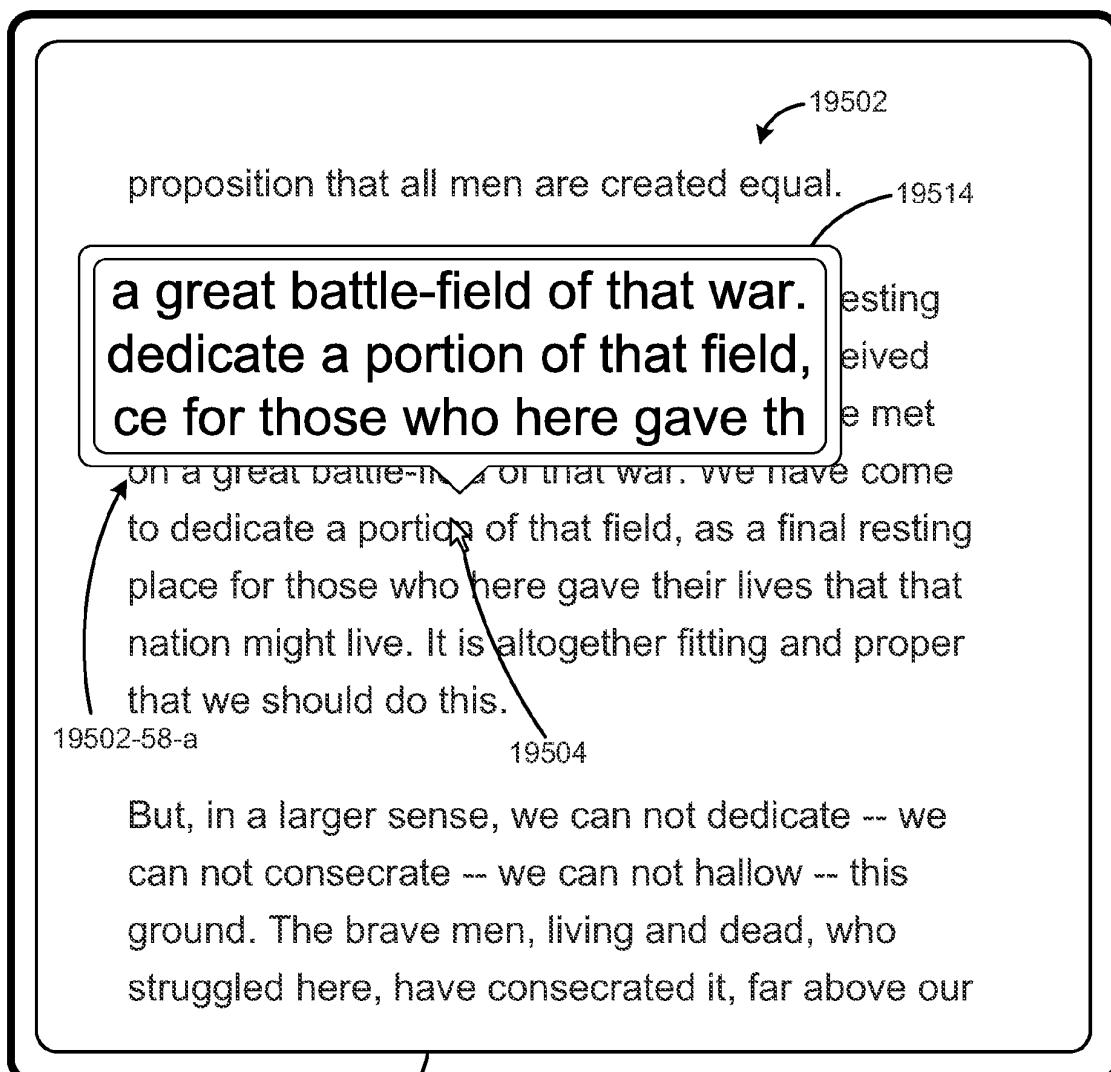


Figure 11G

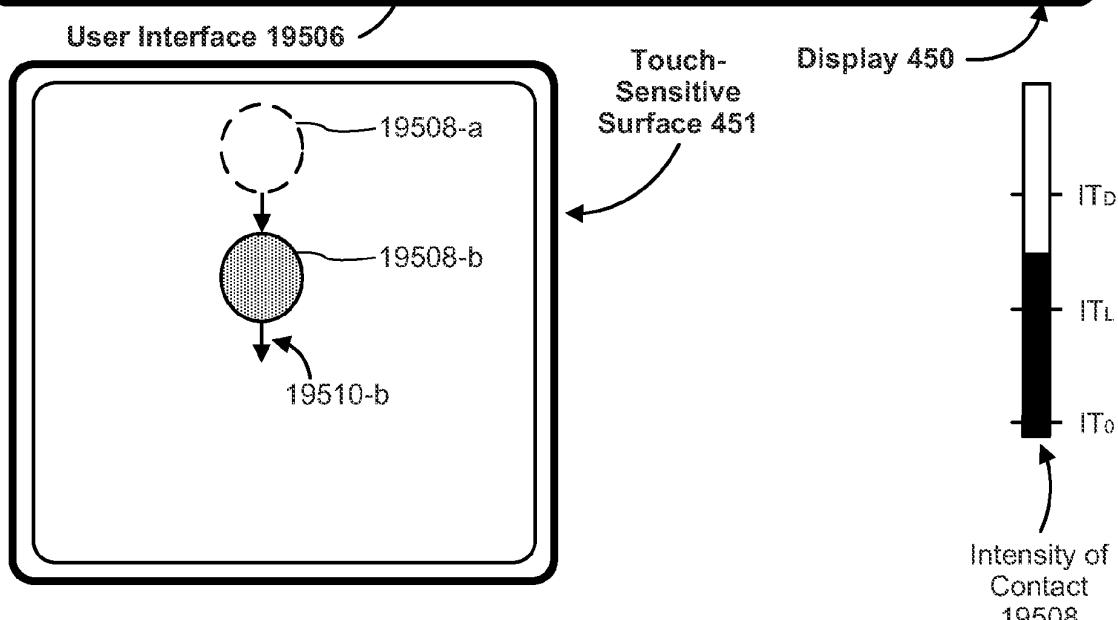
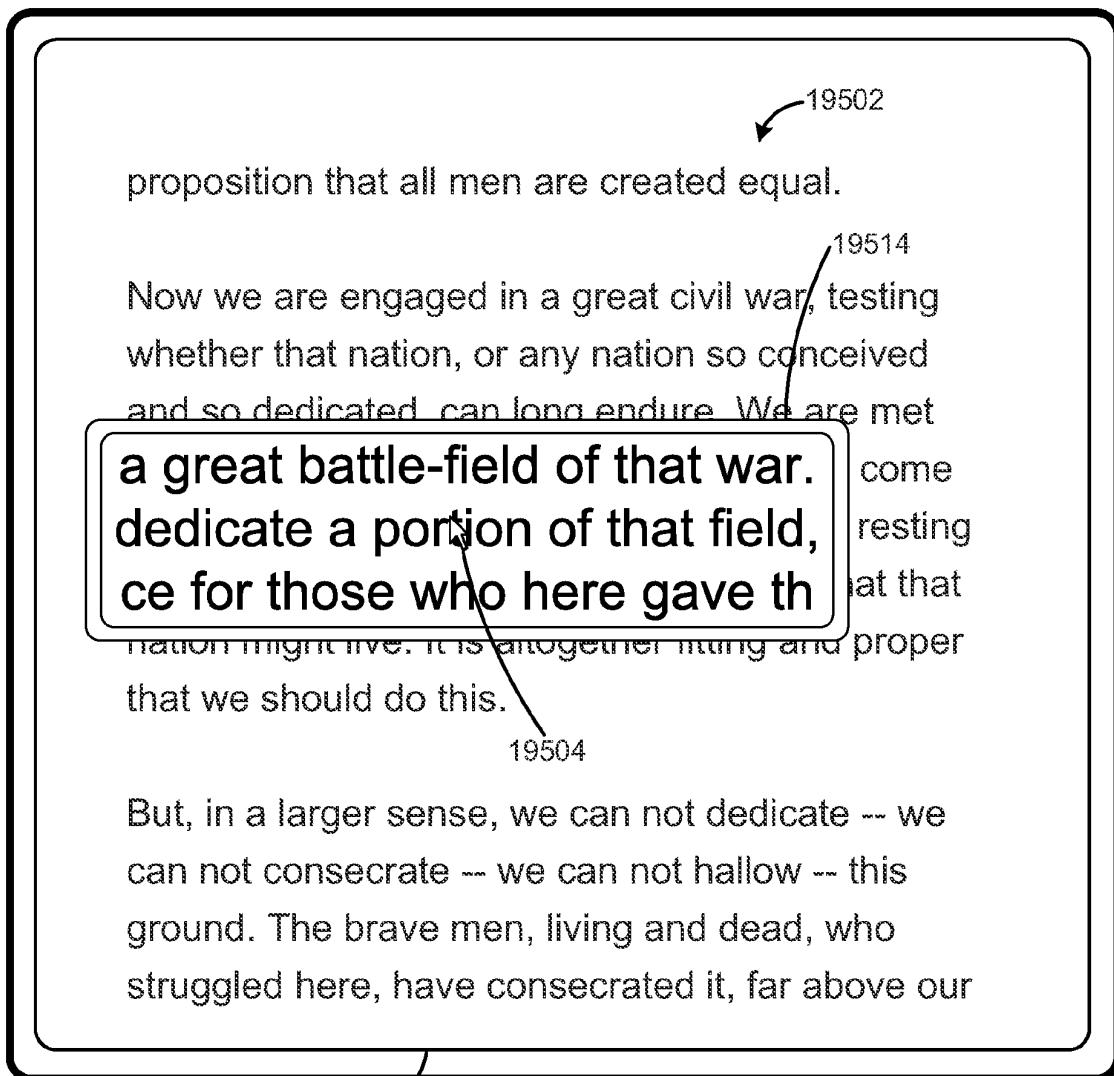


Figure 11H

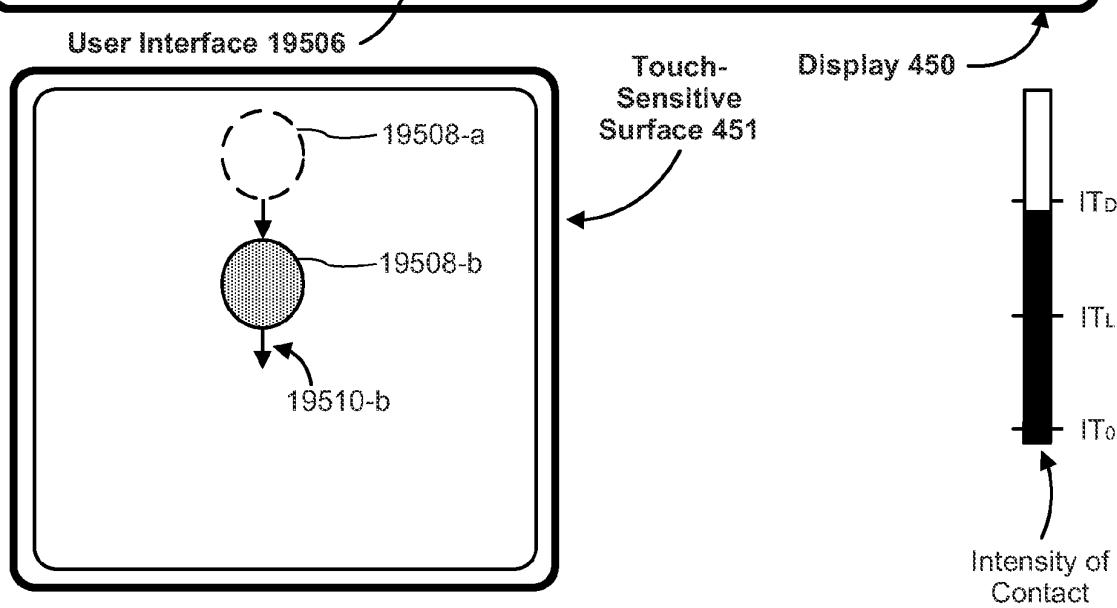
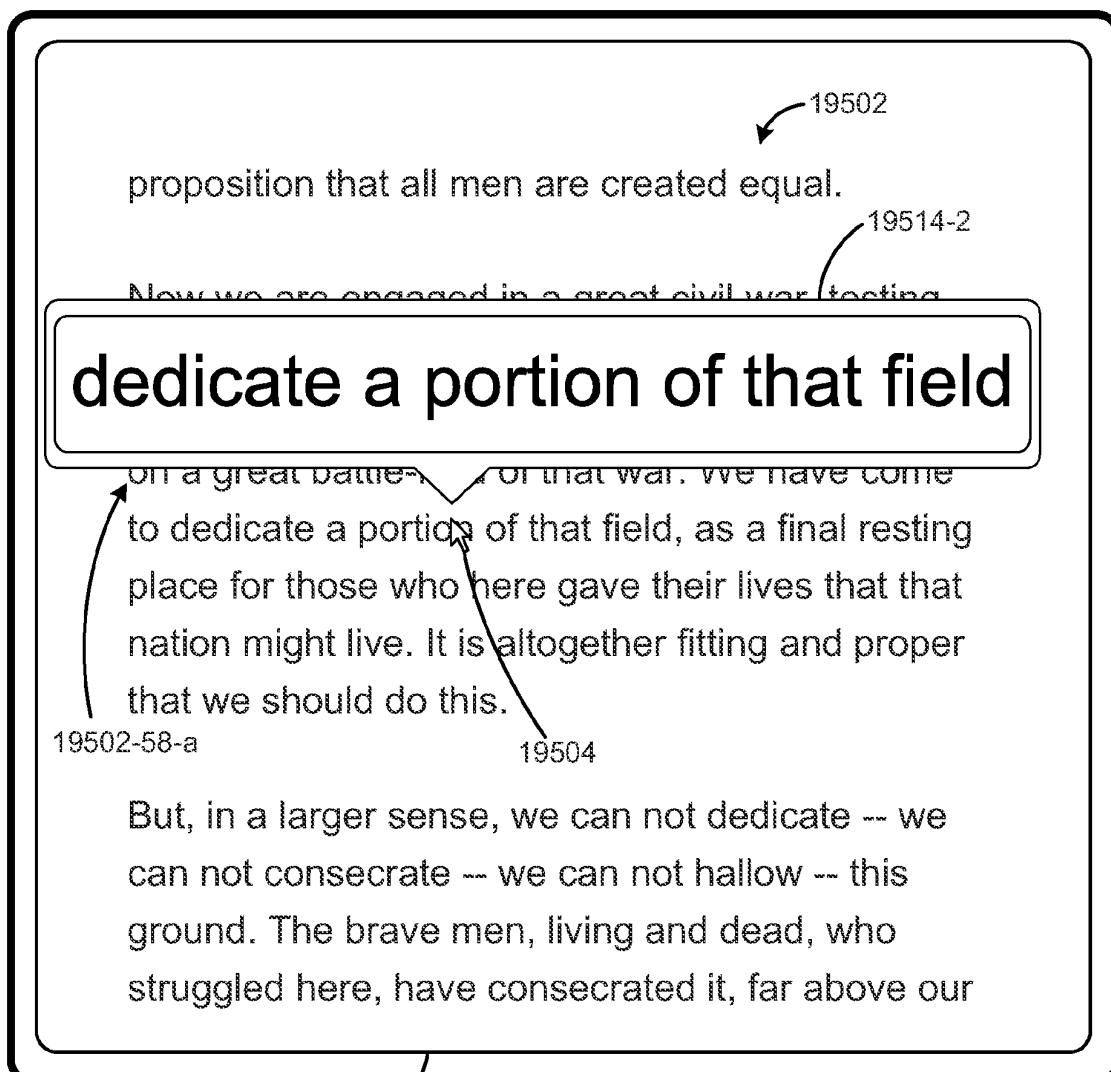


Figure 11

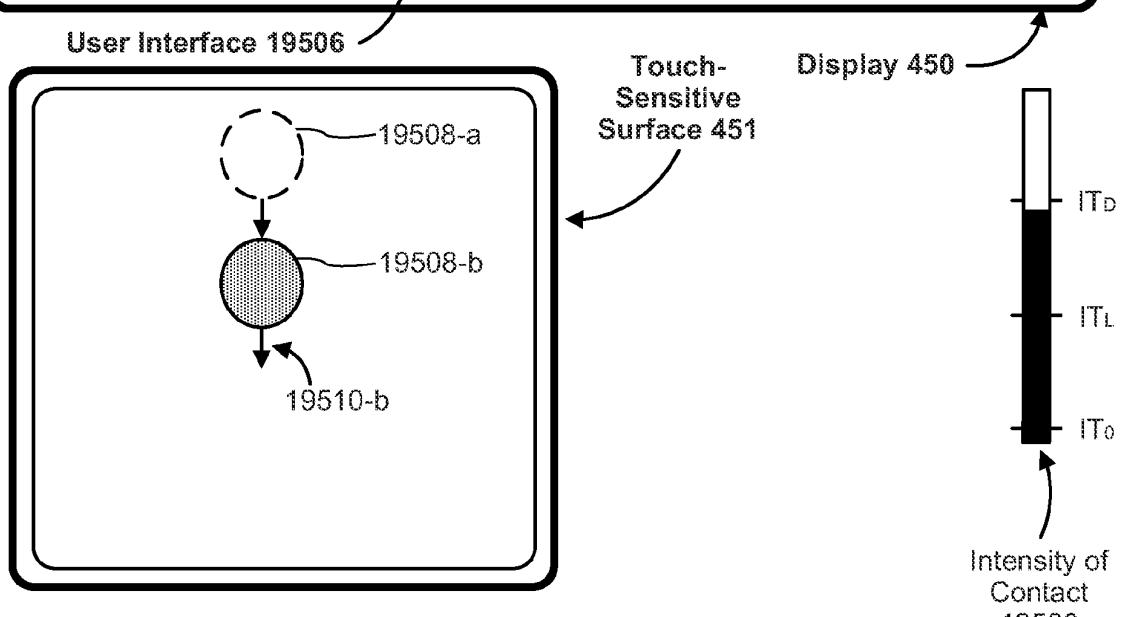
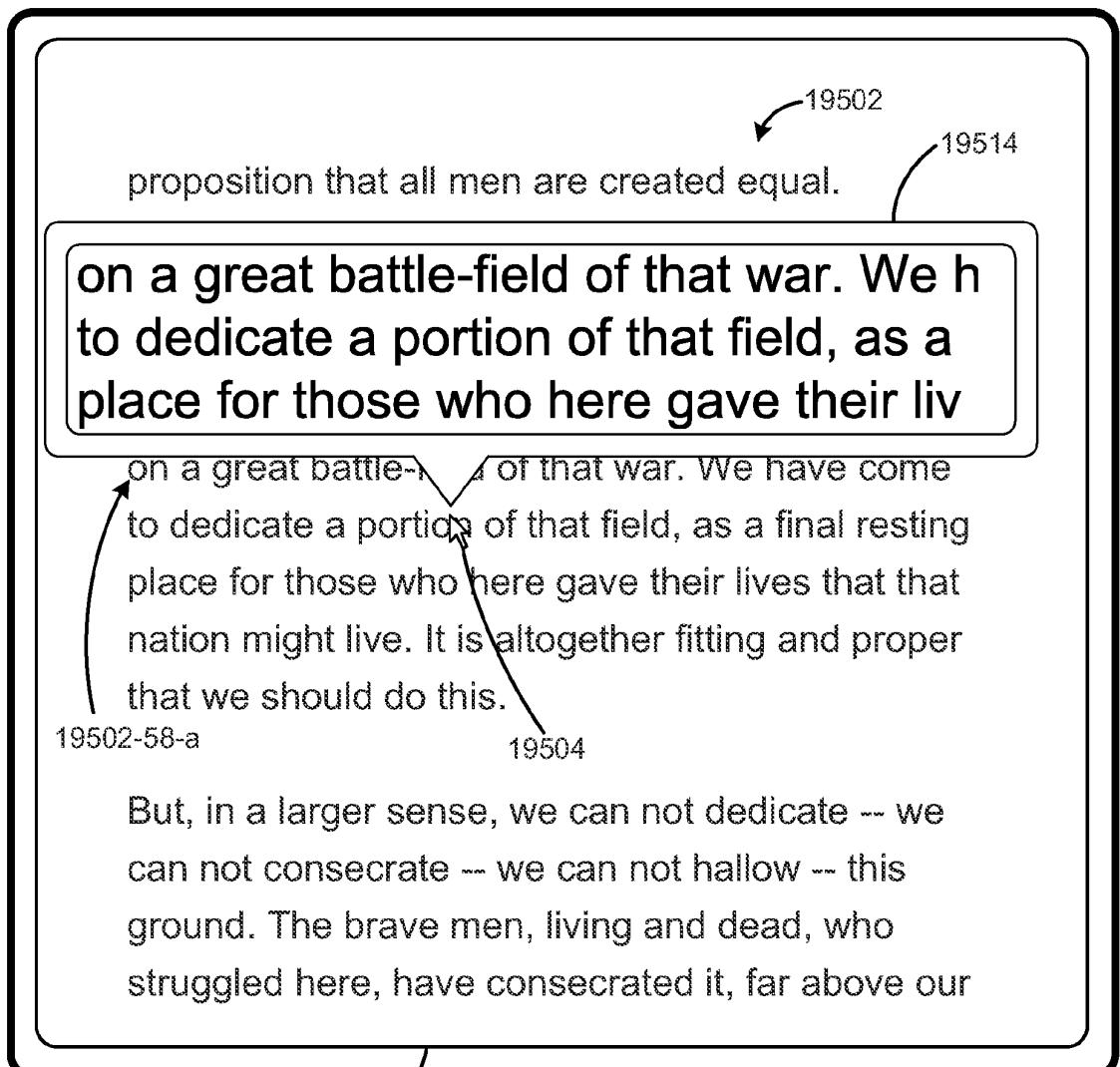


Figure 11J

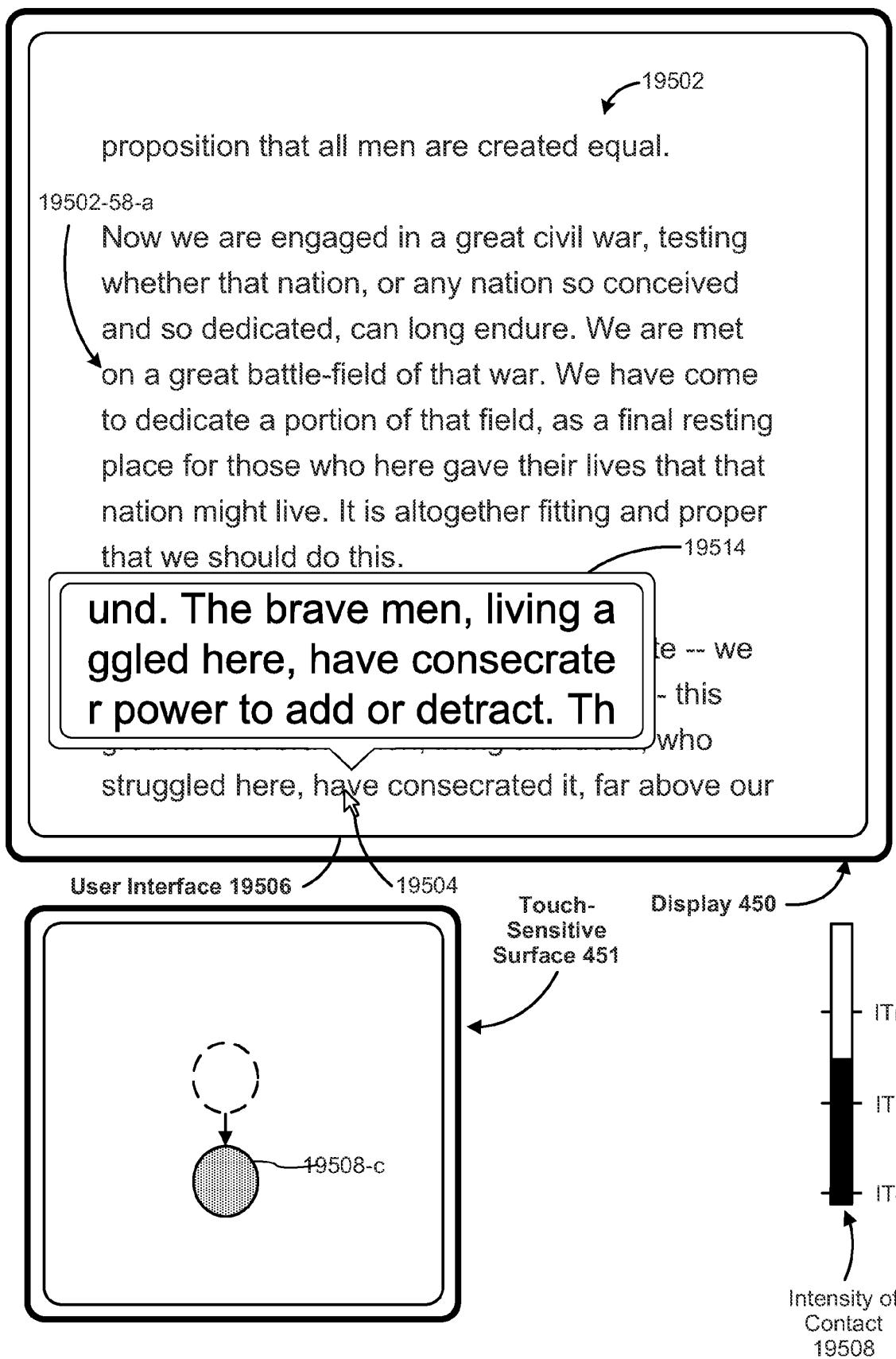


Figure 11K

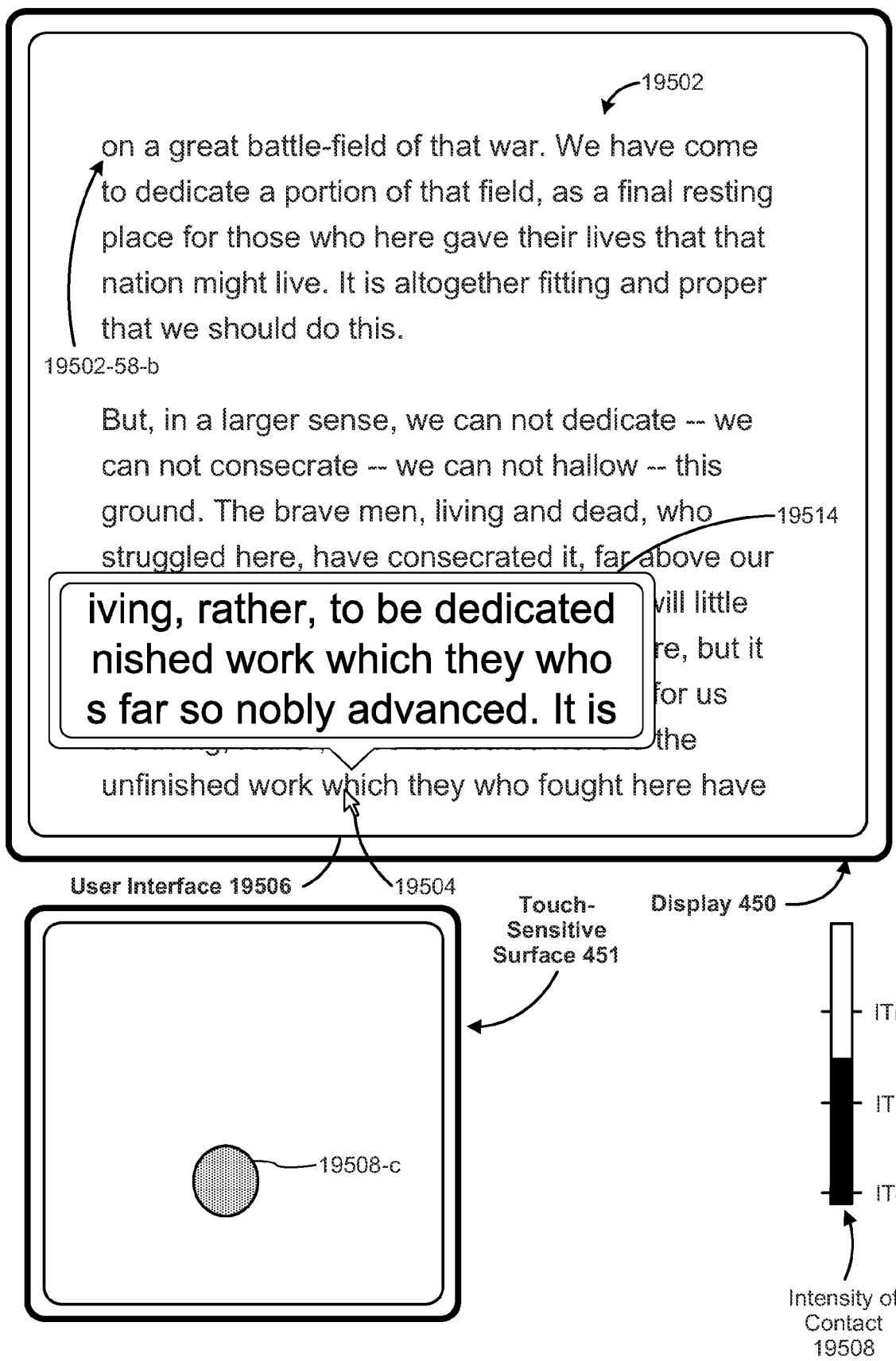
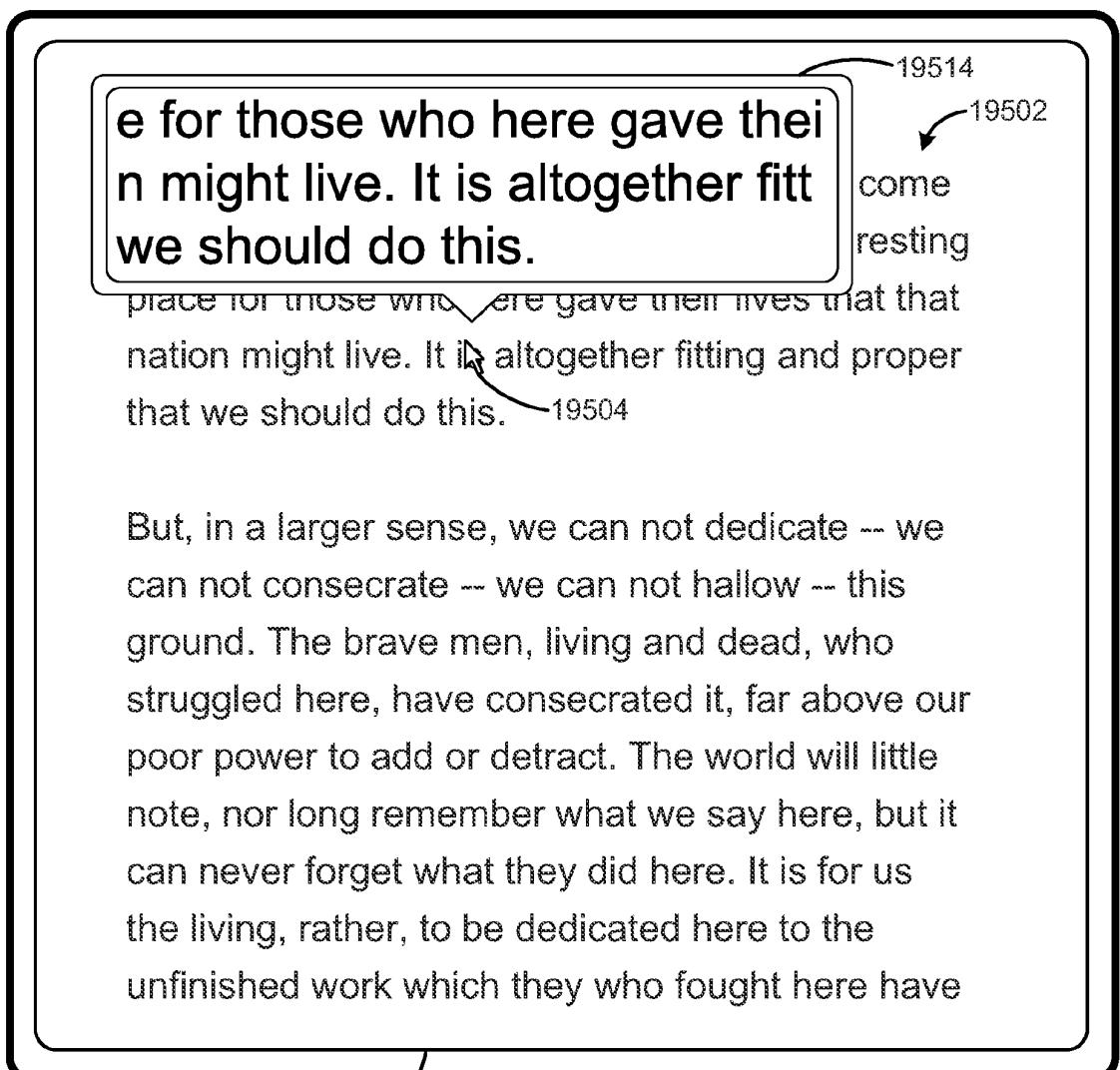


Figure 11L



But, in a larger sense, we can not dedicate -- we  
can not consecrate -- we can not hallow -- this  
ground. The brave men, living and dead, who  
struggled here, have consecrated it, far above our  
poor power to add or detract. The world will little  
note, nor long remember what we say here, but it  
can never forget what they did here. It is for us  
the living, rather, to be dedicated here to the  
unfinished work which they who fought here have

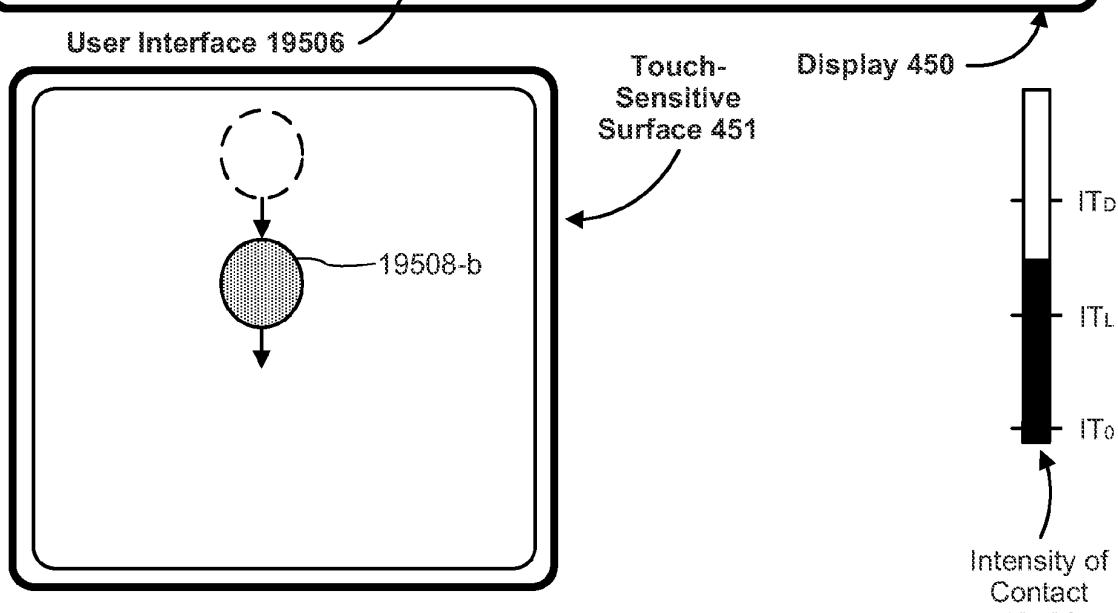


Figure 11M

19502-58-b 19502 19514

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that

**in a larger sense, we can not proper  
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nd. The brave men, living and**

19504

But, in a larger sense, we can not dedicate -- we can not consecrate we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have

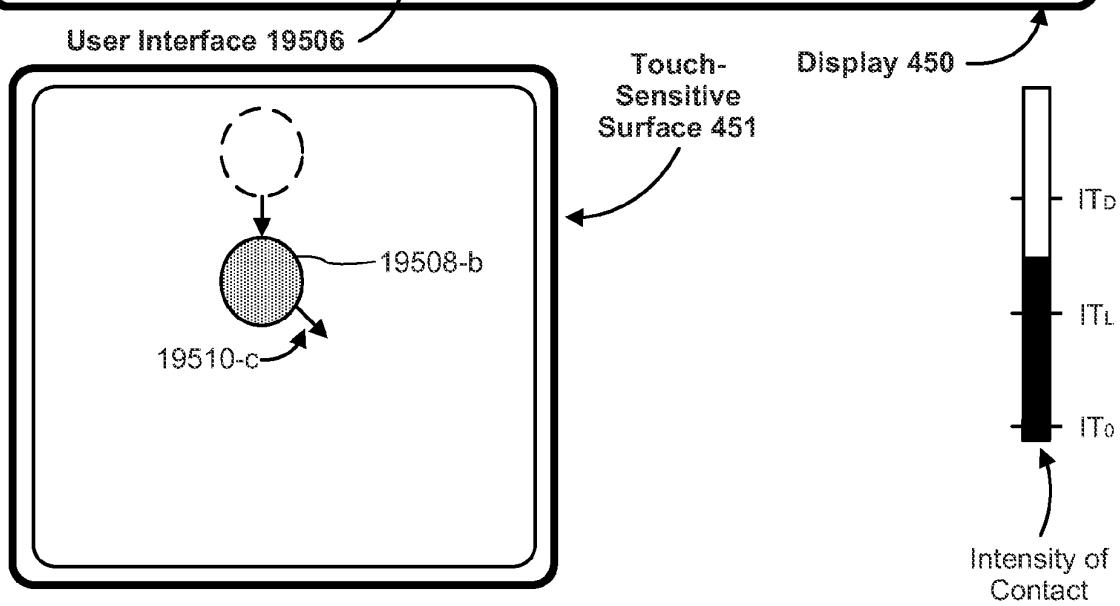


Figure 11N

19502

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19502-58-b

19514

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poor power to add or detract. The world will little  
note, nor long remember what we say here, but it  
can never forget what they did here. It is for us  
the living, rather, to be dedicated here to the  
unfinished work which they who fought here have

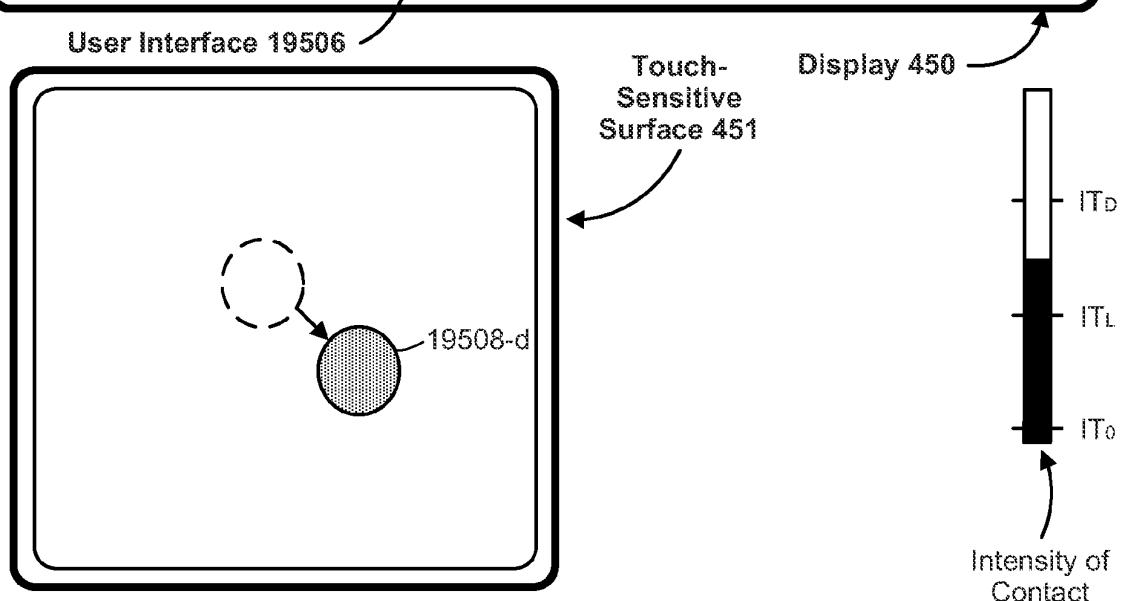


Figure 110

19502

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19502-58-b 19512-2 19514

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can never forget what they did here. It is for us  
the living, rather, to be dedicated here to the  
unfinished work which they who fought here have

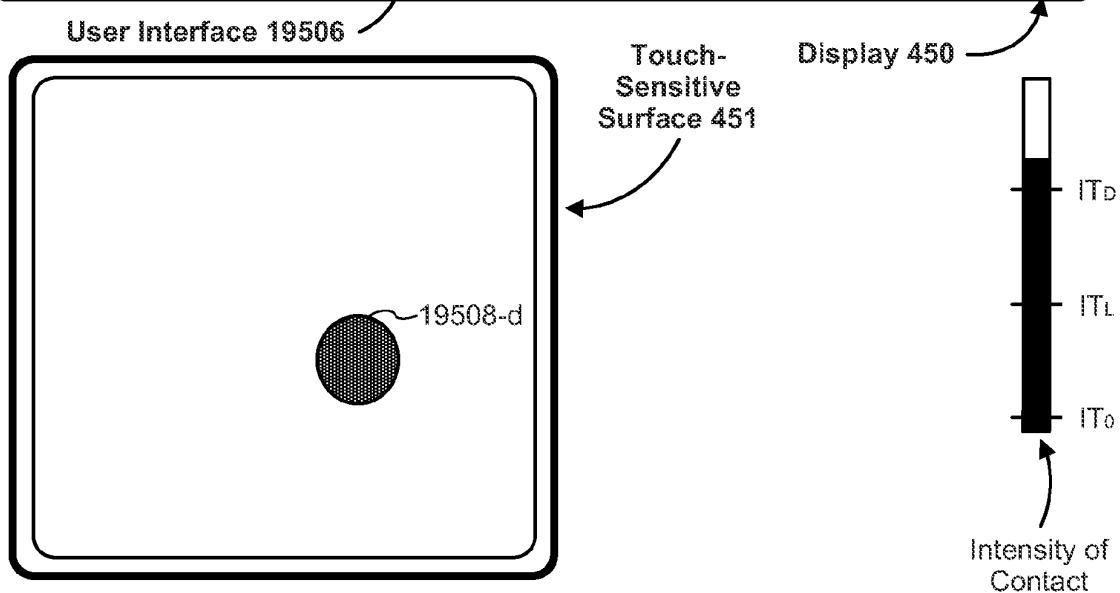


Figure 11P

19502

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19502-58-b 19512-2 19514

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poor power to add or detract. The world will little  
note, nor long remember what we say here, but it  
can never forget what they did here. It is for us  
the living, rather, to be dedicated here to the  
unfinished work which they who fought here have

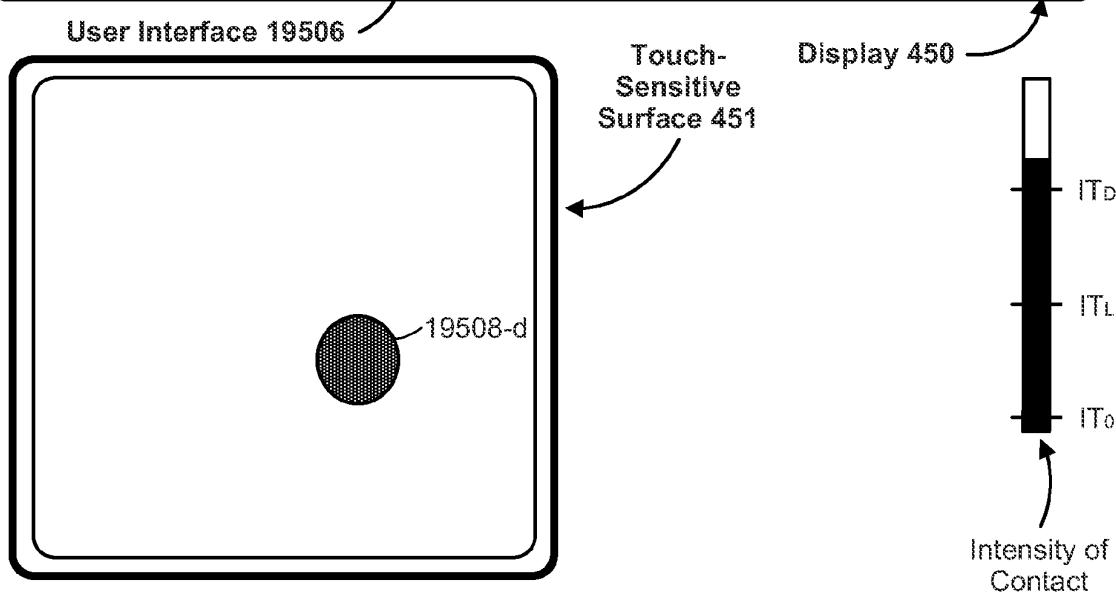


Figure 11Q

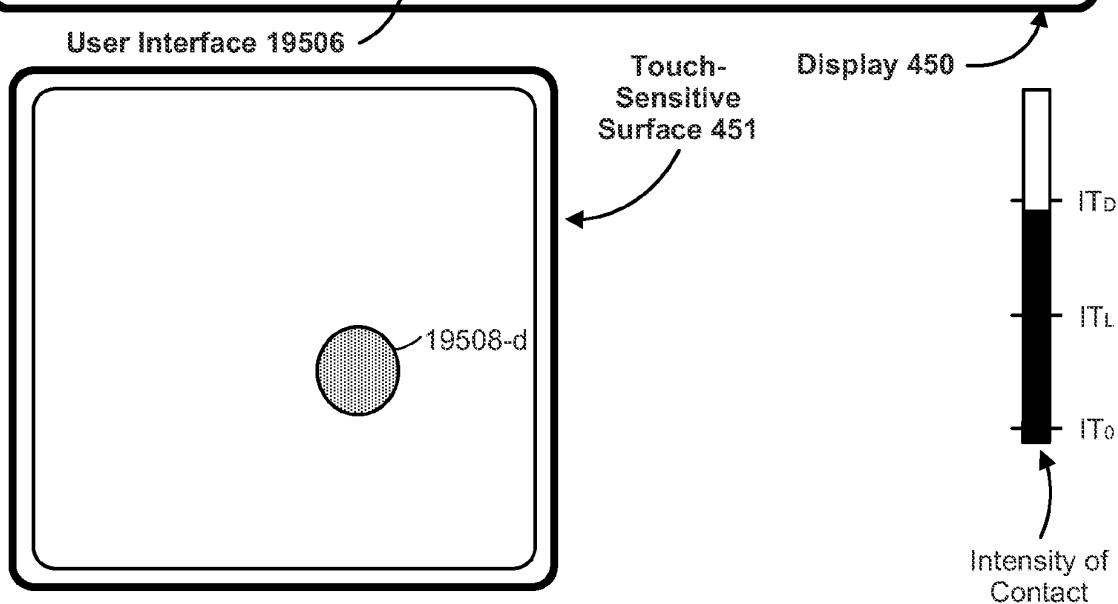
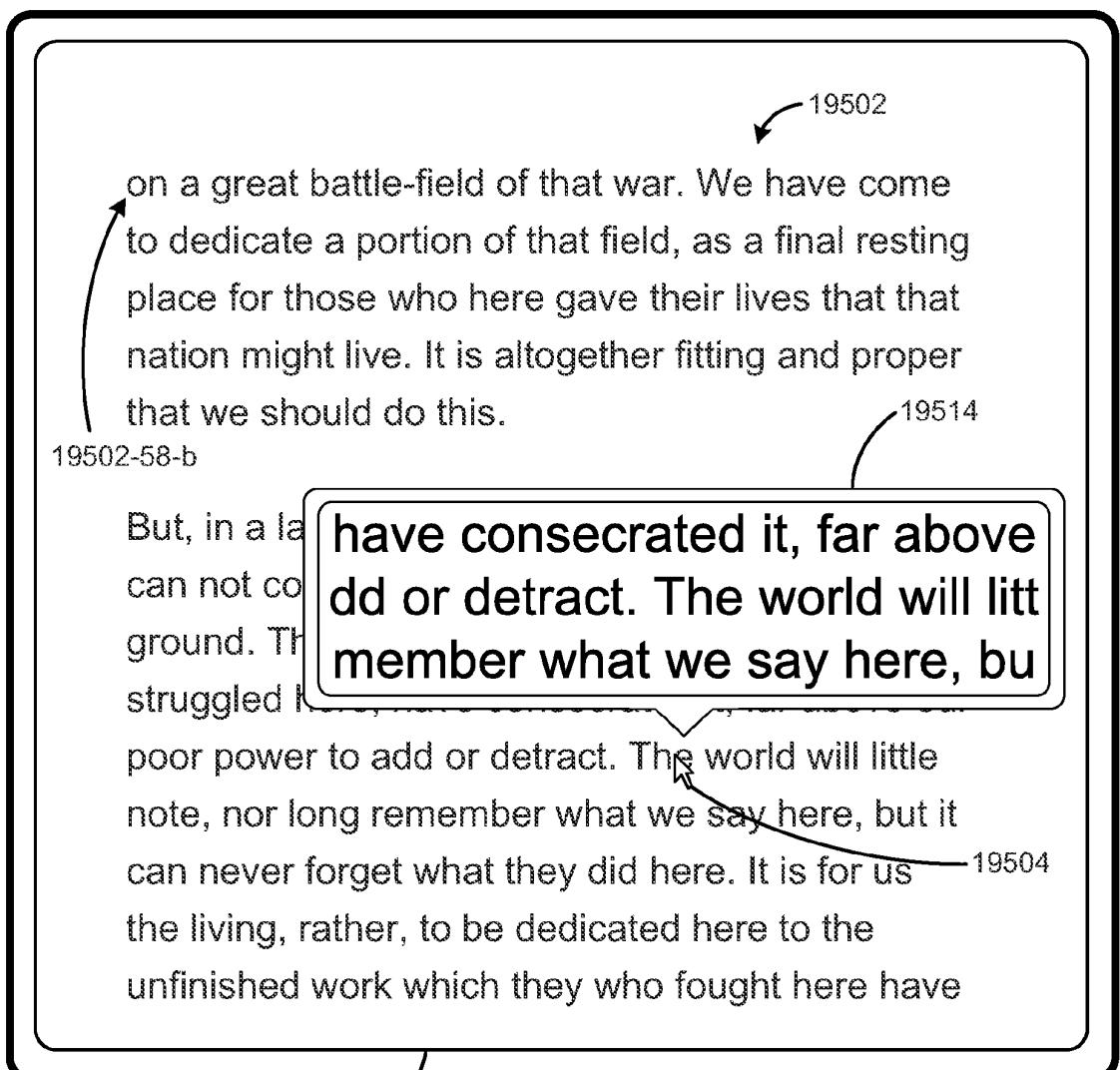


Figure 11R

19502

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19502-58-b 19516-1 19514

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can never forget what they did here. It is for us  
the living, rather, to be dedicated here to the  
unfinished work which they who fought here have

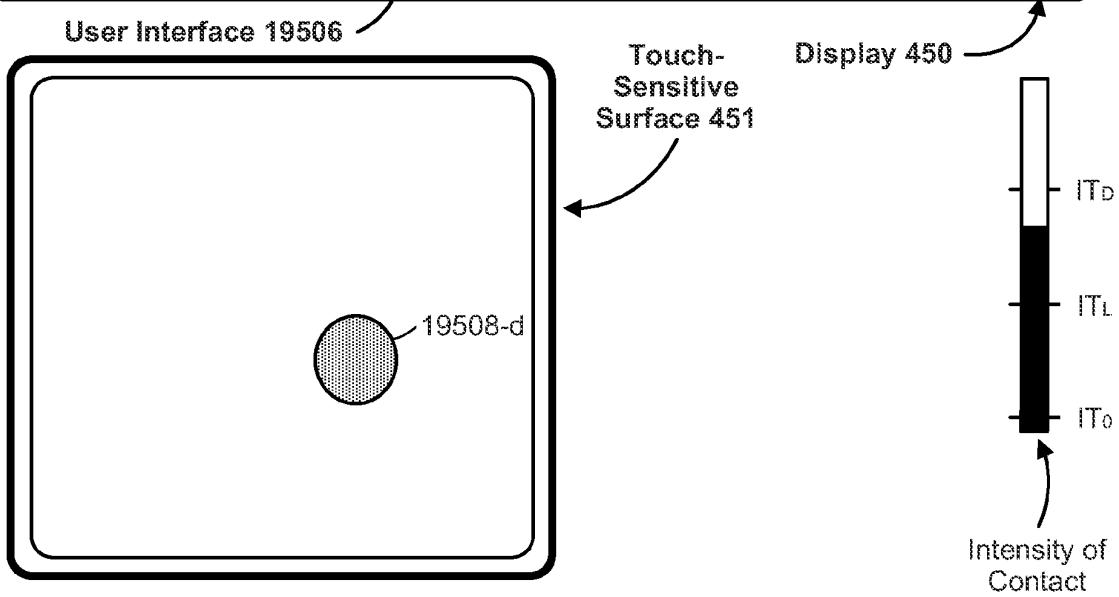


Figure 11S

19502

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19502-58-b 19516-2 19514

But, in a large and little known world, we can not co-add or detract. The world will little member what we say here, but it

**have consecrated it, far above all else, by the mere fact that we have come here to pay our respects to the dead.**

poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have

19504

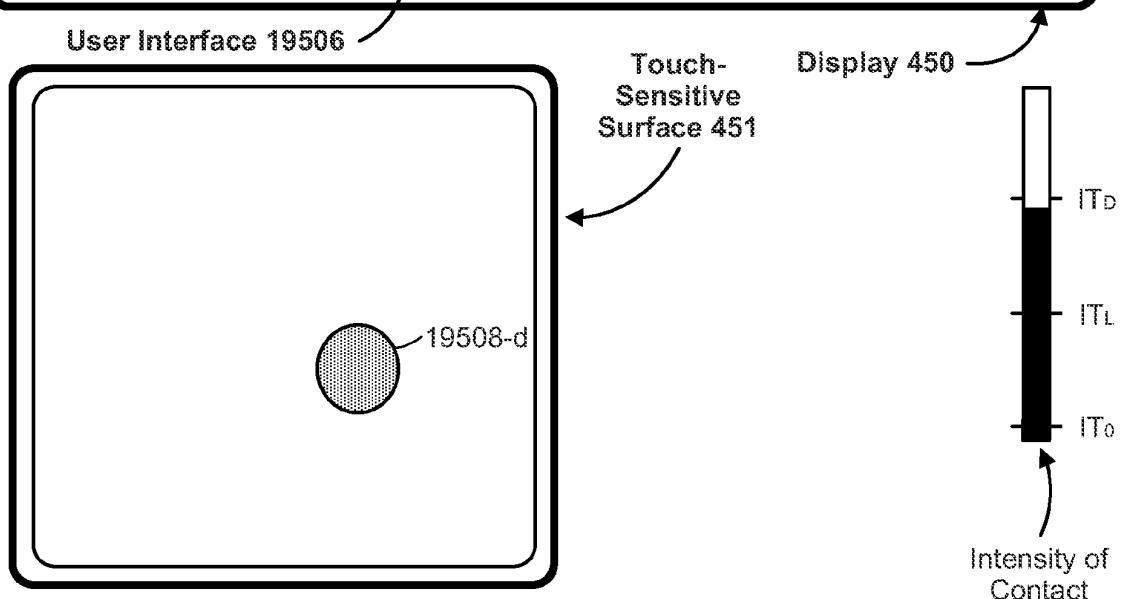


Figure 11T

19502-58-b

19502

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have

19504

User Interface 19506

Touch-Sensitive Surface 451

Display 450

19508-d

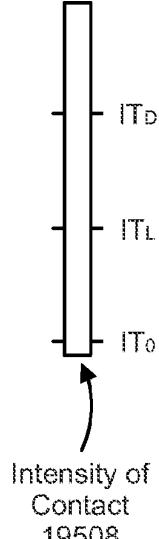


Figure 11U

19502-58-b

19502

on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

19512-1

19514

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poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have

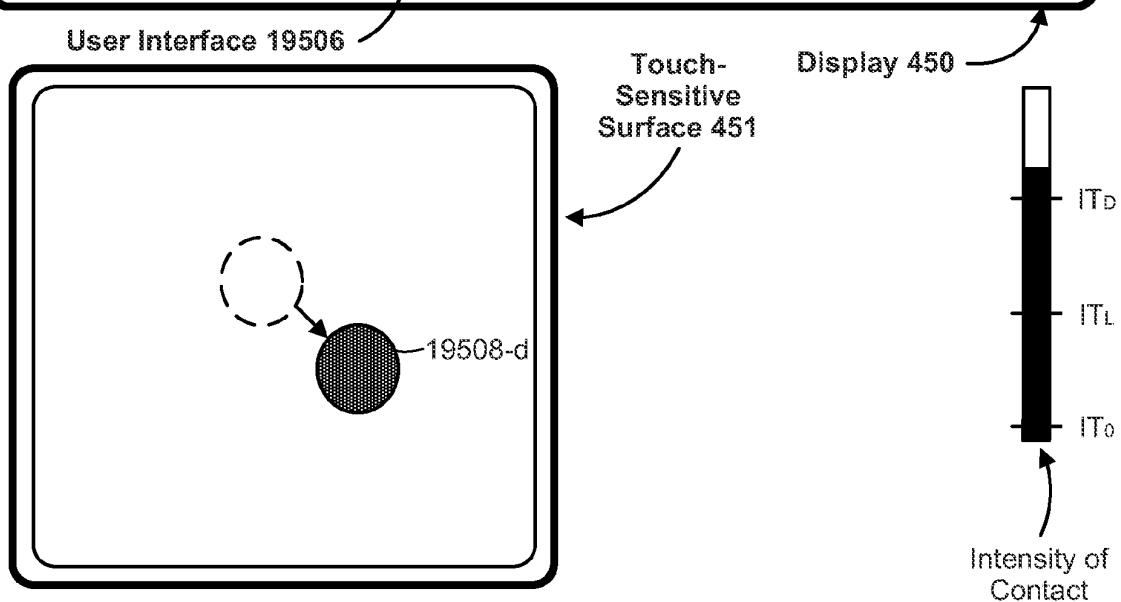


Figure 11V

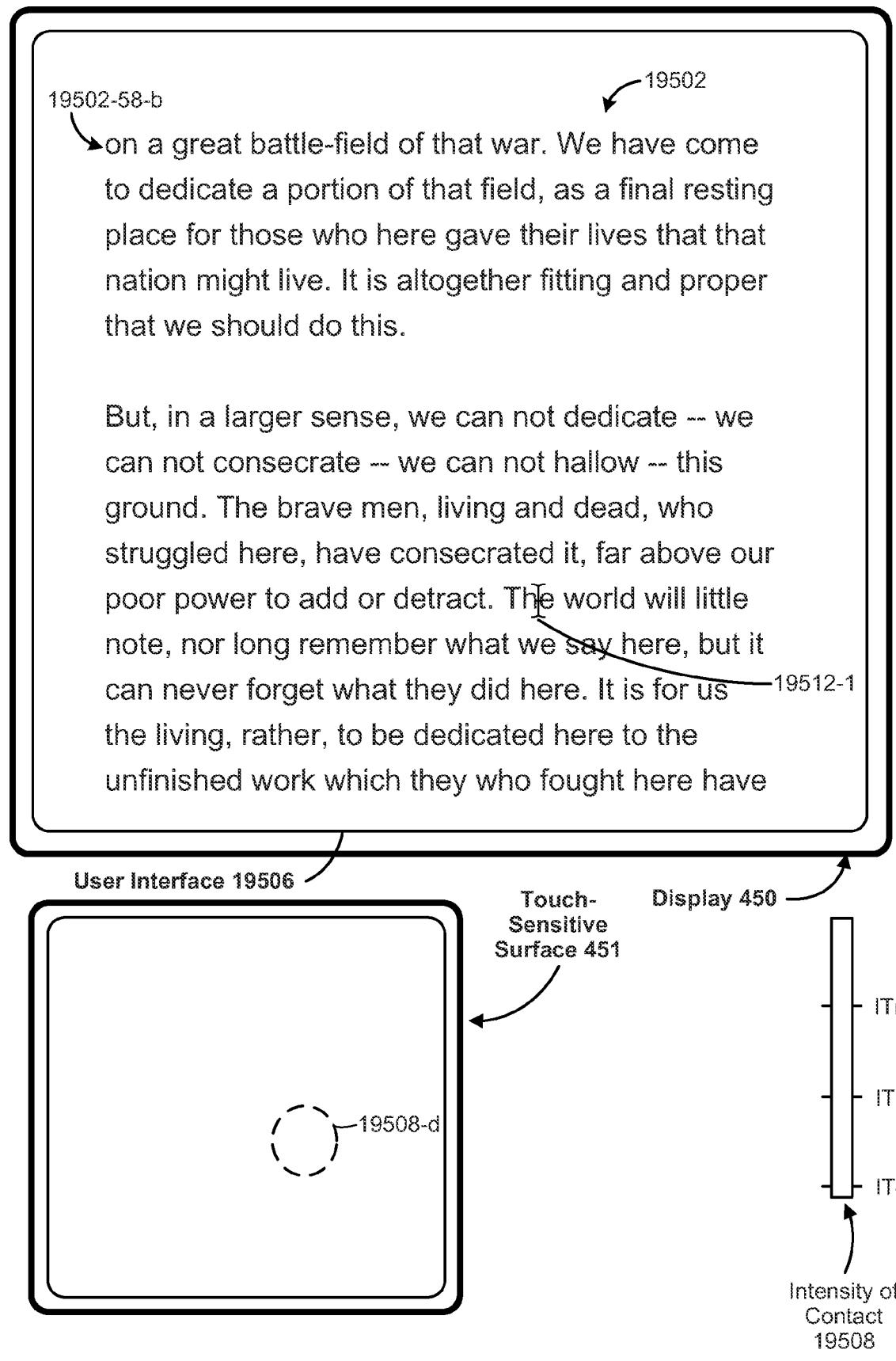


Figure 11W

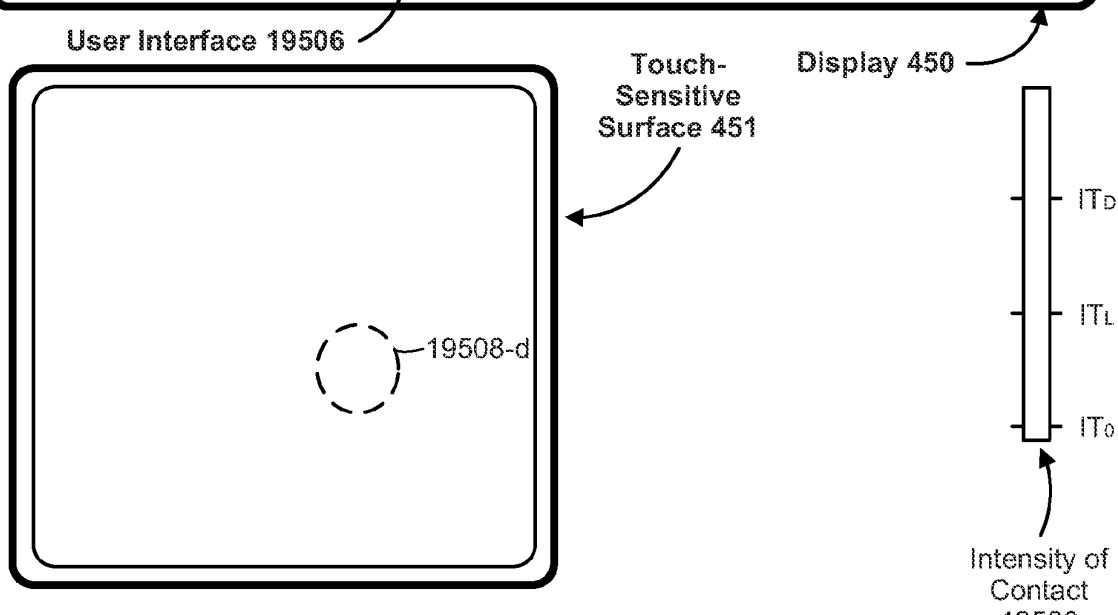
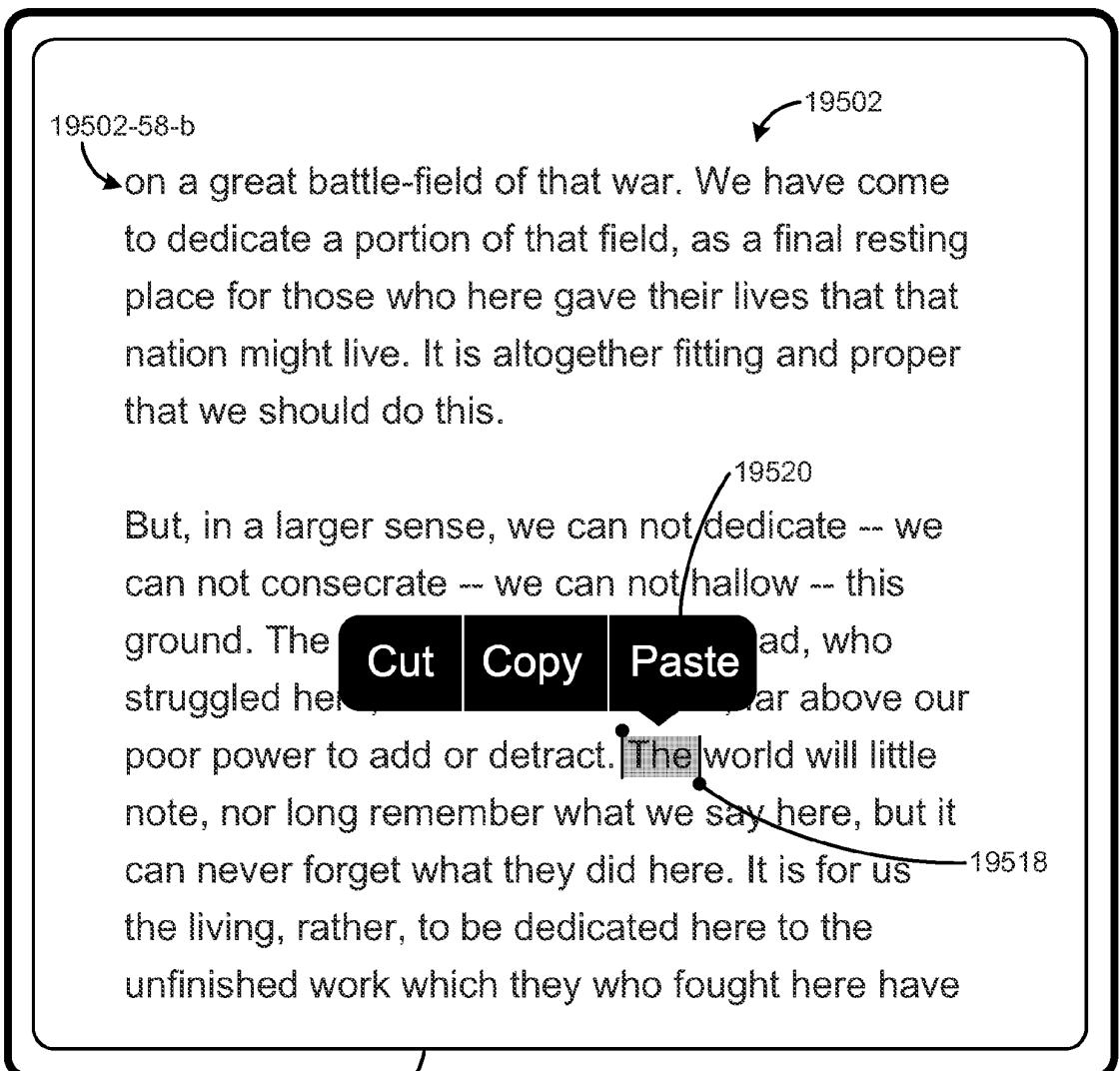


Figure 11X

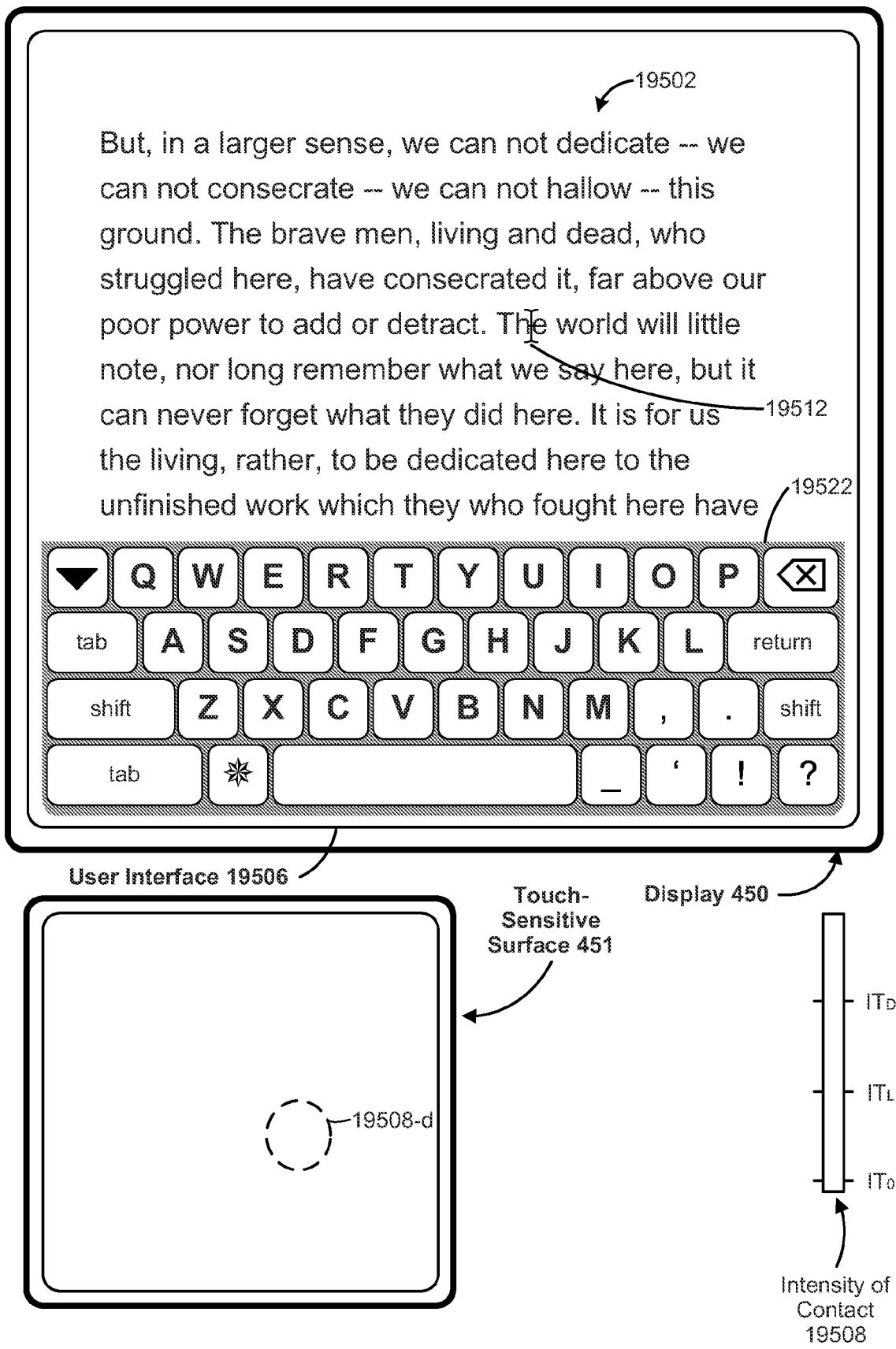


Figure 11Y

19600

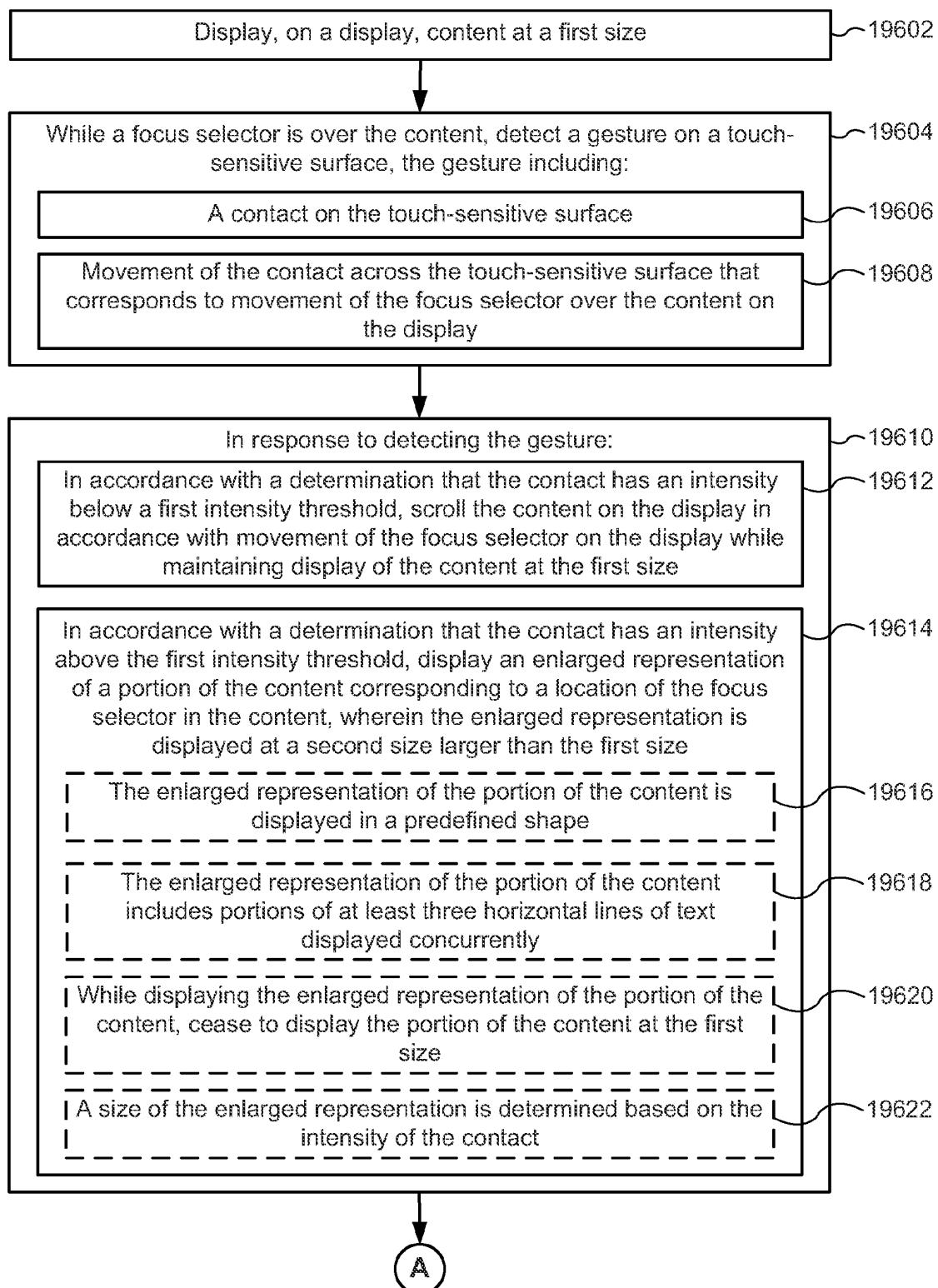


Figure 12A

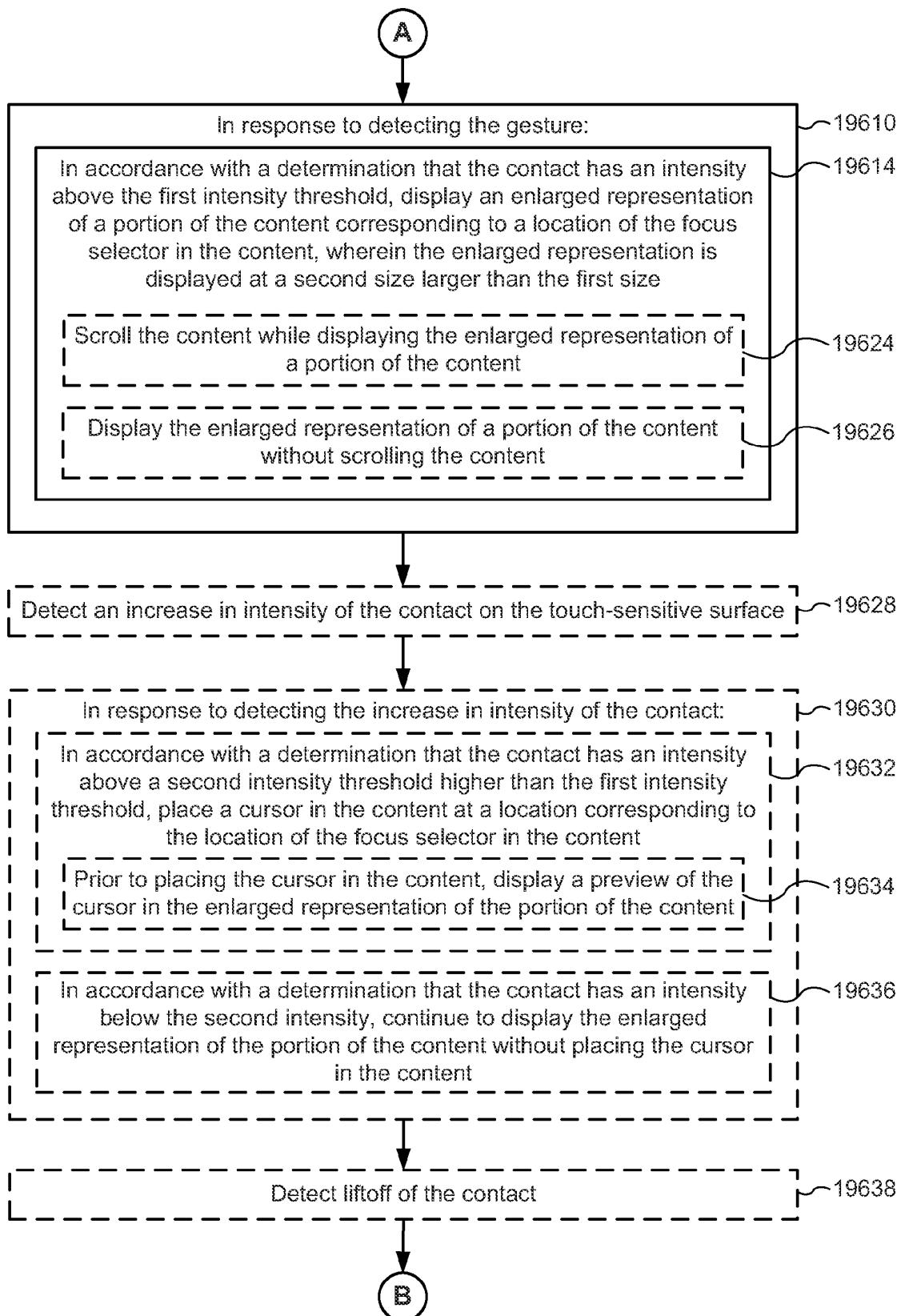


Figure 12B

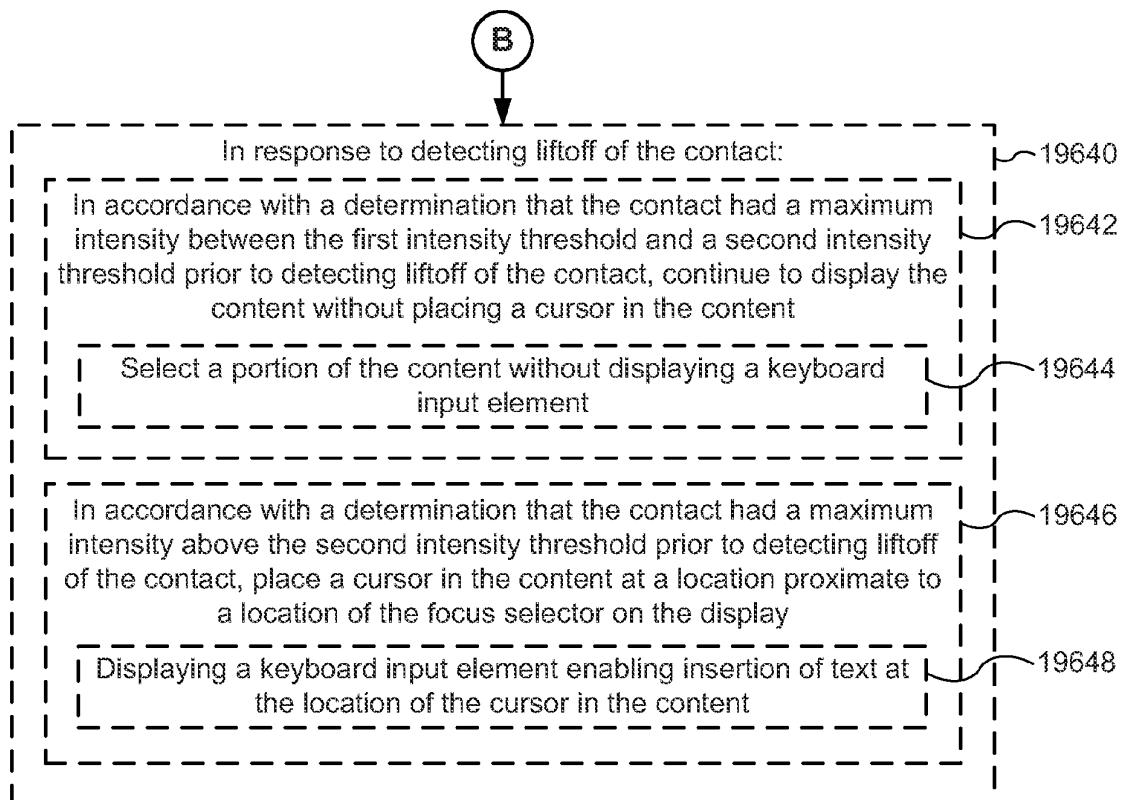


Figure 12C

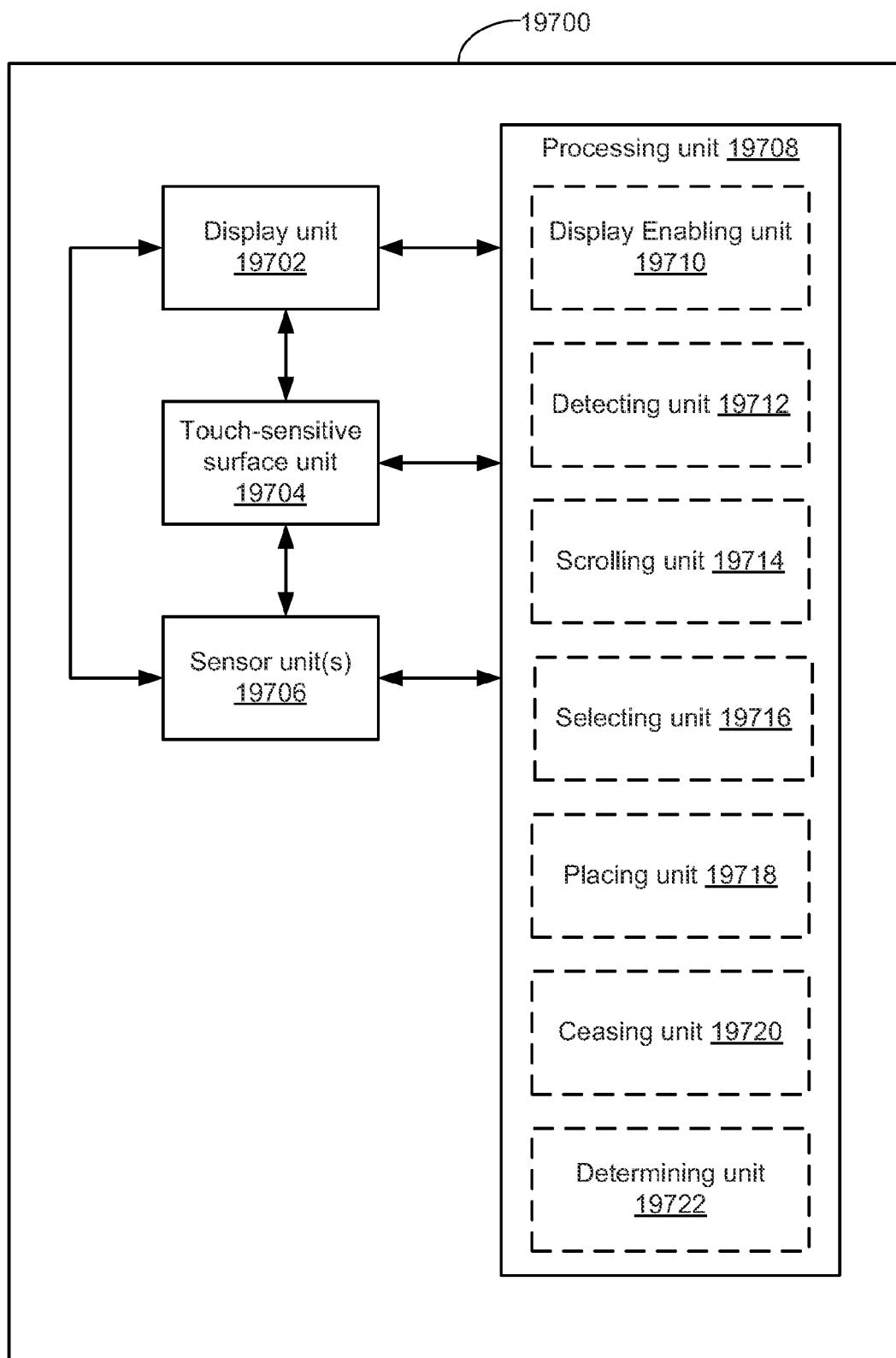


Figure 13

**REFERENCES CITED IN THE DESCRIPTION**

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