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(54) Title: DEVICE, METHOD, AND GRAPHICAL USER INTERFACE FOR FACILITATING USER INTERACTION WITH CONTROLS IN A USER INTERFACE

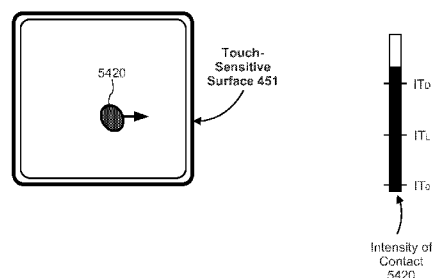
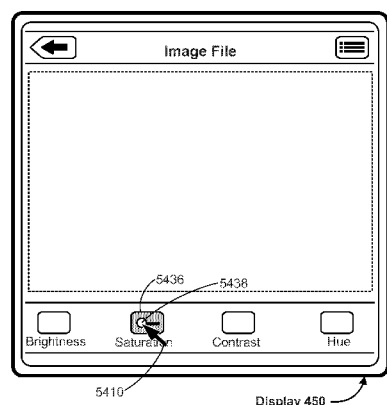


Figure 11M

(57) Abstract: An electronic device, with a touch-sensitive surface and a display, includes one or more sensors to detect intensity of contacts with the touch-sensitive surface. The device displays, on the display, a first control for controlling a first operation. The device detects, on the touch-sensitive surface, a first input that corresponds to the first control; and in response to detecting the first input: in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, the device performs the first operation; and in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, the device displays a second control for performing a second operation associated with the first operation.

Device, Method, and Graphical User Interface for Facilitating User Interaction with Controls in a User Interface

RELATED APPLICATIONS

[0001] This application claims priority to 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 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;” and U.S. Provisional Patent Application No. 61/688,227, filed May 9, 2012, entitled “Device, Method, and Graphical User Interface for Manipulating User Interface Objects with Visual and/or Haptic Feedback,” which applications are incorporated by reference herein in their entirety.

[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. 61/778,239, 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;” 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;” 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,” which are incorporated herein by reference in their entirety.

[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,” which are incorporated herein by reference in their entirety.

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.

SUMMARY

[0008] 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.

[0009] 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”). In some embodiments, 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. In some embodiments, 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.

[0010] There is a need for electronic devices with faster, more efficient methods and interfaces for accessing toolbar controls. Such methods and interfaces may complement or replace conventional methods for accessing toolbar controls. 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.

[0011] In accordance with some embodiments, a method is performed at an electronic device with a display, a touch-sensitive surface, and one or more sensors to detect intensity of contacts with the touch-sensitive surface. The method includes: displaying, on the display, an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window; detecting a press input on the touch-sensitive surface while a focus selector is on the toolbar on the display; and in response to detecting the press input, in accordance with a determination that the press

input includes a contact with an intensity above a respective intensity threshold: ceasing to display one or more of the first plurality of controls; and displaying a second plurality of controls for adjusting properties of the electronic document, where the second plurality of controls includes one or more controls not included in the first plurality of controls.

[0012] In accordance with some embodiments, an electronic device includes a display unit configured to display an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window, a touch-sensitive surface unit configured to receive press inputs, one or more sensors 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: detect a press input on the touch-sensitive surface unit while a focus selector is on the toolbar on the display unit; and in response to detecting the press input, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold: cease to display one or more of the first plurality of controls, and enable display of a second plurality of controls for adjusting properties of the electronic document, where the second plurality of controls includes one or more controls not included in the first plurality of controls.

[0013] 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 accessing toolbar controls, thereby increasing the effectiveness, efficiency, and user satisfaction with such devices. Such methods and interfaces may complement or replace conventional methods for accessing toolbar controls.

[0014] There is a need for electronic devices with faster, more efficient methods and interfaces for displaying hidden text in a user interface. Such methods and interfaces may complement or replace conventional methods for displaying hidden text in a user interface. 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.

[0015] In accordance with some embodiments, a method is performed at an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface. The method includes: displaying a text box

including text, where the text includes more text than can be displayed in the text box; and while the focus selector is over the text box, detecting a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold. The method further includes, in response to detecting the first press input, displaying a previously undisplayed portion of the text.

[0016] In accordance with some embodiments, an electronic device includes an electronic device, comprising: a display unit configured to display a text box where the text includes more text than can be displayed in the text box; a touch-sensitive surface unit configured to receive a first press input corresponding to a contact on the touch-sensitive surface unit; one or more sensor units 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 one or more sensor units. The processing unit is configured to, while the focus selector is over the text box, detect a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold. The processing unit is further configured to, in response to detecting the first press input, display a previously undisplayed portion of the text.

[0017] 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 displaying hidden text using a gesture (e.g., a press input) on a touch-sensitive surface, thereby increasing the effectiveness, efficiency, and user satisfaction with such devices. Such methods and interfaces may complement or replace conventional methods for displaying hidden text using a gesture (e.g., a press input) on a touch-sensitive surface.

[0018] There is a need for electronic devices with faster, more efficient methods and interfaces for facilitating users to interact with controls in a user interface such that a display (for user-selection) of one of two controls—associated with one of two different but related operations—is enabled. Such methods and interfaces may complement or replace conventional methods for interacting with controls in a user interface. 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.

[0019] In accordance with some embodiments, a method is performed at an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface. The method includes displaying, on the display, a first control for controlling a first operation. The method further includes detecting, on the touch-sensitive surface, a first input that corresponds to the first control; and in response to detecting the first input: in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, performing the first operation; and in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, displaying a second control for performing a second operation associated with the first operation.

[0020] In accordance with some embodiments, an electronic device includes a display unit configured display a first control for controlling a first operation, a touch-sensitive surface unit configured to receive a contact on the touch-sensitive surface unit, one or more sensor units 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 one or more sensor units. The processing unit is configured to: detect, on the touch-sensitive surface unit, a first input that corresponds to the first control; and in response to detecting the first input: in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, perform the first operation; and in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, enable display of a second control for performing a second operation associated with the first operation.

[0021] 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 interacting with controls in a user interface, thereby increasing the effectiveness, efficiency, and user satisfaction with such devices. Such methods and interfaces may complement or replace conventional methods for interacting with controls in a user interface.

[0022] There is a need for electronic devices with faster, more efficient methods and interfaces for allowing users to interact with application windows, and in particular, with border regions in application windows (e.g., for interacting with the “chrome” or predefined

border regions outside of, and surrounding, an active display region in application windows). Such methods and interfaces may complement or replace conventional methods for allowing users to interact with application windows. 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.

[0023] In accordance with some embodiments, a method is performed at an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface. The method includes displaying, on the display, an application window that includes content. The application window includes a plurality of visible controls, where the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and the application window includes a border region, where one or more portions of the border region do not include any visible controls. The method further includes detecting a first gesture on the touch-sensitive surface while a focus selector is on a respective portion of the border region that does not include any visible controls, where the first gesture includes a respective contact with an intensity above the control-activation intensity threshold. The method also includes in response to detecting the first gesture: in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, performing a respective operation on the content; and in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgoing performing the respective operation on the content.

[0024] In accordance with some embodiments, an electronic device includes a display unit configured to display an application window that includes content; a touch-sensitive surface unit configured to receive a contact on the touch-sensitive surface unit; one or more sensor units 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 one or more sensor units. The processing unit is configured to: enable display of the application window where, the application window includes a plurality of visible controls, where the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity

threshold; and the application window includes a border region, where one or more portions of the border region do not include any visible controls. The processing unit is further configured to detect a first gesture on the touch-sensitive surface unit while a focus selector is on a respective portion of the border region that does not include any visible controls, where the first gesture includes a respective contact with an intensity above the control-activation intensity threshold. the processing unit is further configured to, in response to detecting the first gesture: in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, perform a respective operation on the content; and in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgo performing the respective operation on the content.

[0025] 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 allowing users to interact with application windows, and in particular, with border regions in application windows , thereby increasing the effectiveness, efficiency, and user satisfaction with such devices. Such methods and interfaces may complement or replace conventional methods for allowing users to interact with application windows.

[0026] There is a need for electronic devices with faster, more efficient methods and interfaces for capturing media. Such methods and interfaces may complement or replace conventional methods for capturing media. 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.

[0027] In accordance with some embodiments, a method is performed at an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface. The method includes: displaying, on the display, a camera preview in a camera application; while displaying the camera preview on the display, detecting a contact on the touch-sensitive surface, wherein the contact corresponds to a focus selector at a respective location in the camera preview; in response to detecting the contact on the touch-sensitive surface, setting the respective location in the camera preview as an autofocus reference point; and after setting the respective location in the camera preview as

the autofocus reference point: continuing to detect the contact on the touch-sensitive surface, detecting a first press input that includes an increase in intensity of the contact above a first intensity threshold, and in response to detecting the first press input, capturing media with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

[0028] In accordance with some embodiments, an electronic device includes a display unit configured to display, on the display unit, a camera preview in a camera application; a touch-sensitive surface unit configured to receive 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: while enabling display of the camera preview on the display unit, detect a contact on the touch-sensitive surface unit, where the contact corresponds to a focus selector at a respective location in the camera preview; in response to detecting the contact on the touch-sensitive surface unit, set the respective location in the camera preview as an autofocus reference point; and after setting the respective location in the camera preview as the autofocus reference point: continue to detect the contact on the touch-sensitive surface unit, detect a first press input that includes an increase in intensity of the contact above a first intensity threshold, and in response to detecting the first press input, capture media with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

[0029] 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 capturing media, thereby increasing the effectiveness, efficiency, and user satisfaction with such devices. Such methods and interfaces may complement or replace conventional methods for capturing media.

[0030] In accordance with some embodiments, an electronic device includes a display, a touch-sensitive surface, optionally one or more sensors to detect intensity of contacts with the touch-sensitive surface, one or more processors, memory, and one or more programs; the one or more programs are stored in the memory and configured to be executed by the one or more processors and the one or more programs include instructions for performing the operations of any of the methods referred to in paragraph [0057]. In accordance with some embodiments, a graphical user interface on an electronic device with a display, a touch-sensitive surface, optionally one or more sensors to detect intensity of

contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory includes one or more of the elements displayed in any of the methods referred to in paragraph [0057], which are updated in response to inputs, as described in any of the methods referred to in paragraph [0057]. In accordance with some embodiments, a computer readable storage medium has stored therein instructions which when executed by an electronic device with a display, a touch-sensitive surface, and optionally one or more sensors to detect intensity of contacts with the touch-sensitive surface, cause the device to perform the operations of any of the methods referred to in paragraph [0057]. In accordance with some embodiments, an electronic device includes: a display, a touch-sensitive surface, and optionally one or more sensors to detect intensity of contacts with the touch-sensitive surface; and means for performing the operations of any of the methods referred to in paragraph [0057]. In accordance with some embodiments, an information processing apparatus, for use in an electronic device with a display and a touch-sensitive surface, optionally one or more sensors to detect intensity of contacts with the touch-sensitive surface, includes means for performing the operations of any of the methods referred to in paragraph [0057].

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] 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.

[0032] Figure 1A is a block diagram illustrating a portable multifunction device with a touch-sensitive display in accordance with some embodiments.

[0033] Figure 1B is a block diagram illustrating exemplary components for event handling in accordance with some embodiments.

[0034] Figure 2 illustrates a portable multifunction device having a touch screen in accordance with some embodiments.

[0035] Figure 3 is a block diagram of an exemplary multifunction device with a display and a touch-sensitive surface in accordance with some embodiments.

[0036] Figure 4A illustrates an exemplary user interface for a menu of applications on a portable multifunction device in accordance with some embodiments.

[0037] 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.

[0038] Figures 5A-5J illustrate exemplary user interfaces for accessing toolbar controls in accordance with some embodiments.

[0039] Figures 6A-6B are flow diagrams illustrating a method of accessing toolbar controls in accordance with some embodiments.

[0040] Figure 7 is a functional block diagram of an electronic device in accordance with some embodiments.

[0041] Figures 8A-8D illustrate exemplary user interfaces for displaying hidden text using a gesture (e.g., a press input) on a touch-sensitive surface in accordance with some embodiments.

[0042] Figure 9 is a flow diagram illustrating a method of displaying hidden text using a gesture (e.g., a press input) on a touch-sensitive surface in accordance with some embodiments.

[0043] Figure 10 is a functional block diagram of an electronic device in accordance with some embodiments.

[0044] Figures 11A-11M illustrate exemplary user interfaces for facilitating user interaction with controls in a user interface in accordance with some embodiments.

[0045] Figures 12A-12C are flow diagrams illustrating a method of facilitating user interaction with controls in a user interface in accordance with some embodiments.

[0046] Figure 13 is a functional block diagram of an electronic device in accordance with some embodiments.

[0047] Figures 14A-14Q illustrate exemplary user interfaces for allowing users to interact with application windows, and in particular, with border regions in application windows in accordance with some embodiments.

[0048] Figures 15A-15B are flow diagrams illustrating a method of for allowing users to interact with application windows, and in particular, with border regions in application windows in accordance with some embodiments.

[0049] Figure 16 is a functional block diagram of an electronic device in accordance with some embodiments.

[0050] Figures 17A-17N illustrate exemplary user interfaces for capturing media in accordance with some embodiments.

[0051] Figures 18A-18C are flow diagrams illustrating a method of capturing media in accordance with some embodiments.

[0052] Figure 19 is a functional block diagram of an electronic device in accordance with some embodiments.

DESCRIPTION OF EMBODIMENTS

[0053] 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.

[0054] 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.

[0055] 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.

[0056] 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."

[0057] 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, methods and user interfaces for including illustrative examples of some of these approaches are described below, as follows:

- Many applications on electronic devices include toolbars for activating various operations or adjusting one or more properties of a document or object. Sometimes an application has more available buttons and controls than can fit into a toolbar given the available display space. Hidden buttons or controls are sometimes accessed by performing a multi-step process to reconfigure the toolbar or by accessing the corresponding functionality from a menu, which can be disruptive and distracting to a user. The embodiments described below provide a convenient and intuitive method for accessing toolbar controls in accordance with an intensity of a contact on a touch-sensitive surface. In particular, Figures 5A-5J illustrate exemplary user interfaces for accessing toolbar controls. Figures 6A-6B are flow diagrams illustrating a method of accessing toolbar controls. The user interfaces in Figures 5A-5J are used to illustrate the processes in Figures 6A-6B.
- Many electronic devices use graphical user interfaces to display information in text boxes. In some circumstances, the layout of the graphical user interface places limits on the size of the text boxes such that long text entries are truncated within the display. Hidden text is sometimes displayed in response to a "mouse over" (e.g., moving a cursor over the textbox) and sometimes requires hovering over the text box, which can be confusing and/or time consuming for a user. The embodiments described below provide a convenient and intuitive method for displaying hidden text in accordance with an intensity of a contact on a touch-sensitive surface. In particular, Figures 8A-8D illustrate exemplary user interfaces for displaying hidden text using a gesture (e.g., a press input) on a touch-sensitive surface. Figure 9 is a flow diagram illustrating a method of displaying hidden text using a gesture (e.g., a press input) on a touch-sensitive surface. The user interfaces in Figures 8A-8D are used to illustrate the processes in Figure 9.

- Many electronic devices have graphical user interfaces include controls (e.g., affordances such as buttons or sliders) which, upon user-activation, are configured to perform specific predefined functions or operations. Sometimes, two controls offer related functionality (e.g., a play button and a fast-forward button on a media player). Sometimes, devices display these buttons in a spatially separated manner on the user interface, which places an added cognitive burden on a user and requires valuable display space. The disclosed embodiments provide the user a capability to activate one of two different operations associated with one of two controls based on a pressure or intensity of a contact on a touch-sensitive surface. In particular, Figures 11A-11M illustrate exemplary user interfaces for interacting with controls in a user interface. Figures 12A-12C are flow diagrams illustrating a method of interacting with controls in a user interface. The user interfaces in Figures 11A-11M are used to illustrate the processes in Figures 12A-12C.
- Many electronic devices have graphical user interfaces with application windows that include border regions, which are not commonly associated with particular functions. It would be beneficial to provide the user an ability to interact with the large border regions of such application windows, by associating such border regions with one or more operations that can be performed upon user-activation of the border regions. The embodiments described below provide a convenient and intuitive method for interacting with application windows in accordance with an intensity of a contact on a touch-sensitive surface. In particular, Figures 14A-14Q illustrate exemplary user interfaces for allowing users to interact with application windows, and in particular, with border regions in application windows. Figures 15A-15B are flow diagrams illustrating a method of allowing users to interact with application windows, and in particular, with border regions in application windows. The user interfaces in Figures 14A-14Q are used to illustrate the processes in Figures 15A-15B.
- Many electronic devices include cameras for capturing media (e.g., photos, video). Many of electronic devices include autofocus capability and also provide a user with a preview image prior to, for example, setting an autofocus reference point and capturing a photo in response to multiple separate inputs, which can be inefficient and time consuming for a user. When the user has particular subject matter of interest within the preview image, it would be beneficial to provide the user with a convenient way to choose a focal point corresponding to that subject matter within the preview

image. The embodiments described provide a convenient and intuitive method for setting an autofocus reference point and capturing media in accordance with an intensity of a contact. In particular, Figures 17A-17N illustrate exemplary user interfaces for capturing media. Figures 18A-18C are flow diagrams illustrating a method of capturing media. The user interfaces in Figures 17A-17N are used to illustrate the processes in Figures 18A-18C.

EXEMPLARY DEVICES

[0058] 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.

[0059] 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.

[0060] 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, integers, steps, operations, elements, components, and/or groups thereof.

[0061] 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.

[0062] 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).

[0063] 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.

[0064] 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.

[0065] 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.

[0066] 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.

[0067] 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).

[0068] 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.

[0069] 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.

[0070] 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.

[0071] 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.

[0072] 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.

[0073] 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.

[0074] 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).

[0075] 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).

[0076] 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.

[0077] 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.

[0078] 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.

[0079] 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.

[0080] 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.

[0081] 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.

[0082] 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.

[0083] 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.

[0084] 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).

[0085] 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.

[0086] 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.

[0087] 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.

[0088] 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.

[0089] 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.

[0090] 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 module 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.

[0091] 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 predefined 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).

[0092] 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.

[0093] 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.

[0094] 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 along with, if necessary, coordinate data and other graphic property data, and then generates screen image data to output to display controller 156.

[0095] Haptic feedback module 133 includes various 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.

[0096] Text input module 134, which is, optionally, a 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).

[0097] GPS module 135 determines the location of the 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).

[0098] Applications 136 optionally include the following modules (or sets of instructions), or a subset or superset thereof:

- contacts module 137 (sometimes called an address book or contact list);
- telephone module 138;

- video conferencing module 139;
- e-mail client module 140;
- instant messaging (IM) module 141;
- workout support module 142;
- camera module 143 for still and/or video images;
- image management module 144;
- 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.

[0099] 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.

[00100] 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.

[00101] 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.

[00102] 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.

[00103] 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.

[00104] 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).

[00105] 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.

[00106] 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.

[00107] 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 instructions 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.

[00108] 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.

[00109] 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.

[00110] 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).

[00111] 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).

[00112] 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.

[00113] 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.).

[00114] 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.

[00115] 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.

[00116] 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.

[00117] 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.

[00118] 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.

[00119] The predefined set of functions that are performed exclusively through a touch screen and/or a touchpad optionally include navigation between user interfaces. 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.

[00120] 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).

[00121] 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.

[00122] 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.

[00123] 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.

[00124] In some embodiments, event monitor 171 sends requests to the peripherals interface 118 at predetermined 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).

[00125] In some embodiments, event sorter 170 also includes a hit view determination module 172 and/or an active event recognizer determination module 173.

[00126] 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.

[00127] 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.

[00128] 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.

[00129] 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.

[00130] 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 receiver module 182.

[00131] 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.

[00132] 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.

[00133] 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).

[00134] 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.

[00135] 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.

[00136] 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.

[00137] 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.

[00138] 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.

[00139] 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.

[00140] 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.

[00141] 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.

[00142] 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.

[00143] 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.

[00144] 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.

[00145] 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.

[00146] 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.

[00147] 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.

[00148] 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.

[00149] 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.

[00150] Attention is now directed towards embodiments of user interfaces ("UI") that is, optionally, implemented on portable multifunction device 100.

[00151] Figure 4A illustrates an exemplary user interface 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.

[00152] 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.

[00153] 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.

[00154] 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.

[00155] 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.

[00156] 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).

[00157] 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.

[00158] 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.

[00159] 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 response 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).

[00160] 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).

[00161] 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

Accessing Toolbar Controls

[00162] Many applications on electronic devices include toolbars for activating various operations or adjusting one or more properties of a document or object. A toolbar can have one or more buttons or controls for activating operations, adjusting properties, etc. An application can have more available buttons and controls than can fit onto a toolbar given the available display space. In some methods, the display space issue can be resolved by hiding some buttons and controls. The hidden buttons or controls are accessed by performing a multi-step process to reconfigure the toolbar or by accessing the corresponding functionality from a menu, which can be disruptive and distracting from the task at hand. The embodiments described below improve on these methods. When a user makes a press input with sufficient intensity while a cursor is located over a toolbar of controls, one or more of the controls in the toolbar are replaced with other controls, which are, optionally, related to the replaced control(s). This provides a less disruptive and more efficient way to access toolbar buttons and controls.

[00163] Figures 5A-5J illustrate exemplary user interfaces for accessing toolbar controls in accordance with some embodiments. The user interfaces in these figures are used to illustrate the processes described below, including the processes in Figures 6A-6B. Figures 5A-5J 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 deep press intensity threshold (e.g., “IT_D”) and a light press intensity threshold (e.g., “IT_L”). In some embodiments, operations similar to those described below with reference to “IT_D” are performed with reference to a different intensity threshold (e.g., “IT_L”).

[00164] 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 5A-5J and Figures 6A-6B 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-5J on the touch-sensitive display system 112 while displaying the user interfaces shown in Figures 5A-5J 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 cursor 4514.

[00165] Figure 5A illustrates application window 4502 displayed on display 450. Application window 4502 is a window associated with an application, such as a web browser, a word processing application, or an electronic document application. Document 4504 is displayed in window 4502. Document 4504 is, optionally, a word processing document, a text document, a web page, a spreadsheet, a drawing, an image, a Portable Document Format (PDF) document, etc.

[00166] Window 4502 includes toolbar 4506-1. Toolbar 4506-1 includes one or more controls (e.g., buttons, pull-down menus, etc.) for adjusting one or more properties of a document (e.g., document 4504) displayed in window 4502. For example, toolbar 4506-1 includes font selection control 4508 (e.g., for selecting a font for text in the document), change tracking control 4510 (e.g., for turning change tracking on or off in the document), and text alignment (also called “paragraph alignment”) control 4512 (e.g., for changing an alignment of text in the document). A focus selector (e.g., cursor 4514) is also displayed on display 450. In some embodiments, cursor 4514 is a pointer (e.g., a mouse pointer). In Figure 5A, cursor 4514 is located over text alignment control 4512 in toolbar 4506-1.

[00167] The device detects a press input that includes an increase in intensity of contact 4516 from an intensity below a light press intensity threshold (e.g., “IT_L”) in Figure 5A to an intensity above a deep press intensity threshold (e.g., “IT_D”) in Figure 5B on touch-sensitive surface 451. In some embodiments, the press input includes and, optionally, a subsequent decrease in intensity of contact 4516 below IT_D or a hysteresis threshold associated with IT_D. In response to detection of the press input that includes contact 4516, one or more of the controls in toolbar 4506-1 cease to be displayed, and those controls are

replaced by another set of controls for adjusting one or more properties of document 4504. For example, in Figure 5B, in response to detection of the press input that includes contact 4516, toolbar 4506-1 is rotating or flipping off display 450 about axis 4517 parallel to display 450 and running along the length of toolbar 4506-1. In Figure 5C, toolbar 4506-1 has rotated off display 451 and toolbar 4506-2 is rotating onto display 450 about axis 4517; the controls in toolbar 4506-2 replace the controls in toolbar 4506-1. In some embodiments, toolbar 4506-1 rotating off display 451 and toolbar 4506-2 rotating onto display 450 are displayed in one animation; the animation shows toolbar 4506-1 flipping into toolbar 4506-2 as if toolbar 4506-1 and toolbar 4506-2 are opposite sides of the same toolbar.

[00168] Figure 5D shows toolbar 4506-2 displayed on display 450 after its rotation onto display 450. Toolbar 4506-2 includes one or more controls that were not included in toolbar 4506-1. For example, toolbar 4506-2 includes “align text left” control 4518, “align text center” control 4520, “align text right” control 4522, “justify text” control 4524, paragraph spacing control 4526, and paragraph indentation control 4528. In some embodiments, controls 4518, 4520, 4522, 4524, 4526, and 4528 are selected for inclusion in toolbar 4506-2 because they are related to text alignment control 4512, over which cursor 4514 is located when the press input was detected; control 4512 and controls 4518, 4520, 4522, 4524, 4526, and 4528 are related to paragraph formatting, such as text alignment and text spacing.

[00169] In some embodiments, the controls in toolbar 4506-2 include one or more controls that are used less frequently than the controls in toolbar 4506-1. For example, the specific text alignment controls 4518, 4520, 4522, and 4524, paragraph spacing control 4526, and paragraph indentation control 4528 in toolbar 4506-2 are used less frequently than at least one of font selection control 4508, change tracking control 4510, and text alignment control 4512 in toolbar 4506-1 shown in Figure 5A.

[00170] In some embodiments, toolbar 4506-2 is replaced with toolbar 4506-1 (e.g., reversal of the replacement described above) in response to detection of a press input that has a contact with an intensity above the deep press intensity threshold (e.g. “IT_D”) while cursor 4514 is located over toolbar 4506-2.

[00171] Figure 5E illustrates toolbar 4506-1 and document 4504 displayed in window 4502. Cursor 4514 is located over text alignment control 4512 in toolbar 4506-1. While cursor 4514 is located over text alignment control 4512 in toolbar 4506-1, the device detects

a press input that includes an increase in intensity of contact 4530 from an intensity below the light press intensity threshold (e.g., “IT_L”) in Figure 5E to an intensity above the light press intensity threshold (e.g., “IT_L”) in Figure 5F on touch-sensitive surface 451. In some embodiments, the press input includes and, optionally, a subsequent decrease in intensity of contact 4530 below IT_L or a hysteresis threshold associated with IT_L. Contact 4530 meets one or more control-activation criteria and has a maximum intensity that is below the respective intensity threshold (e.g., IT_D). In some embodiments, the one or more control-activation criteria include that the contact has an intensity that is above a minimum threshold for activating a control (e.g., IT_L). As shown in Figure 5F, contact 4530 has a maximum intensity between threshold IT_L and IT_D. In response to detection of the press input that includes contact 4530, text alignment control 4512 is activated. In response to activation of text alignment control 4512, the text in document 4504 is changed from a left alignment (Figure 5E) to a center alignment, as shown in Figure 5F. In some embodiments, additional press inputs similar to the press input that includes contact 4530 shown in Figures 5E-5F while cursor 4514 is located over text alignment control 4512 further activates text alignment control 4512 to change the text alignment in document 4504 to other alignments (e.g., right alignment, justified text). Thus, in some embodiments, activating text alignment control 4512 multiple times cycles through text alignment options for the text in document 4504.

[00172] The other controls in toolbar 4506-1 and 4506-2 (e.g., controls 4508, 4510, 4518, 4520, etc.), described with reference to Figures 5A-5J, can be activated in a similar manner as described above with respect to control 4512. For example, while cursor 4514 is located over a respective control, a user performs a press input on touch-sensitive surface 451, where the press input includes an increase in intensity of a contact that meets the one or more control-activation criteria and has a maximum intensity that is below the respective intensity threshold (e.g., press input includes an increase in intensity of a contact from an intensity below IT_L to an intensity between IT_L and IT_D). The respective control is activated in response to detection of the press input. Additionally, in some embodiments, respective controls in toolbars 4506-1 and 4506-2 are configured to be activated in response to detecting a tap input while a focus selector corresponding to the tap input is over a respective control.

[00173] Figure 5G illustrates toolbar 4506-1 and document 4504 displayed in window 4502. Cursor 4514 is moved over change tracking control 4510 in toolbar 4506-1 in response to detecting movement 4533 of contact 4532 across the touch-sensitive surface 451 as shown

in Figure 5G. While cursor 4514 is located over change tracking control 4510 in toolbar 4506-1, the device detects a press input that includes an increase in intensity of contact 4532 from an intensity below a light press intensity threshold (e.g., “IT_L”) in Figure 5G to an intensity above a deep press intensity threshold (e.g., “IT_D”) in Figure 5H on touch-sensitive surface 451. In some embodiments, the press input includes and, optionally, a subsequent decrease in intensity of contact 4532 below IT_D or a hysteresis threshold associated with IT_D. In response to detection of the press input that includes contact 4532, change tracking control 4510 in toolbar 4506-1 is replaced with controls 4534, 4536, 4538, and 4540 related to change tracking to create toolbar 4506-3. The controls replacing change tracking control 4510 include previous change control 4534, next change control 4536, accept change control 4538, and reject change control 4540. These controls are used to jump to a location of a previous change (e.g., control 4534) or next change (e.g., control 4536) in document 4504, or to accept a change (e.g., control 4538) or reject a change (e.g., control 4540) in document 4504.

[00174] In some embodiments, controls 4534, 4536, 4538, and 4540 are selected for inclusion in toolbar 4506-3 because they are related to change tracking control 4510, over which cursor 4514 is located when the press input was detected; control 4510 and controls 4534, 4536, 4538, and 4540 are related to the tracking of changes to a document. In some embodiments, controls 4534, 4536, 4538, and 4540 are replaced with change tracking control 4510 (e.g., reversal of the replacement described above) in response to detection of a press input that has a contact with an intensity above the deep press intensity threshold (e.g., “IT_D”) while cursor 4514 is located over any of controls 4534, 4536, 4538, or 4540.

[00175] Figure 5I illustrates toolbar 4506-1 and document 4504 displayed in window 4502. Toolbar 4506-1 in Figure 5I includes change tracking control 4510. Cursor 4514 is located over change tracking control 4510 in toolbar 4506-1. While cursor 4514 is located over change tracking control 4510 in toolbar 4506-1, the device detects a press input that includes an increase in intensity of contact 4542 from an intensity below the light press intensity threshold (e.g., “IT_L”) in Figure 5I to an intensity above the light press intensity threshold (e.g., “IT_L”) in Figure 5J on touch-sensitive surface 451. In some embodiments, the press input includes and, optionally, a subsequent decrease in intensity of contact 4542 below IT_L or a hysteresis threshold associated with IT_L. Contact 4542 meets the control-activation criteria and has a maximum intensity that is below the respective intensity threshold (e.g., the maximum intensity of contact 4542 is between threshold IT_L and IT_D). In response to

detection of the press input that includes contact 4542, change tracking control 4510 is activated, as shown in Figure 5J. In response to the activation of change tracking control 4510, change tracking is activated for document 4504, and new changes to document 4504 (e.g., new text, deletion of text, formatting changes, etc.) are tracked and, optionally, visually emphasized (e.g., underlined, struck through, different font color, etc.).

[00176] Figures 6A-6B are flow diagrams illustrating a method 4600 of accessing toolbar controls in accordance with some embodiments. The method 4600 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 4600 are, optionally, combined and/or the order of some operations is, optionally, changed.

[00177] As described below, the method 4600 provides an intuitive way to access toolbar controls. The method reduces the cognitive burden on a user when accessing toolbar controls, thereby creating a more efficient human-machine interface. For battery-operated electronic devices, enabling a user to access toolbar controls faster and more efficiently conserves power and increases the time between battery charges.

[00178] The device displays (4602), on the display, an application window and a toolbar that includes a first plurality of controls for adjusting properties (e.g., text properties such as font, font size, color, style; image properties such as brightness, contrast, saturation; and/or shape properties such as opacity, text wrapping, border thickness) of an electronic document (e.g., a webpage, word processing document, presentation document, spreadsheet document, PDF, or image) displayed in the application window. Figure 5A, for example, shows window 4502 displayed on display 450. Document 4504 and toolbar 4506-1 are included in windows 4502. Toolbar 4506-1 includes controls 4508, 4510, and 4512 for adjusting one or more properties of document 4504 (e.g., control 4508 for changing a font of document 4504).

[00179] The device detects (4604) a press input on the touch-sensitive surface while a focus selector is on the toolbar on the display. Figure 5A, for example, shows a press input that includes contact 4516 detected on touch-sensitive surface 451 while cursor 4514 is located over toolbar 4506-1. Figure 5E shows a press input that includes contact 4530 detected on touch-sensitive surface 451 while cursor 4514 is located over toolbar 4506-1.

Figure 5G shows a press input that includes contact 4532 detected on touch-sensitive surface 451 while cursor 4514 is located over toolbar 4506-1. Figure 5I shows a press input that includes contact 4542 detected on touch-sensitive surface 451 while cursor 4514 is located over toolbar 4506-1.

[00180] The device, in response (4606) to detecting the press input, in accordance with a determination that the press input includes (4607) a contact with an intensity above a respective intensity threshold (e.g., “IT_D”), ceases (4608) to display one or more of the first plurality of controls, and displays (4612) a second plurality of controls for adjusting properties of the electronic document, where the second plurality of controls includes one or more controls not included in the first plurality of controls. For example, in Figures 5A-5D, in response to detection of the press input that includes contact 4516, controls 4508, 4510, and 4512 cease to be displayed and controls 4518, 4520, 4522, and 4524 are displayed. Contact 4516 has an intensity that is above a respective intensity threshold (e.g., “IT_D”). As another example, in Figures 5G-5H, in response to detection of the press input that includes 4532, change tracking control 4510 ceases to be displayed, and controls 4534, 4536, 4538, and 4540 are displayed. Contact 4532 has an intensity that is above the respective intensity threshold (e.g., “IT_D”).

[00181] In some embodiments, ceasing to display the one or more of the first plurality of controls includes (4610) displaying an animation of the toolbar rotating around an axis parallel to the display, so that a side of the toolbar that includes the first plurality of controls is rotated off of the display and a side of the toolbar that includes the second plurality of controls is rotated onto the display. For example, in Figures 5A-5D, in response to detection of the press input that includes contact 4516, toolbar 4506-1, which includes controls 4508, 4510, and 4512, rotates around axis 4517 off display 450, and toolbar 4506-2, which includes controls 4518, 4520, 4522, and 4524, rotates onto display 450. In Figures 5B-5D, toolbar 4506-1 rotating off display 450 and toolbar 4506-2 rotating onto display 450 are displayed in one animation.

[00182] In some embodiments, the second plurality of controls replaces (4614) the first plurality of controls. For example, as shown in Figures 5A-5D, toolbar 4506-2 (and the controls therein) replaces toolbar 4506-1 (and the controls therein).

[00183] In some embodiments, the second plurality of controls includes (4616) controls that are used less frequently than the first plurality of controls (e.g., the first plurality

of controls includes controls that are used frequently, and the second plurality of controls are a second tier of controls for controlling functions that are usually hidden from the user because the user is less likely to need to access these controls). In some embodiments, the second plurality of controls are selected based on inputs from the user (e.g., controls that are less used based on historical usage patterns or controls actively hidden or moved from the first plurality of controls by the user). In some embodiments, the second plurality of controls are selected by an application developer based on typical usage patterns (e.g., detailed options for paragraph formatting such as paragraph indents and spacing are not used frequently and thus are generally hidden from view while a few frequently used options such as paragraph alignment are displayed in the first plurality of controls). For example, toolbar 4506-2 in Figure 5D includes “align text left” control 4518, “align text center” control 4520, “align text right” control 4522, “justify text” control 4524, paragraph spacing control 4526, and paragraph indentation control 4528, which are used less frequently than controls 4508, 4510, and 4512 in toolbar 4506-1.

[00184] In some embodiments, the second plurality of controls is selected (4618) based at least in part on a location of the focus selector on the toolbar when the press input is detected (e.g., in response to detecting a deep press on a particular button in a toolbar or a particular region of the toolbar, show a plurality of buttons related to the particular button). For example, if the press input is detected on a paragraph alignment button, the device would display additional options for paragraph spacing and indentation. For example, in Figure 5A, cursor 4514 is located over text alignment control 4512. In response to detection of the press input that includes 4516 shown in Figures 5A-5B, controls 4508, 4510, and 4512 are replaced with controls 4518, 4520, 4522, 4524, 4526, and 4528, which are related to text alignment control 4512, as shown in Figure 5D. On the other hand, in Figure 5G, cursor 4514 is located over change tracking control 4510. In response to detection of the press input that includes 4532 shown in Figures 5G-5H, change tracking control 4510 is replaced with controls 4534, 4536, 4538, and 4540, which are related to change tracking control 4510, as shown in Figure 5H.

[00185] In some embodiments, the press input is detected while a focus selector is on an icon associated with a respective operation (e.g., turning a “track changes” mode on/off), and the second plurality of controls are controls associated with operations that are related to the respective operation (e.g., options for reviewing an electronic document). In some of these embodiments, in response (4606) to detecting the press input, in accordance with a

determination that the press input meets control-activation criteria but does not include a contact with a maximum intensity above the respective intensity threshold (e.g., “IT_D”), the device performs (4620) the respective operation. For example, the respective operation is turning on a “track changes” mode, which is turned on if the press input meets the control-activation criteria (e.g., the press input includes an increase in intensity of a contact from an intensity below IT_L or a hysteresis intensity threshold associated with IT_L) to an intensity above IT_L) but does not include a contact with a maximum intensity above the respective intensity threshold (e.g., “IT_D”). In this example, if the press input includes a contact that has a maximum intensity above the respective intensity threshold (e.g., “IT_D”), the options for reviewing the electronic document would be displayed instead of, or in addition to, turning on the “track changes” mode. Other examples of icons corresponding to operations associated with the second plurality of controls include: a text formatting icon associated with a set of text formatting controls; a paragraph formatting icon associated with a set of paragraph formatting controls; an image insertion icon associated with a plurality of image property controls; a table insertion icon associated with a plurality of table property controls; an equation insertion icon associated with a plurality of equation entry controls; and a chart insertion icon associated with a plurality of chart property controls.

[00186] For example, in Figures 5I-5J, in response to detection of the press input that includes contact 4542 which meets the control-activation criteria and has an intensity below the respective intensity threshold (e.g., “IT_D”) while cursor 4514 is located over change tracking control 4510, change tracking control 4510 is activated, activating change tracking in document 4504. In contrast, in Figures 5G-5H, in response to detection of the press input that includes contact 4532 which has an intensity above the respective intensity threshold (e.g., “IT_D”) while cursor 4514 is located over change tracking control 4510, change tracking control 4510 is replaced with controls 4534, 4536, 4538, and 4540, which are controls for reviewing changes (e.g., previous/next change, accept/reject change) in an electronic document. In some embodiments, a light press input (e.g., activating a control such as change tracking control 4510 as described with reference to Figures 5I-5J) and a deep press input (e.g., displaying controls associated with the a control such as additional change tracking controls 4534, 4536, 4538 and 4540 as described with reference to Figures 5G-5H) are detected sequentially, and the operations described with reference to Figures 5G-5H (e.g., turning on track changes mode) and the operations described with reference to Figures 5I-5J (e.g., displaying controls associated with the track changes mode) are performed sequentially.

For example, the user can perform a light press input while a focus selector is over change tracking control 4510 to turn change tracking on, and then perform a deep press input while a focus selector is over change tracking control 4510 to display additional change tracking controls 4534, 4536, 4538 and 4540 for use in the change tracking mode (e.g., while the device remains in change tracking mode).

[00187] It should be understood that the particular order in which the operations in Figures 6A-6B 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 [0057]) are also applicable in an analogous manner to method 4600 described above with respect to Figures 6A-6B. For example, the contacts, intensity thresholds, focus selectors, and animations described above with reference to method 4600 optionally have one or more of the characteristics of the contacts, intensity thresholds, focus selectors, and animations described herein with reference to other methods described herein (e.g., those listed in paragraph [0057]). For brevity, these details are not repeated here.

[00188] In accordance with some embodiments, Figure 7 shows a functional block diagram of an electronic device 4700 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 7 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.

[00189] As shown in Figure 7, an electronic device 4700 includes a display unit 4702 configured to display an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window, a touch-sensitive surface unit 4704 configured to receive press inputs, one or more sensors 4706 to detect intensity of contacts with the touch-sensitive surface unit 4704, and a processing unit 4708 coupled to the display unit 4702, the touch-sensitive surface unit 4704,

and the sensors 4706. In some embodiments, the processing unit 4708 includes a detecting unit 4710, a ceasing unit 4712, a display enabling unit 4714, and a performing unit 4716.

[00190] The processing unit 4708 is configured to: detect a press input on the touch-sensitive surface unit 4704 while a focus selector is on the toolbar on the display unit 4702 (e.g., with the detecting unit 4710); and in response to detecting the press input, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold (e.g., “IT_D”): cease to display one or more of the first plurality of controls (e.g., with the ceasing unit 4712), and enable display of a second plurality of controls for adjusting properties of the electronic document (e.g., with the display enabling unit 4714), wherein the second plurality of controls includes one or more controls not included in the first plurality of controls.

[00191] In some embodiments, the second plurality of controls replaces the first plurality of controls.

[00192] In some embodiments, the second plurality of controls includes controls that are used less frequently than the first plurality of controls.

[00193] In some embodiments, the second plurality of controls are selected based at least in part on a location of the focus selector on the toolbar when the press input is detected.

[00194] In some embodiments, ceasing to display the one or more of the first plurality of controls includes displaying an animation of the toolbar rotating around an axis parallel to the display unit 4702, so that a side of the toolbar that includes the first plurality of controls is rotated off of the display unit 4702 and a side of the toolbar that includes the second plurality of controls is rotated onto the display unit 4702.

[00195] In some embodiments, the press input is detected while a focus selector is on an icon associated with a respective operation, the second plurality of controls are controls associated with operations that are related to the respective operation, and the processing unit 4708 is configured to, in response to detecting the press input, in accordance with a determination that the press input meets control-activation criteria but does not include a contact with a maximum intensity above the respective intensity threshold (e.g., “IT_D”), perform the respective operation (e.g., with the performing unit 4716).

[00196] 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.

[00197] The operations described above with reference to Figures 6A-6B are, optionally, implemented by components depicted in Figures 1A-1B or Figure 7. For example, detection operation 4604, ceasing operation 4608, and displaying operation 4612 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 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.

Displaying Hidden Text Using a Deep Press

[00198] Many electronic devices use graphical user interfaces to display information and allow users to perform tasks. For example, a media player will display a list of content (e.g., songs, videos, and pictures) available to a user. In some examples, tasks associated with the content include playing a song or displaying a picture stored in a computer's memory. In some embodiments, information about the media is contained in fields and displayed in text boxes within the graphical user interface. For example, a song is associated with certain fields such as the name of the song, artist, album, the length of the song or its rating. Likewise, personal information managers provide user access to electronic documents, such as email, by displaying information about those documents (e.g., sender, subject line) in text fields. In some circumstances, the layout of the graphical user interface places limits on the size of the text boxes such that long text entries are truncated within the display. There is a need to provide a fast, efficient, and convenient way for users to view the entire contents of a text box.

[00199] Figures 8A-8D illustrate exemplary user interfaces for displaying hidden text using a gesture (e.g., a press input) on a touch-sensitive surface. The user interfaces in these figures are used to illustrate processes described below, including the processes described with reference to Figure 9. Figures 8B-8D 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 respective threshold (e.g., “IT_D”). In some embodiments, operations similar to those described below with reference to IT_D are performed with reference to a different intensity threshold (e.g., “IT_L”).

[00200] Figure 8A shows an example of a display 450 and a touch-sensitive surface 451 of an electronic device 300 (Figure 3). The touch-sensitive surface 451 includes a touch-sensitive surface with one or more contact intensity sensors 359 (Figure 3). Display 450 displays a graphical user interface 4802 containing one or more text boxes, an example of which is text box 4804. 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-8D and Figure 9 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-8D on the touch-sensitive display system 112 while displaying the user interfaces shown in Figures 8A-8D 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 cursor 4806.

[00201] In some circumstances, the amount of text exceeds what can be displayed in text box 4804. For example, the text box 4804 includes text (“Piano Sonata No. 14 in C Sharp Minor – II. Allegretto,” as shown in Figure 8B) that includes both displayed text (“Piano Sonata No. 14 in C S”) and hidden text (“harp Minor – II. Allegretto”), sometimes called “undisplayed text.” When the full text in a respective text box exceeds what can be displayed, the displayed text includes a truncated portion of the full text.

[00202] In some embodiments, as shown in Figure 8A, graphical user interface 4802 also includes a displayed representation of a focus selector 4806, responsive to gestures (e.g., press inputs) on touch-sensitive surface 451, for performing operations such as selecting a row or playing a song. In some instances, a displayed representation of the focus selector 4806 is a cursor with a position on the display 450 in accordance with inputs received by touch-sensitive surface 451. Alternatively, in some embodiments a representation of the focus selector is not displayed. For example, in embodiments using a touch-sensitive display system, the position of the focus selector corresponds to the location on the display of the contact. Further, the focus selector is herein defined to be “over” a user interface object (e.g., text box 4804) when the position of the focus selector corresponds to the location on the display of the user interface object.

[00203] In some embodiments, gestures (e.g., swiping with one finger or swiping with two fingers, pinching, or applying a press input) are associated with context dependent operations. For example, if a focus selector is over a folder in a graphical user interface for an operating system, tapping once on the touch-sensitive surface will often “open” the folder by displaying its contents. On the other hand, if a focus selector is over a text box containing a song title in a graphical user interface for a media player, tapping once on a touch-sensitive surface with an intensity above a lower intensity threshold (e.g., “IT_L”) will, in some embodiments, be interpreted as a command to play the song.

[00204] Also for convenience of explanation, reference numbers appended with hyphens and lower case letters (e.g., “4806-a”, Figure 8A) indicate similar elements at different positions.

[00205] Figure 8B illustrates an example of displaying a previously undisplayed portion of the text (hidden text) in response to a gesture on the touch-sensitive surface by expanding the text outside the boundary of the text box 4804 corresponding to the current position of the focus selector. In some embodiments, the deep press (e.g., a contact with an intensity above “IT_D”) is detected while the focus selector is over a text box containing more text than can be displayed. In response to the deep press, the graphical user interface displays the previously undisplayed portion of a textbox by expanding the boundary of the text box.

[00206] In some embodiments, the touch-sensitive surface is configured to detect the intensity of the contact associated with the press input, as illustrated by the intensity meter in Figures 8B-8D (e.g., a “deep press” input 4808 with an intensity above IT_D in Figure 8B with

a “soft-press” input 4810 with an intensity between IT_L and IT_D in Figure 8D). For example, in Figure 8B a press input 4808 is detected on the touch-sensitive surface corresponding to a contact on the touch-sensitive surface with an intensity above a predefined threshold (e.g., “ IT_D ”). For ease of explanation, such a press input is referred to as a “deep press,” or alternatively as a “press input with an intensity above a predefined threshold.” For ease of explanation, the intensity of a contact associated with a press input is sometimes referred to as “the intensity of a press input.”

[00207] Figure 8C illustrates an example of displaying hidden text in response to detecting a press input 4812 on the touch-sensitive surface by displaying different segments of the text within text box 4804 at different times (e.g., scrolling the text within the text box). In the example illustrated in Figure 8C, the text is scrolled to the left within the text box.

[00208] Figure 8D illustrates an exemplary user interface in accordance with some embodiments. In some embodiments, other gestures are detected on touch-sensitive surface 451. For example, a press input 4810 with an intensity below the aforementioned predefined activation threshold (e.g., a press input with a maximum intensity between IT_L and IT_D , sometimes referred to as a “light press” input or low intensity press input) is detected on the touch-sensitive surface 451. In some circumstances (e.g., when the focus selector is positioned over a respective text box, such as text box 4804 in Figure 8D), in response to detecting soft press 4810, a cut/copy/paste user interface is provided for interacting with content of the text box, which enables the user to cut or copy content of the text box and/or paste content into the text box in accordance with selection of the corresponding options in the cut/copy/paste user interface. In other circumstances (e.g., in a graphical user interface for a media player), in response to detecting a soft press, a song associated with the text box is played. In some circumstances, in response to detecting a soft press, a row of text boxes that includes the text box is selected.

[00209] Figure 9 is a flow diagram illustrating a method 4900 of displaying hidden text in a text box in accordance with some embodiments. The method 4900 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 4900 are, optionally combined and/or the order of some operations is, optionally changed.

[00210] As described below, the method 4900 provides an intuitive way to display hidden text in a text box. The method reduces the cognitive burden on a user when displaying hidden text in a text box, thereby creating a more efficient human-machine interface. For battery-operated electronic devices, enabling a user to display hidden text in a text box faster and more efficiently conserves power and increases the time between battery charges.

[00211] The device displays (4902) a text box that includes text. The text includes more text than can be displayed in the text box. In some embodiments, such as when the method is implemented in a media player or a device with a media player application, the text includes (4904) a song name in a play list. While the embodiments described below are illustrated with reference to an example of a song name in a playlist, the embodiments described below are, optionally, used in analogous way to display a previously undisplayed portion of text in any text box or text field that includes a previously undisplayed portion of text, such as, for example: a cell in a spreadsheet; a text box in a form; or a metadata field in an application (e.g., a song title, artist name, album name, song length, song rating, file name, file edit date, file path).

[00212] While a focus selector is over the text box, the device detects (4906) a first press input corresponding to a contact (e.g., a finger contact) on a touch-sensitive surface with an intensity above a predefined activation threshold (e.g., IT_D). In response to detecting the first press input, the device displays (4908) the previously undisplayed portion of the text (e.g., the hidden portion). In some embodiments, the previously undisplayed portion of the text is a portion of text that was not displayed in the text box immediately prior to detecting the first press input. Thus, in some situations, even when respective text was previously displayed at a point in time prior to detecting the first press input, if the respective text was not displayed just before the first press input was detected (e.g., the respective text was hidden when the first press input was detected), then the respective text was an “undisplayed portion of the text” at the point in time when the first press input was detected. Various optional ways to display the previously undisplayed portion of the text are described above, with reference to the graphical user interfaces shown in Figures 8B-8C.

[00213] In some embodiments, displaying the previously undisplayed portion of the text includes (4910) expanding the text outside of a boundary of the text box (e.g., as illustrated in Figure 8B). In some embodiments, displaying the previously undisplayed portion of the text includes (4912) scrolling the text within the text box (e.g., as illustrated in Figure 8C). In some embodiments, the text is scrolled in the text box at a speed determined

(4914) in accordance with the intensity of the press input. For example, the speed at which animation of scrolling of the text is determined based on a current intensity of the contact. In some embodiments, the text is scrolled (4916) in the text box at a fixed speed. For example, the speed is not based on a current intensity of the contact. In some embodiments, the text is scrolled (4918) in the text box in accordance with a change in intensity of the contact. For example, different scroll states of the text are mapped to predefined intensity ranges, so that the beginning of the text is displayed when the intensity of the contact is at or below a first/minimum intensity threshold and the end of the text is displayed when the intensity of the contact is at or above a second/maximum intensity threshold. In such embodiments, the user can use changes in the intensity of contact to spend more or less time viewing a region of the text that is of particular interest.

[00214] In some embodiments, while the focus selector is over the text box, the device (4940) detects a second press input (e.g., after the first press input) from a contact (e.g., a finger contact) on the touch-sensitive surface with a maximum intensity below the predefined activation threshold (e.g., a maximum intensity between IT_L and IT_D). In response to detection of the second press input, the device performs (4942) an operation associated with the text box without redisplaying the portion of the text that was displayed in response to the first input (e.g., as described above with reference to Figure 8D). For example, the device plays a song associated with the text box, selecting a row that includes the text box, or provides a cut/copy/paste user interface for interacting with content of the text box. In some embodiments, if the device detects a press input with a maximum intensity below IT_L , the device does not perform an operation associated with the text box (e.g., contacts with intensity below IT_L are associated with moving the focus selector rather than interacting with the text box).

[00215] It should be understood that the particular order in which the operations in Figure 9 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 [0057]) are also applicable in an analogous manner to method 4900 described above with respect to Figure 9. For example, the contacts, gestures, user interface objects, intensity thresholds, focus selectors, and animations described above with reference to method 4900 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 [0057]). For brevity, these details are not repeated here.

[00216] In accordance with some embodiments, Figure 10 shows a functional block diagram of an electronic device 5000 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.

[00217] As shown in Figure 10, an electronic device 5000 includes a display unit 5002 configured to display a text box where the text includes more text than can be displayed in the text box, a touch-sensitive surface unit 5004 configured to receive contacts, one or more sensor units 5006 configured to detect intensity of contacts with the touch-sensitive surface unit 5004; and a processing unit 5008 coupled to the display unit 5002, the touch-sensitive surface unit 5004 and the one or more sensor units 5006. In some embodiments, the processing unit 5008 includes a detecting unit 5010, a changing unit 5012, a selecting unit 5014, a display enabling unit 5016, a scrolling unit 5018, and a performing unit 5020.

[00218] The processing unit 5008 is configured to, while the focus selector is over the text box, detect (e.g., with the detecting unit 5010) a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold. The processing unit 5008 is configured to, in response to detecting the first press input, enable display of a previously undisplayed portion of the text (e.g., with the display enabling unit 5016).

[00219] In some embodiments, the text includes a song name in a playlist.

[00220] In some embodiments, enabling display of the previously undisplayed portion of the text includes expanding the text outside of a boundary of the text box (e.g., with the display enabling unit 5016).

[00221] In some embodiments, enabling display of the previously undisplayed portion of the text includes scrolling the text within the text box (e.g., with the scrolling unit 5018).

[00222] In some embodiments, the text is scrolled in the text box at a speed determined in accordance with an intensity of the contact (e.g., with the scrolling unit 5018).

[00223] In some embodiments, the text is scrolled in the text box at a fixed speed (e.g., with the scrolling unit 5018).

[00224] In some embodiments, the text is scrolled in the text box in accordance with a change in intensity of the contact (e.g., with the scrolling unit 5018).

[00225] In some embodiments, the processing unit 5008 is configured to, while the focus selector is over the text box, detect a second press input (e.g., with the detecting unit 5010) corresponding to a contact on the touch-sensitive surface unit 5004 with a maximum intensity below the predefined activation threshold; and in response to detecting the second press input (e.g., with the detecting unit 5010), performing an operation associated with the text box without redisplaying the portion of the text that was displayed in response to the first press input (e.g., with the performing unit 5020).

[00226] 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.

[00227] The operations described above with reference to Figure 9 are, optionally implemented by components depicted in Figures 1A-1B or Figure 10. For example, display operation 4902, detection operation 4906, and display operation 4908 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 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.

Facilitating User Interaction with Controls in a User Interface

[00228] Many electronic devices have graphical user interfaces with user interface objects (such as controls – e.g., buttons or sliders) which, upon user-activation, are configured to perform specific predefined functions or operations. Frequently, two or more controls displayed separately (e.g., displayed concurrently, in distinct spatial locations) in a user interface are associated with related functions. For example, the ‘play’ button on a media player interface upon activation is configured to enable media playback at a default speed, whereas a ‘fast forward’ button on a media player interface upon activation is configured to enable media playback at a speed faster than the default speed. While the functionality provided by these buttons is related, traditional interfaces display these buttons in a spatially separated manner on the user interface. As a result, the user experiences increased cognitive burden associated with selecting or activating one of these related controls by having to physically move his/her finger on the touch-screen display or on a touch-sensitive surface so as to select one out of the two controls for performing one of the related functions. It would be beneficial to provide the user the enhanced capability to select one out of the two controls based on the one of the two related operations that the user intends to perform (e.g., either select the ‘play’ button and the associated default media playback speed, or select the ‘fast forward’ button and the associated higher media playback speed), based on a pressure or intensity of the user contact on the touch-screen display (or on the touch-sensitive surface) rather than on the location of the user contact with respect to the desired one out of the two controls.

[00229] The disclosed embodiments provide the user a capability to activate one of two different operations associated with one of two controls—a first operation (e.g., activating playback of a media file at a default playback speed) associated with a first control (e.g., the ‘play’ button) or a second operation (e.g., activating playback of a media file at a speed other than a regular playback speed, such as 2x or twice the default playback speed) associated with a second control—either the first or second control being made available (e.g., being displayed for activation) to the user based on the intensity (e.g., pressure) of a contact associated with the user input. Thus, in some embodiments, the first control (associated with the first operation) is made available (e.g., is displayed for activation) to the

user if the user input includes a contact with an intensity below a respective threshold whereas the second control (associated with the first operation) is made available to the user if the user input includes a contact with an intensity above a respective threshold. As a result, the user has the enhanced capability to interact with a control in at least two distinct manners (e.g., based on an intensity or pressure of the user's contact) to serve one of two distinct but related operations; for example, the control functioning as a first control associated with a first operation if the contact has an intensity below a respective intensity threshold or the control functioning as a second control associated with a second operation if the contact has an intensity above the respective intensity threshold.

[00230] Figures 11A-11M illustrate exemplary user interfaces for facilitation user interaction with controls in a user interface in accordance with some embodiments. The user interfaces in these figures are used to illustrate the processes described below, including the processes in Figures 12A-12C. Figures 11A-11M include an intensity diagram that shows the current intensity of the contact on the touch-sensitive surface relative to a deep press intensity threshold ("IT_D") and a light press intensity threshold ("IT_L"). In some embodiments, operations similar to those described below with reference "IT_D" are performed with reference a different intensity threshold (e.g., "IT_L").

[00231] Figure 11A illustrates a user interface (e.g., a camera view-finder interface), with one or more controls (e.g., a first control 5406 that activates the camera shutter to capture one or more images), that is displayed on touch screen 112. Figures 11A-11E illustrate performing one of two different operations associated with one of two controls—a first operation (e.g., activating the shutter once to capture a single image with a camera) associated with a first control or a second operation (e.g., activating the shutter multiple times to capture multiple images with a camera) associated with a second control—either of the first or second control being made available to the user based on the intensity (e.g., pressure) of a contact associated with the user input. Thus, in some embodiments, the first control (associated with the first operation) is made available to the user if the user input includes a contact with an intensity below a deep press intensity threshold (e.g., IT_D) whereas the second control (associated with the first operation) is made available to the user if the user input includes a contact with an intensity above the deep press intensity threshold (e.g., IT_D).

[00232] In Figure 11A, no contact is present or detected on touch screen 112. In Figure 11B, a contact or an input that includes a contact (e.g., contact 5412 in Figure 11B) is detected on touch screen 112 on a first control (e.g., control button 5406 that activates the

camera shutter to capture one or more images). The input in Figure 11B meets first control-activation criteria (e.g., the intensity of contact 5412 is above a light press intensity threshold “IT_L”). In some embodiments, a focus selector (corresponding to contact 5412) is at a location on display 112 corresponding to the first control 5406. As shown in the intensity diagram in Figure 11B, contact 5412 has an intensity lower than the deep press intensity threshold (e.g., “IT_D”). Since intensity of contact 5412 is lower than the deep press intensity threshold (e.g., “IT_D”) and the input meets first control-activation criteria (e.g., contact 5412 has an intensity above and above a light press intensity threshold IT_L), in response to detecting lift-off of contact 5412, a first operation associated with first control 5406 is performed (e.g., the camera shutter is activated once and a single image, such as, Image 1 illustrated as a thumbnail 5404-1 in Figure 11C is captured).

[00233] In Figure 11C, another contact 5413 is detected on touch screen 112 on the first control (e.g., first control 5406, Figure 11C). As shown in the intensity diagram in Figure 11C, contact 5413 has an intensity less than or below the deep press intensity threshold (e.g., “IT_D”), and optionally below the light press intensity threshold (e.g., “IT_L”). Subsequently, as shown in Figure 11D, the intensity of contact 5413 increases to an intensity greater than the deep press intensity threshold (e.g., “IT_D”); for example, as the user pushes harder on touch screen 112. Since the intensity of contact 5413 is greater than the deep press intensity threshold (e.g., “IT_D”), a second control (e.g., control 5408, Figures 11D-11E) is displayed (e.g., in place of first control 5406, which, for instance, is replaced at least partially by second control 5408 on the user interface).

[00234] In Figures 11D-11E, a second input is optionally detected as contact 5413 moves along the slider to move control 5408 (e.g., as the user moves his/her finger on the touch-screen display 112) from the position of control 5408 shown in Figure 11D to the position of control 5408 shown in Figure 11E. In response to detecting the second input, a second operation associated with second control 5408 is performed (e.g., the camera shutter is activated multiple times in quick succession and multiple images, such as, Image 2, Image 3 and Image 4, illustrated as thumbnails 5404-2, 5404-3 and 5404-4 in Figure 11E, are captured, sometimes called “burst mode”).

[00235] Thus, in some embodiments, the device provides a user with a capability to interact with a first control associated with a first operation if the user input meets first control-activation criteria (e.g., a tap gesture with an intensity below IT_L or a press input with an intensity between IT_L and IT_D) and the user input includes a contact that has an intensity

below the deep press intensity threshold (e.g., IT_D). On the other hand, when interacting with the first control, if the user input includes a contact that has an intensity above the deep press intensity threshold (e.g., IT_D), then the first control reveals a second control (e.g., the first control morphs into, or is partially or fully replaced or adjoined by a second control) associated with a second operation. As a result, the user has the enhanced capability to interact with a control in at least two distinct manners (e.g., based on an intensity or pressure of the user's contact) to serve one of two distinct but related operations; for example, the control functioning as a first control associated with a first operation if the contact has an intensity below the deep press intensity threshold (e.g., IT_D) or the control functioning as a second control associated with a second operation if the contact has an intensity above the deep press intensity threshold (e.g., IT_D).

[00236] Along similar lines, Figures 11F-11J illustrate performing one of two different operations associated with one of two controls—a first operation (e.g., activating playback of a media file at a default playback speed) associated with a first control and a second operation (e.g., activating playback of a media file at a speed other than a default playback speed, such as 2x or twice the regular playback speed) associated with a second control—the first or second control being made available to the user based on the intensity (e.g., pressure) of a contact associated with the user input. Thus, in some embodiments, the first control (associated with the first operation) is made available to the user if the user input includes a contact with an intensity below the deep press intensity threshold (e.g., IT_D) whereas the second control (associated with the second operation) is made available to the user if the user input includes a contact with an intensity above the deep press intensity threshold (e.g., IT_D).

[00237] In Figure 11F, no contact is present or detected on touch screen 112. In Figure 11G, a contact or a first input that includes a contact (e.g., contact 5414 in Figure 11G) is detected on touch screen 112 on a first control (e.g., first control 5431 shown in Figure 11F that activates playback of a media file at a regular playback speed). The first input in Figure 11G meets first control-activation criteria (e.g., the intensity of contact 5414 is above a light press threshold " IT_L "). In some embodiments, a focus selector (corresponding to contact 5414) is at a location on display 112 corresponding to the first control 5431. As shown in the intensity diagram in Figure 11G, contact 5414 has an intensity lower than the deep press intensity threshold (e.g., " IT_D "). Since intensity of contact 5414 is lower than the deep press intensity threshold (e.g., " IT_D ") and the first input meets first control-activation criteria (e.g., contact 5414 has an intensity above and above a light press intensity threshold IT_L), in

response to detecting lift-off of contact 5414, a first operation associated with first control 5431 is performed (e.g., media playback is activated at a regular or default playback speed and position indicator 5432 moves along a predefined path on the slider bar from a location of position indicator 5432 shown in Figure 11G to a location of position indicator 5432 shown in Figure 11H, at a first predefined speed corresponding to and indicative of a regular or default rate of media playback).

[00238] In Figure 11H, another contact 5416 is detected on touch screen 112 on the first control (e.g., first control 5431, Figure 11F). As shown in the intensity diagram in Figure 11H, contact 5416 has an intensity less than or below the deep press intensity threshold (e.g., “IT_D”), and optionally below the light press intensity threshold (e.g., “IT_L”). Subsequently, as shown in Figure 11I, the intensity of contact 5416 increases to an intensity greater than the deep press intensity threshold (e.g., “IT_D”); for example, as the user pushes harder on touch screen 112. Since the intensity of contact 5416 is greater than the respective intensity threshold (e.g., “IT_D”), a second control (e.g., control 5434, Figures 11I-11J) is displayed (e.g., while continuing to display first control 5431).

[00239] In Figures 11I-11J, a second input is detected as contact 5416 moves along the slider to move control 5434 (e.g., as the user moves his/her finger on the touch-screen display 112) from the position of control 5434 shown in Figure 11I to the position of control 5434 shown in Figure 11J. In response to detecting the second input, a second operation associated with second control 5408 is performed (e.g., media playback is activated at a speed or rate other than the regular or default playback speed, such as at 2x or twice the regular or default playback speed and position indicator 5432 moves along the predefined path from a location of position indicator 5432 shown in Figure 11I to a location of position indicator 5432 shown in Figure 11J, at a second predefined speed corresponding to and indicative of a second rate of media playback different from the default rate of media playback).

[00240] Figures 11K-11M illustrate two different but related operations associated with two different controls—a first operation (e.g., selecting a parameter, such as saturation, of a digital image that is desired to be modified) associated with a first control and a second operation (e.g., adjusting a value or magnitude of the parameter, such as adjusting the level of saturation, of a digital image) associated with a second control—being made available to a user (e.g., being displayed) in response to detecting a contact with an intensity (e.g., pressure) either below a respective threshold or above a respective threshold, respectively.

[00241] In Figure 11K, contact 5420 is present or detected on touch-sensitive surface 451 while a focus selector (e.g., cursor 5410) is at a first location on display 450. As shown in the intensity diagram in Figure 11K, the intensity of contact 5420 is below the deep press intensity threshold (e.g., “IT_D”). As shown in Figures 11K-11L, in response to detecting movement of contact 5420 on the touch-sensitive surface 451, the device moves cursor 5410 to a second location on display 450 (e.g., corresponding to a location of a first control 5436, Figure 11L). As shown in Figure 11L, since contact 5420 meets first-control activation criteria (e.g., intensity of contact is above a light press intensity threshold “IT_L”), a first operation, associated with first control 5436, is performed, for example, a default saturation adjustment operation is performed on a currently displayed digital image. In some embodiments, the default saturation adjustment operation is performed when the user lifts contact 5420 off of the touch-sensitive surface 451. In some embodiments, the default saturation adjustment operation is performed when the user reduces the intensity of contact 5420 to an intensity below IT_L or a hysteresis intensity threshold associated with, and below IT_L.

[00242] In Figure 11M, as shown in the intensity diagram the intensity of contact 5420 increases to a value that is above or greater than the deep press intensity threshold (e.g., “IT_D”). For example, as the user pushes harder than the deep press intensity threshold (e.g., “IT_D”) on touch-sensitive surface 451. In response to detecting the increase in intensity of contact 5420 over the deep press intensity threshold (e.g., “IT_D”) a second control (e.g., control 5438) is displayed (e.g., overlaid on the first control 5436, which is replaced at least partially by second control 5438 on the user interface). As shown in Figure 11M, control 5438 is configured to move along the slider (e.g., as contact 5420 is moved on touch-sensitive surface 451), and correspondingly a second operation associated with second control 5438 is configured to be performed. For example, sliding thumb 5438 of the slider control to the right would increase the amount of saturation in the currently displayed image when control 5436 is activated (e.g., as described above with reference to Figures 11K-11L), whereas sliding thumb 5438 of the slider control to the left would decrease the amount of saturation in the currently displayed image when control 5436 is activated (e.g., as described above with reference to Figures 11K-11L).

[00243] Figures 12A-12C are flow diagrams illustrating a method 5500 of interacting with controls in a user interface in accordance with some embodiments. The method 5500 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 5500 are, optionally, combined and/or the order of some operations is, optionally, changed.

[00244] As described below, the method 5500 provides an intuitive way to interact with controls in a user interface. The method reduces the cognitive burden on a user when interacting with controls in a user interface, thereby creating a more efficient human-machine interface. For battery-operated electronic devices, enabling a user to interact with controls in a user interface faster and more efficiently conserves power and increases the time between battery charges.

[00245] The device displays (5502), on the display, a first control (e.g., control 5406 in Figure 11A; or control 5431 in Figure 11F; or control 5436 in Figure 11K) for controlling a first operation (e.g., a first control for turning on and off a filter or a particular function of a device). The device detects (5504), on the touch-sensitive surface, a first input that corresponds to the first control. For example, the device detects a press input on the touch-sensitive surface while a focus selector (e.g., contact 5412 in Figure 11B, contact 5413 in Figures 11C-11D, contact 5414 in Figure 11G, contact 5416 in Figures 11H-11I, cursor 5410 in Figures 11K-11M) is over or proximate to the first control, where the press input includes an increase in intensity of a contact associated with the focus selector.

[00246] In response (5506) to detecting the first input: in accordance with a determination that the first input meets first control-activation criteria (e.g., the first input includes a contact that has an intensity above the light press intensity threshold “IT_L”) but does not include a contact with a maximum intensity above a respective intensity threshold (e.g., deep press intensity threshold “IT_D”), the device performs the first operation (e.g., the device activates the shutter once to capture a single image with a camera as explained with reference to Figure 11B; the device activates playback of a media file at a default playback speed as explained with reference to Figure 11G; or the device applies default saturation adjustment operation as explained with reference to Figure 11L); and in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold (e.g., deep press intensity threshold “IT_D”), the device displays a second control (e.g., control 5408 in Figure 11D; or control 5434 in Figure 11I; or control 5438 in Figure 11M) for performing a second operation (e.g., activating the shutter multiple times to

capture multiple images with a camera as explained with reference to Figure 11E; activating playback of a media file at a speed other than a default playback speed, such as 2x or twice the regular playback speed as explained with reference to Figure 11J; or adjusting a magnitude of a saturation adjustment operation as explained with reference to Figure 11M) associated with the first operation.

[00247] In some embodiments, displaying the second control includes replacing (5508) at least a portion of the first control with the second control (e.g., second control 5408 shown in Figure 11D replaces at least a portion of first control 5406 shown in Figure 11A). For example, the first control “fades out” to reveal the second control underneath. In some embodiments, the second control is (5510) a control for adjusting a parameter of the first operation (e.g., control 5434 is a second control that adjusts the media playback speed to a speed other than the default speed as shown in Figure 11I). In some embodiments, the first control includes (5512) a button (e.g., control 5436, Figure 11K); and the second control includes a slider (e.g., control 5438, Figure 11M).

[00248] In some embodiments, the second control is (5514) a control for performing an operation that includes one or more steps in common with the first operation. For example, the first operation is taking a single photograph (e.g., as explained with reference to Figure 11B above) and the second operation is taking a sequence of photos in a burst mode (e.g., as explained with reference to Figure 11E above), taking a sequence of photos in a continuous shooting mode, or taking video, where both operations include the step of capturing image data from a camera sensor.

[00249] In some embodiments, the first operation includes (5516) turning a visual effect on or off; and the second operation includes adjusting a magnitude of the visual effect. For example, the first operation includes toggling a visual effect such as changing brightness/hue/saturation/contrast adjustment or other image property of an image (e.g., as explained with reference to Figure 11K above) and the second operation includes adjusting the magnitude of the brightness/hue/saturation/contrast adjustment or other image property of an image (e.g., as explained with reference to Figure 11M above). As another example, the first operation includes adjusting a zoom level of an electronic document and the second operation includes adjusting the magnitude of the zoom. As a further example, the first operation includes applying a filter or image mask to a digital photograph or another operation that adjusts the appearance of a graphical user interface object displayed on the display; and the second operation includes adjusting the magnitude of the filter or mask

applied to the digital photograph or adjusting the magnitude of adjustment made to the graphical user interface object, respectively.

[00250] In some embodiments, the first operation includes (5518) controlling media playback at a default playback speed (e.g., playing or pausing music, video, or slideshow at a standard playback speed – e.g., as explained with reference to Figures 11G-11H); and the second operation includes navigating through the media at a respective speed that is different from the default playback speed (e.g., scrubbing through the media at a rate corresponding to a displacement of the contact during a second input, scrubbing through the media by an amount corresponding to displacement of the contact during the second input, and/or fast forwarding through the media at a 2x or 3x speed – for instance, as explained with reference to Figure 11J; or playing back the media in slow motion at a 0.25x or 0.5x speed).

[00251] In some embodiments, the first operation includes (5520) turning a timer on or off (e.g., toggling the timer); and the second operation includes setting a time of the timer (e.g., selecting an amount of time that the timer will count down from, and or adding time to or removing time from a count-down timer or a count-up timer). In some embodiments, the first operation includes (5522) turning an alarm on or off (e.g., toggling the alarm); and the second operation includes setting a time for the alarm (e.g., changing a day or time at which the alarm will be played by the device if the alarm is on).

[00252] In some embodiments, the device detects (5524) a second input on the touch-sensitive surface (e.g., movement of the respective contact on the touch-sensitive surface that corresponds to movement of the focus selector relative to the second control – e.g., movement of contact 5416 as shown in Figures 11I-11J relative to second control 5434 which causes second control 5434 to move along a slider bar). In some embodiments, the first input and the second input are (5526) part of a multi-part gesture that includes at least one continuously detected contact (e.g., contact 5413 in Figures 11C-11E, contact 5416, Figures 11H-11J, or contact 5420 in Figures 11K-11M). In some embodiments, the first input and the second input are performed by the same continuously detected contact. For example, the first input is a press input performed by a respective contact (e.g., an increase in intensity of a contact from an intensity below IT_D or a hysteresis intensity threshold associated with and below IT_D , to an intensity above IT_D) and the second input includes movement of the respective contact across the touch-sensitive surface (e.g., as explained with reference to Figure 11J). In response to detecting the second input, the device performs (5528) the second operation corresponding to the second control. For example, as explained with reference to

Figures 11I-11J, the first input (e.g., including an increase in intensity of contact 5416 from an intensity below IT_D to an intensity above IT_D) causes control 5434 to be displayed, and second input (e.g., including movement of contact 5416 relative to second control 5434 which causes second control 5434 to move along the slider bar) causes the device to perform the second operation (e.g., activate playback of the media file at a speed twice the default playback speed).

[00253] In some embodiments, after displaying (5530) the second control: the device detects (5532) a decrease in intensity of the contact below an intensity threshold that meets second control display criteria (e.g., an intensity threshold at or below the respective intensity threshold IT_D , such as IT_D , IT_L , or a hysteresis intensity threshold associated with IT_D). In response to detecting the decrease in intensity of the contact, the device ceases (5534) to display the second control on the display and, optionally, redisplay the first control or a portion thereof that was replaced by the second control. For example, in response to a decrease in intensity of contact 5413 to an intensity below IT_L , control 5406 would be redisplayed in the camera user interface (e.g., as shown in Figure 11A).

[00254] 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 [0057]) are also applicable in an analogous manner to method 5500 described above with respect to Figures 12A-12C. For example, the controls, contacts, gestures, intensity thresholds described above with reference to method 5500 optionally have one or more of the characteristics of the controls, contacts, gestures, intensity thresholds described herein with reference to other methods described herein (e.g., those listed in paragraph [0057]). For brevity, these details are not repeated here.

[00255] In accordance with some embodiments, Figure 13 shows a functional block diagram of an electronic device 5600 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 13 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.

[00256] As shown in Figure 13, an electronic device 5600 includes a display unit 5602 configured to display a first control for controlling a first operation, a touch-sensitive surface unit 5604 configured to receive a contact on the touch-sensitive surface unit, one or more sensor units 5606 configured to detect intensity of contacts with the touch-sensitive surface unit 5604; and a processing unit 5608 coupled to the display unit 5602, the touch-sensitive surface unit 5604 and the one or more sensor units 5606. In some embodiments, the processing unit 5608 includes a detecting unit 5610, a performing unit 5612, a display enabling unit 5614, and a ceasing unit 5616).

[00257] The processing unit 5608 is configured to: detect, on the touch-sensitive surface unit 5604, a first input that corresponds to the first control (e.g., with the detecting unit 5610); and in response to detecting the first input: in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold (e.g., IT_D), perform the first operation (e.g., with the performing unit 5612); and in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, enable display of a second control for performing a second operation associated with the first operation (e.g., with the display enabling unit 5614).

[00258] In some embodiments, displaying the second control includes replacing at least a portion of the first control with the second control.

[00259] In some embodiments, the second control is a control for adjusting a parameter of the first operation.

[00260] In some embodiments, the first control includes a button; and the second control includes a slider.

[00261] In some embodiments, the second control is a control for performing an operation that includes one or more steps in common with the first operation.

[00262] In some embodiments, processing unit 5608 is further configured to: detect a second input on the touch-sensitive surface unit (e.g., with the detecting unit 5610); and in response to detecting the second input, perform the second operation corresponding to the second control (e.g., with the performing unit 5612).

[00263] In some embodiments, the first input and the second input are part of a multi-part gesture that includes at least one continuously detected contact.

[00264] In some embodiments, processing unit 5608 is further configured to, after displaying the second control: detect a decrease in intensity of the contact below an intensity threshold that meets second control display criteria (e.g., with the detecting unit 5610); and in response to detecting the decrease in intensity of the contact, cease to enable display of the second control on the display unit 5602 (e.g., with the ceasing unit 5616).

[00265] In some embodiments, the first operation includes turning a visual effect on or off; and the second operation includes adjusting a magnitude of the visual effect.

[00266] In some embodiments, the first operation includes controlling media playback at a default playback speed; and the second operation includes navigating through the media at a respective speed that is different from the default playback speed.

[00267] In some embodiments, the first operation includes turning a timer on or off; and the second operation includes setting a time of the timer.

[00268] In some embodiments, the first operation includes turning an alarm on or off; and the second operation includes setting a time for the alarm.

[00269] 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.

[00270] 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, display operation 5502, detection operation 5504, and display operation 5508 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 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.

Interacting with Border Regions in Application Windows

[00271] Many electronic devices have graphical user interfaces with application windows that include controls (e.g., buttons) associated with various operations, such as content modification buttons (e.g., text/image/table formatting buttons), content navigation buttons (e.g., scroll bar arrows), and/or application menu buttons for displaying menus associated with the application. Such application windows frequently include large border regions which are not commonly associated with particular functions. It would be beneficial to provide the user an ability to interact with the large border regions of such application windows, by associating such border regions with one or more operations that can be performed upon user-activation of the border regions. However, in such embodiments, it would be desirable to prevent accidental activation of the border regions by the user. Accordingly, some embodiments provide dual activation criteria, based on dual activation intensity thresholds of user contact—a lower control-activation intensity threshold for the regular controls present in the application window and a higher border-activation intensity threshold for the border region—for activating either of the regular controls or the border region.

[00272] As a result, when the user can activate a regular control in an application window with an input that includes a contact with an intensity below the border-activation intensity threshold as long as the contact has an intensity above the control-activation intensity threshold (. However, when the user interacts with a portion of the border region in the application window, the user needs to provide an input including a contact with an intensity above the border-activation intensity threshold in order for the device to perform operation corresponding to the respective portion of the border region to be performed. The dual contact intensity thresholds preserve the expected behavior of regular controls (e.g., controls normally expected to be responsive to regular or lower contact pressures), while enabling users to interact with a larger hit region (e.g., border regions) to perform various operations associated with the application, while still preventing accidental or inadvertent

activation of those operations by the user by activating these border regions upon detection of a contact with an intensity above the border-activation intensity threshold.

[00273] Figures 14A-14Q illustrate exemplary user interfaces for allowing users to interact with application windows, and in particular, with border regions in application windows in accordance with some embodiments. The user interfaces in these figures are used to illustrate the processes described below, including the processes in Figures 15A-15B. Figures 14A-14K 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 control-activation intensity threshold (e.g., “IT_L”) and a border-activation intensity threshold (e.g., “IT_D”).

[00274] Figure 14A illustrates a user interface with an application window 6604 (e.g., a photo album with a display region that includes thumbnails of photographs or other images represented as Image 1, Image 2, Image 3, and the like; and a border region 6606 surrounding the display region), that is displayed on a display 450. As shown in Figure 14A, application window 6604 includes a plurality of visible controls (e.g., button 6608-1, button 6608-2, navigation arrow 6609-1, and navigation arrow 6609-2) which are configured to respond to user gestures that include contacts with intensity (e.g., pressure) above a control-activation intensity threshold (e.g., “IT_L”).

[00275] Figures 14A-14D illustrate an example of performing a respective operation (e.g., by scrolling the photo album) in response to detecting a gesture on touch-sensitive surface 451 in accordance with a determination that the gesture includes a contact (e.g., contact 6614) that has an intensity (e.g., pressure) that is above (e.g., greater than) a predefined border-activation intensity threshold (e.g., “IT_D”) while a focus selector (e.g., cursor 6610) is on a respective portion of the border region 6606 that does not include any visible controls.

[00276] In Figure 14A, at time T₀, no contact is present or detected on touch-sensitive surface 451 while cursor 6610 is on a respective portion of the border region 6606 that does not include any visible controls (e.g., cursor 6610 is not over any of the buttons 6608 or navigation arrows 6609). In Figure 14B, at time T', a contact (e.g., contact 6614 in Figure 14B) is detected on the touch-sensitive surface 451. As shown in Figure 14B, the intensity I' of contact 6614 at time T' is lower than or below the control-activation intensity threshold (e.g., “IT_L”), which in turn is lower than or below the border-activation intensity threshold

(e.g., “IT_D”). In accordance with a determination that the contact (e.g., contact 6614) has an intensity that is below (or less than) the border-activation intensity threshold (e.g., “IT_D”), a respective operation (e.g., scrolling of the photo album) is not performed in response to detecting the contact on the touch-sensitive surface 451. In some embodiments, this prevents the user from accidentally and inadvertently performing the respective operation (e.g., accidentally scrolling through the photo album), for instance, by ensuring that the user needs to push harder than (e.g., with greater intensity than) the border-activation intensity threshold (e.g., “IT_D”).

[00277] In Figure 14C, at time T1, while cursor 6610 is still positioned on display 450 on a respective portion of the border region 6606 that does not include any visible controls, the intensity of the contact (e.g., contact 6614 in Figure 14C) on the touch-sensitive surface 451 exceeds the control-activation intensity threshold (e.g., “IT_L”) as the user pushes harder on touch-sensitive surface 451, as compared to Figure 14B. However, as shown in Figure 14C, the intensity of contact 6614 (Figure 14C) on the touch-sensitive surface 451 still does not exceed the border-activation intensity threshold (e.g., “IT_D”). Since contact 6614 has an intensity that is below the border-activation intensity threshold (e.g., “IT_D”), the respective operation (e.g., scrolling of the photo album) is still not performed by the device in response to detecting the contact on the touch-sensitive surface 451, in spite of the intensity of contact 6614 exceeding the control-activation intensity threshold (e.g., “IT_L”).

[00278] In Figure 14D, at time T2, as the user pushes harder on touch-sensitive surface 451, as compared to Figures 14B and 14C, while cursor 6610 is on a respective portion of the border region 6606 that does not include any visible controls, the intensity of contact 6614 exceeds the border-activation intensity threshold (e.g., “IT_D”). As shown in Figure 14D, in accordance with a determination that contact 6614 has an intensity that is above (or greater than) the border-activation intensity threshold (e.g., “IT_D”), the device performs the respective operation (e.g., scrolling of the photo album) in response to detecting contact 6614 on the touch-sensitive surface 451. As shown in Figure 14D, the photo album is scrolled in response to the intensity of contact 6614 exceeding the border-activation intensity threshold, and additional thumbnails (e.g., not previously displayed in Figures 14A-14C prior to the scrolling operation) corresponding to Image 7, Image 8, Image 9, are displayed in application window 6604.

[00279] In some embodiments, as shown in Figure 14D, when the intensity of contact 6614 exceeds the border-activation intensity threshold (e.g., “IT_D”), the content is scrolled by

a predefined amount for the gesture. For example, the content is advanced by one page (e.g., from the page that includes thumbnails for Image 1 through Image 6 to the next page that includes thumbnails for Image 7 through Image 12) each time the user presses on the touch-sensitive surface 451 with an intensity above the border-activation intensity threshold (e.g., “IT_D”) while cursor 6610 is on a respective portion of the border region 6606 that does not include any visible controls. In alternative embodiments, when the intensity of the contact exceeds the border-activation intensity threshold (e.g., “IT_D”), the content is scrolled at a speed that varies smoothly corresponding to the intensity of the contact. In such embodiments, in the example shown in Figure 14D, between time T2 and T3 when the intensity of the contact 6614 exceeds the border-activation intensity threshold (e.g., “IT_D”), the speed of scrolling would first increase (e.g., content would scroll faster) as the intensity of contact 6614 increases (between time T2 and T”) and then the speed of scrolling would decrease (e.g., content would scroll slower) as the intensity of contact 6614 decreases (between time T” and T3).

[00280] In some embodiments, if the user places a contact with an intensity above a predefined border-activation intensity threshold (e.g., an intensity threshold such as IT_D that is higher than a control-activation intensity threshold IT_L that is used to activate regular controls in an application window or user interface), while the focus-selector is on a predefined portion of the border region that does not include any visible controls, a respective predefined operation is performed (e.g., the user interface is scrolled through). On the other hand, though, if the user places a contact with an intensity below the predefined border-activation intensity threshold (e.g., “IT_D”), while the focus-selector is on a predefined portion of the border region that does not include any visible controls, the respective predefined operation is not performed (e.g., the user interface is scrolled through), even if the intensity of the contact is greater than a regular (control-activation) intensity threshold (e.g., “IT_L”). As a result, by requiring the user to place a contact with an intensity that is higher than the border-activation intensity threshold (e.g., an intensity threshold that exceeds the control-activation intensity threshold required to activate regular controls in a user interface), the user is provided with a safeguard against accidentally performing the respective predefined operation.

[00281] Figures 14E-14G illustrate an example of performing a respective operation (e.g., by scrolling the photo album) in response to detecting a gesture on touch-sensitive surface 451 in accordance with a determination that the gesture includes a contact (e.g.,

contact 6616) that has an intensity (e.g., pressure) that is above (e.g., greater than) a predefined control-activation intensity threshold (e.g., intensity threshold IT_L , which is lower than the previously described border-activation intensity threshold IT_D , as shown graphically in Figures 14E-14G) while a focus selector (e.g., cursor 6610) is on a respective control (e.g., on control 6608-2), rather than on a respective portion of the border region 6606 that does not include any visible controls.

[00282] In Figure 14E, at time T_0 , no contact is present or detected on touch-sensitive surface 451 while cursor 6610 is on a respective control (e.g., on control 6608-2, for scrolling down) in application window 6604. In Figure 14F, at time T' , a contact (e.g., contact 6616 in Figure 14F) is detected on the touch-sensitive surface 451. As shown in Figure 14F, the intensity I' of contact 6616 at time T' is lower than or below both the control-activation intensity threshold (e.g., " IT_L ") and the border-activation intensity threshold (e.g., " IT_D ") (as shown in Figures 14A-14D). In accordance with a determination that the contact (e.g., contact 6616) has an intensity that is below (or less than) the control-activation intensity threshold (e.g., " IT_L "), a respective operation (e.g., scrolling of the photo album) corresponding to the respective control (e.g., control 6608-2) is not performed in response to detecting the contact on the touch-sensitive surface 451. The user is therefore prevented from accidentally and inadvertently performing the respective operation (e.g., accidentally scrolling through the photo album) by ensuring that the user needs to push harder than (e.g., with greater intensity than) the control-activation intensity threshold (e.g., " IT_L ").

[00283] In Figure 14G, at time T_1 , while cursor 6610 is still positioned on display 450 on a respective control (e.g., on control 6608-2, for scrolling down) in application window 6604, the intensity of the contact (e.g., contact 6616 in Figure 14G) on the touch-sensitive surface 451 exceeds the control-activation intensity threshold (e.g., as the user pushes harder on touch-sensitive surface 451 so that contact 6616 has an intensity above IT_L , as compared to Figure 14F where contact 6616 has an intensity below IT_L). As shown in Figure 14G, since the focus selector (e.g., cursor 6610) is positioned on a respective control (e.g., on control 6608-2), rather than on a respective portion of the border region 6606 that does not include any visible controls, despite the intensity of contact 6616 (Figure 14G) on the touch-sensitive surface 451 not being above the border-activation intensity threshold (e.g., " IT_D "), the respective operation (e.g., scrolling of the photo album) is performed in response to detecting the contact on the touch-sensitive surface 451 (as long as the intensity of the contact exceeds the control-activation intensity threshold).

[00284] In some embodiments, if the user places a contact with an intensity above a predefined control-activation intensity threshold (e.g., “IT_L”) and lower than the border-activation intensity threshold (e.g., “IT_D”), while the focus-selector is positioned on a respective control (e.g., on control 6608-2) rather than on a respective portion of the border region 6606 that does not include any visible controls, a respective predefined operation is performed (e.g., the user interface is scrolled through if the respective control is a scroll arrow). As a result, when the user interacts with a respective control (e.g., of regular controls) in an application window, the device will respond to user inputs that include contacts with an intensity below the border-activation intensity threshold (e.g., “IT_D”) as long as the inputs include a contact with an intensity above the control-activation intensity threshold (e.g., “IT_L”). However, when the user interacts with a respective portion of a border region that does not include any visible controls in an application window, device will only respond to user inputs that include contacts with an intensity above the border-activation intensity threshold (e.g., “IT_D”). This dual threshold preserves the expected behavior of regular controls (responsive to regular contact pressures), while enabling users to interact with a larger hit region (e.g., border regions) to perform various operations associated with the application, while still preventing accidental or inadvertent activation of those operations by the user by necessitating a higher pressure of contact while interacting with such border regions.

[00285] Figures 14H-14K illustrate an example of performing a respective operation (e.g., by scrolling a photo album in an application window) in response to detecting a gesture on touch-sensitive display 112 in accordance with a determination that the gesture includes a contact (e.g., contact 6620) that has an intensity (e.g., pressure) that is above (e.g., greater than) a predefined border-activation intensity threshold (e.g., “IT_D”) while a focus selector (e.g., a focus selector corresponding to contact 6620) is on a respective portion of the border region 6606 that does not include any visible controls.

[00286] In Figure 14H, at time T₀, no contact is present or detected on touch-sensitive display 112 while focus selector (e.g., corresponding to contact 6620) is on a respective portion of the border region 6606 that does not include any visible controls (e.g., focus selector 6620 is not over any of the buttons 6608 or navigation arrows 6609). In Figure 14I, at time T', a contact (e.g., contact 6620 in Figure 14I) is detected on the touch-sensitive display 112. As shown in Figure 14I, the intensity I' of contact 6620 at time T' is lower than or below the control-activation intensity threshold (e.g., “IT_L”), which in turn is lower than or

below the border-activation intensity threshold (e.g., “IT_D”). In accordance with a determination that the contact (e.g., contact 6620) has an intensity that is below (or less than) the border-activation intensity threshold (e.g., “IT_D”), a respective operation (e.g., scrolling of the photo album) is not performed in response to detecting the contact on the touch-sensitive display 112. Consequently, the user is prevented from accidentally and inadvertently performing the respective operation (e.g., accidentally scrolling through the photo album) by ensuring that the user needs to push harder than (e.g., with greater intensity than) the border-activation intensity threshold (e.g., “IT_D”).

[00287] In Figure 14J, at time T1, while focus selector (e.g., corresponding to contact 6620) is still positioned on touch-sensitive display 112 on a respective portion of the border region 6606 that does not include any visible controls, the intensity of the contact (e.g., contact 6620 in Figure 14J) on the touch-sensitive display 112 exceeds the control-activation intensity threshold (e.g., “IT_L”) as the user pushes harder on touch-sensitive display 112, as compared to Figure 14I. However, as shown in Figure 14J, the intensity of contact 6620 (Figure 14J) on the touch-sensitive display 112 still does not exceed the border-activation intensity threshold (e.g., “IT_D”). Since contact 6620 has an intensity that is below the border-activation intensity threshold (e.g., “IT_D”), the respective operation (e.g., scrolling of the photo album) is still not performed by the device in response to detecting the contact on the touch-sensitive display 112, in spite of the intensity of contact 6620 exceeding the control-activation intensity threshold (e.g., “IT_L”).

[00288] In Figure 14K, at time T2, as the user pushes harder on touch-sensitive display 112, as compared to Figures 14I and 14J, the intensity of contact 6620 exceeds the border-activation intensity threshold (e.g., “IT_D”). As shown in Figure 14K, in accordance with a determination that contact 6620 has an intensity that is above (or greater than) the border-activation intensity threshold (e.g., “IT_D”), the device performs the respective operation (e.g., scrolling of the photo album) in response to detecting contact 6620 on the touch-sensitive surface 112. As shown in Figure 14K, the photo album is scrolled in response to the intensity of contact 6620 exceeding the border-activation intensity threshold, and additional thumbnails (e.g., not previously displayed in Figures 14H-14J prior to the scrolling operation) corresponding to Image 7, Image 8, Image 9, are displayed in application

[00289] Figure 14L illustrates an example where different portions of the border region of application window 6604, that do not include any visible controls, being associated with different predefined operations. For example, when contact 6622-1 is detected in the lower

border region of application window 6604 on touch-sensitive display 112, if the intensity of contact 6622-1 exceeds the border-activation intensity threshold (e.g., “IT_D”), the content is scrolled down by the device (as described with reference to Figures 14H-14K). In some embodiments, the lower border region of application window 6604 is associated with the scroll-down operation (e.g., as is control 6608-2). On the other hand, in accordance with a determination that contact 6622-2 is detected in the upper border region of application window 6604 on touch-sensitive display 112, if the intensity of contact 6622-2 exceeds the border-activation intensity threshold (e.g., “IT_D”), the content is scrolled up by the device. In some embodiments, the upper border region of application window 6604 is associated with the scroll-up operation (e.g., as is control 6608-1). In some embodiments, when contact 6622-3 is detected in the left border region of application window 6604 on touch-sensitive display 112, if the intensity of contact 6622-3 exceeds the border-activation intensity threshold (e.g., “IT_D”), content (e.g., image thumbnails) from a previous photo album is displayed by the device. In some embodiments, the left border region of application window 6604 is associated with a ‘display previous album’ operation (e.g., as is control 6609-1). In some embodiments, when contact 6622-4 is detected in the right border region of application window 6604 on touch-sensitive display 112, if the intensity of contact 6622-4 exceeds the border-activation intensity threshold (e.g., “IT_D”), content (e.g., image thumbnails) from a next photo album is displayed by the device. In some embodiments, the right border region of application window 6604 is associated with a ‘display next album’ operation (e.g., as is control 6609-2). In the examples illustrated through Figure 14L, visible controls 6608-1, 6608-2, 6609-1, and 6609-2 are responsive to contacts that exceed a control-activation intensity threshold (e.g., “IT_L”).

[00290] Figures 14M-14Q illustrate an example where an animation is displayed that indicates that an end of scrolling has been reached for a scrollable region of a user interface (e.g., the region that includes images 1-6 in Figures 14M-14Q). For example, in Figure 14M, contact 6624 is detected in the upper border region of application window 6604 on touch-sensitive display 112 while the region is at an end of scrolling corresponding to the upper border region 6606 of the application region (e.g., the top image in a set of images is displayed at the top of the application window). In response to detecting an increase in intensity of contact 6624 above a respective intensity threshold (e.g., IT_D) as shown in Figures 14M-14N, the device scrolls the images downwards and displays a grayed out area that represents scrolling beyond an end of the region so as to indicate that an end of scrolling

for the region has been reached and exceeded. Additionally, in some embodiments, as the intensity of contact 6624 further increases above the respective intensity threshold (e.g., IT_D) as shown in Figures 14N-14O, the extent of the grayed out area that is beyond the end of the region is expanded and the images are scrolled further downward so as to provide the user with an indication of the increase in intensity of the contact. Subsequently, as the intensity of contact 6624 decreases back toward the respective intensity threshold (e.g., IT_D) as shown in Figures 14O-14P, the extent of the grayed out area that is beyond the end of the region is reduced in size and the images are scrolled upward so as to provide the user with an indication of the increase in intensity of the contact. Finally, after the intensity of the contact decreases below the respective intensity threshold (e.g., IT_D) or a different intensity threshold such as a hysteresis intensity threshold associated with the respective intensity threshold (e.g., IT_D) or a different intensity threshold (e.g., IT_L) as shown in Figures 14P-14Q, the device scrolls the images upward and ceases to display the grayed out area that represents scrolling beyond an end of the region. The animation described with reference to Figures 14M-14Q provides the appearance that scrollable region is being pushed away from the edge of the application window 6604 as the intensity of the contact detected on the touch-sensitive surface increases and is bouncing back toward the edge of the application window 6604 as the intensity of the contact detected on the touch-sensitive surface decreases. While this example has been illustrated with respect to a touch-sensitive display 112, analogous operations are, optionally, performed when the user interface is displayed on a display that is separate from a touch-sensitive surface and a focus selector (e.g., a cursor) is located at the location of contact 6624 in Figures 14M-14Q and the contact is detected on the touch-sensitive surface that is separate from the display.

[00291] Figures 15A-15B are flow diagrams illustrating a method 6700 of allowing users to interact with application windows, and in particular, with border regions in application windows in accordance with some embodiments. The method 6700 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 6700 are, optionally, combined and/or the order of some operations is, optionally, changed.

[00292] As described below, the method 6700 provides an intuitive way to allow users to interact with application windows, and in particular, with border regions in application windows. The method reduces the cognitive burden on a user when the user interacts with application windows, thereby creating a more efficient human-machine interface. For battery-operated electronic devices, enabling a user to interact with application windows faster and more efficiently conserves power and increases the time between battery charges.

[00293] The device displays (6702), on the display, an application window that includes content. The application window includes (6704) a plurality of visible controls. In some embodiments, the plurality of visible controls include content modification buttons (e.g., text, image, table formatting buttons), content navigation buttons (e.g., scroll bar arrows), and/or application menu buttons for displaying menus associated with the application. The plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold. The application window includes (6708) a border region, wherein one or more portions of the border region do not include any visible controls. For example, the border region is a predefined border region corresponding to the “chrome” of the application window. For example, as shown in Figures 14A-14Q, application window 6604 includes visible controls (e.g., 6608-1, 6608-2, 6609-1, and 6609-2) for content navigation and a border region (e.g., 6606). As explained with reference to Figures 14E-14G, the visible controls (e.g., control 6608-2) are responsive to gestures that include at least one contact (e.g., contact 6616, Figures 14F-14G) with an intensity above a control-activation intensity threshold (e.g., “IT_L”), as shown in Figures 14E-14G.

[00294] The device detects (6710) a first gesture on the touch-sensitive surface while a focus selector (e.g., cursor 6610 in Figures 14A-14G, contact 6620 in Figures 14I-14K, or one of contacts 6622 in Figure 14L) is on a respective portion of the border region that does not include any visible controls. The first gesture includes (6712) a respective contact with an intensity above the control-activation intensity threshold. In some embodiments, the first gesture includes (6714) a press input corresponding to the respective contact. In some embodiments, the first gesture includes (6716) a press input corresponding to the respective contact and liftoff of the respective contact. In some embodiments, the press input is a stationary press input. For example, as explained with reference to Figures 14A-14D, a gesture (e.g., including a stationary contact 6614) is detected on touch-sensitive surface 451 while cursor 6610 is on a respective portion of the border region that does not include any

visible controls. As another example, as explained with reference to Figures 14H-14K, a gesture (e.g., including a stationary contact 6620) is detected on touch-sensitive display 112 while contact 6620 is on a respective portion of the border region that does not include any visible controls.

[00295] In response (6718) to detecting the first gesture, in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold (e.g., even though the first gesture includes a contact with an intensity greater than the control-activation intensity threshold), the device forgoes (6720) performing the respective operation on the content. For example, as explained with reference to Figure 14C, at time T1 (while cursor 6610 is positioned on display 450 on a respective portion of the border region 6606 that does not include any visible controls), since the intensity of the contact 6614 on the touch-sensitive surface 451 does not exceed the border-activation intensity threshold (e.g., “IT_D”), even though the intensity of contact 6614 exceeds the control-activation intensity threshold (e.g., “IT_L”), the device does not perform (e.g., the device forgoes performing) the respective operation (e.g., scrolling of the photo album).

[00296] In contrast, in response (6718) to detecting the first gesture, in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold (e.g., “IT_D”) that is higher than the control-activation intensity threshold (e.g., “IT_L”), the device performs (6722) a respective operation on the content. In some embodiments, the plurality of visible controls include (6724) one or more controls for performing operations other than the respective operation. For example as shown in Figures 14A-14K, the respective operation corresponds to a scrolling-down of the photo album. In this example, application window 6604 includes a plurality of visible controls for performing operations other than a scrolling-down of the photo album (e.g., control 6608-1 corresponds to a scrolling-up of the photo album, control 6609-1 corresponds to a ‘display previous album’ operation, control 6609-2 corresponds to a ‘display next album’ operation).

[00297] In some embodiments, the respective operation is (6726) a scrolling operation. In some embodiments, a direction of the scrolling operation depends (6728) on location of the respective portion of the border region that does not include any visible controls relative to the content. For example, as explained with reference to Figure 14L, if the intensity of the contact exceeds border-activation intensity threshold (e.g., “IT_D”) while the focus selector is over a top portion of the border region (e.g., focus selector corresponding to contact 6622-2,

Figure 14L), the device performs a scroll up operation; on the other hand, if the intensity of the contact exceeds border-activation intensity threshold (e.g., “IT_D”) while the focus selector is over a bottom portion of the border region (e.g., focus selector corresponding to contact 6622-1, Figure 14L), the device performs a scroll down operation.

[00298] In some embodiments, performing the respective operation in response to detecting the first gesture on the touch-sensitive surface while the focus selector is on the respective portion of the border region includes (6730) scrolling the content at a speed determined in accordance with the intensity of the respective contact. For example, the scrolling speed increases as the intensity of the respective contact increases. In the example shown in Figure 14D, between time T2 and T3 when the intensity of the contact 6614 exceeds the border-activation intensity threshold, the speed of scrolling would first increase (e.g., content would scroll faster) as the intensity of contact 6614 increases (between time T2 and T”) and then the speed of scrolling would decrease (e.g., content would scroll slower) as the intensity of contact 6614 decreases (between time T” and T3). In some embodiments, performing the respective operation in response to detecting the first gesture on the touch-sensitive surface while the focus selector is on the respective portion of the border region includes (6732) scrolling the content by a predefined amount for the first gesture. For example, the scrolling includes advancing the content by one page each time the user presses on the “chrome” (e.g., the border region) with an intensity of contact above the border-activation intensity threshold (e.g., “IT_D”). For example, as explained with reference to Figure 14D, when contact 6614 has an intensity that is above the border-activation intensity threshold (e.g., “IT_D”), the content is advanced by one page (e.g., from the page that includes thumbnails for Image 1 through Image 6 to the next page that includes thumbnails for Image 7 through Image 12) each time the user presses on the touch-sensitive surface 451 with an intensity above the border-activation intensity threshold (e.g., “IT_D”) while cursor 6610 is on a respective portion of the border region 6606 that does not include any visible controls.

[00299] In some embodiments, the plurality of visible controls include (6734) a respective control for performing the respective operation that is responsive to a corresponding gesture that includes at least one contact with an intensity above a control-activation intensity threshold (e.g., “IT_L”). In some embodiments, the respective control is (6736) a scroll arrow. In some embodiments, the respective control is (6738) a thumb in a slider control. For example as shown in Figures 14E-14G, the respective operation corresponds to a scrolling-down of the photo album. In this example, application window

6604 includes control 6608-2 for performing the respective operation (e.g., in this example, scroll arrow 6608-2 is a control for scrolling the photo album down to reveal additional photos) that is responsive to a gesture that includes a contact (e.g., contact 6616 in Figures 14F-14G) with an intensity above a control-activation intensity threshold (e.g., even if the intensity of contact 6616 is lower than the border-activation intensity threshold). In some embodiments, the respective control (e.g., control 6608-2, Figures 14E-14G) is responsive to a corresponding gesture that includes a contact (e.g., contact 6616, Figure 14G) without regard to whether or not the contact has an intensity above the border-activation intensity threshold (e.g., “IT_D”), as long as the contact has an intensity above a control-activation intensity threshold (e.g., “IT_L”), where the control-activation intensity threshold is lower than the border-activation intensity threshold.

[00300] In some embodiments, the device detects (6740) a second gesture that includes a contact with a maximum intensity above the control-activation intensity (e.g., “IT_L”) threshold and below the border-activation intensity threshold (e.g., “IT_D”) while a focus selector is over or proximate to the respective control, and in response to detecting the second gesture, the device performs (6742) the respective operation on the content. For example, as explained with reference to Figures 14E-14G, the control (e.g., control 6608-2) for scrolling the content responds to gestures with contacts (e.g., contact 6616, Figure 14G) above a control-activation intensity threshold (e.g., “IT_L”), while as explained with reference to Figures 14A-14D, the “chrome” (e.g., border region 6606) responds to gestures with contacts (e.g., contact 6614, Figure 14D) above a deep-press intensity threshold (e.g., “IT_D”) that is higher than a control-activation intensity threshold (e.g., “IT_L”).

[00301] While the example above is described with reference to detecting the first gesture on a respective portion of the border region that does not include any visible controls, operations analogous to operations 6718-6732 are, optionally, performed in response to detecting a first gesture on a respective portion of the border region that does not include visible controls that are activatable by the first gesture. For example, a next album button 6609-2 is activatable in response to a tap gesture (e.g., a contact detected for less than a tap-gesture time threshold such as 0.1, 0.2, 0.5, or 1 second or some other reasonable time threshold) and the first gesture is a press and hold input that includes a contact with a duration greater than the tap-gesture time threshold. When the device detects a tap and hold input while a focus selector is over next album button in this example (e.g., next album button 6609-2 in Figure 14D), the device performs an operation associated with the first

gesture (e.g., scrolling the images upward) instead of performing an operation associated with the next album button (e.g., switching from displaying the current album to displaying a next album).

[00302] It should be understood that the particular order in which the operations in Figures 15A-15B 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 [0057]) are also applicable in an analogous manner to method 6700 described above with respect to Figures 15A-15B. For example, the contacts, gestures, controls, intensity thresholds, focus selectors described above with reference to method 6700 optionally have one or more of the characteristics of the contacts, gestures, controls, intensity thresholds, focus selectors described herein with reference to other methods described herein (e.g., those listed in paragraph [0057]). For brevity, these details are not repeated here.

[00303] In accordance with some embodiments, Figure 16 shows a functional block diagram of an electronic device 6800 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 16 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.

[00304] As shown in Figure 16, an electronic device 6800 includes a display unit 6802 configured to display an application window that includes content; a touch-sensitive surface unit 6804 configured to receive a contact on the touch-sensitive surface unit; one or more sensor units 6805 configured to detect intensity of contacts with the touch-sensitive surface unit; and a processing unit 6806 coupled to the display unit 6802, touch-sensitive surface unit 6804, and the sensor units 6805. In some embodiments, the processing unit 6806 includes a display enabling unit 6809, a detecting unit 6810, and a performing unit 6812.

[00305] The processing unit 6806 is configured to: enable display of the application window, where the application window includes a plurality of visible controls, wherein the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and the application window includes a border region, where one or more portions of the border region do not include any visible controls. The processing unit 6806 is further configured to detect a first gesture on the touch-sensitive surface unit 6804 while a focus selector is on a respective portion of the border region that does not include any visible controls, wherein the first gesture includes a respective contact with an intensity above the control-activation intensity threshold (e.g., with the detecting unit 6810); and in response to detecting the first gesture: in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, perform a respective operation on the content (e.g., with the performing unit 6812); and in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgo performing the respective operation on the content (e.g., with the performing unit 6812).

[00306] In some embodiments, the plurality of visible controls include one or more controls for performing operations other than the respective operation.

[00307] In some embodiments, the plurality of visible controls include a respective control for performing the respective operation that is responsive to a corresponding gesture that includes at least one contact with an intensity above a control-activation intensity threshold.

[00308] In some embodiments, the processing unit 6806 is configured to: detect a second gesture that includes a contact with a maximum intensity above the control-activation intensity threshold and below the border-activation intensity threshold while a focus selector is over or proximate to the respective control (e.g., with the detecting unit 6810); and in response to detecting the second gesture, perform the respective operation on the content (e.g., with the performing unit 6812).

[00309] In some embodiments, the respective control is a scroll arrow. In some embodiments, the respective control is a thumb in a slider control. In some embodiments, the respective operation is a scrolling operation. In some embodiments, a direction of the

scrolling operation depends on location of the respective portion of the border region that does not include any visible controls relative to the content. In some embodiments, performing the respective operation in response to detecting the first gesture on the touch-sensitive surface while the focus selector is on the respective portion of the border region includes scrolling the content at a speed determined in accordance with the intensity of the respective contact.

[00310] In some embodiments, performing the respective operation in response to detecting the first gesture on the touch-sensitive surface while the focus selector is on the respective portion of the border region includes scrolling the content by a predefined amount for the first gesture.

[00311] In some embodiments, the first gesture includes a press input corresponding to the respective contact.

[00312] In some embodiments, the first gesture includes a press input corresponding to the respective contact and liftoff of the respective contact.

[00313] 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.

[00314] The operations described above with reference to Figures 15A-15B are, optionally, implemented by components depicted in Figures 1A-1B or Figure 16. For example, displaying operation 6702, detecting operation 6710, and performing operation 6722 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 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.

Capturing Media

[00315] Many electronic devices include optical sensors (e.g., camera) and camera applications for capturing media (e.g., photos, video) with the optical sensors. The camera applications typically include autofocus capability. Sometimes, the user prefers to manually set an autofocus point for a camera rather than use an autofocus point automatically selected by the camera application. However, in some methods, once the user sets the autofocus point, the user has to make a non-continuous input to activate the shutter button. In the mean time, too much time may have passed, and the camera application may have intervened to automatically select a new autofocus point. The embodiments described below provide convenient and intuitive methods for allowing the user to activate media capture after setting an autofocus point without activating the shutter button. The user makes a contact at a location that corresponds to a location in a camera preview to set an autofocus point in the camera preview. While the contact continues to be detected, the user makes a press input with the contact to activate media capture in accordance with the set autofocus point. Thus, the user has more effective and efficient manual control of the autofocus point as desired.

[00316] Figures 17A-17N illustrate exemplary user interfaces for capturing media in accordance with some embodiments. The user interfaces in these figures are used to illustrate the processes described below, including the processes in Figures 18A-18C. Figures 17A-17N include intensity diagrams that show the current intensity of the contact on the touch-sensitive surface relative to a plurality of intensity thresholds including an input-detection intensity threshold (e.g., “IT₀”), a light press intensity threshold (e.g., “IT_L”), and a deep press intensity threshold (e.g., “IT_D”).

[00317] 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). The embodiments described with reference to Figures 17A-17G 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 17A-17G on the touch-sensitive display system 112 while displaying the user interfaces shown in Figures 17A-17G on the touch-sensitive display system 112; in such embodiments, namely the embodiments described with reference to Figures 17H-17N, 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 7216. The embodiments described with reference to Figures 18A-18C will be discussed with reference to display 450 and a separate touch-sensitive surface 451, and also with reference to touch-sensitive display system 112.

[00318] Figure 17A illustrates user interface 7202 for a camera application (e.g., camera module 143) displayed on display 450. User interface 7202 includes virtual shutter button 7204. Media (e.g., photo images, video) is, optionally, captured by the camera application, in conjunction with a camera (e.g., optical sensors 164) on the device or coupled to the device, in response to activation of virtual shutter button 7204.

[00319] In some embodiments, the device includes a physical shutter button (e.g., a dedicated physical shutter button, a physical button that serves as a shutter button as well as other functions) in addition to, or in lieu of, virtual shutter button 7204. As with virtual shutter button 7204, media is, optionally, captured by the camera application, in conjunction with the camera (e.g., optical sensors 164) on the device or coupled to the device, in response to activation of the physical shutter button.

[00320] User interface 7202 also includes a virtual mode switch 7206. While mode switch 7206 is under photo icon 7208, the camera application is in photo mode; while in photo mode, the camera application captures still images. While mode switch 7206 is under video icon 7210, the camera application is in video mode; while in video mode, the camera application captures video. The mode of the camera application (i.e., photo mode or video mode) is switched by toggling mode switch 7206 (e.g., in response to detection of an input (e.g., a gesture) on touch-sensitive surface 451 while a focus selector (e.g., cursor 7216) is located over mode switch 7206) so that mode switch 7206 is under the icon (photo icon 7208 or video icon 7210) corresponding to the desired mode. In Figure 17A, mode switch 7206 is under photo icon 7208; camera application is in photo mode.

[00321] Camera preview 7212 is displayed in user interface 7202. Camera preview 7212 shows a preview of the environment, objects, and subjects that are sensed by the optical

sensors (e.g., optical sensors 164, sometimes called a digital camera) on the device or coupled to the device prior to capture into media (e.g., one or more images and/or video). In other words, camera preview 7212 displays whatever content is sensed by the camera (e.g., optical sensors 164) in real time or near real time. In Figure 17A, camera preview 7212 includes subjects (e.g., persons, objects) 7214-1 and 7214-2.

[00322] A focus selector (e.g., cursor 7216) is displayed on display 450. In some embodiments cursor 7216 is a pointer (e.g., a mouse pointer). In Figure 17A, cursor 7216 is located at a location in camera preview 7212, away from virtual shutter button 7204.

[00323] In Figure 17B, contact 7218 is detected on touch-sensitive surface 451. Contact 7218 has an intensity above an input-detection intensity threshold (e.g., IT_0) and below a light press intensity threshold (e.g., IT_L). In response to detection of contact 7218, a location in camera preview 7212 corresponding to the focus selector (e.g., cursor 7216) is set as an autofocus reference point, marked in camera preview 7212 on display 450 by autofocus reference point marker 7220, as shown in Figure 17B.

[00324] After the autofocus reference point is set, contact 7218 continues to be detected on touch-sensitive surface 451. A press input that includes an increase in the intensity of contact 7218 above the light press intensity threshold (e.g., IT_L) is detected, as shown in Figure 17C. In response to detection of the press input with the increase in the intensity of contact 7218, the device captures media (e.g., an image that includes content sensed by optical sensors 164 and shown in camera preview 7212 at the moment of capture) with the camera application, in accordance with the autofocus reference point marked by autofocus reference point marker 7220 in Figure 17C. Since the camera application is in photo mode, the device captures an image (e.g., a photo) with focus on the set autofocus reference point.

[00325] In some embodiments, there are multiple thresholds above the input-detection intensity threshold. For example, in Figures 17A-17G there are, besides the input-detection intensity threshold, the light press intensity threshold (e.g., IT_L) and a deep press intensity threshold (e.g., IT_D) higher than the light press intensity threshold. In some embodiments, the device captures a single image or multiple sequential images with the camera application in accordance with the intensity with respect to the light press and deep press intensity thresholds (e.g., IT_L and IT_D respectively). For example, in accordance with a determination that the intensity of contact 7218 is between the light press intensity threshold (e.g., IT_L) and

the deep press intensity threshold (e.g., IT_D), as in Figure 17C, the device captures a single image per press input (e.g., increase of contact from an intensity below IT_L to an intensity above IT_L) in accordance with the marked autofocus reference point. In accordance with a determination that the intensity of the contact is above the deep press intensity threshold (e.g., contact 7221 (Figure 17D)), which is analogous to contact 7218 except that the press input performed with contact 7221 includes an increase in the intensity of contact 7221 from an intensity below IT_L to an intensity above the deep press threshold IT_D), the device captures multiple sequential images (e.g., the device captures 5 images in burst photo mode) in accordance with the autofocus reference point marked by autofocus reference point marker 7220 in Figure 17D.

[00326] If mode switch 7206 is under video icon 7210 (e.g., the camera application is in video mode) while the contact and press input (e.g., contact 7222 and the press input performed with contact 7222 (Figure 17E) including an increase in intensity of contact 7222 from an intensity below IT_L to an intensity above IT_L , which are analogous to contact 7218 and the press input performed with contact 7218) are detected, the device starts capturing (e.g., recording) video with the camera application in accordance with the autofocus reference point marked by autofocus reference point marker 7220 in Figure 17E.

[00327] Additional press inputs are, optionally, detected. For example, Figure 17F illustrates contact 7224 detected on touch-sensitive display 451 while cursor 7216 is located at a location over virtual shutter button 7204 (e.g., cursor 7216 is moved from the location in Figure 17E in response to detecting movement 7223 of contact 7224 downward on the touch-sensitive surface 451, as shown in Figure 17F). In Figure 17F, contact 7224 has an intensity below the light press intensity threshold (e.g., IT_L). A press input that includes an increase in the intensity of contact 7224 above the light press intensity threshold (e.g., IT_L) is detected, as shown in Figure 17G. In response to detecting the press input performed with contact 7224, in accordance with the determination that cursor 7216 is located over virtual shutter button 7204 (and thus the press input is at a location that corresponds to virtual shutter button 7204), the device automatically, without user intervention, selects (e.g., based on face recognition, object detection, etc.) subject 7214-2 as an autofocus reference point, and captures media in accordance with the automatically selected autofocus reference point (marked by autofocus reference marker 7220 in Figure 17G), as shown in Figures 17F-17G.

[00328] In contrast, if contact 7224 and the press input performed with contact 7224 are detected while cursor 7216 is located at a location in camera preview 7212 (e.g., the

location of cursor 7216 shown in Figure 17B) instead of over virtual shutter button 7204, then the location of cursor 7216 in camera preview 7212 is set as the autofocus reference point and the device captures media with the set autofocus reference point, similar to the capture of media described above with reference to Figures 17A-17C.

[00329] Figure 17H illustrates user interface 7202 displayed on touch screen 112. User interface 7202 includes virtual shutter button 7204 mode switch 7206, photo icon 7208, video icon 7210, and camera preview 7212 with subjects 7214. The details of these elements are described above with reference to Figure 17A, and are not repeated here.

[00330] In Figure 17I, contact 7230 is detected on touch screen 112 at a location in camera preview 7212. Contact 7230 in Figure 17I is analogous to contact 7218 in Figure 17B, except that contact 7230 also serves as the focus selector in place of cursor 7216. In response to detection of contact 7230, the location of contact 7230 in camera preview 7212 is set as an autofocus reference point, marked in camera preview 7212 on touch screen 112 by autofocus reference point marker 7220, as shown in Figure 17I.

[00331] After the autofocus reference point is set, contact 7230 continues to be detected on touch screen 112. A press input that includes an increase in the intensity of contact 7230 from an intensity between the input-detection intensity threshold IT_0 and the light press intensity threshold IT_L to an intensity above the light press intensity threshold IT_L is detected, as shown in Figure 17J. In response to detection of the press input with the increase in the intensity of contact 7218, the device captures an image with the camera application, in accordance with the autofocus reference point marked by autofocus reference point marker 7220 in Figure 17J.

[00332] If the press input increased the intensity of the contact above the deep press intensity threshold (e.g., contact 7232 and its corresponding press input including an increase in intensity of contact 7232 from an intensity below IT_L to an intensity above IT_D , which are analogous to contact 7221 and its corresponding press input (Figure 17D)), the device captures multiple sequential images (e.g., the device captures 5 images in burst mode) in accordance with the autofocus reference point marked by autofocus reference point marker 7220, as shown in Figure 17K.

[00333] If mode switch 7206 is under video icon 7210 e.g., the camera application is in video mode) while the contact and press input (e.g., contact 7234 and the press input performed with contact 7234 (Figure 17L) that includes an increase in intensity of contact

7234 from an intensity below IT_L to an intensity above IT_L , which are analogous to contact 7222 and the press input performed with contact 7222) are detected, the device starts capturing (e.g., recording) video with the camera application in accordance with the autofocus reference point marked by autofocus reference point marker 7220 in Figure 17L.

[00334] Figure 17M illustrates contact 7236 detected on touch screen 112, at location over virtual shutter button 7204. A press input that increases the intensity of contact 7236 above the light press intensity threshold (e.g., IT_L) is detected, as shown in Figure 17N. Contact 7236 and the press input performed with contact 7236 are analogous to contact 7224 and the press input performed with contact 7224. In response to detecting the press input performed with contact 7236, in accordance with the determination that contact 7236 is located over virtual shutter button 7204, the device automatically, without user intervention, selects subject 7214-2 as the autofocus reference point, and captures media in accordance with the automatically selected autofocus reference point (marked by autofocus reference marker 7220).

[00335] In contrast, if contact 7236 and the press input performed with contact 7236 are detected at a location in camera preview 7212 (e.g., the location of contact 7234 in Figure 17L) instead of over virtual shutter button 7204, then the location of contact 7236 in camera preview 7212 is set as the autofocus reference point and the device captures media with the set autofocus reference point, similar to the capture of media described above with reference to Figures 17H-17J.

[00336] Figures 18A-18C are flow diagrams illustrating a method 7300 of capturing media in accordance with some embodiments. The method 7300 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 7300 are, optionally, combined and/or the order of some operations is, optionally, changed.

[00337] As described below, the method 7300 provides an intuitive way to capture media. The method reduces the cognitive burden on a user when capturing media, thereby creating a more efficient human-machine interface. For battery-operated electronic devices, enabling a user to capture media faster and more efficiently conserves power and increases the time between battery charges.

[00338] The device displays (7302), on the display, a camera preview in a camera application; (e.g., a still and/or video camera application). For example, in Figures 17A and 17H, camera preview 7212 is displayed in user interface 7202 for a camera application.

[00339] While displaying the camera preview on the display, the device detects (7304) a contact on the touch-sensitive surface, where the contact corresponds to a focus selector at a respective location in the camera preview. For example, in Figure 17B, contact 7218 is detected while cursor 7216 is located at a location in camera preview 7212. In Figure 17I, contact 7230 is detected on touch screen 112, at a location in camera preview 7212.

[00340] In response to detecting the contact on the touch-sensitive surface, the device sets (7310) the respective location in the camera preview as an autofocus reference point. The location of cursor 7216 in Figure 17B is set as an autofocus reference point marked by autofocus reference point marker 7220, as shown in Figure 17B. Similarly, the location of contact 7230 in Figure 17I is set as an autofocus reference point marked by autofocus reference point marker 7220, as shown in Figure 17I.

[00341] After setting (7312) the respective location in the camera preview as the autofocus reference point, the device continues (7314) to detect the contact on the touch-sensitive surface, detects (7316) a first press input that includes an increase in intensity of the contact above a first intensity threshold (e.g., IT_L), and in response to detecting the first press input, captures (7320) media with the camera application, where the camera application captures the media in accordance with the autofocus reference point. In some embodiments, media capture occurs in response to detecting the increase in intensity of the contact above the first intensity threshold (e.g., IT_L). In some embodiments, media capture occurs in response to detecting lift off of the contact, provided the intensity of the contact was above the first intensity threshold prior to detecting lift off (e.g., the first press input includes an increase in intensity above the first intensity threshold IT_L followed by lift off of the contact). For example, in Figure 17C, contact 7218 continues to be detected and a press input increases the intensity of contact 7218 above a first intensity threshold (e.g., IT_L). In response to detecting the press input performed with contact 7218, the device captures media with focus on the marked autofocus reference point. In Figure 17J, contact 7230 continues to be detected and a press input increases the intensity of contact 7230 above the first intensity threshold (e.g., IT_L). In response to detecting the press input performed with contact 7230, the device captures media with focus on the marked autofocus reference point 7220.

[00342] In some embodiments, the display is a touch screen display and the contact is detected at the respective location on the touch screen display (7306). For example, Figure 17H shows contact 7230 being detected on touch screen 112, at a location in camera preview 7212.

[00343] In some embodiments, the contact is detected (7308) at a location on the touch-sensitive surface that is remote from a virtual or physical camera shutter button (e.g., the camera application includes a virtual shutter button that is separate from the camera preview). For example, In Figure 17I, contact 7230 is detected at a location on touch screen 112 away from virtual shutter button 7204. As another example, in Figure 17B, contact 7218 is detected on touch-sensitive surface 451 while cursor 7216 is at a location on display 450, away from virtual shutter button 7204.

[00344] In some embodiments, the device includes sensors that are (7318) configured to detect a range of contact intensity from an input-detection intensity threshold at which a contact is detected as present on the touch-sensitive surface through a plurality of contact intensities that are higher than the input-detection intensity threshold, and the first intensity threshold is higher than the input-detection intensity threshold. For example, the embodiments described above include an input-detection intensity threshold (e.g., IT_0), a first intensity threshold (e.g., IT_L), and a second intensity threshold (e.g., IT_D).

[00345] In some embodiments, the device includes (7322) a camera, the media is an image, and capturing the media includes taking a photo with the camera. For example, the device includes optical sensors 164 and a camera application (e.g., camera module 143). When the camera application is in photo mode, as in Figures 17A-17C or Figures 17H-17J, for example, an image is captured with optical sensors 164 and the camera application in response to detection of the press input (e.g., the press input with an increase in the intensity of contact 7218 or 7230).

[00346] In some embodiments, the device includes (7324) a camera, the media is a video, and capturing the media includes beginning to record video with the camera. For example, the device includes optical sensors 164 and camera application 143. When the camera application is in video mode, as in Figure 17E or Figure 17L, for example, video recording is started optical sensors 164 and the camera application in response to detection of the press input (e.g., the press input with an increase in the intensity of contact 7222 or 7234).

[00347] In some embodiments, capturing the media includes: in accordance with a determination that the contact has an intensity between the first intensity threshold and a second intensity threshold (e.g., IT_D) that is higher than the first intensity threshold (e.g., IT_L) during the first press input, capturing (7326) a single image; and in accordance with a determination that the contact has an intensity above the second intensity threshold during the first press input, capturing (7328) multiple sequential images (e.g., when the device detects a “deep press,” the camera application enters a burst photo capture mode, a continuous photo capture mode, or a video capture mode, whereas when the device detects a normal press, the camera application takes a single photo). For example, in Figures 17C and 17J, a single image is captured in accordance with a determination that the intensity of contact 7218 and 7230, respectively, is increased to a level between the first intensity threshold (e.g., IT_L) and the second intensity threshold (e.g., IT_D). In Figures 17D and 17K, multiple sequential image are captured in accordance with a determination that the intensity of contact 7221 and 7232, respectively, is increased to a level above the second intensity threshold (e.g., IT_D).

[00348] In some embodiments, the device includes (7330) a camera shutter button (e.g., a virtual camera shutter button displayed on a touch screen display or a physical camera shutter button on the device). In some embodiments, the device detects (7332) a second press input on the device. In response to detecting the second press input on the device (7334) in accordance with a determination that the second press input is at a location that corresponds to the camera shutter button, the device automatically, without user intervention, selects (7336) an autofocus reference point remote from the camera shutter button and captures media in accordance with the autofocus reference point (e.g., the device selects the autofocus reference point based on an infrared rangefinder, facial recognition or other techniques to automatically detect a likely point of interest in the field of view of the camera and takes a picture in response to detecting a press input by the user on a camera shutter button that is remote from the autofocus reference point). In contrast, in response to detecting the second press input on the device (7334) in accordance with a determination that the second press input is at a user-selected location in the camera preview that is remote from the camera shutter button, the device sets (7338) the user-selected location in the camera preview as the autofocus reference point and captures media in accordance with the autofocus reference point (e.g., the user selects the autofocus reference point by placing a contact at the autofocus reference point and then takes a picture by pressing the contact harder on the touch screen at the autofocus reference point or by pressing the contact harder on the touch screen at the

autofocus reference point and then lifting off the contact). The devices shown in Figures 17A-17N include virtual shutter button 7204 and, optionally, a physical shutter button (not shown). In response to detection of a press input at a location corresponding to virtual shutter button 7204 (e.g., press input performed with contact 7224 (Figures 17F-17G) or 7236 (Figures 17M-17N)), an autofocus reference point in camera preview is automatically selected and media is captured in accordance with the selected autofocus reference point. In response to detection of a press input at a location corresponding to a location in camera preview 7212 (e.g., press input performed with contact 7218 (Figures 17B-17C) or 7230 (Figures 17I-17J)), the location in camera preview 7212 is set as the autofocus reference point and media is captured in accordance with the set autofocus reference point.

[00349] While the examples described herein have been described primarily with reference to an autofocus reference point, in some embodiments analogous operations are performed for other media capture settings. For example the location of an auto exposure reference point, a white balance reference point, and/or a filter reference point (e.g., a radial blur point or a vignette hotspot) could be set instead of, or in addition to, an autofocus reference point using the various approaches described above. Thus, in some embodiments the device displays, on the display, a camera preview in a camera application; and while displaying the camera preview on the display, the device detects a contact on the touch-sensitive surface, where the contact corresponds to a focus selector at a respective location in the camera preview. In response to detecting the contact on the touch-sensitive surface, the device sets the respective location in the camera preview as media-capture setting reference point (e.g., a media-capture setting reference point for autofocus, auto exposure, white balance and/or one or more media filters). After setting the respective location in the camera preview as the media-capture setting reference point, the device continues to detect the contact on the touch-sensitive surface, detects a first press input that includes an increase in intensity of the contact above a first intensity threshold. In response to detecting the first press input, the device captures media with the camera application, where the camera application captures the media in accordance with the media-capture setting reference point. For example the device sets the respective location as the reference point for the autofocus, auto exposure, white balance and/or one or more media filter reference and takes a picture or video accordingly (e.g., based on autofocus, auto exposure, white balance or media filter settings based on the respective location in the media preview). In contrast, when a predefined shutter button of the media capture application is activated, the device

automatically selects the media-capture setting reference point (e.g., automatically, without user intervention, selecting an automatically selected location in the media preview as an autofocus, auto exposure, white balance, and/or media filter reference point)

[00350] In some embodiments different intensity thresholds set different media-capture setting reference points for different media-capture settings. For example when the focus selector is at a first location on the display the device detects an increase in intensity of the contact above a first intensity threshold (e.g., IT_L) and the device sets a first media-capture reference point at the first location for a first media-capture setting (e.g., an autofocus reference point). Subsequently when the focus selector is at a second location on the display (e.g., a location different from the first location determined based on movement of the contact that corresponds to movement of the focus selector) the device detects an increase in intensity of the contact above a second intensity threshold (e.g., IT_D) and the device sets a second media-capture reference point (e.g., different from the first media-capture reference point) at the second location for a second media-capture setting different from the first media-capture setting (e.g., an auto exposure, white balance, or filter reference point). In some embodiments, the media is captured in response to detecting the increase in intensity of the contact above the second intensity threshold. In some embodiments, the media is captured in response to detecting an increase in intensity of the contact above a third intensity threshold that is greater than the second intensity threshold. In some embodiments, there are N intensity thresholds each of which corresponds to setting a different media-capture setting, where N is an integer between 1 and 10. In some embodiments, there are $N+1$ intensity thresholds, where the first N intensity thresholds each correspond to a different media-capture setting and the $N+1^{th}$ intensity threshold corresponds to a media capture input that, when detected by the device, causes the device to capture media in accordance with the various media-capture settings set at lower. The ability to set multiple different media-capture settings at different locations with a single continuous contact enables a user to quickly and intuitively apply multiple different settings to media capture rather than having to navigate through a complex set of menus and settings. Improving the speed and efficiency of changing media capture settings is especially important in media capture applications such as still image capture and video capture applications, where a delay in changing the appropriate settings may cause the operator of the device to “miss the moment” or fail to get a desired photo or video. Thus, the quick and intuitive media-capture setting features described above can dramatically improve

user experience by enabling a user to control a larger range of media-capture settings without “missing the moment.”

[00351] It should be understood that the particular order in which the operations in Figures 18A-18C 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 [0057]) are also applicable in an analogous manner to method 7300 described above with respect to Figures 18A-18C. For example, the contacts, intensity thresholds, and focus selectors described above with reference to method 7300 optionally have one or more of the characteristics of the contacts, intensity thresholds, and focus selectors described herein with reference to other methods described herein (e.g., those listed in paragraph [0057]). For brevity, these details are not repeated here.

[00352] In accordance with some embodiments, Figure 19 shows a functional block diagram of an electronic device 7400 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 19 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.

[00353] As shown in Figure 19, an electronic device 7400 includes a display unit 7402 configured to display, on the display unit 7402, a camera preview in a camera application; a touch-sensitive surface unit 7404 configured to receive contacts; one or more sensors configured to detect intensity of contacts with the touch-sensitive surface unit 7404; and a processing unit 7408 coupled to the display unit 7402, the touch-sensitive surface unit 7404, and the sensors. In some embodiments, the processing unit 7408 includes a detecting unit 7410, a setting unit 7412, a capturing unit 7414, and a selecting unit 7416.

[00354] The processing unit 7408 is configured to: while enabling display of the camera preview on the display unit 7402, detect a contact on the touch-sensitive surface unit

7404 (e.g., with the detecting unit 7410), where the contact corresponds to a focus selector at a respective location in the camera preview; in response to detecting the contact on the touch-sensitive surface unit 7404, set the respective location in the camera preview as an autofocus reference point (e.g., with the setting unit 7412); and after setting the respective location in the camera preview as the autofocus reference point: continue to detect the contact on the touch-sensitive surface unit 7404 (e.g., with the detecting unit 7410), detect a first press input that includes an increase in intensity of the contact above a first intensity threshold (e.g., IT_L) (e.g., with the detecting unit 7410), and in response to detecting the first press input, capture media with the camera application (e.g., with the capturing unit 7414), wherein the camera application captures the media in accordance with the autofocus reference point.

[00355] In some embodiments, the display unit 7402 is a touch screen display and the contact is detected at the respective location on the touch screen display.

[00356] In some embodiments, the contact is detected at a location on the touch-sensitive surface unit 7404 that is remote from a virtual or physical camera shutter button.

[00357] In some embodiments, the device includes a camera shutter button, and the processing unit 7408 is configured to: detect a second press input on the device (e.g., with the detecting unit 7410); and in response to detecting the second press input on the device: in accordance with a determination that the second press input is at a location that corresponds to the camera shutter button, automatically, without user intervention, select an autofocus reference point remote from the camera shutter button (e.g., with the selecting unit 7416) and capture media in accordance with the autofocus reference point (e.g., with the capturing unit 7414), and in accordance with a determination that the second press input is at a user-selected location in the camera preview that is remote from the camera shutter button, set the user-selected location in the camera preview as the autofocus reference point (e.g., with the setting unit 7412) and capture media in accordance with the autofocus reference point (e.g., with the capturing unit 7414).

[00358] In some embodiments, the device includes a camera, the media is an image, and capturing the media includes taking a photo with the camera.

[00359] In some embodiments, the device includes a camera, the media is a video, and capturing the media includes beginning to record video with the camera.

[00360] In some embodiments, the device includes sensors that are configured to detect a range of contact intensity from an input-detection intensity threshold (e.g., IT_0) at

which a contact is detected as present on the touch-sensitive surface unit 7404 through a plurality of contact intensities that are higher than the input-detection intensity threshold, and the first intensity threshold is higher than the input-detection intensity threshold.

[00361] In some embodiments, capturing the media includes: in accordance with a determination that the contact has an intensity between the first intensity threshold (e.g., IT_L) and a second intensity threshold (e.g., IT_D) that is higher than the first intensity threshold during the first press input, capturing a single image, and in accordance with a determination that the contact has an intensity above the second intensity threshold during the first press input, capturing multiple sequential images.

[00362] 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.

[00363] The operations described above with reference to Figures 18A-18C are, optionally, implemented by components depicted in Figures 1A-1B or Figure 19. For example, detection operations 7304, 7314 and 7316, setting operation 7310, and capturing operation 7320 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 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.

[00364] 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 [0057]) 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 [0057]) 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 [0057]). 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.

[00365] 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.

What is claimed is:

1. A method, comprising:
at an electronic device with a touch-sensitive surface and a display, wherein the device includes one or more sensors to detect intensity of contacts with the touch-sensitive surface:
displaying, on the display, a first control for controlling a first operation;
detecting, on the touch-sensitive surface, a first input that corresponds to the first control; and
in response to detecting the first input:
in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, performing the first operation; and
in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, displaying a second control for performing a second operation associated with the first operation.
2. The method of claim 1, wherein displaying the second control includes replacing at least a portion of the first control with the second control.
3. The method of any of claims 1-2, wherein the second control is a control for adjusting a parameter of the first operation.
4. The method of any of claims 1-3, wherein:
the first control includes a button; and
the second control includes a slider.
5. The method of any of claims 1-4, wherein the second control is a control for performing an operation that includes one or more steps in common with the first operation.
6. The method of any of claims 1-5, including:
detecting a second input on the touch-sensitive surface; and
in response to detecting the second input, performing the second operation corresponding to the second control.
7. The method of claim 6, wherein the first input and the second input are part of a multi-part gesture that includes at least one continuously detected contact.

8. The method of any of claims 1-7, including, after displaying the second control:
detecting a decrease in intensity of the contact below an intensity threshold that meets second control display criteria; and
in response to detecting the decrease in intensity of the contact, ceasing to display the second control on the display.
9. The method of any of claims 1-8, wherein:
the first operation includes turning a visual effect on or off; and
the second operation includes adjusting a magnitude of the visual effect.
10. The method of any of claims 1-8, wherein:
the first operation includes controlling media playback at a default playback speed;
and
the second operation includes navigating through the media at a respective speed that is different from the default playback speed.
11. The method of any of claims 1-8, wherein:
the first operation includes turning a timer on or off; and
the second operation includes setting a time of the timer.
12. The method of any of claims 1-8, wherein:
the first operation includes turning an alarm on or off; and
the second operation includes setting a time for the alarm.
13. An electronic device, comprising:
a display;
a touch-sensitive surface;
one or more sensors to detect intensity of contacts with the touch-sensitive surface;
one or more processors;
memory; 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:
displaying, on the display, a first control for controlling a first operation;
detecting, on the touch-sensitive surface, a first input that corresponds to the first control; and

in response to detecting the first input:

in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, performing the first operation; and

in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, displaying a second control for performing a second operation associated with the first operation.

14. 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 intensity of contacts with the touch-sensitive surface, cause the device to:

display, on the display, a first control for controlling a first operation;

detect, on the touch-sensitive surface, a first input that corresponds to the first control;

and

in response to detecting the first input:

in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, perform the first operation; and

in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, display a second control for performing a second operation associated with the first operation.

15. A graphical user interface on an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising:

a first control for controlling a first operation;

wherein:

a first input that corresponds to the first control is detected on the touch-sensitive surface,

in response to detecting the first input:

in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, first operation is performed; and

in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, a second control is displayed for performing a second operation associated with the first operation.

16. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

and

means for displaying, on the display, a first control for controlling a first operation;

means for detecting, on the touch-sensitive surface, a first input that corresponds to the first control; and

means, responsive to detecting the first input, for:

in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, performing the first operation; and

in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, displaying a second control for performing a second operation associated with the first operation.

17. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for displaying, on the display, a first control for controlling a first operation;

means for detecting, on the touch-sensitive surface, a first input that corresponds to the first control; and

means, responsive to detecting the first input, for:

in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, performing the first operation; and

in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, displaying a second control for performing a second operation associated with the first operation.

18. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

one or more processors;

memory; 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 1-12.

19. 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 intensity of contacts with the touch-sensitive surface, cause the device to perform any of the methods of claims 1-12.

20. A graphical user interface on an electronic device with a display, a touch-sensitive surface, one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising user interfaces displayed in accordance with any of the methods of claims 1-12.

21. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

and

means for performing any of the methods of claims 1-12.

22. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for performing any of the methods of claims 1-12.

23. An electronic device, comprising:
- a display unit configured to display a first control for controlling a first operation;
 - a touch-sensitive surface unit configured to receive a contact on the touch-sensitive surface unit;
 - one or more sensor units 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 sensor units, the processing unit configured to:
 - detect, on the touch-sensitive surface unit, a first input that corresponds to the first control; and
 - in response to detecting the first input:
 - in accordance with a determination that the first input meets first control-activation criteria but does not include a contact with a maximum intensity above a respective intensity threshold, perform the first operation; and
 - in accordance with a determination that the first input includes a contact with an intensity above the respective intensity threshold, enable display of a second control for performing a second operation associated with the first operation.
24. The electronic device of claim 23, wherein displaying the second control includes replacing at least a portion of the first control with the second control.
25. The electronic device of any of claims 23-24, wherein the second control is a control for adjusting a parameter of the first operation.
26. The electronic device of any of claims 23-25, wherein:
- the first control includes a button; and
 - the second control includes a slider.
27. The electronic device of any of claims 23-26, wherein the second control is a control for performing an operation that includes one or more steps in common with the first operation.
28. The electronic device of any of claims 23-27, wherein the processing unit is further configured to:
- detect a second input on the touch-sensitive surface unit; and

in response to detecting the second input, perform the second operation corresponding to the second control.

29. The electronic device of claim 28, wherein the first input and the second input are part of a multi-part gesture that includes at least one continuously detected contact.

30. The electronic device of any of claims 23-29, wherein the processing unit is further configured to, after displaying the second control:

detect a decrease in intensity of the contact below an intensity threshold that meets second control display criteria; and

in response to detecting the decrease in intensity of the contact, cease to enable display of the second control on the display unit.

31. The electronic device of any of claims 23-30, wherein:

the first operation includes turning a visual effect on or off; and

the second operation includes adjusting a magnitude of the visual effect.

32. The electronic device of any of claims 23-30, wherein:

the first operation includes controlling media playback at a default playback speed;

and

the second operation includes navigating through the media at a respective speed that is different from the default playback speed.

33. The electronic device of any of claims 23-30, wherein:

the first operation includes turning a timer on or off; and

the second operation includes setting a time of the timer.

34. The electronic device of any of claims 23-30, wherein:

the first operation includes turning an alarm on or off; and

the second operation includes setting a time for the alarm.

35. A method, comprising:

at an electronic device with a touch-sensitive surface and a display, wherein the device includes one or more sensors to detect intensity of contacts with the touch-sensitive surface:

displaying, on the display, an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window;

detecting a press input on the touch-sensitive surface while a focus selector is on the toolbar on the display; and

in response to detecting the press input, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold:

ceasing to display one or more of the first plurality of controls; and

displaying a second plurality of controls for adjusting properties of the electronic document, wherein the second plurality of controls includes one or more controls not included in the first plurality of controls.

36. The method of claim 35, wherein the second plurality of controls replaces the first plurality of controls.

37. The method of any of claims 35-36, wherein the second plurality of controls includes controls that are used less frequently than the first plurality of controls.

38. The method of any of claims 35-37, wherein the second plurality of controls is selected based at least in part on a location of the focus selector on the toolbar when the press input is detected.

39. The method of any of claims 35-38, wherein ceasing to display the one or more of the first plurality of controls includes displaying an animation of the toolbar rotating around an axis parallel to the display, so that a side of the toolbar that includes the first plurality of controls is rotated off of the display and a side of the toolbar that includes the second plurality of controls is rotated onto the display.

40. The method of any of claims 35-39, wherein:

the press input is detected while a focus selector is on an icon associated with a respective operation;

the second plurality of controls are controls associated with operations that are related to the respective operation; and

the method includes, in response to detecting the press input, in accordance with a determination that the press input meets control-activation criteria but does not include a

contact with a maximum intensity above the respective intensity threshold, performing the respective operation.

41. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

one or more processors;

memory; 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:

displaying, on the display, an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window;

detecting a press input on the touch-sensitive surface while a focus selector is on the toolbar on the display; and

in response to detecting the press input, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold:

ceasing to display one or more of the first plurality of controls; and

displaying a second plurality of controls for adjusting properties of the electronic document, wherein the second plurality of controls includes one or more controls not included in the first plurality of controls.

42. 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 intensity of contacts with the touch-sensitive surface, cause the device to:

display, on the display, an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window;

detect a press input on the touch-sensitive surface while a focus selector is on the toolbar on the display; and

in response to detecting the press input, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold:

cease to display one or more of the first plurality of controls; and

display a second plurality of controls for adjusting properties of the electronic document, wherein the second plurality of controls includes one or more controls not included in the first plurality of controls.

43. A graphical user interface on an electronic device with a display, a touch-sensitive surface, and one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising:

an application window; and

a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window;

wherein:

in response to detecting a press input on the touch-sensitive surface while a focus selector is on the toolbar on the display, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold:

one or more of the first plurality of controls cease to be displayed; and

a second plurality of controls for adjusting properties of the electronic document is displayed, wherein the second plurality of controls includes one or more controls not included in the first plurality of controls.

44. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

and

means for displaying, on the display, an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window;

means for detecting a press input on the touch-sensitive surface while a focus selector is on the toolbar on the display; and

means responsive to detecting the press input, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold, including:

means for ceasing to display one or more of the first plurality of controls; and

means for displaying a second plurality of controls for adjusting properties of the electronic document, wherein the second plurality of controls includes one or more controls not included in the first plurality of controls.

45. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface, and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for displaying, on the display, an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window;

means for detecting a press input on the touch-sensitive surface while a focus selector is on the toolbar on the display; and

means responsive to detecting the press input, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold, including:

means for ceasing to display one or more of the first plurality of controls; and

means for displaying a second plurality of controls for adjusting properties of the electronic document, wherein the second plurality of controls includes one or more controls not included in the first plurality of controls.

46. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

one or more processors;

memory; 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 35-40.

47. 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 intensity of contacts with the touch-sensitive surface, cause the device to perform any of the methods of claims 35-40.

48. A graphical user interface on an electronic device with a display, a touch-sensitive surface, one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising user interfaces displayed in accordance with any of the methods of claims 35-40.

49. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

and

means for performing any of the methods of claims 35-40.

50. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface, and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for performing any of the methods of claims 35-40.

51. An electronic device, comprising:

a display unit configured to display an application window and a toolbar that includes a first plurality of controls for adjusting properties of an electronic document displayed in the application window;

a touch-sensitive surface unit configured to receive press inputs;

one or more sensors 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 configured to:

detect a press input on the touch-sensitive surface unit while a focus selector is on the toolbar on the display unit; and

in response to detecting the press input, in accordance with a determination that the press input includes a contact with an intensity above a respective intensity threshold:

cease to display one or more of the first plurality of controls; and
enable display of a second plurality of controls for adjusting properties of the electronic document, wherein the second plurality of controls includes one or more controls not included in the first plurality of controls.

52. The electronic device of claim 51, wherein the second plurality of controls replaces the first plurality of controls.

53. The electronic device of any of claims 51-52, wherein the second plurality of controls includes controls that are used less frequently than the first plurality of controls.

54. The electronic device of any of claims 51-53, wherein the second plurality of controls are selected based at least in part on a location of the focus selector on the toolbar when the press input is detected.

55. The electronic device of any of claims 51-54, wherein ceasing to display the one or more of the first plurality of controls includes enabling display of an animation of the toolbar rotating around an axis parallel to the display unit, so that a side of the toolbar that includes the first plurality of controls is rotated off of the display unit and a side of the toolbar that includes the second plurality of controls is rotated onto the display unit.

56. The electronic device of any of claims 51-55, wherein:

the press input is detected while a focus selector is on an icon associated with a respective operation;

the second plurality of controls are controls associated with operations that are related to the respective operation; and

the processing unit is configured to, in response to detecting the press input, in accordance with a determination that the press input meets control-activation criteria but does not include a contact with a maximum intensity above the respective intensity threshold, perform the respective operation.

57. A method, comprising:

at an electronic device with a touch-sensitive surface and a display, wherein the device includes one or more sensors to detect intensity of contacts with the touch-sensitive surface:

displaying a text box including text, wherein the text includes more text than can be displayed in the text box;

while the focus selector is over the text box, detecting a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold; and

in response to detecting the first press input, displaying a previously undisplayed portion of the text.

58. The method of claim 57, wherein the text includes a song name in a playlist.

59. The method of any of claims 57-58, wherein displaying the previously undisplayed portion of the text includes expanding the text outside of a boundary of the text box.

60. The method of any of claims 57-58, wherein displaying the previously undisplayed portion of the text includes scrolling the text within the text box.

61. The method of claim 60, wherein the text is scrolled in the text box at a speed determined in accordance with an intensity of the contact.

62. The method of claim 60, wherein the text is scrolled in the text box at a fixed speed.

63. The method of claim 60, wherein the text is scrolled in the text box in accordance with a change in intensity of the contact.

64. The method of any of claims 57-63, including:

while the focus selector is over the text box, detecting a second press input corresponding to a contact on the touch-sensitive surface with a maximum intensity below the predefined activation threshold; and

in response to detecting the second press input, performing an operation associated with the text box without redisplaying the portion of the text that was displayed in response to the first press input.

65. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;
one or more processors;
memory; 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:

displaying a text box including text, wherein the text includes more text than can be displayed in the text box

while a focus selector is over the text box, detecting a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold; and

in response to detecting the first press input, displaying a previously undisplayed portion of the text.

66. 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 intensity of contacts with the touch-sensitive surface, cause the device to:

display a text box including text, wherein the text includes more text than can be displayed in the text box

while a focus selector is over the text box, detect a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold; and

in response to detection of the first press input, display a previously undisplayed portion of the text.

67. A graphical user interface on an electronic device with a display, a touch-sensitive surface, one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising:

a text box including text, wherein the text includes more text than can be displayed in the text box;

a focus selector;

wherein:

a previously undisplayed portion of the text is displayed, while a focus selector is over the text box, in response to detection of a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold.

68. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

and

means for displaying a text box including text, wherein the text includes more text than can be displayed in the text box;

means for, while the focus selector is over the text box, detecting a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold; and

means, responsive to detecting the first press input, for displaying a previously undisplayed portion of the text.

69. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for displaying a text box including text, wherein the text includes more text than can be displayed in the text box;

means for, while the focus selector is over the text box, detecting a first press input corresponding to a contact on the touch-sensitive surface with an intensity above a predefined activation threshold; and

means, responsive to detecting the first press input, for displaying a previously undisplayed portion of the text.

70. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

one or more processors;

memory; 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 57-64.

71. 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 intensity of contacts with the touch-sensitive surface, cause the device to perform any of the methods of claims 57-64.

72. A graphical user interface on an electronic device with a display, a touch-sensitive surface, one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising user interfaces displayed in accordance with any of the methods of claims 57-64.

73. An electronic device, comprising:
a display;
a touch-sensitive surface;
one or more sensors to detect intensity of contacts with the touch-sensitive surface;
and
means for performing any of the methods of claims 57-64.

74. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:
means for performing any of the methods of claims 57-64.

75. An electronic device, comprising:
a display unit configured to display a text box including text, wherein the text includes more text than can be displayed in the text box;
a touch-sensitive surface unit configured to receive a first press input corresponding to a contact on the touch-sensitive surface unit;
one or more sensor units 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 one or more sensor units, the processing unit configured to:

while a focus selector is over the text box, detect the first press input corresponding to the contact on the touch-sensitive surface unit with an intensity above a predefined activation threshold; and

in response to detection of the first press input, enable display of a previously undisplayed portion of the text.

76. The electronic device of claim 75, wherein the text includes a song name in a playlist.

77. The electronic device of any of claims 75-76, wherein the processing unit is further configured to enable display of the previously undisplayed portion of the text by expanding the text outside of a boundary of the text box.

78. The electronic device of any of claims 75-76, wherein the processing unit is further configured to enable display of the previously undisplayed portion of the text by scrolling the text within the text box.

79. The electronic device of claim 78, wherein the processing unit is further configured to scroll the text in the text box at a speed determined in accordance with an intensity of the contact.

80. The electronic device of claim 78, wherein the processing unit is further configured to scroll the text in the text box at a fixed speed.

81. The electronic device of claim 78, wherein the processing unit is further configured to scroll the text in the text box in accordance with a change in intensity of the contact.

82. The electronic device of claim 75-81, wherein:

the touch-sensitive surface unit is further configured to, while the focus selector is over the text box, detect a second press input corresponding to a contact on the touch-sensitive surface with a maximum intensity below the predefined activation threshold; and

the processing unit is further configured to, in response to detecting the second press input, perform an operation associated with the text box without redisplaying the portion of the text that was displayed in response to the first press input.

83. A method, comprising:

at an electronic device with a touch-sensitive surface and a display, wherein the device includes one or more sensors to detect intensity of contacts with the touch-sensitive surface:

displaying, on the display, an application window that includes content, wherein:

the application window includes a plurality of visible controls, wherein the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and

the application window includes a border region, wherein one or more portions of the border region do not include any visible controls;

detecting a first gesture on the touch-sensitive surface while a focus selector is on a respective portion of the border region that does not include any visible controls, wherein the first gesture includes a respective contact with an intensity above the control-activation intensity threshold; and

in response to detecting the first gesture:

in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, performing a respective operation on the content; and

in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgoing performing the respective operation on the content.

84. The method of claim 83, wherein the plurality of visible controls include one or more controls for performing operations other than the respective operation.

85. The method of any of claims 83-84, wherein the plurality of visible controls include a respective control for performing the respective operation that is responsive to a corresponding gesture that includes at least one contact with an intensity above a control-activation intensity threshold.

86. The method of claim 85, including:

detecting a second gesture that includes a contact with a maximum intensity above the control-activation intensity threshold and below the border-activation intensity threshold while a focus selector is over or proximate to the respective control; and

in response to detecting the second gesture, performing the respective operation on the content.

87. The method of any of claims 85-86, wherein the respective control is a scroll arrow.

88. The method of any of claims 85-86, wherein the respective control is a thumb in a slider control.

89. The method of any of claims 83-88, wherein the respective operation is a scrolling operation.

90. The method of claim 89, wherein a direction of the scrolling operation depends on location of the respective portion of the border region that does not include any visible controls relative to the content.

91. The method of any of claims 89-90, wherein performing the respective operation in response to detecting the first gesture on the touch-sensitive surface while the focus selector is on the respective portion of the border region includes scrolling the content at a speed determined in accordance with the intensity of the respective contact.

92. The method of any of claims 89-90, wherein performing the respective operation in response to detecting the first gesture on the touch-sensitive surface while the focus selector is on the respective portion of the border region includes scrolling the content by a predefined amount for the first gesture.

93. The method of any of claims 83-92, wherein the first gesture includes a press input corresponding to the respective contact.

94. The method of any of claims 83-92, wherein the first gesture includes a press input corresponding to the respective contact and liftoff of the respective contact.

95. An electronic device, comprising:
a display;
a touch-sensitive surface;
one or more sensors to detect intensity of contacts with the touch-sensitive surface;
one or more processors;
memory; 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:

displaying, on the display, an application window that includes content, wherein:

the application window includes a plurality of visible controls, wherein the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and

the application window includes a border region, wherein one or more portions of the border region do not include any visible controls;

detecting a first gesture on the touch-sensitive surface while a focus selector is on a respective portion of the border region that does not include any visible controls, wherein the first gesture includes a respective contact with an intensity above the control-activation intensity threshold; and

in response to detecting the first gesture:

in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, performing a respective operation on the content; and

in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgoing performing the respective operation on the content.

96. 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 intensity of contacts with the touch-sensitive surface, cause the device to:

display, on the display, an application window that includes content, wherein:

the application window includes a plurality of visible controls, wherein the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and

the application window includes a border region, wherein one or more portions of the border region do not include any visible controls;

detect a first gesture on the touch-sensitive surface while a focus selector is on a respective portion of the border region that does not include any visible controls, wherein the first gesture includes a respective contact with an intensity above the control-activation intensity threshold; and

in response to detecting the first gesture:

in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, perform a respective operation on the content; and

in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgo performing the respective operation on the content.

97. A graphical user interface on an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising:

an application window that includes content, wherein:

the application window includes a plurality of visible controls, wherein the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and

the application window includes a border region, wherein one or more portions of the border region do not include any visible controls;

wherein:

a first gesture is detected on the touch-sensitive surface while a focus selector is on a respective portion of the border region that does not include any visible controls, wherein the first gesture includes a respective contact with an intensity above the control-activation intensity threshold; and

in response to detecting the first gesture:

in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, a respective operation is performed on the content; and

in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, performing the respective operation on the content is forgone.

98. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

and

means for displaying, on the display, an application window that includes content, wherein:

the application window includes a plurality of visible controls, wherein the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and

the application window includes a border region, wherein one or more portions of the border region do not include any visible controls;

means for detecting a first gesture on the touch-sensitive surface while a focus selector is on a respective portion of the border region that does not include any visible controls, wherein the first gesture includes a respective contact with an intensity above the control-activation intensity threshold; and

means, responsive to detecting the first gesture, for:

in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, performing a respective operation on the content; and

in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgoing performing the respective operation on the content.

99. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for displaying, on the display, an application window that includes content, wherein:

the application window includes a plurality of visible controls, wherein the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and

the application window includes a border region, wherein one or more portions of the border region do not include any visible controls;

means for detecting a first gesture on the touch-sensitive surface while a focus selector is on a respective portion of the border region that does not include any visible controls, wherein the first gesture includes a respective contact with an intensity above the control-activation intensity threshold; and

means, responsive to detecting the first gesture, for:

in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, performing a respective operation on the content; and

in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgoing performing the respective operation on the content.

100. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

one or more processors;

memory; 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 83-94.

101. 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 intensity of contacts with the touch-sensitive surface, cause the device to perform any of the methods of claims 83-94.

102. A graphical user interface on an electronic device with a display, a touch-sensitive surface, one or more sensors to detect intensity of contacts with the touch-sensitive surface, a

memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising user interfaces displayed in accordance with any of the methods of claims 83-94.

103. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

and

means for performing any of the methods of claims 83-94.

104. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for performing any of the methods of claims 83-94.

105. An electronic device, comprising:

a display unit configured to display an application window that includes content;

a touch-sensitive surface unit configured to receive a contact on the touch-sensitive surface unit;

one or more sensor units 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 sensor units, the processing unit configured to:

enable display of the application window, wherein:

the application window includes a plurality of visible controls, wherein the plurality of visible controls include one or more controls that are responsive to corresponding gestures that include at least one contact with an intensity above a control-activation intensity threshold; and

the application window includes a border region, wherein one or more portions of the border region do not include any visible controls;

detect a first gesture on the touch-sensitive surface unit while a focus selector is on a respective portion of the border region that does not include any visible controls, wherein the first gesture includes a respective contact with an intensity above the control-activation intensity threshold; and

in response to detecting the first gesture:

in accordance with a determination that the respective contact has an intensity above a border-activation intensity threshold that is higher than the control-activation intensity threshold, perform a respective operation on the content; and

in accordance with a determination that the first gesture does not include any contact with a maximum intensity above the border-activation intensity threshold, forgo performing the respective operation on the content.

106. The electronic device of claim 105, wherein the plurality of visible controls include one or more controls for performing operations other than the respective operation.

107. The electronic device of any of claims 105-106, wherein the plurality of visible controls include a respective control for performing the respective operation that is responsive to a corresponding gesture that includes at least one contact with an intensity above a control-activation intensity threshold.

108. The electronic device of claim 107, wherein the processing unit is configured to:
detect a second gesture that includes a contact with a maximum intensity above the control-activation intensity threshold and below the border-activation intensity threshold while a focus selector is over or proximate to the respective control; and
in response to detecting the second gesture, perform the respective operation on the content.

109. The electronic device of any of claims 107-108, wherein the respective control is a scroll arrow.

110. The electronic device of any of claims 107-108, wherein the respective control is a thumb in a slider control.

111. The electronic device of any of claims 105-110, wherein the respective operation is a scrolling operation.

112. The electronic device of claim 111, wherein a direction of the scrolling operation depends on location of the respective portion of the border region that does not include any visible controls relative to the content.

113. The electronic device of any of claims 111-112, wherein performing the respective operation in response to detecting the first gesture on the touch-sensitive surface while the focus selector is on the respective portion of the border region includes scrolling the content at a speed determined in accordance with the intensity of the respective contact.

114. The electronic device of any of claims 111-112, wherein performing the respective operation in response to detecting the first gesture on the touch-sensitive surface while the focus selector is on the respective portion of the border region includes scrolling the content by a predefined amount for the first gesture.

115. The electronic device of any of claims 105-114, wherein the first gesture includes a press input corresponding to the respective contact.

116. The electronic device of any of claims 105-114, wherein the first gesture includes a press input corresponding to the respective contact and liftoff of the respective contact.

117. A method, comprising:

at an electronic device with a touch-sensitive surface and a display, wherein the device includes one or more sensors to detect intensity of contacts with the touch-sensitive surface:

displaying, on the display, a camera preview in a camera application;

while displaying the camera preview on the display, detecting a contact on the touch-sensitive surface, wherein the contact corresponds to a focus selector at a respective location in the camera preview;

in response to detecting the contact on the touch-sensitive surface, setting the respective location in the camera preview as an autofocus reference point; and

after setting the respective location in the camera preview as the autofocus reference point:

continuing to detect the contact on the touch-sensitive surface;

detecting a first press input that includes an increase in intensity of the contact above a first intensity threshold; and

in response to detecting the first press input, capturing media with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

118. The method of claim 117, wherein the display is a touch screen display and the contact is detected at the respective location on the touch screen display.

119. The method of any of claims 117-118, wherein the contact is detected at a location on the touch-sensitive surface that is remote from a virtual or physical camera shutter button.

120. The method of any of claims 117-119, wherein the device includes a camera shutter button; and the method includes:

detecting a second press input on the device; and

in response to detecting the second press input on the device:

in accordance with a determination that the second press input is at a location that corresponds to the camera shutter button, automatically, without user intervention, selecting an autofocus reference point remote from the camera shutter button and capturing media in accordance with the autofocus reference point; and

in accordance with a determination that the second press input is at a user-selected location in the camera preview that is remote from the camera shutter button, setting the user-selected location in the camera preview as the autofocus reference point and capturing media in accordance with the autofocus reference point.

121. The method of any of claims 117-120, wherein:

the device includes a camera;

the media is an image; and

capturing the media includes taking a photo with the camera.

122. The method of any of claims 117-120, wherein:

the device includes a camera;

the media is a video; and

capturing the media includes beginning to record video with the camera.

123. The method of any of claims 117-122, wherein:

the device includes sensors that are configured to detect a range of contact intensity from an input-detection intensity threshold at which a contact is detected as present on the touch-sensitive surface through a plurality of contact intensities that are higher than the input-detection intensity threshold; and

the first intensity threshold is higher than the input-detection intensity threshold.

124. The method of any of claims 117-123, wherein capturing the media includes:

in accordance with a determination that the contact has an intensity between the first intensity threshold and a second intensity threshold that is higher than the first intensity threshold during the first press input, capturing a single image; and

in accordance with a determination that the contact has an intensity above the second intensity threshold during the first press input, capturing multiple sequential images.

125. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

one or more processors;

memory; 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:

displaying, on the display, a camera preview in a camera application;

while displaying the camera preview on the display, detecting a contact on the touch-sensitive surface, wherein the contact corresponds to a focus selector at a respective location in the camera preview;

in response to detecting the contact on the touch-sensitive surface, setting the respective location in the camera preview as an autofocus reference point; and

after setting the respective location in the camera preview as the autofocus reference point:

continuing to detect the contact on the touch-sensitive surface;

detecting a first press input that includes an increase in intensity of the contact above a first intensity threshold; and

in response to detecting the first press input, capturing media with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

126. 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 intensity of contacts with the touch-sensitive surface, cause the device to:

- display, on the display, a camera preview in a camera application;

- while displaying the camera preview on the display, detect a contact on the touch-sensitive surface, wherein the contact corresponds to a focus selector at a respective location in the camera preview;

- in response to detecting the contact on the touch-sensitive surface, set the respective location in the camera preview as an autofocus reference point; and

- after setting the respective location in the camera preview as the autofocus reference point:

- continue to detect the contact on the touch-sensitive surface;

- detect a first press input that includes an increase in intensity of the contact above a first intensity threshold; and

- in response to detecting the first press input, capture media with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

127. A graphical user interface on an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising:

- a camera preview in a camera application;

- wherein:

- in response to detecting a contact on the touch-sensitive surface while displaying the camera preview on the display, wherein the contact corresponds to a focus selector at a respective location in the camera preview, the respective location in the camera preview is set as an autofocus reference point;

- after setting the respective location in the camera preview as the autofocus reference point:

- the contact continues to be detected on the touch-sensitive surface;

- a first press input that includes an increase in intensity of the contact above a first intensity threshold is detected; and

in response to detecting the first press input, media is captured with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

128. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

and

means for displaying, on the display, a camera preview in a camera application;

while displaying the camera preview on the display, means for detecting a contact on the touch-sensitive surface, wherein the contact corresponds to a focus selector at a respective location in the camera preview;

means, responsive to detecting the contact on the touch-sensitive surface, for setting the respective location in the camera preview as an autofocus reference point; and

means, for after setting the respective location in the camera preview as the autofocus reference point:

continuing to detect the contact on the touch-sensitive surface;

detecting a first press input that includes an increase in intensity of the contact above a first intensity threshold; and

in response to detecting the first press input, capturing media with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

129. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for displaying, on the display, a camera preview in a camera application;

while displaying the camera preview on the display, means for detecting a contact on the touch-sensitive surface, wherein the contact corresponds to a focus selector at a respective location in the camera preview;

means, responsive to detecting the contact on the touch-sensitive surface, for setting the respective location in the camera preview as an autofocus reference point; and

means for, after setting the respective location in the camera preview as the autofocus reference point:

continuing to detect the contact on the touch-sensitive surface;

detecting a first press input that includes an increase in intensity of the contact above a first intensity threshold; and

in response to detecting the first press input, capturing media with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

130. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;

one or more processors;

memory; 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 117-124.

131. 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 intensity of contacts with the touch-sensitive surface, cause the device to perform any of the methods of claims 117-124.

132. A graphical user interface on an electronic device with a display, a touch-sensitive surface, one or more sensors to detect intensity of contacts with the touch-sensitive surface, a memory, and one or more processors to execute one or more programs stored in the memory, the graphical user interface comprising user interfaces displayed in accordance with any of the methods of claims 117-124.

133. An electronic device, comprising:

a display;

a touch-sensitive surface;

one or more sensors to detect intensity of contacts with the touch-sensitive surface;
and

means for performing any of the methods of claims 117-124.

134. An information processing apparatus for use in an electronic device with a display, a touch-sensitive surface and one or more sensors to detect intensity of contacts with the touch-sensitive surface, comprising:

means for performing any of the methods of claims 117-124.

135. An electronic device, comprising:

a display unit configured to display, on the display unit, a camera preview in a camera application;

a touch-sensitive surface unit configured to receive 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 configured to:

while enabling display of the camera preview on the display unit, detect a contact on the touch-sensitive surface unit, wherein the contact corresponds to a focus selector at a respective location in the camera preview;

in response to detecting the contact on the touch-sensitive surface unit, set the respective location in the camera preview as an autofocus reference point; and

after setting the respective location in the camera preview as the autofocus reference point:

continue to detect the contact on the touch-sensitive surface unit;

detect a first press input that includes an increase in intensity of the contact above a first intensity threshold; and

in response to detecting the first press input, capture media with the camera application, wherein the camera application captures the media in accordance with the autofocus reference point.

136. The electronic device of claim 135, wherein the display unit is a touch screen display and the contact is detected at the respective location on the touch screen display.

137. The electronic device of any of claims 135-136, wherein the contact is detected at a location on the touch-sensitive surface unit that is remote from a virtual or physical camera shutter button.

138. The electronic device of any of claims 135-137, wherein the device includes a camera shutter button; and the processing unit is configured to:

detect a second press input on the device; and

in response to detecting the second press input on the device:

in accordance with a determination that the second press input is at a location that corresponds to the camera shutter button, automatically, without user intervention, select an autofocus reference point remote from the camera shutter button and capture media in accordance with the autofocus reference point; and

in accordance with a determination that the second press input is at a user-selected location in the camera preview that is remote from the camera shutter button, set the user-selected location in the camera preview as the autofocus reference point and capture media in accordance with the autofocus reference point.

139. The electronic device of any of claims 135-138, wherein:

the device includes a camera;

the media is an image; and

capturing the media includes taking a photo with the camera.

140. The electronic device of any of claims 135-138, wherein:

the device includes a camera;

the media is a video; and

capturing the media includes beginning to record video with the camera.

141. The electronic device of any of claims 135-140, wherein:

the device includes sensors that are configured to detect a range of contact intensity from an input-detection intensity threshold at which a contact is detected as present on the touch-sensitive surface unit through a plurality of contact intensities that are higher than the input-detection intensity threshold; and

the first intensity threshold is higher than the input-detection intensity threshold.

142. The electronic device of any of claims 135-141, wherein capturing the media includes:

in accordance with a determination that the contact has an intensity between the first intensity threshold and a second intensity threshold that is higher than the first intensity threshold during the first press input, capturing a single image; and

in accordance with a determination that the contact has an intensity above the second intensity threshold during the first press input, capturing multiple sequential images.

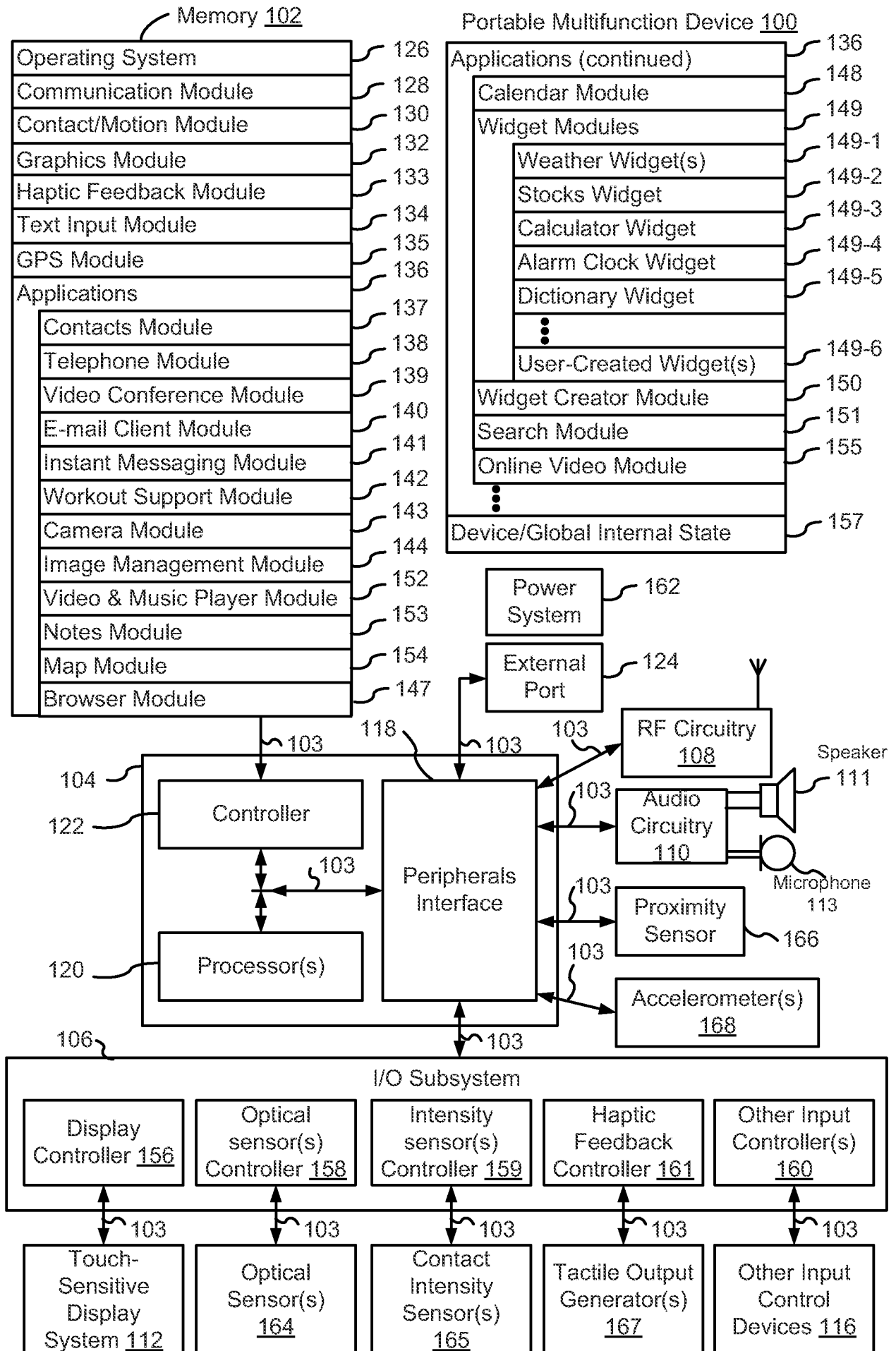


Figure 1A

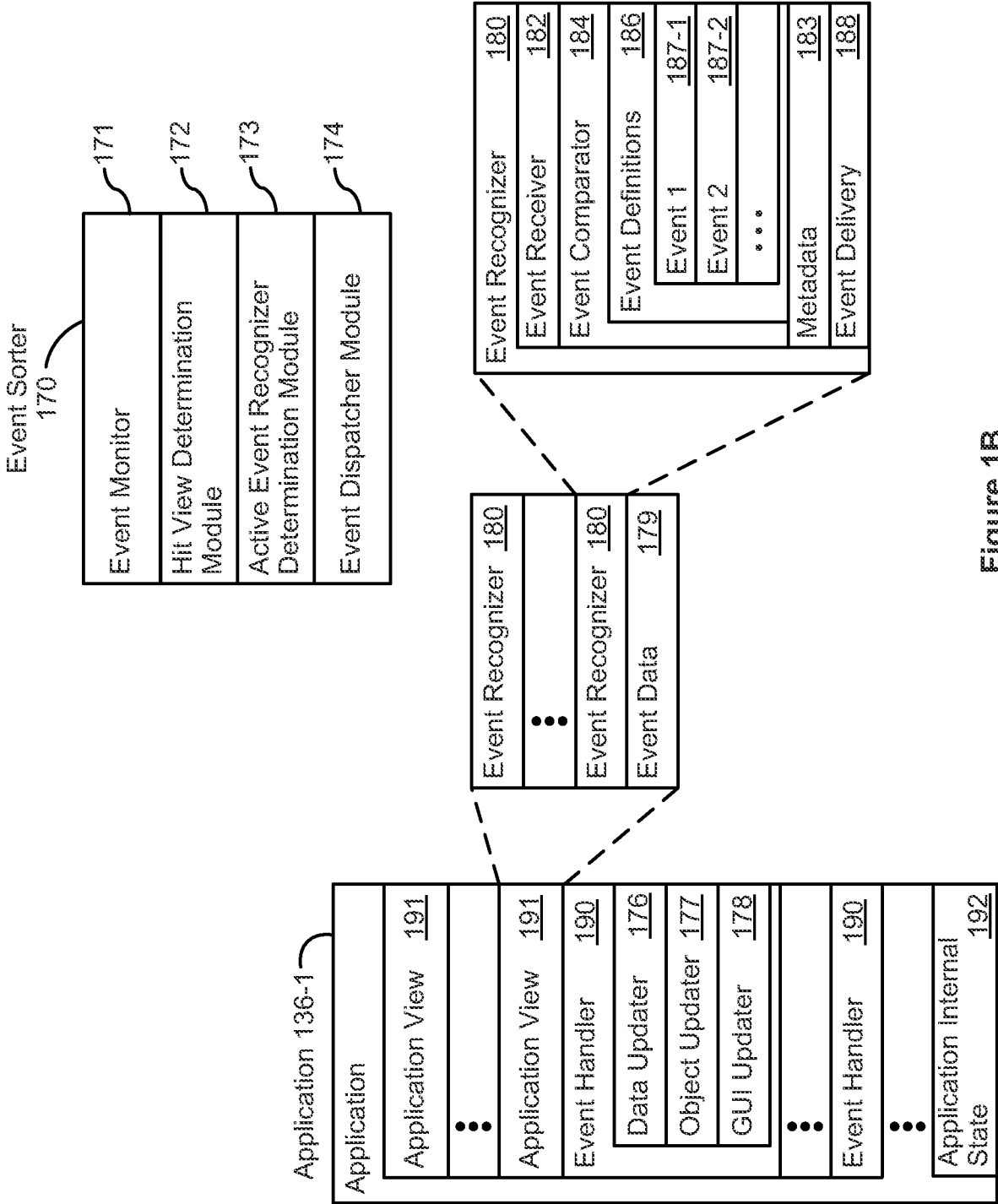


Figure 1B

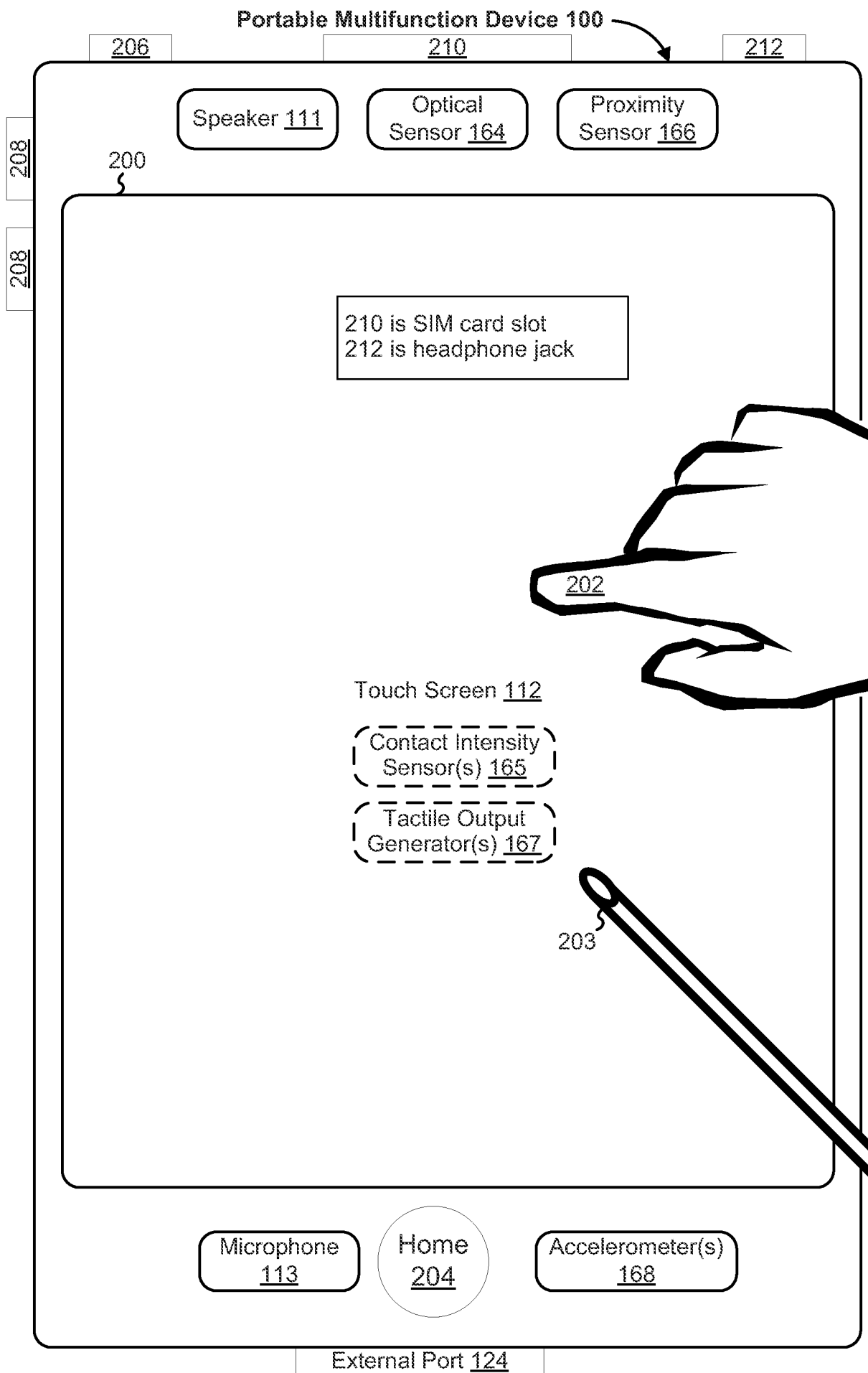


Figure 2

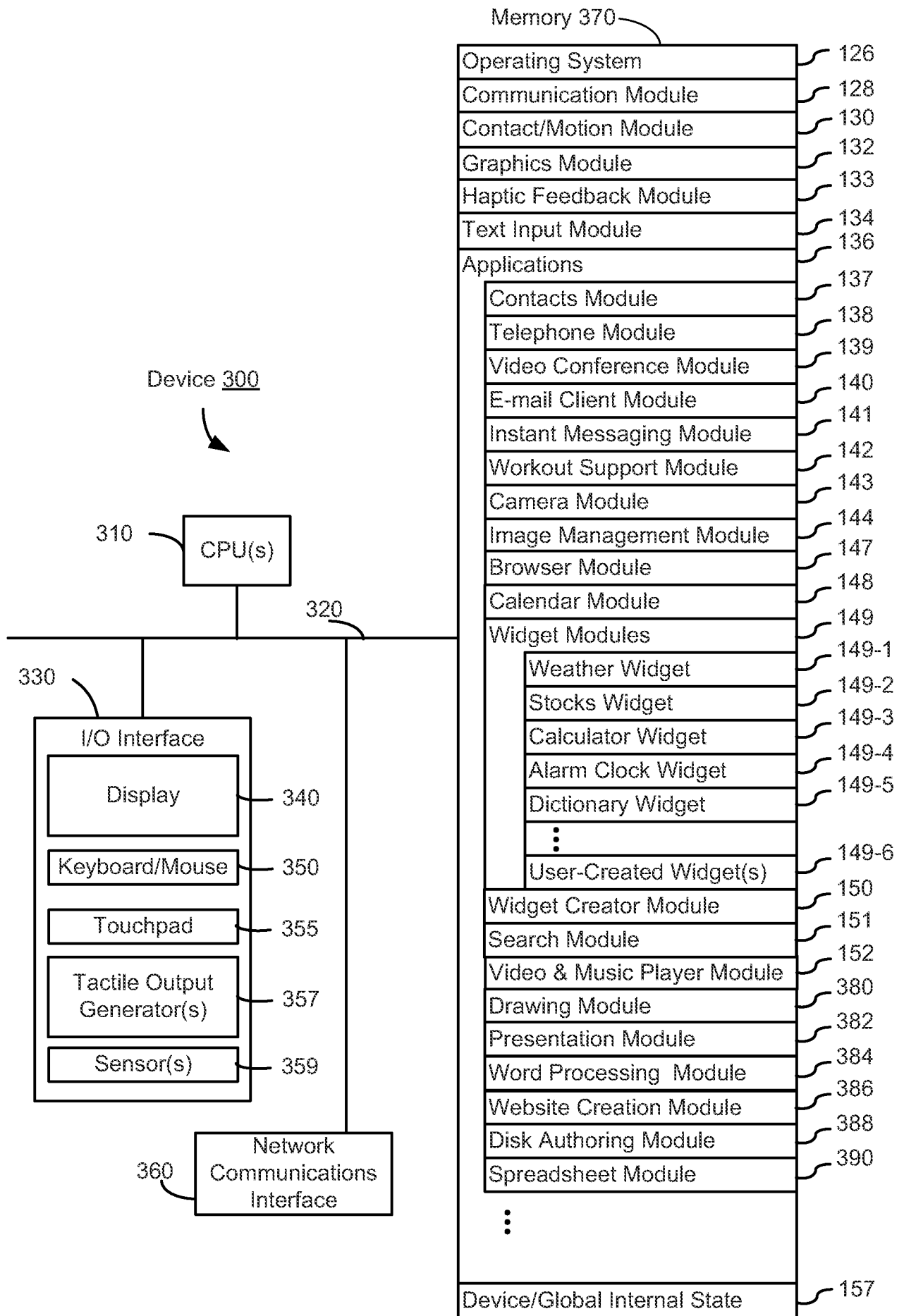


Figure 3

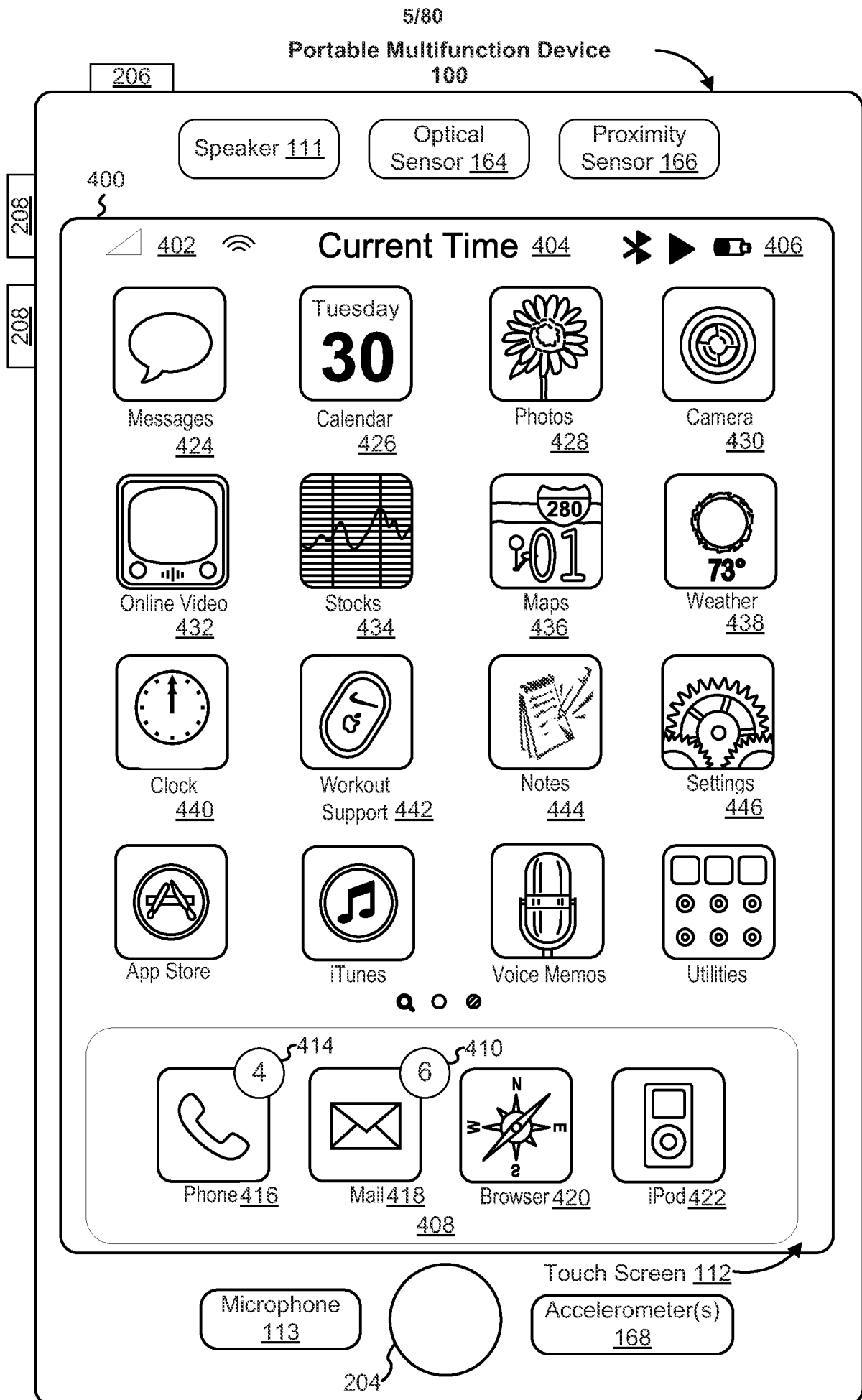


Figure 4A

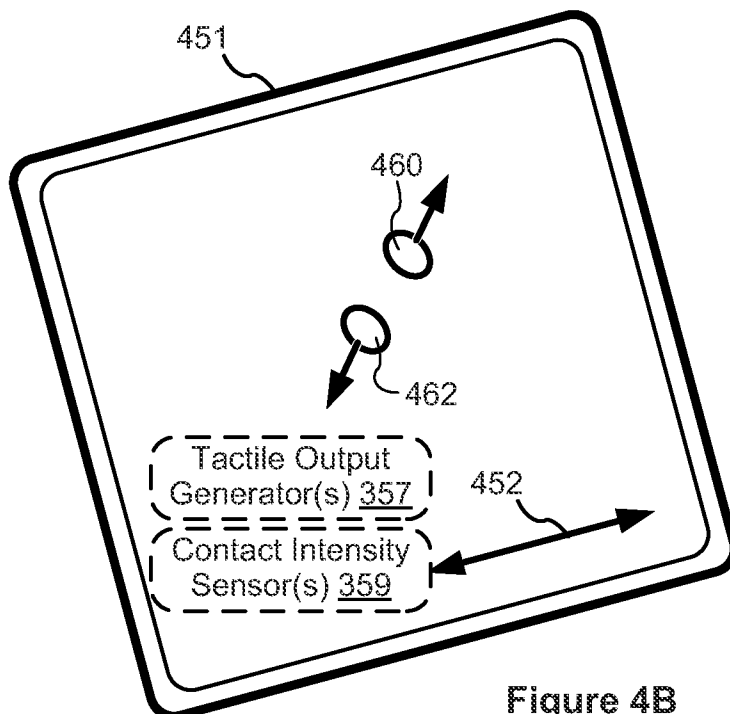
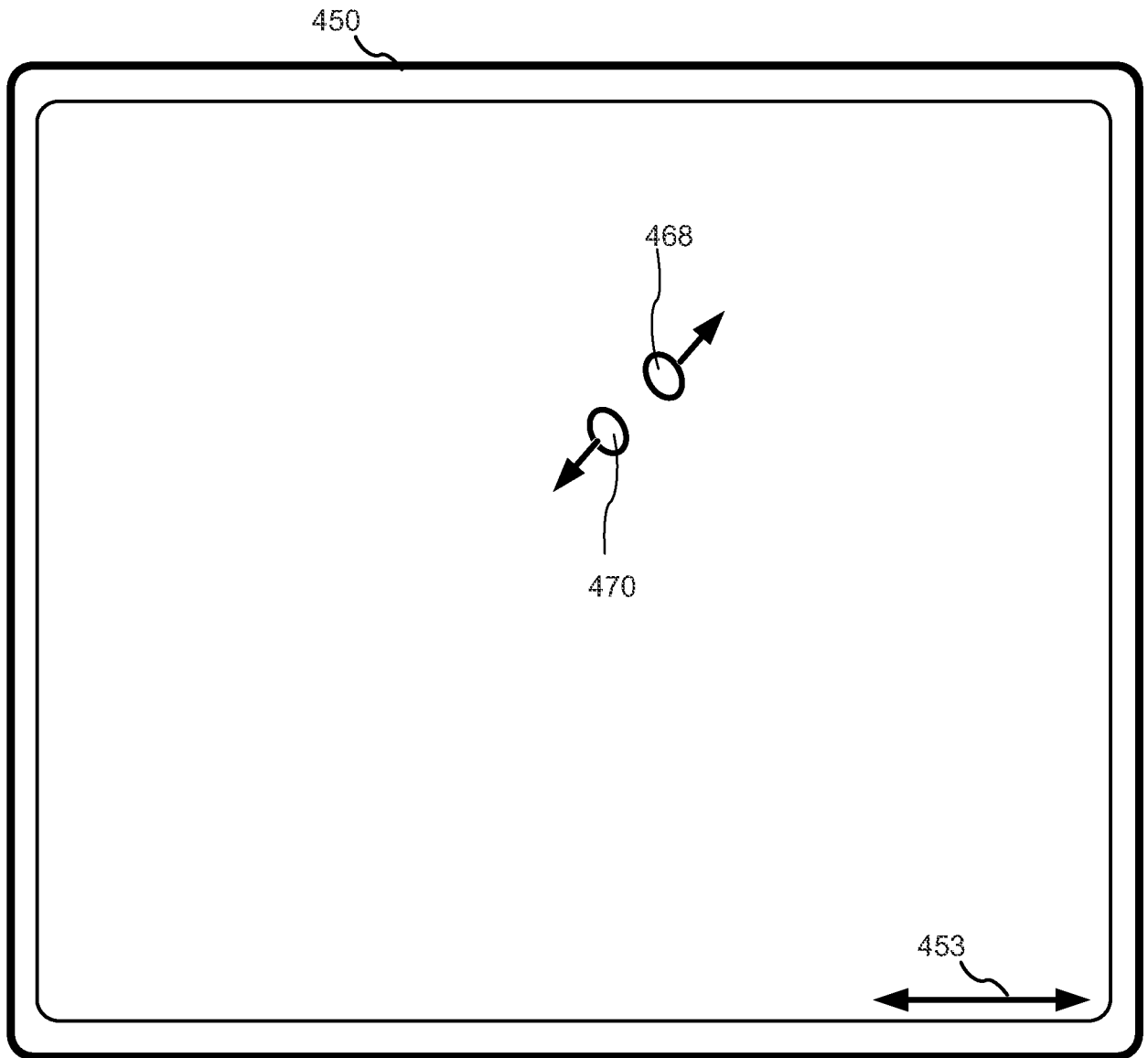


Figure 4B

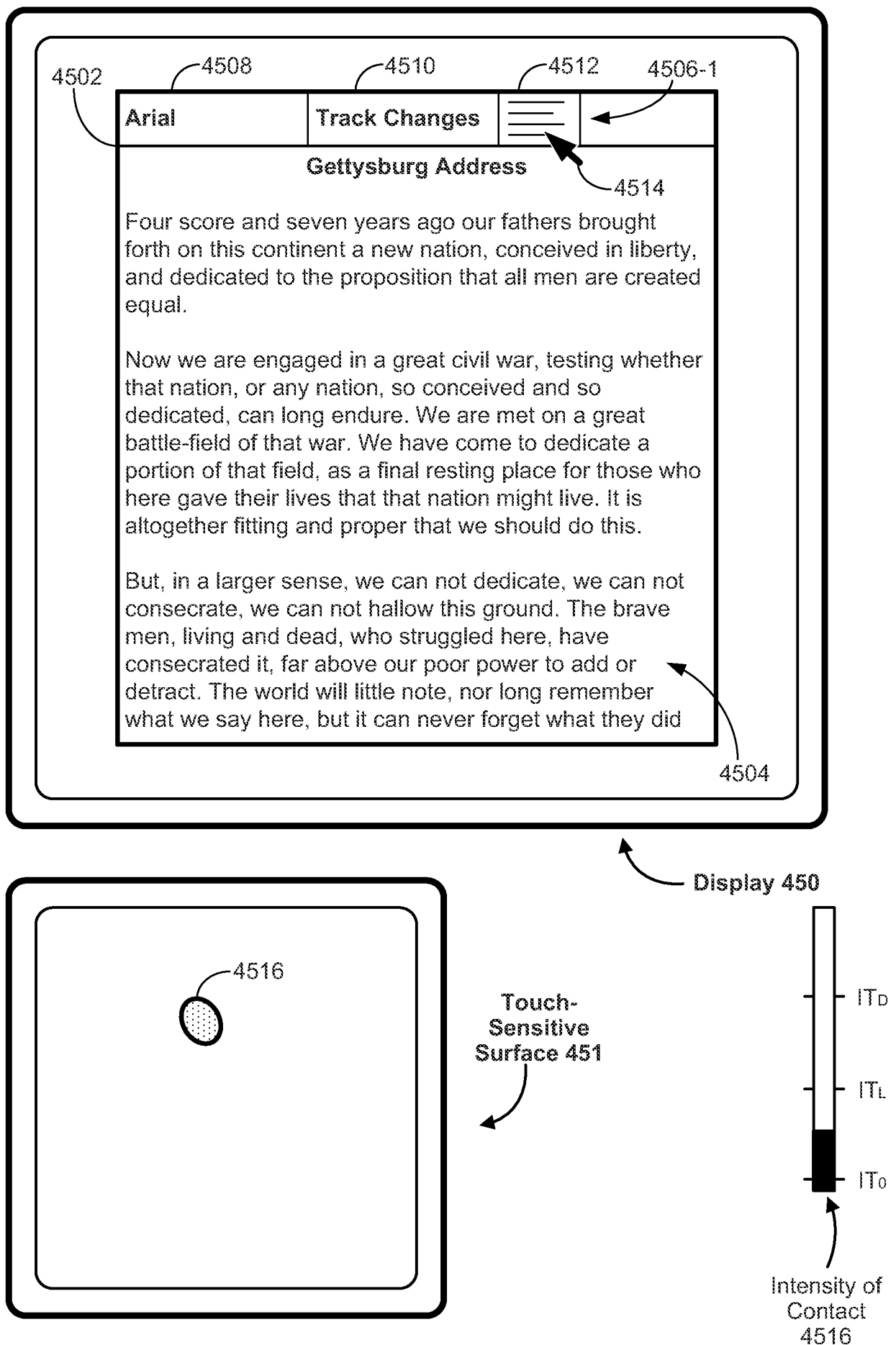


Figure 5A

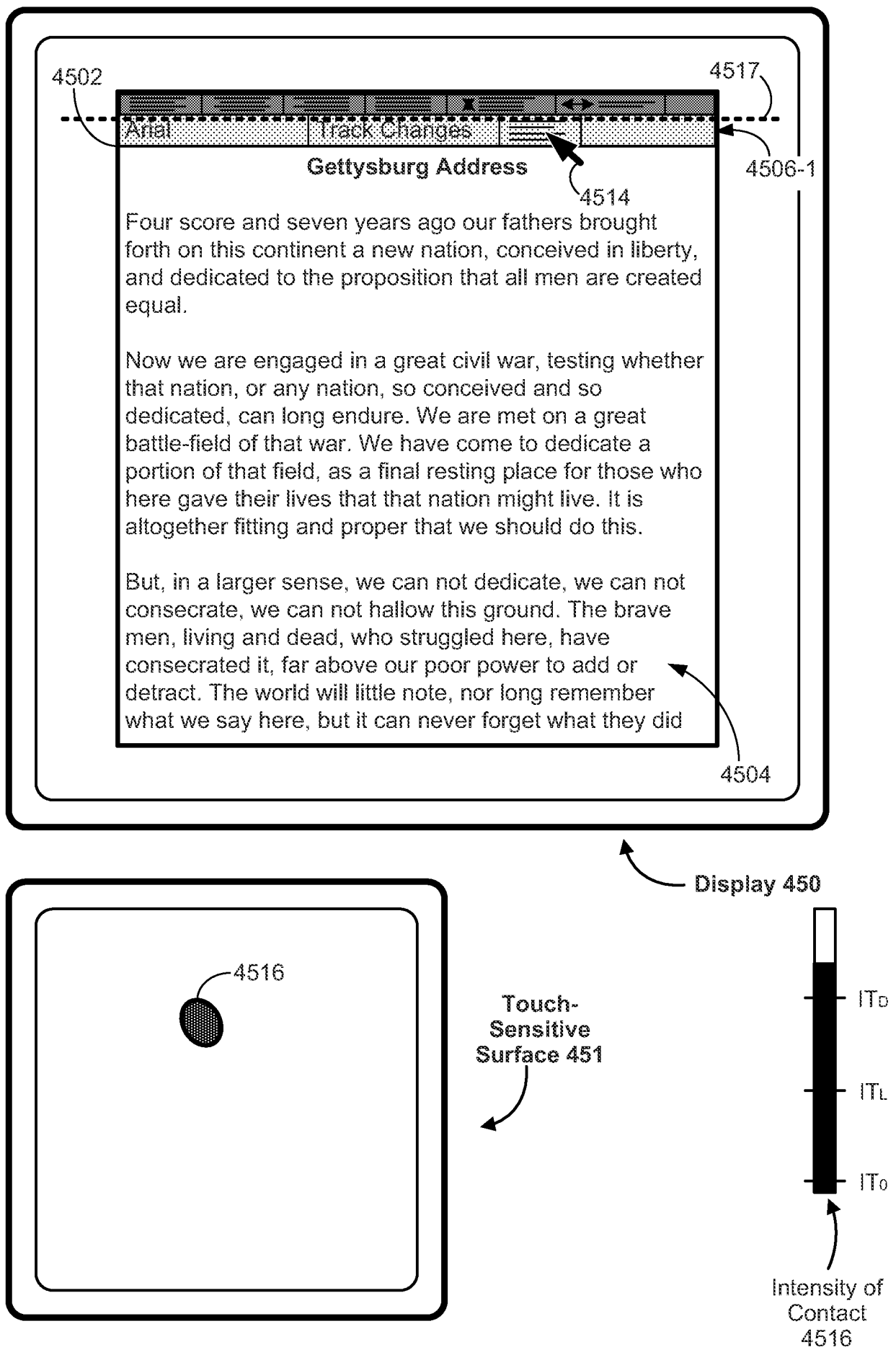


Figure 5B

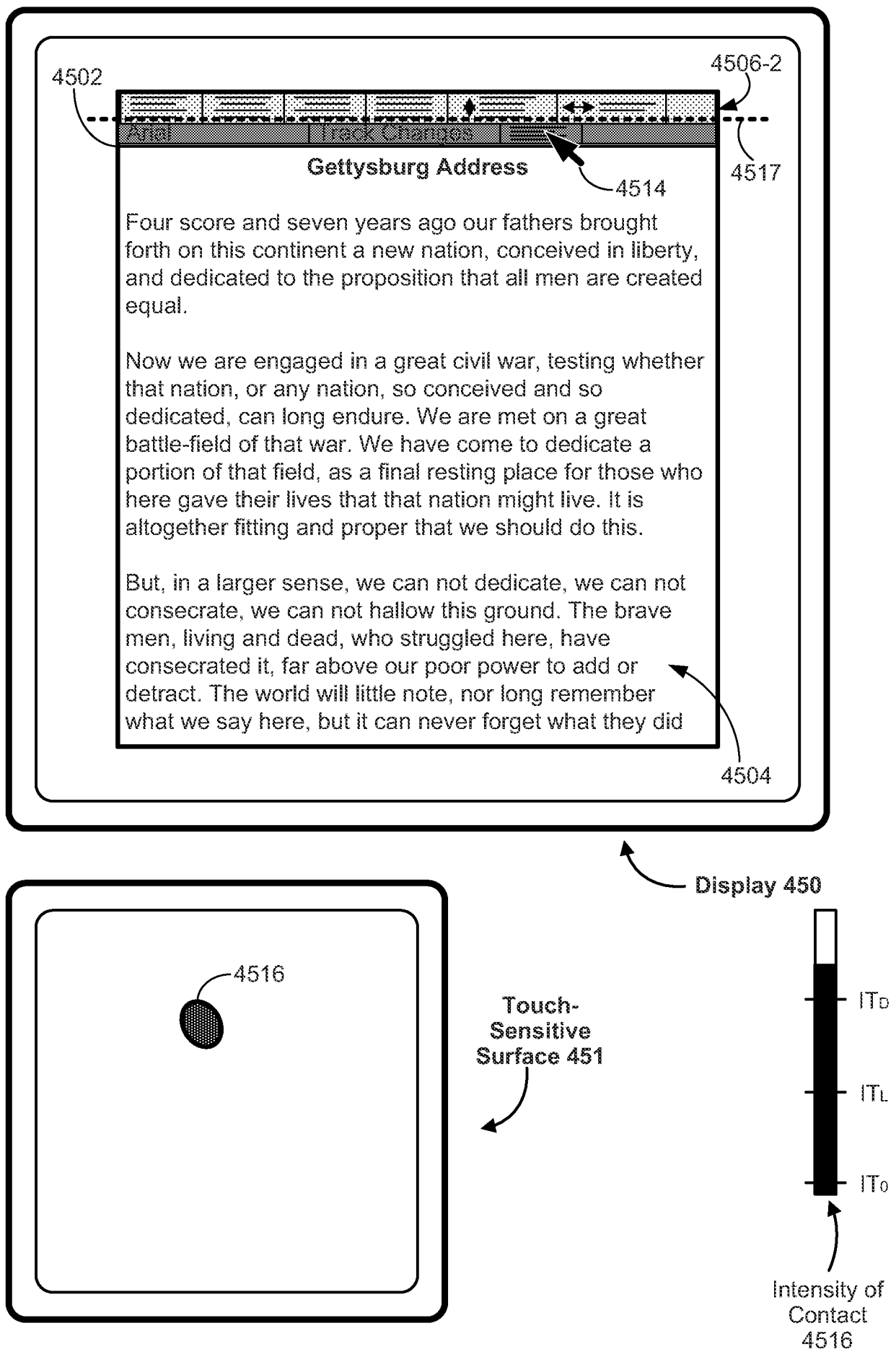


Figure 5C

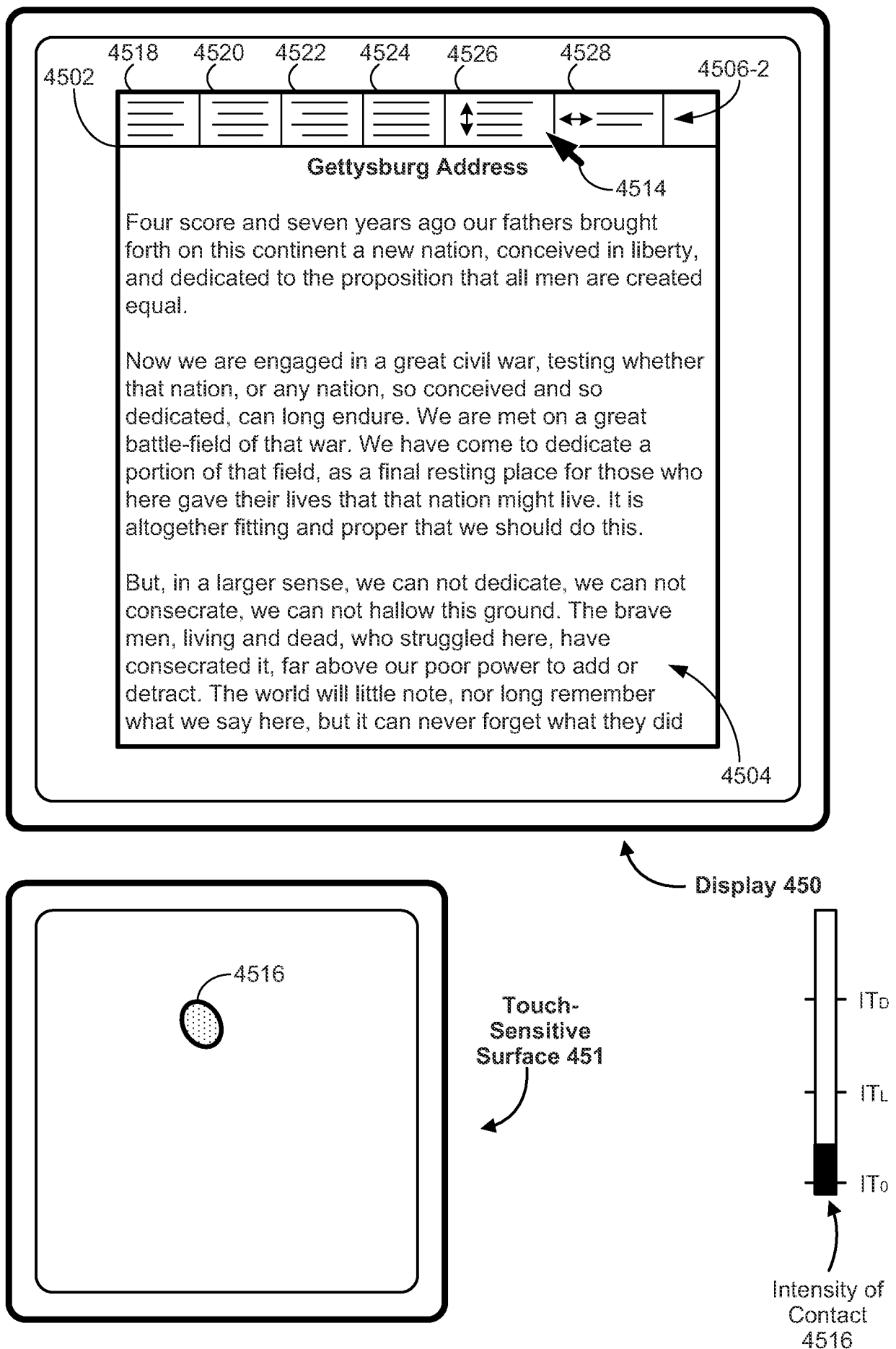


Figure 5D

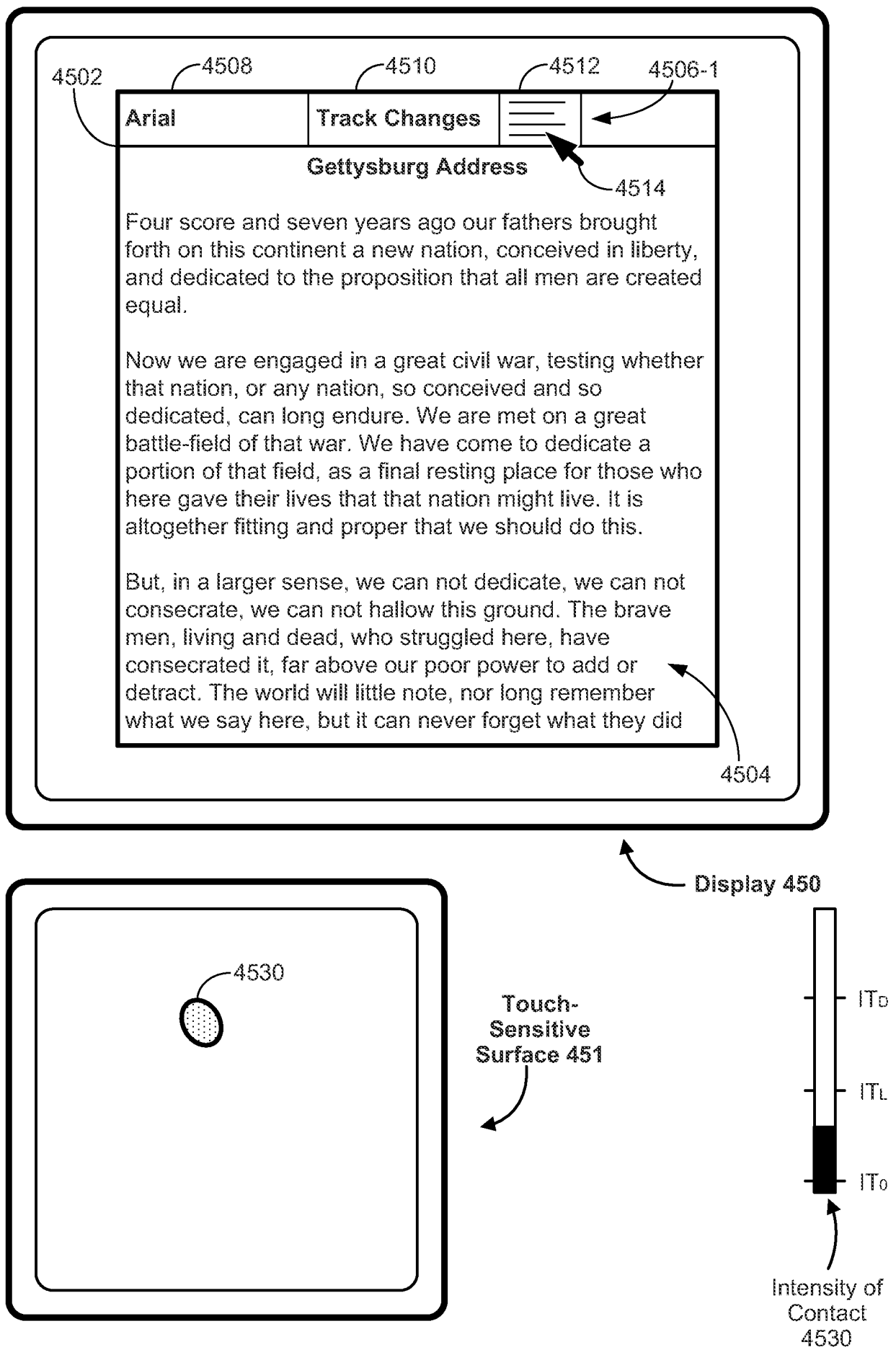


Figure 5E

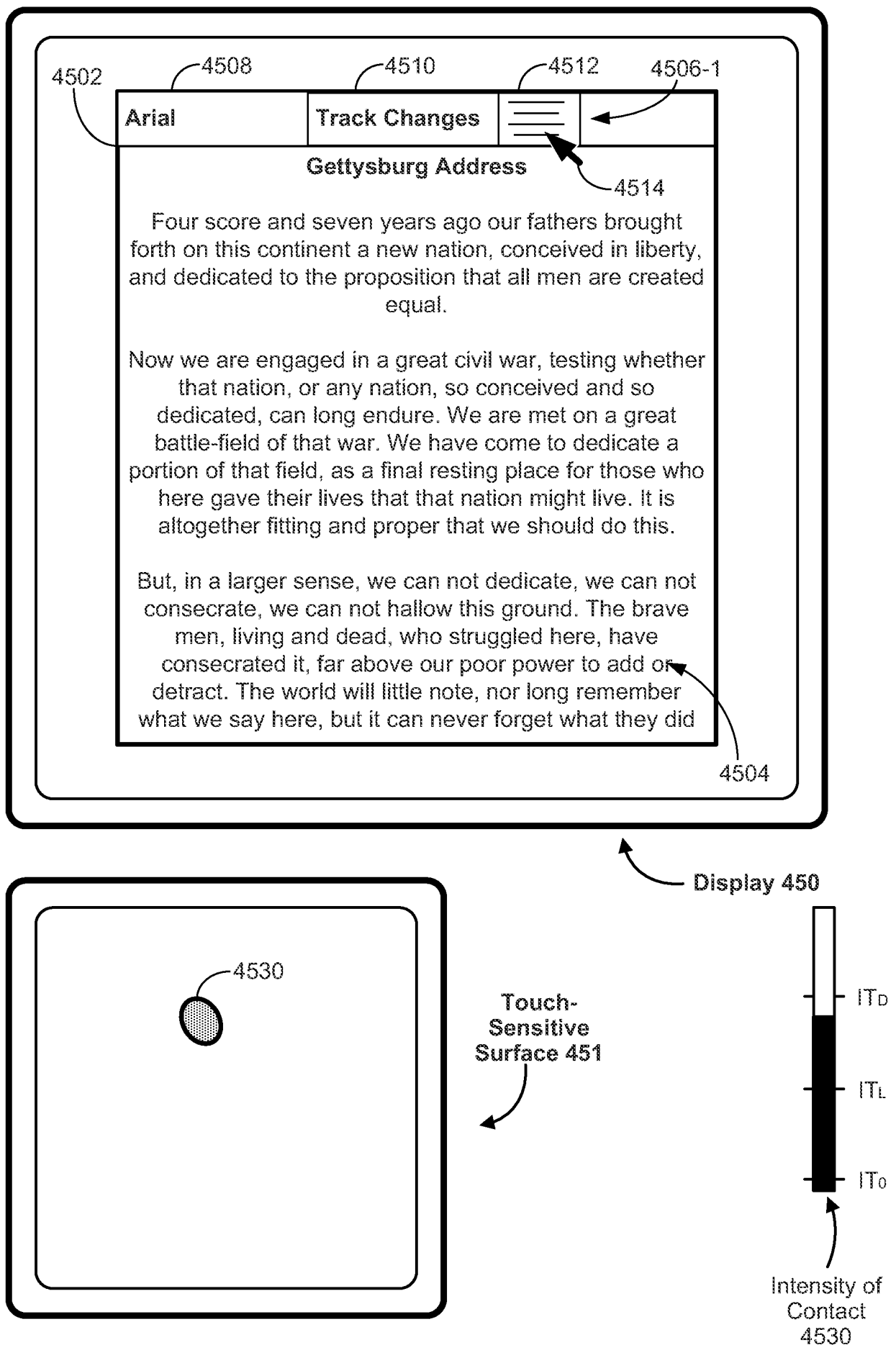


Figure 5F

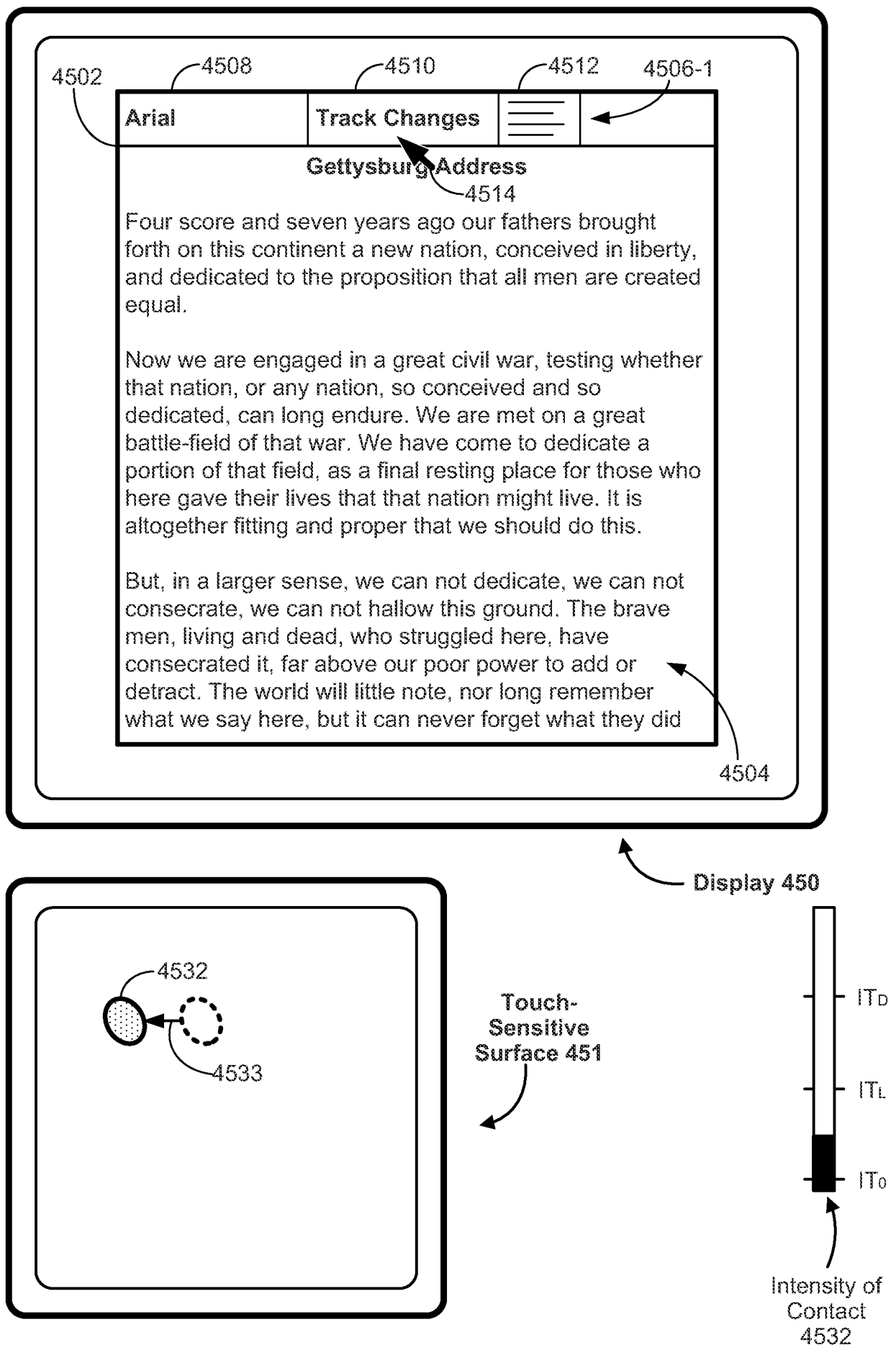


Figure 5G

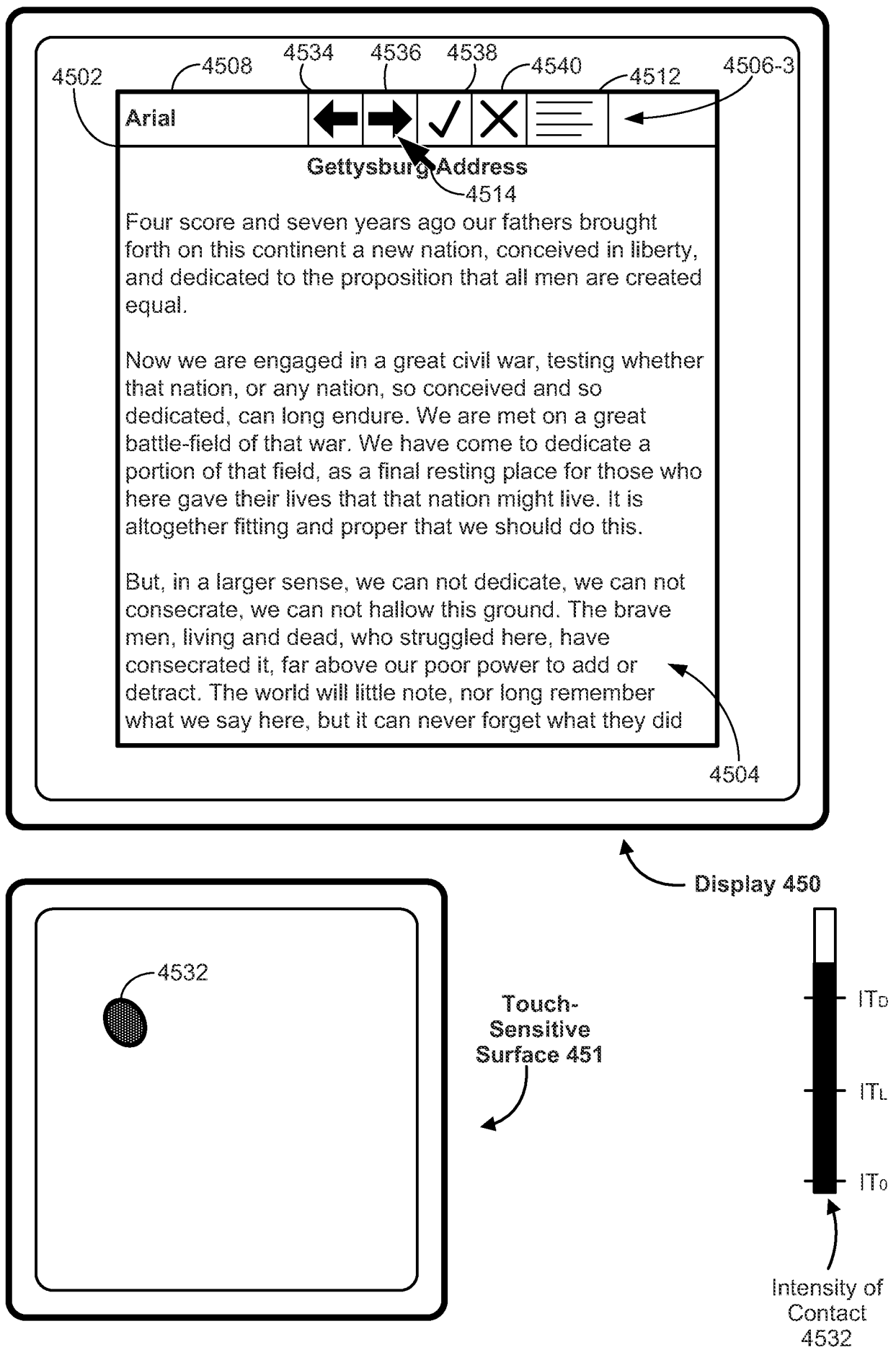


Figure 5H

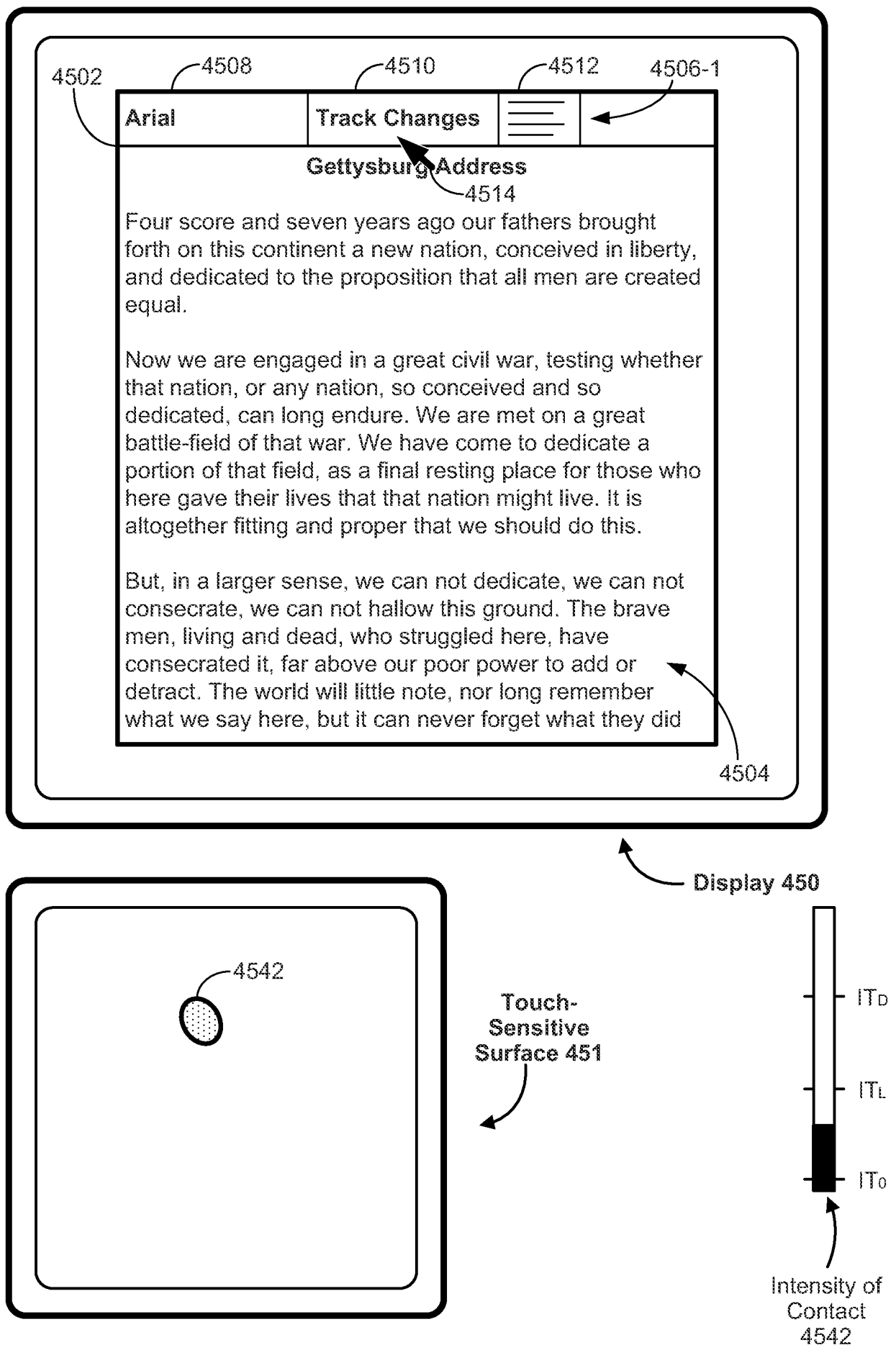


Figure 5I

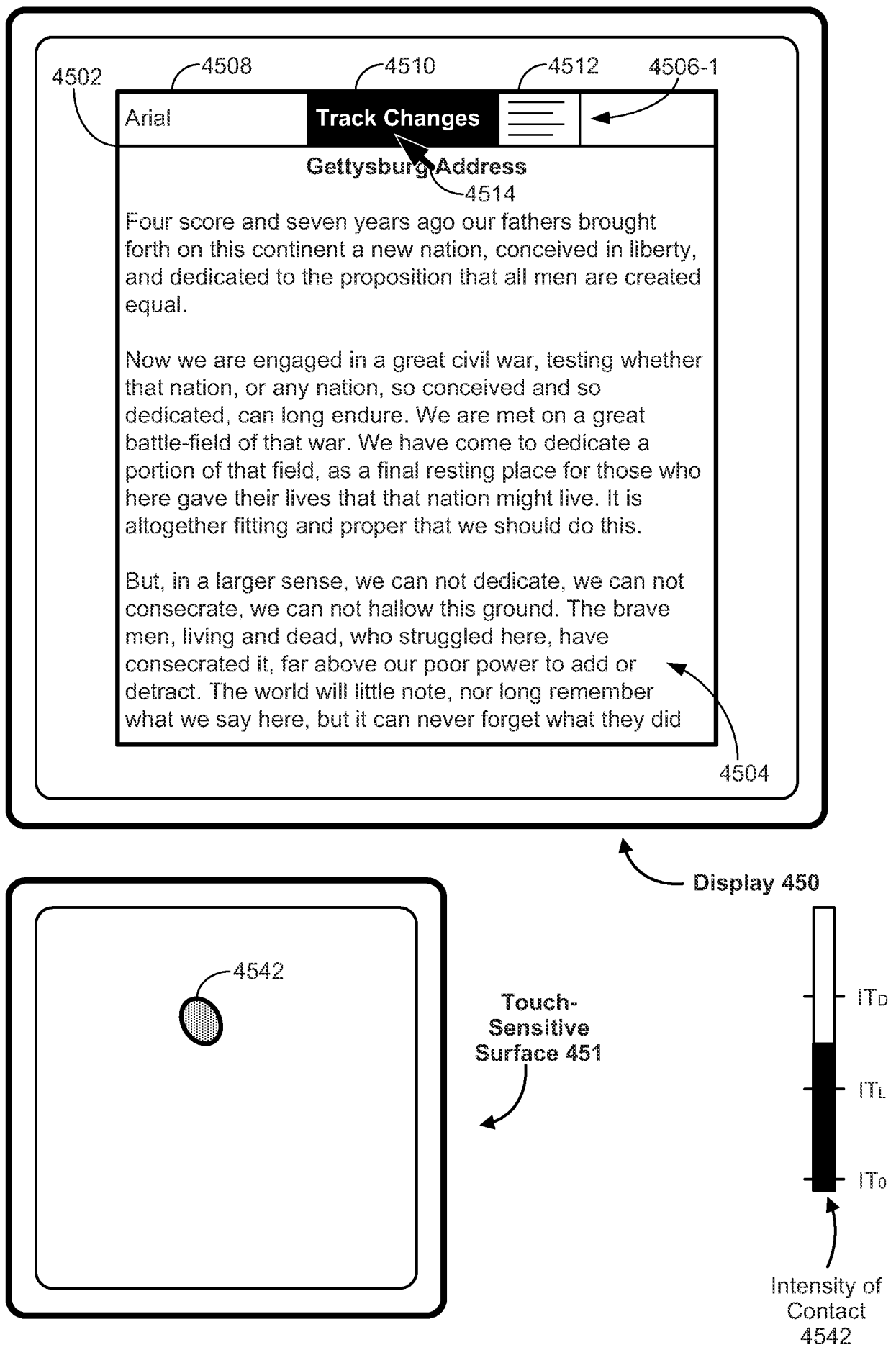


Figure 5J

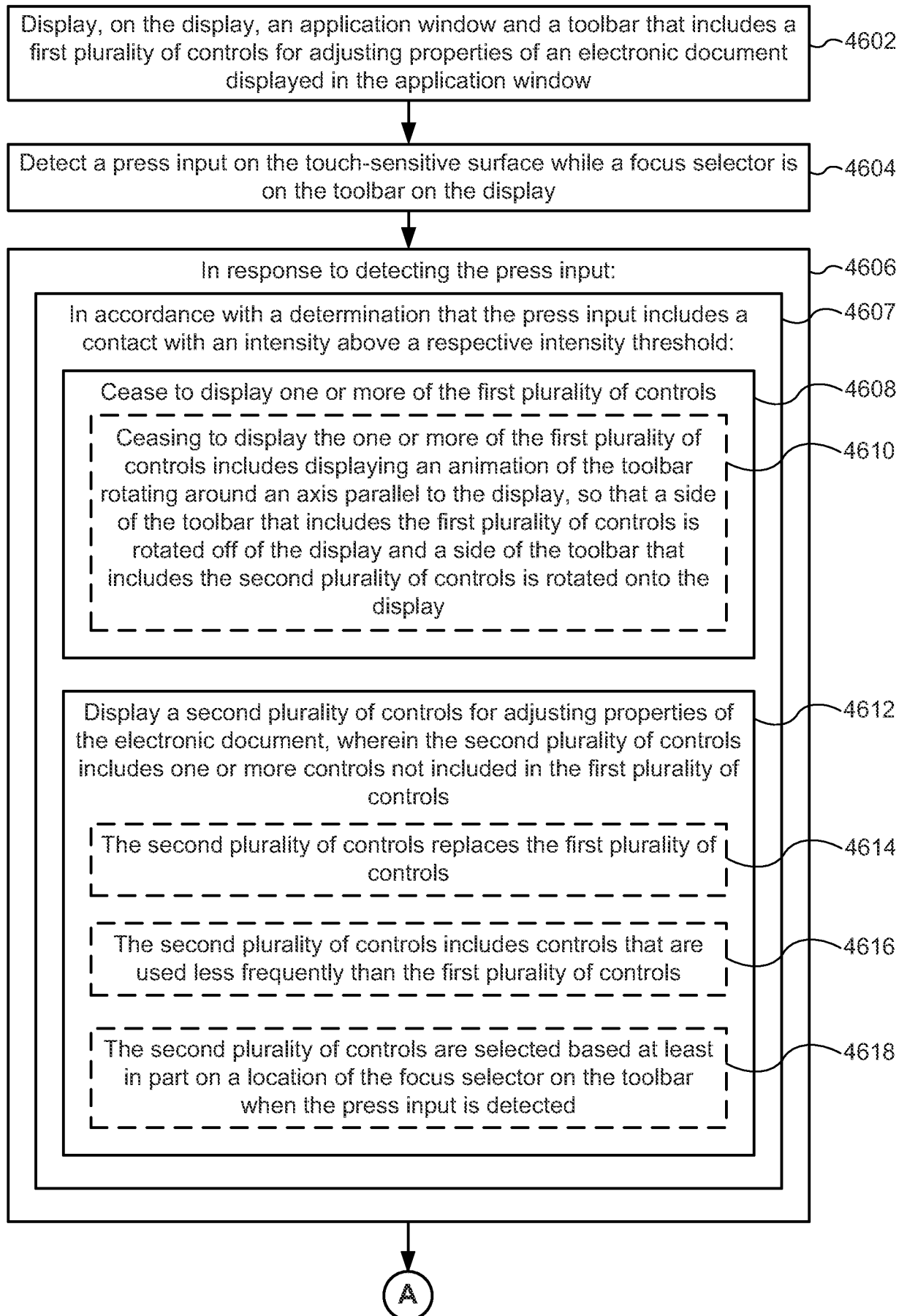
4600

Figure 6A

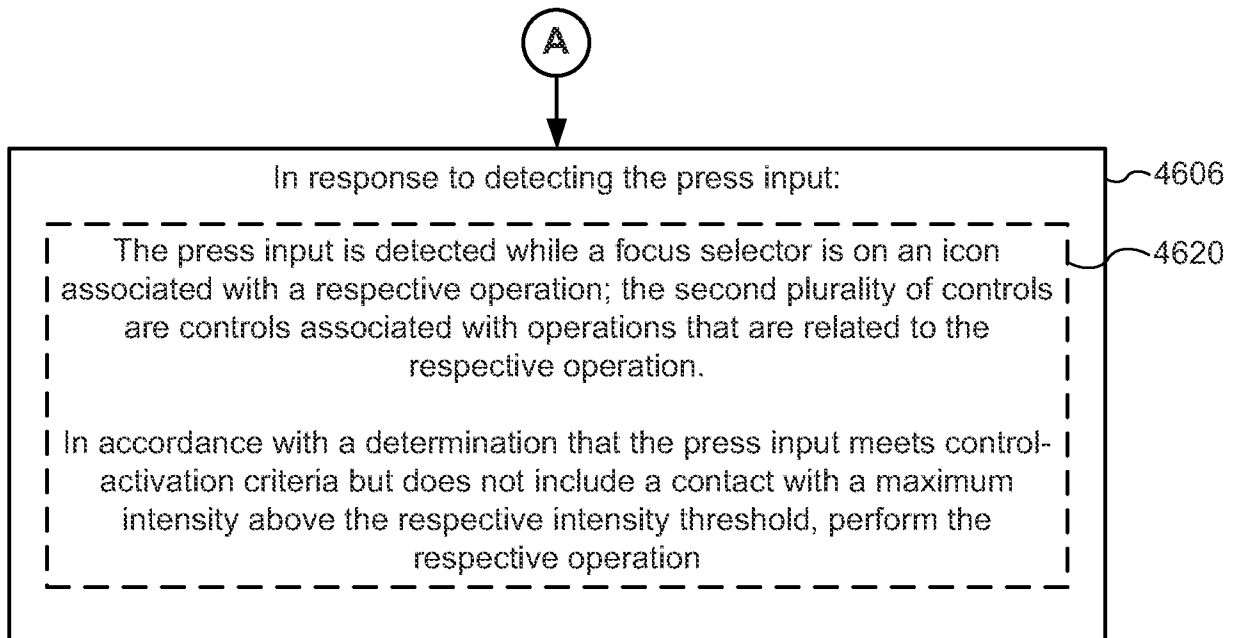


Figure 6B

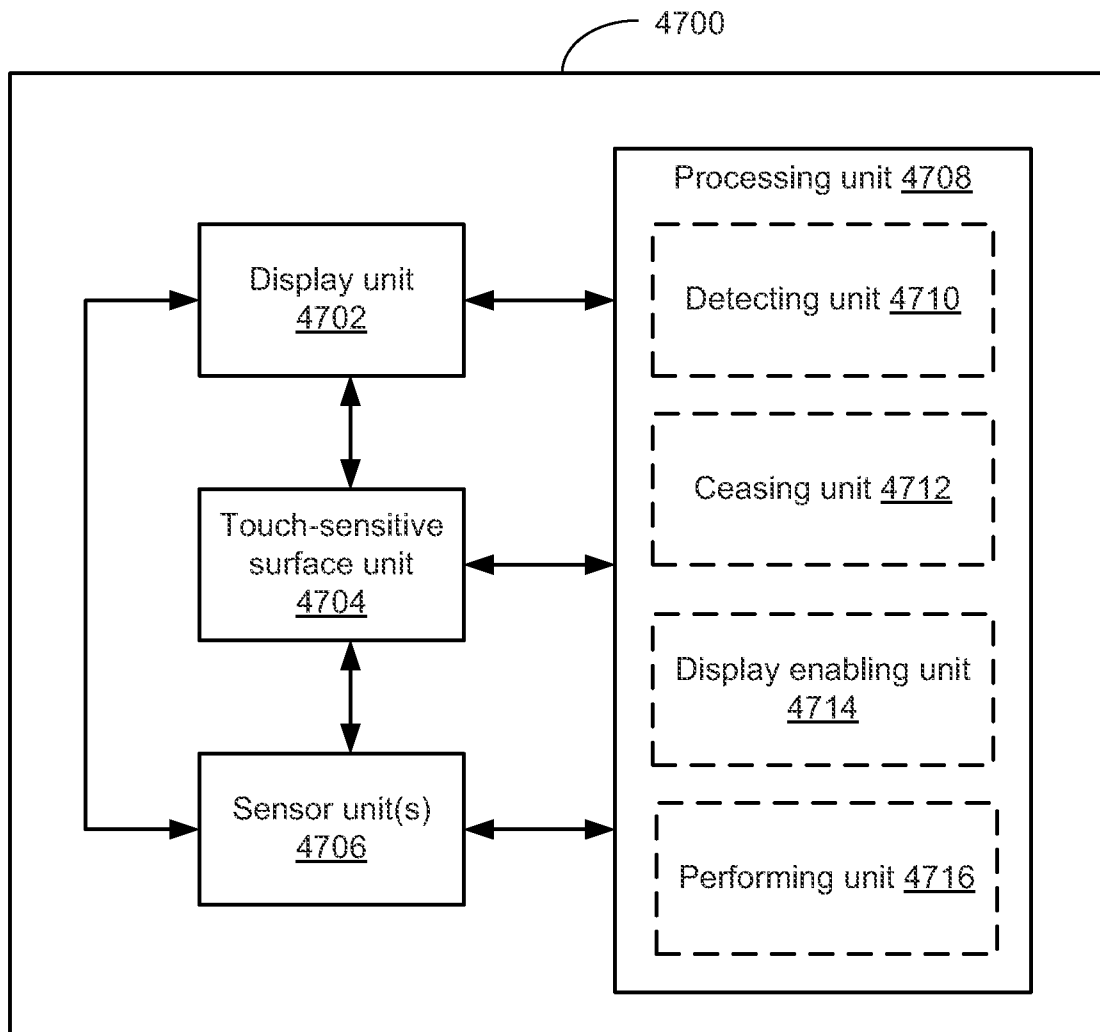


Figure 7

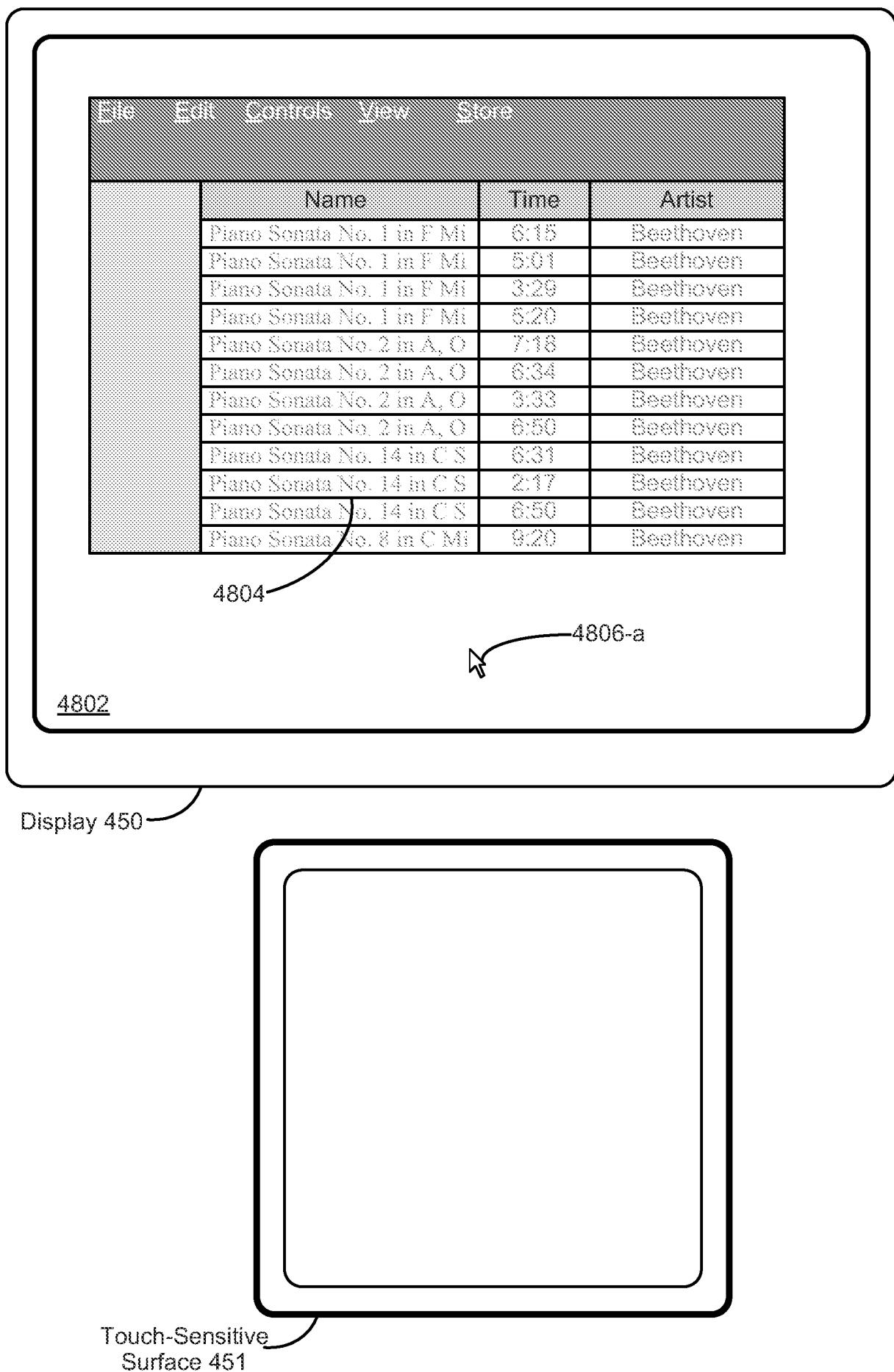
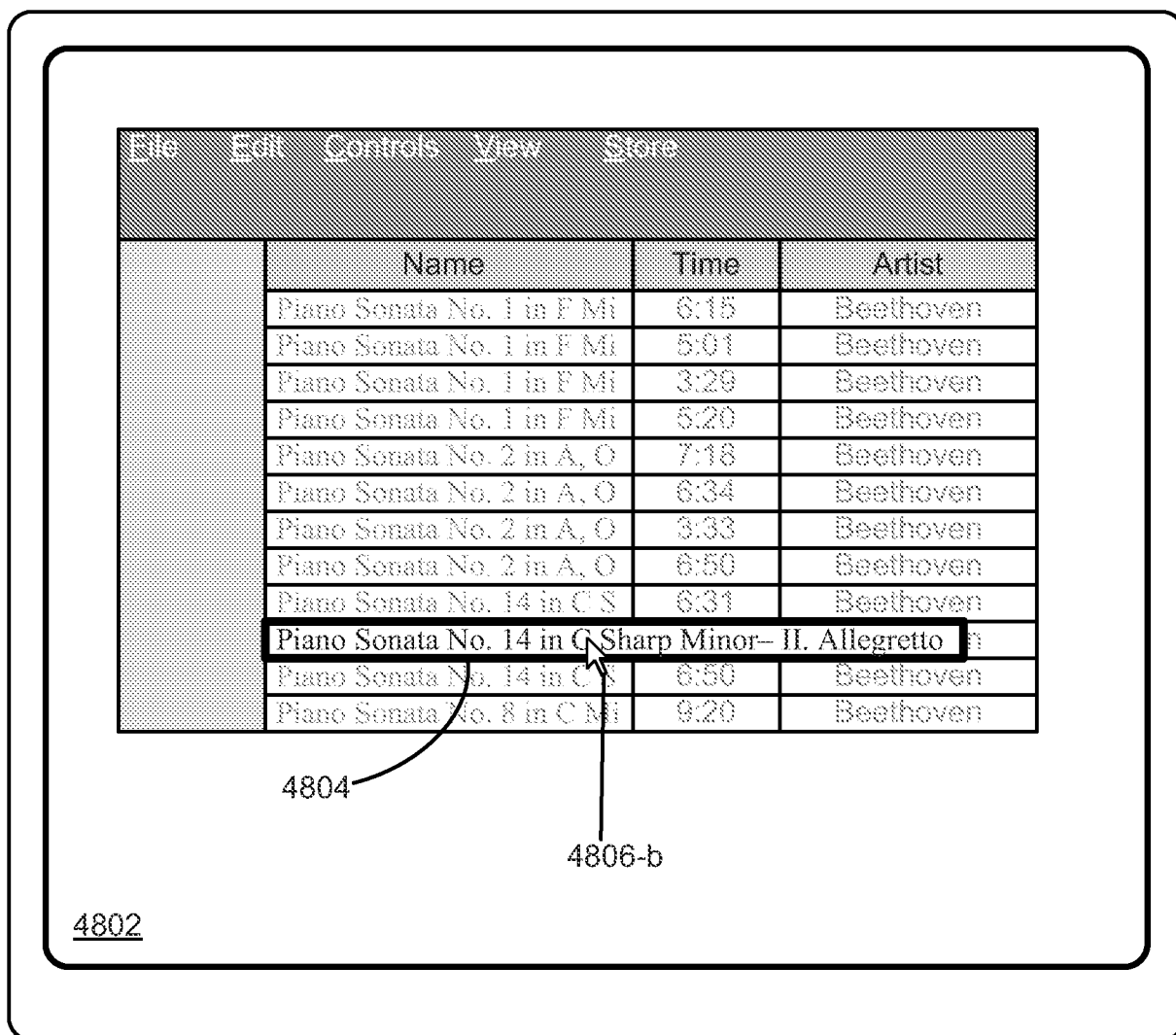
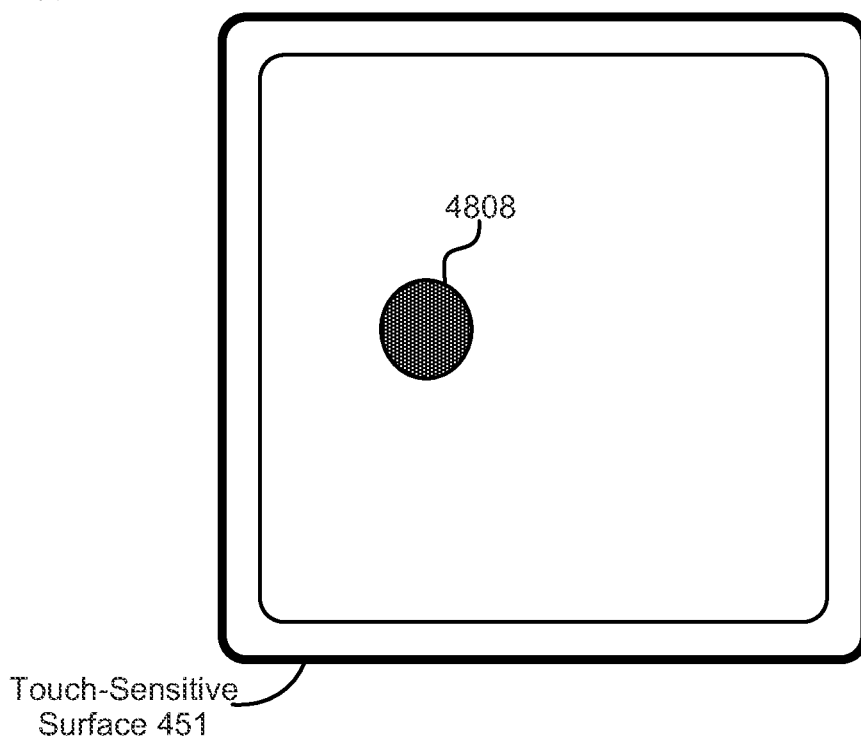


Figure 8A



Display 450



Touch-Sensitive Surface 451

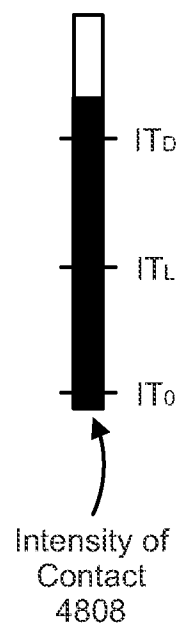
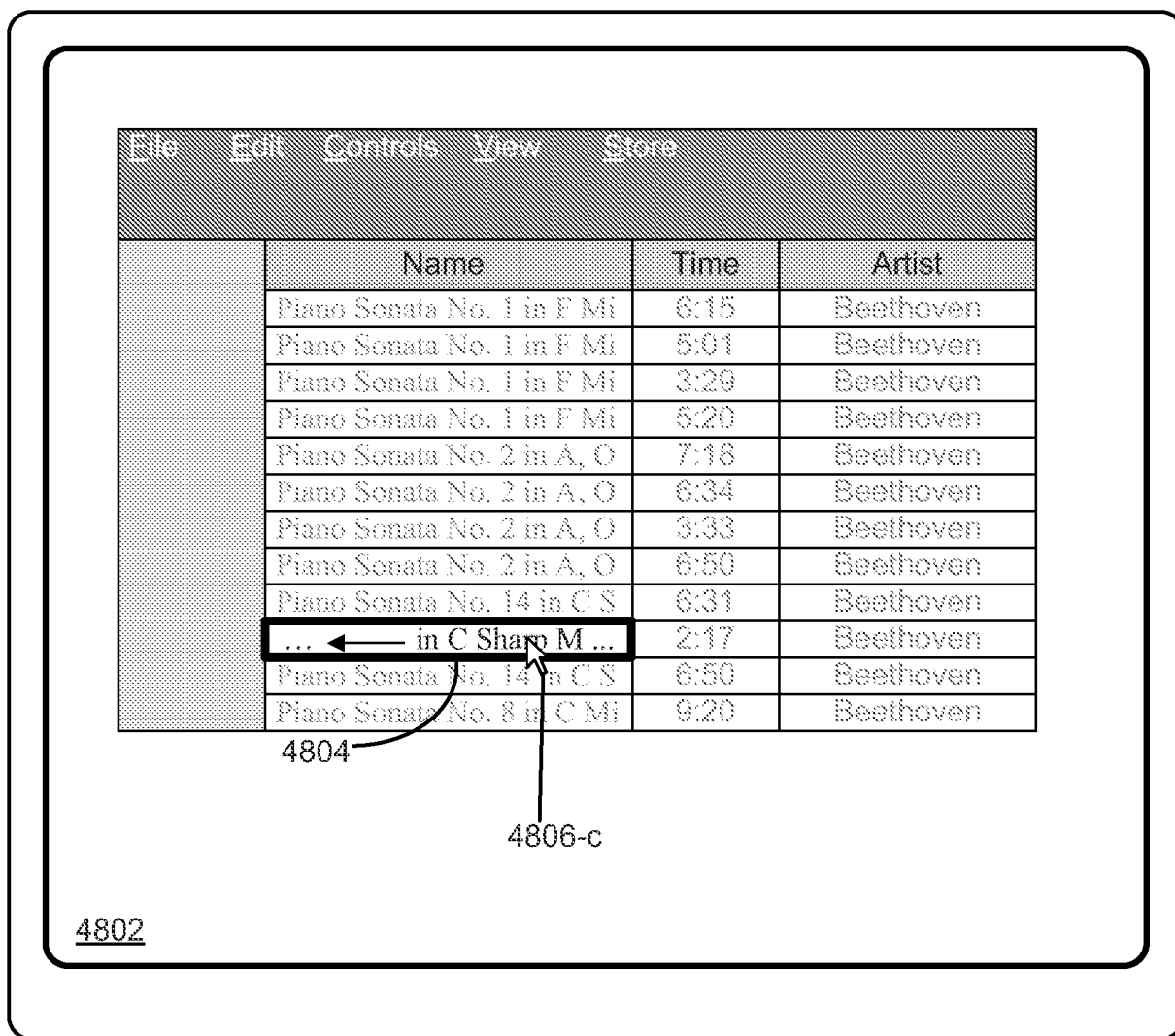


Figure 8B



Display 450

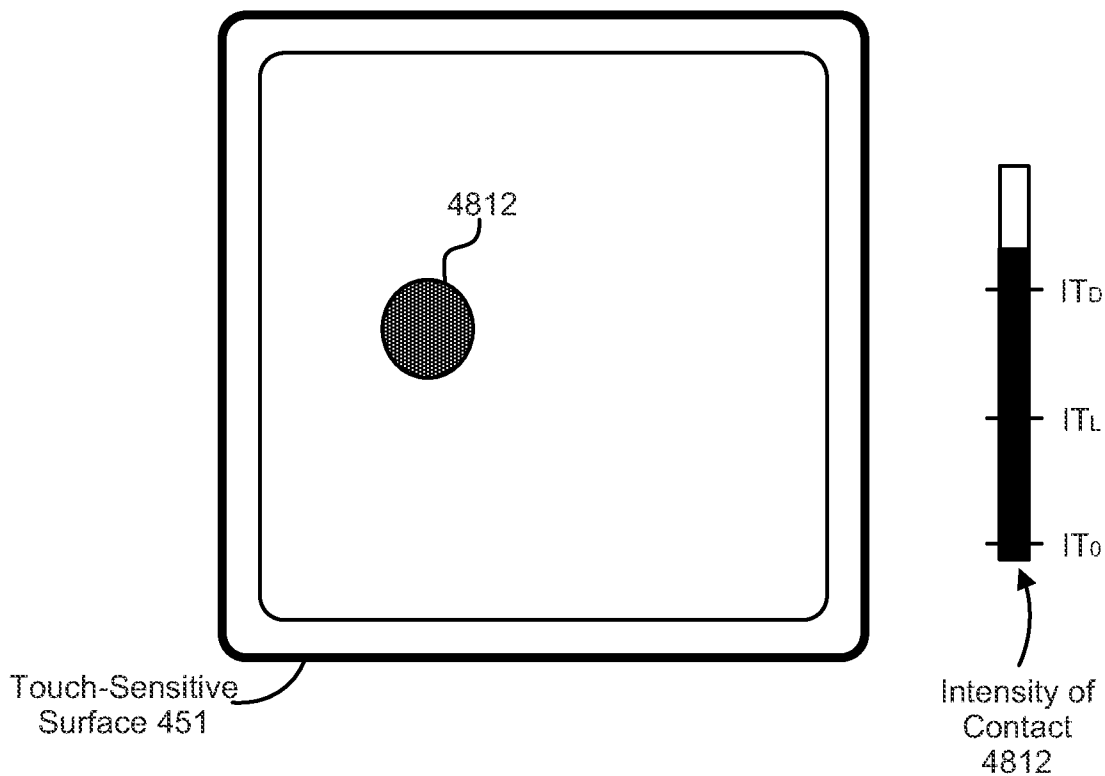
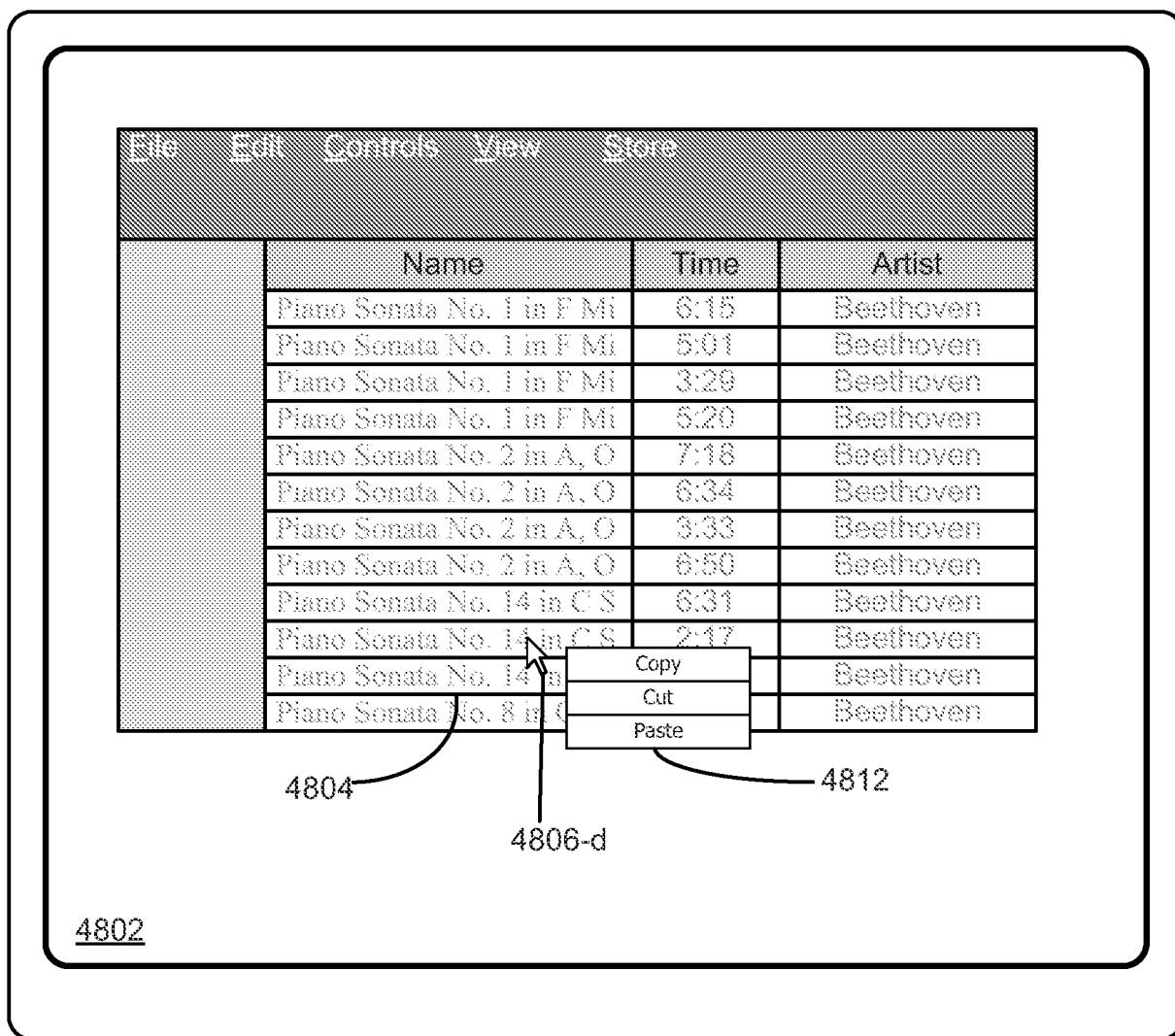


Figure 8C



Display 450

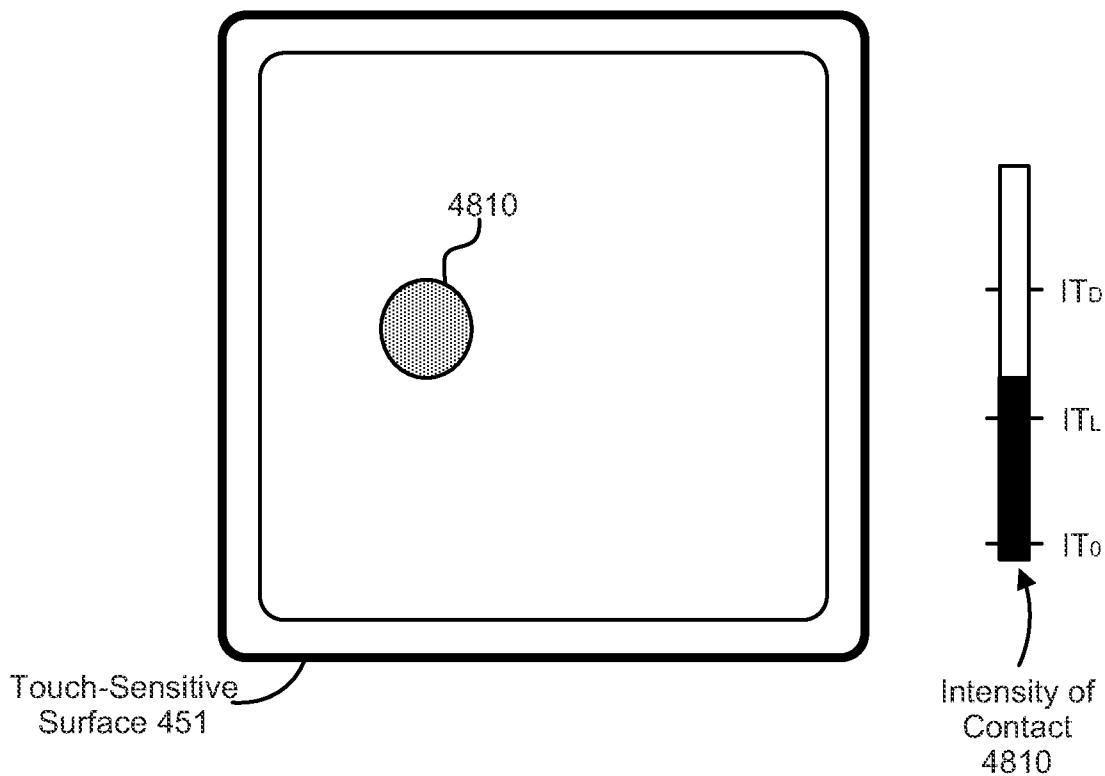
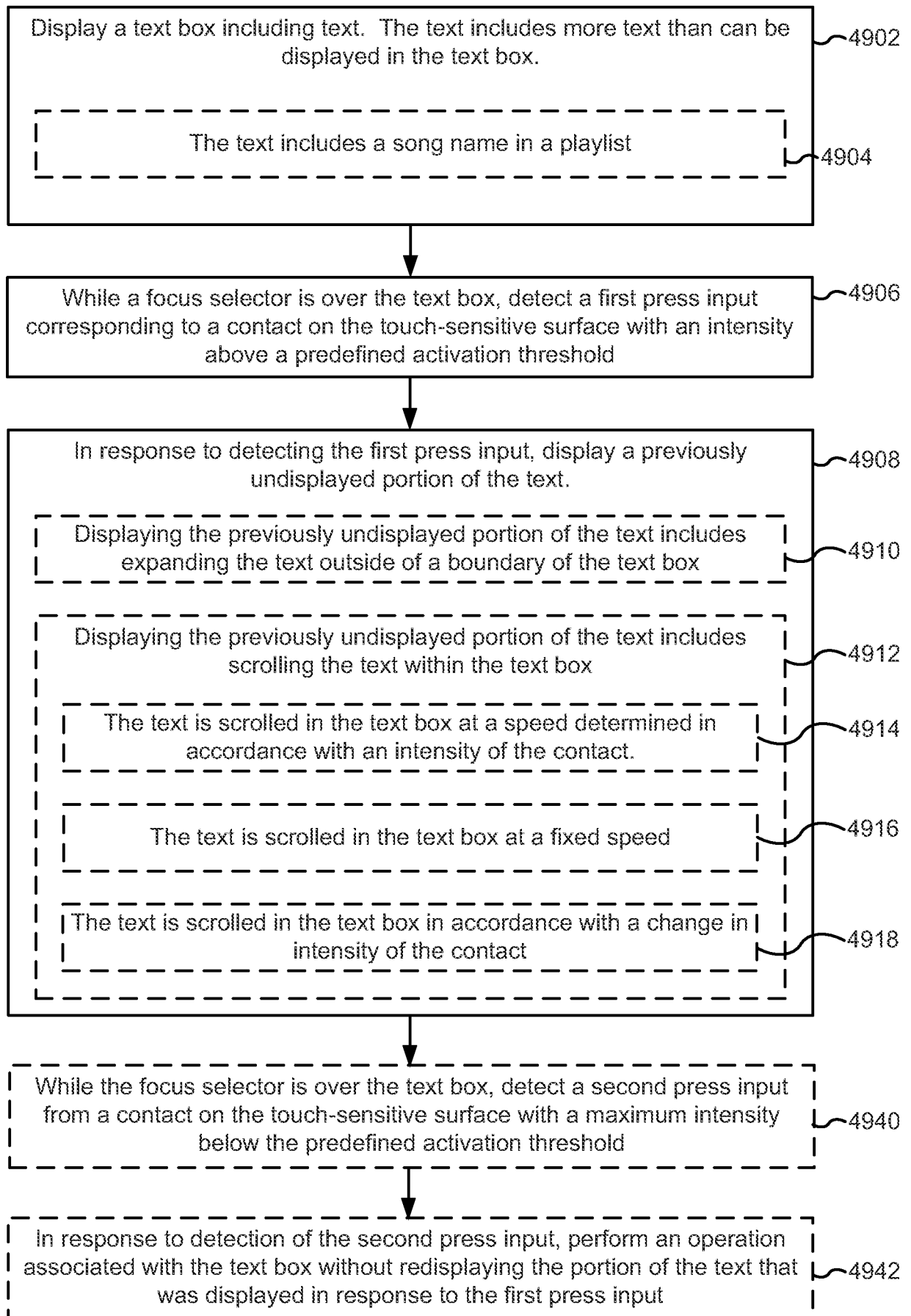


Figure 8D

4900**Figure 9**

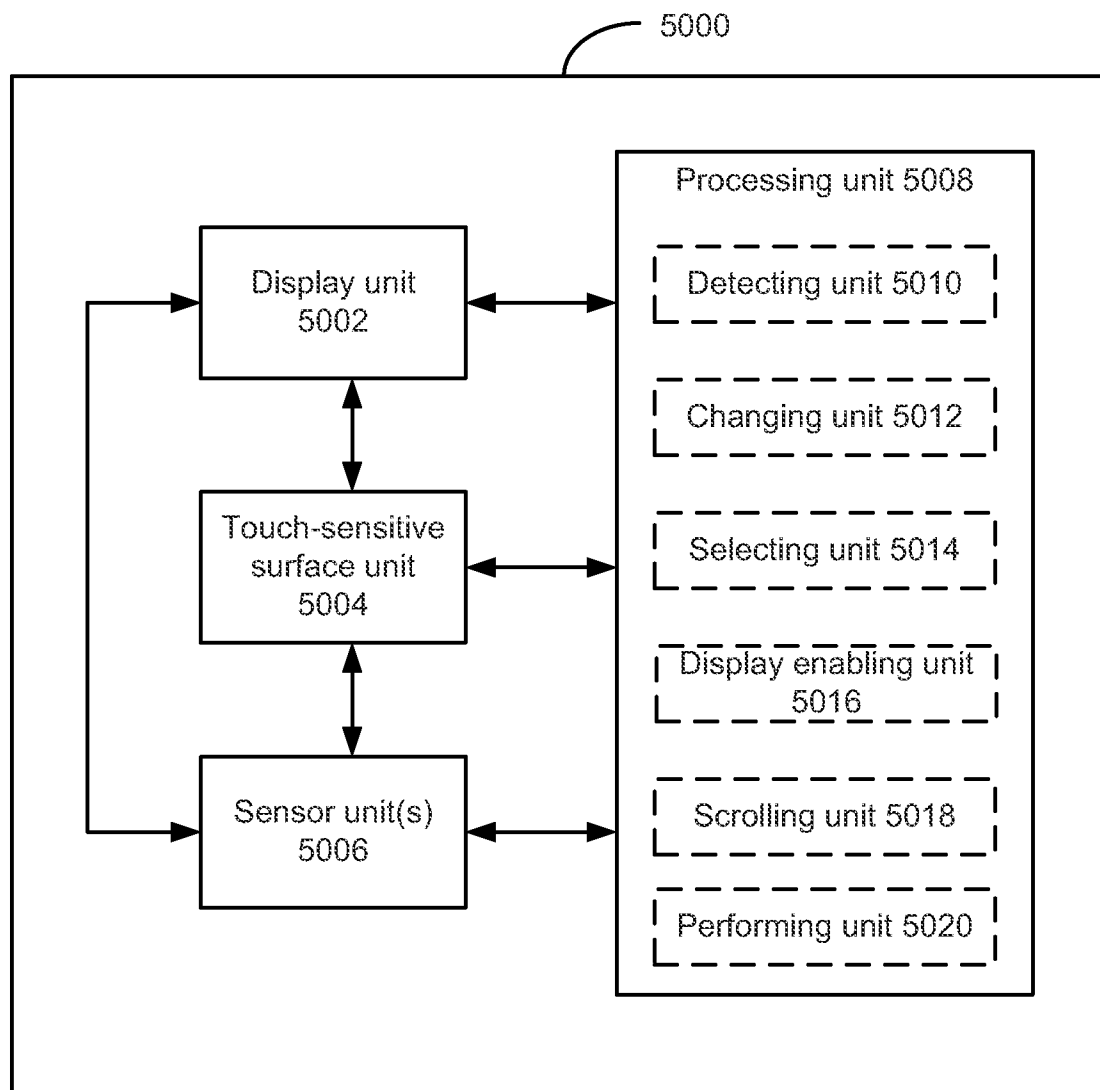


Figure 10

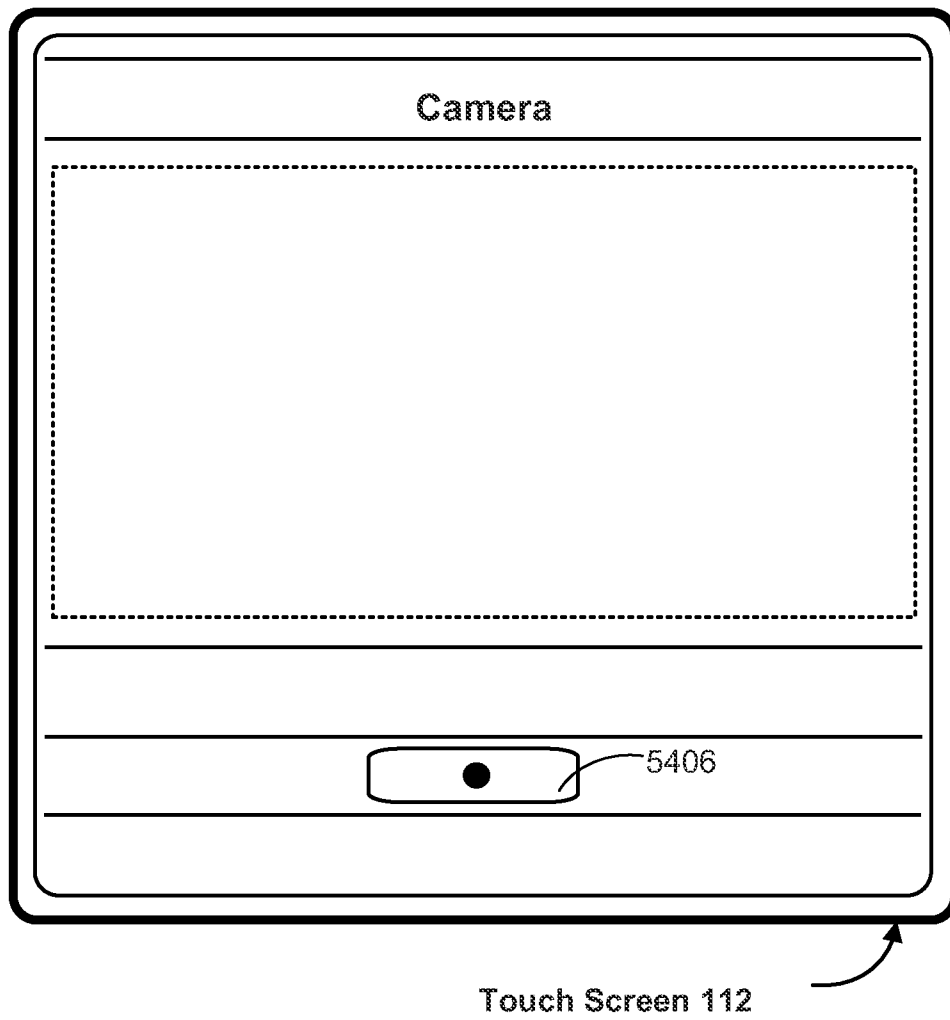


Figure 11A

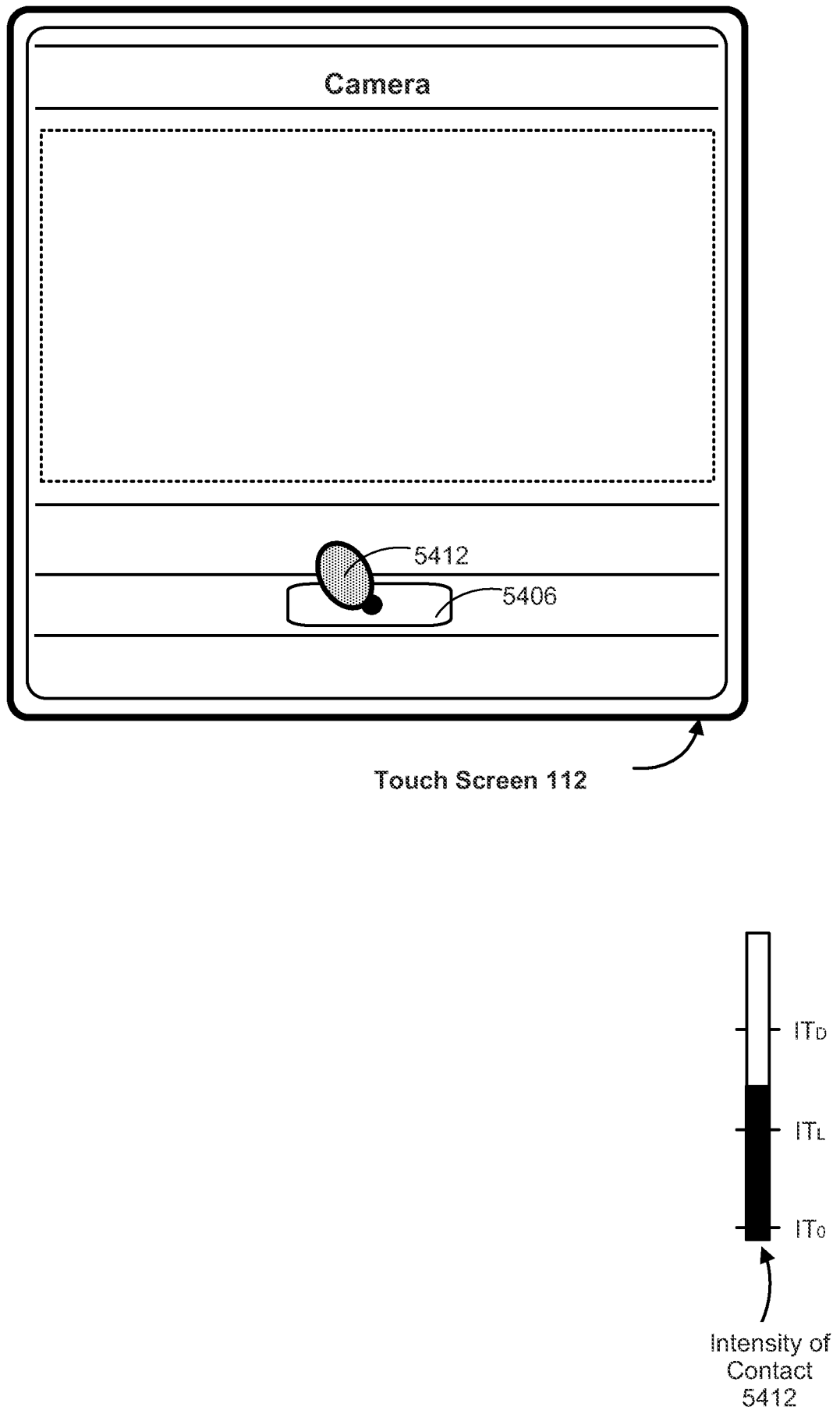


Figure 11B

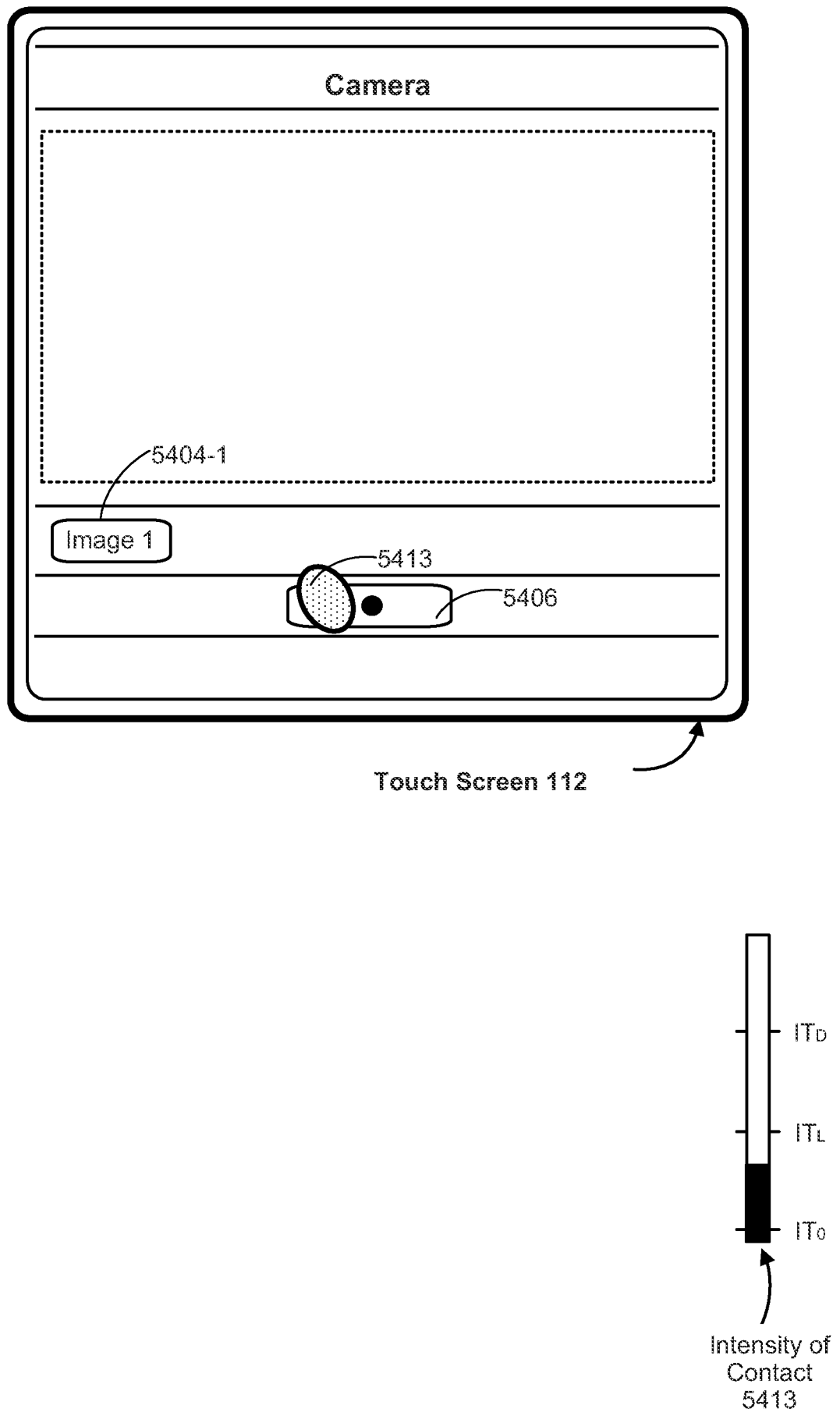


Figure 11C

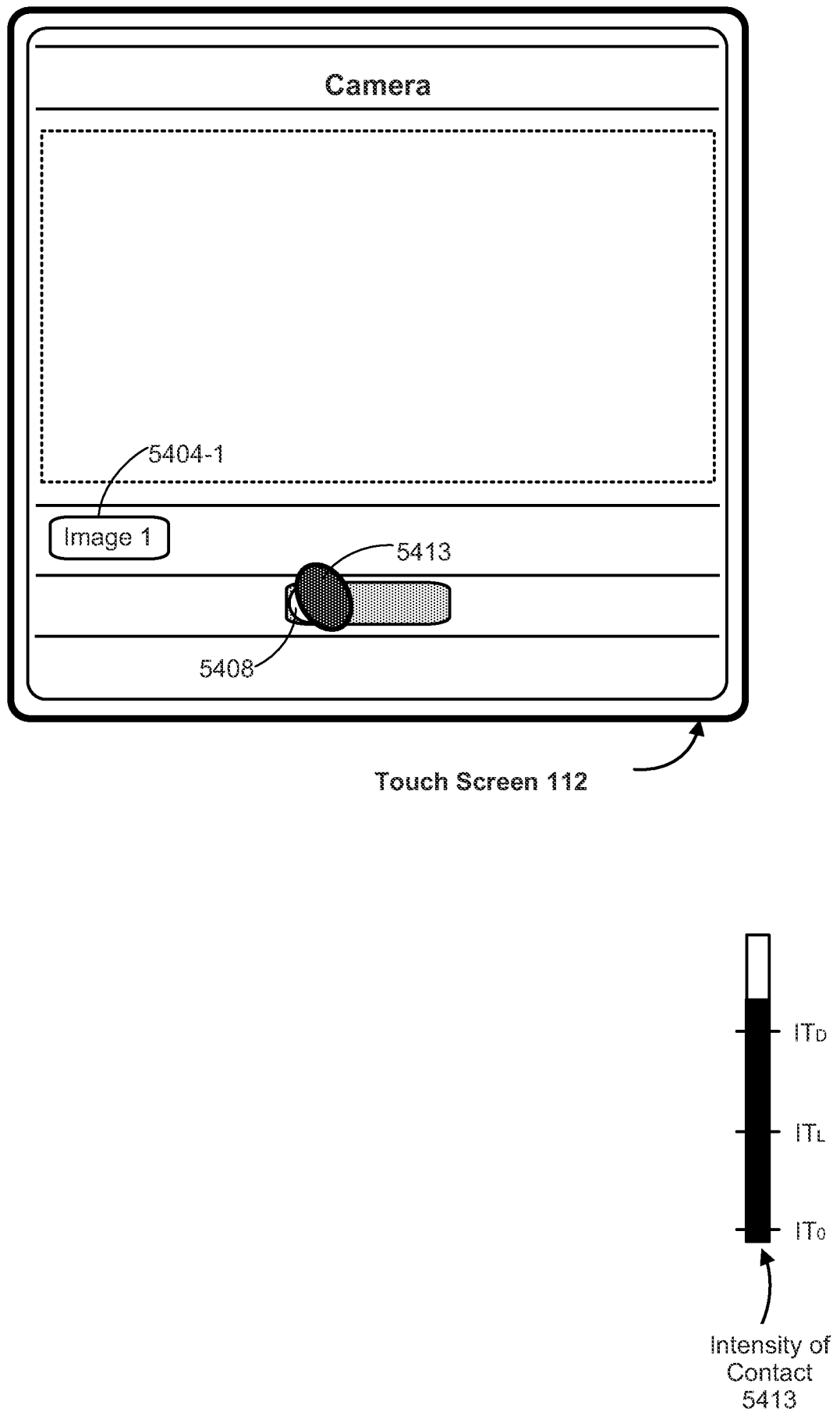


Figure 11D

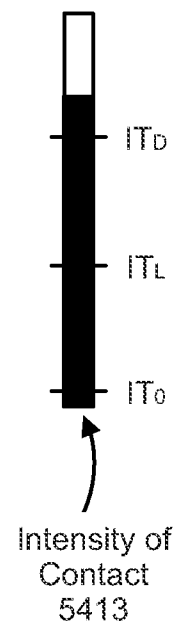
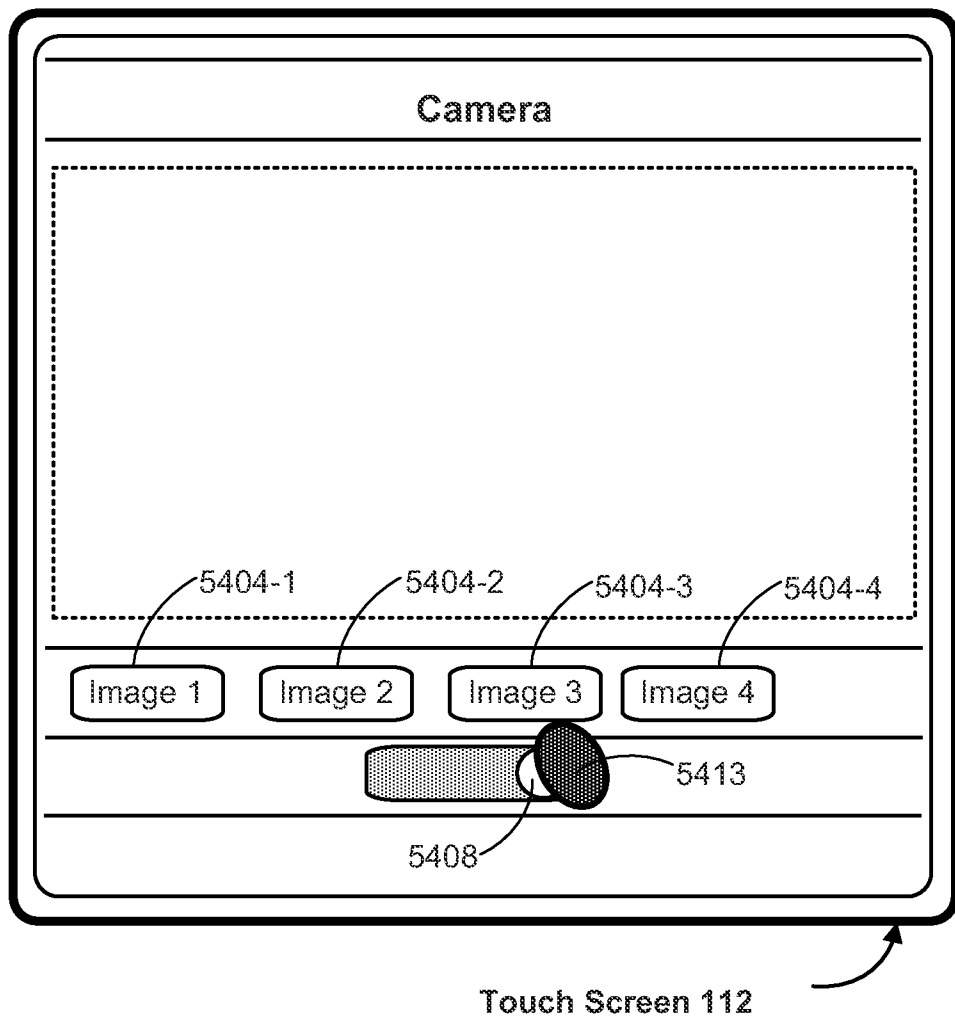


Figure 11E

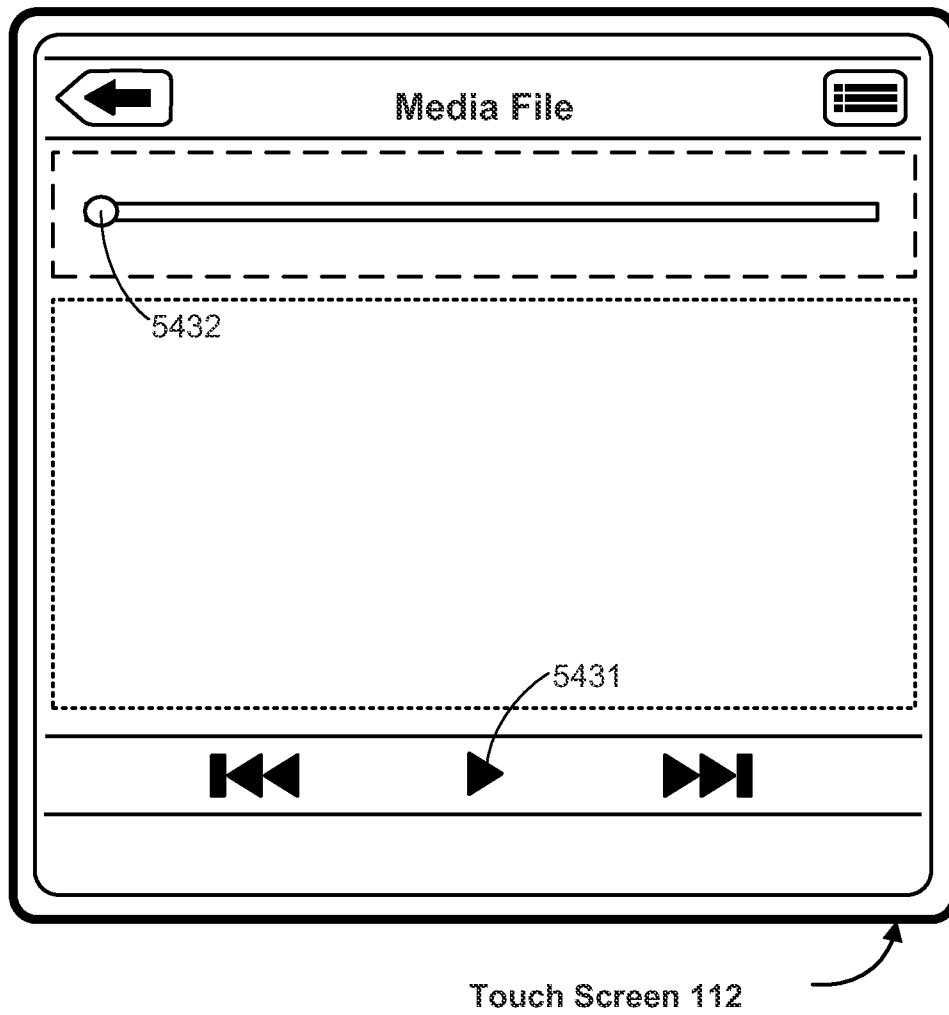


Figure 11F

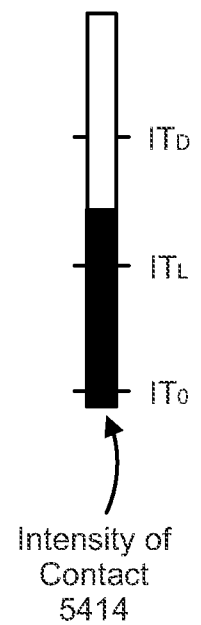
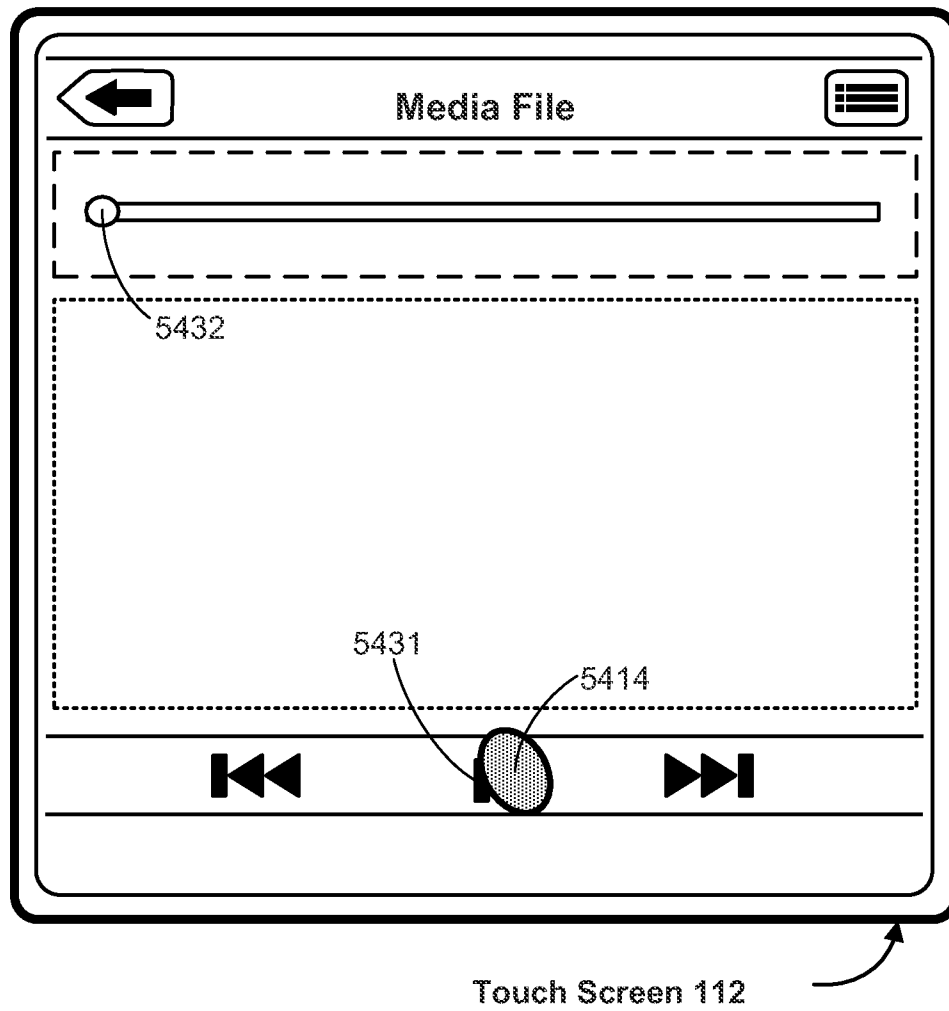


Figure 11G

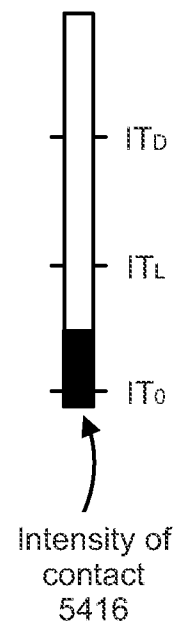
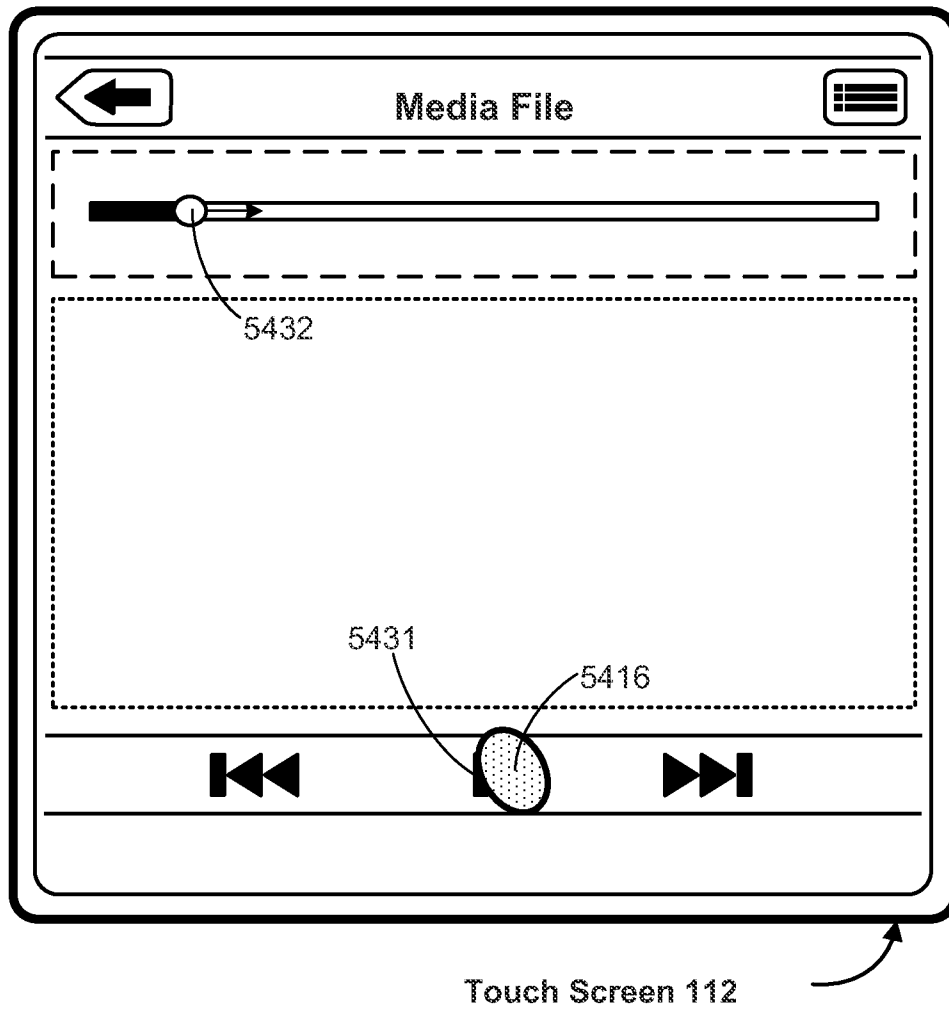


Figure 11H

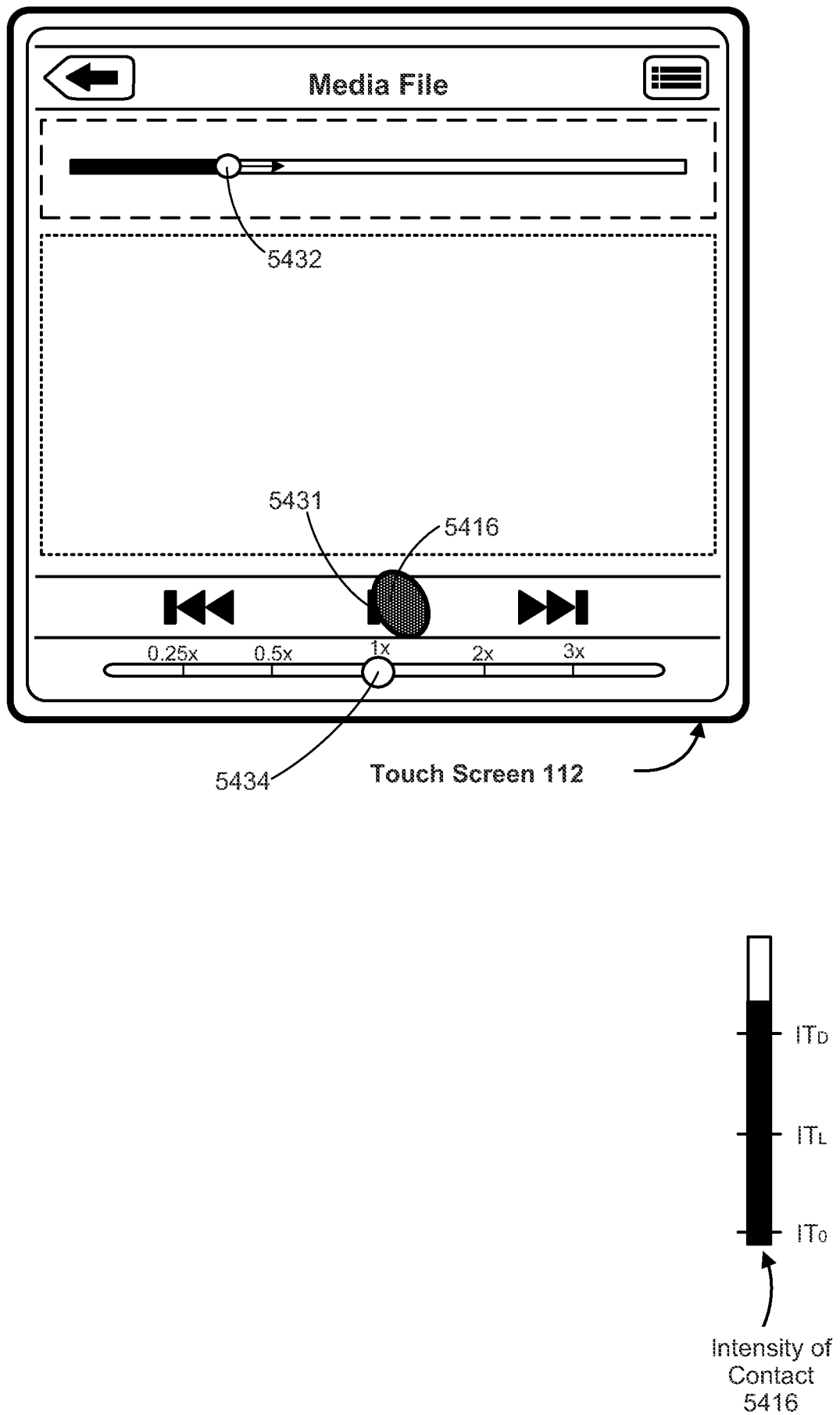


Figure 11I

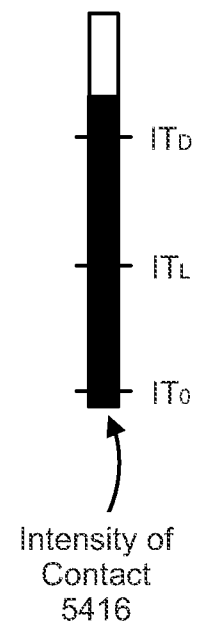
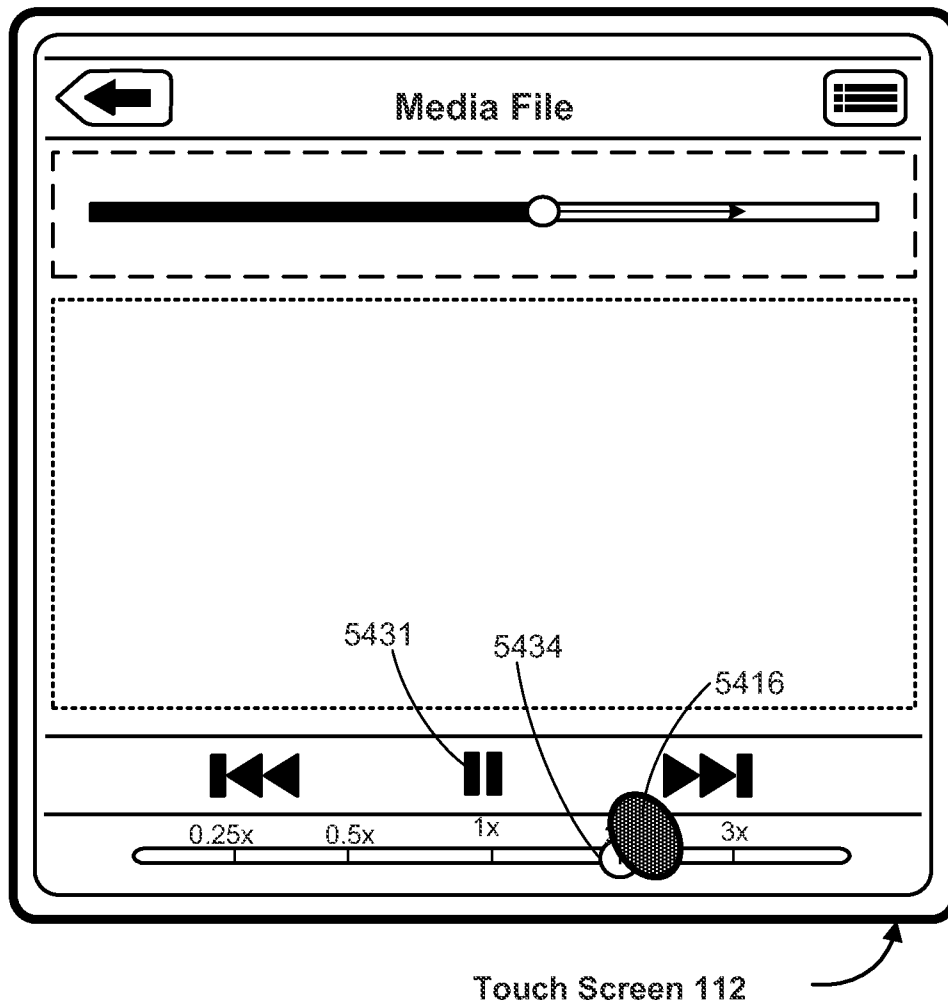


Figure 11J

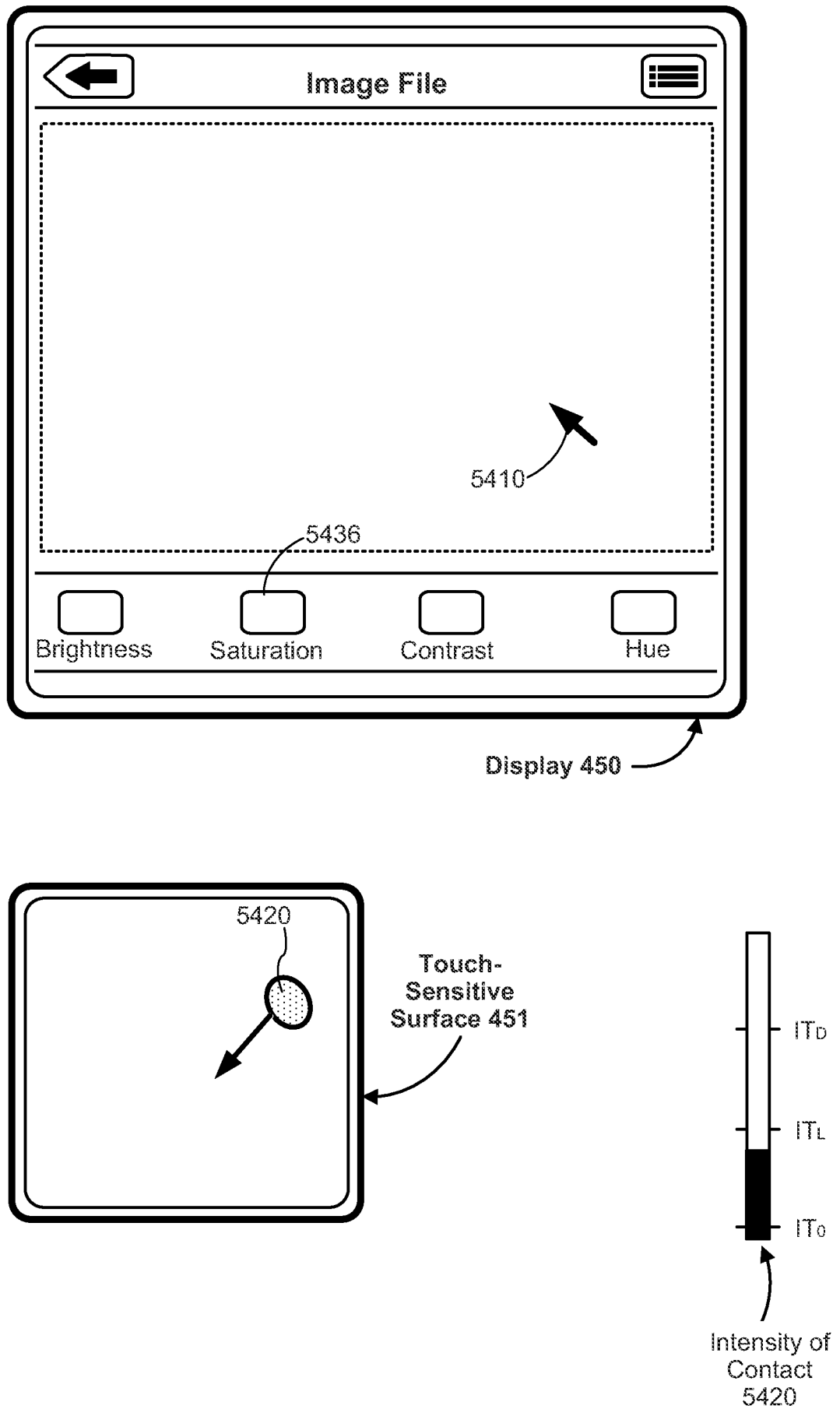


Figure 11K

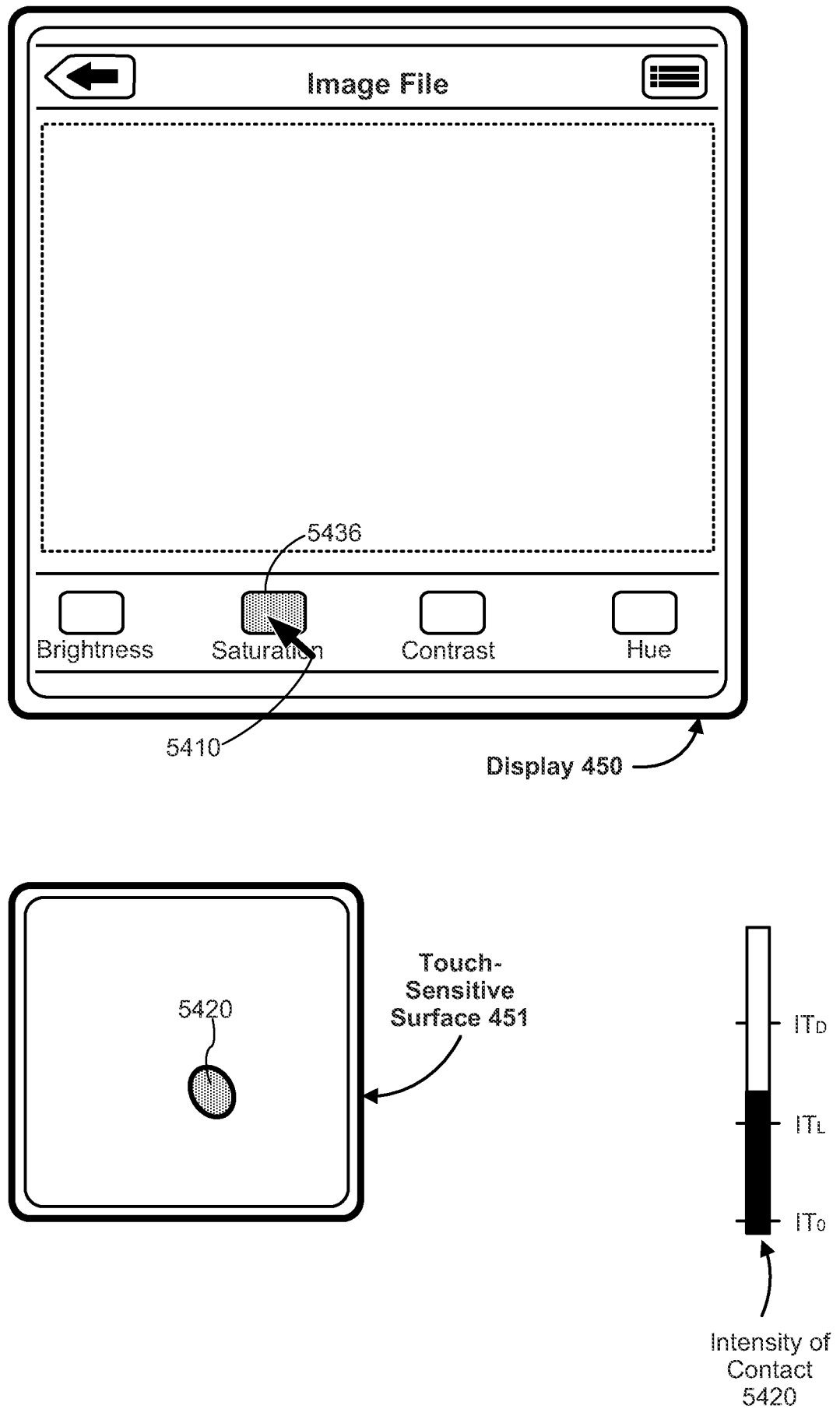


Figure 11L

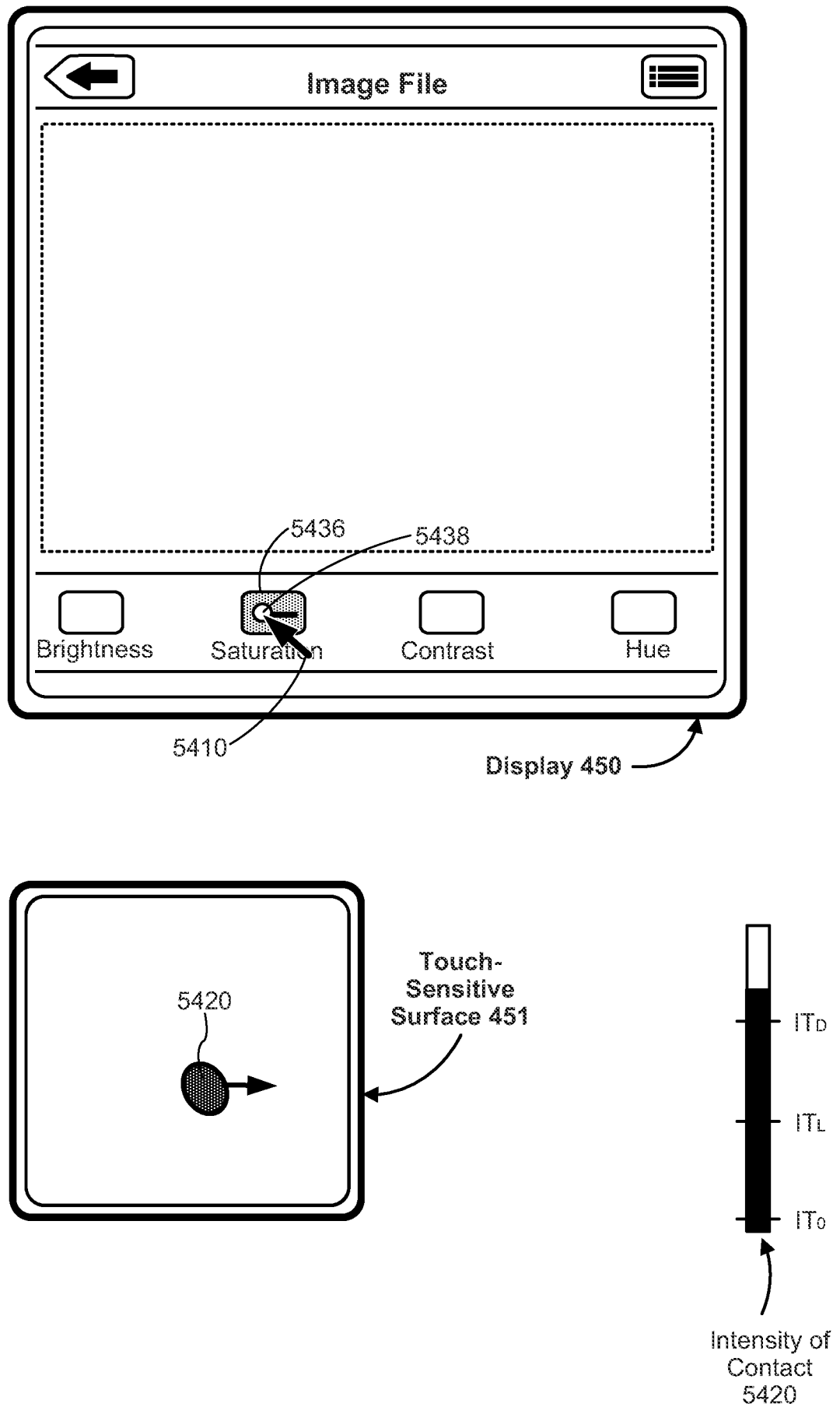


Figure 11M

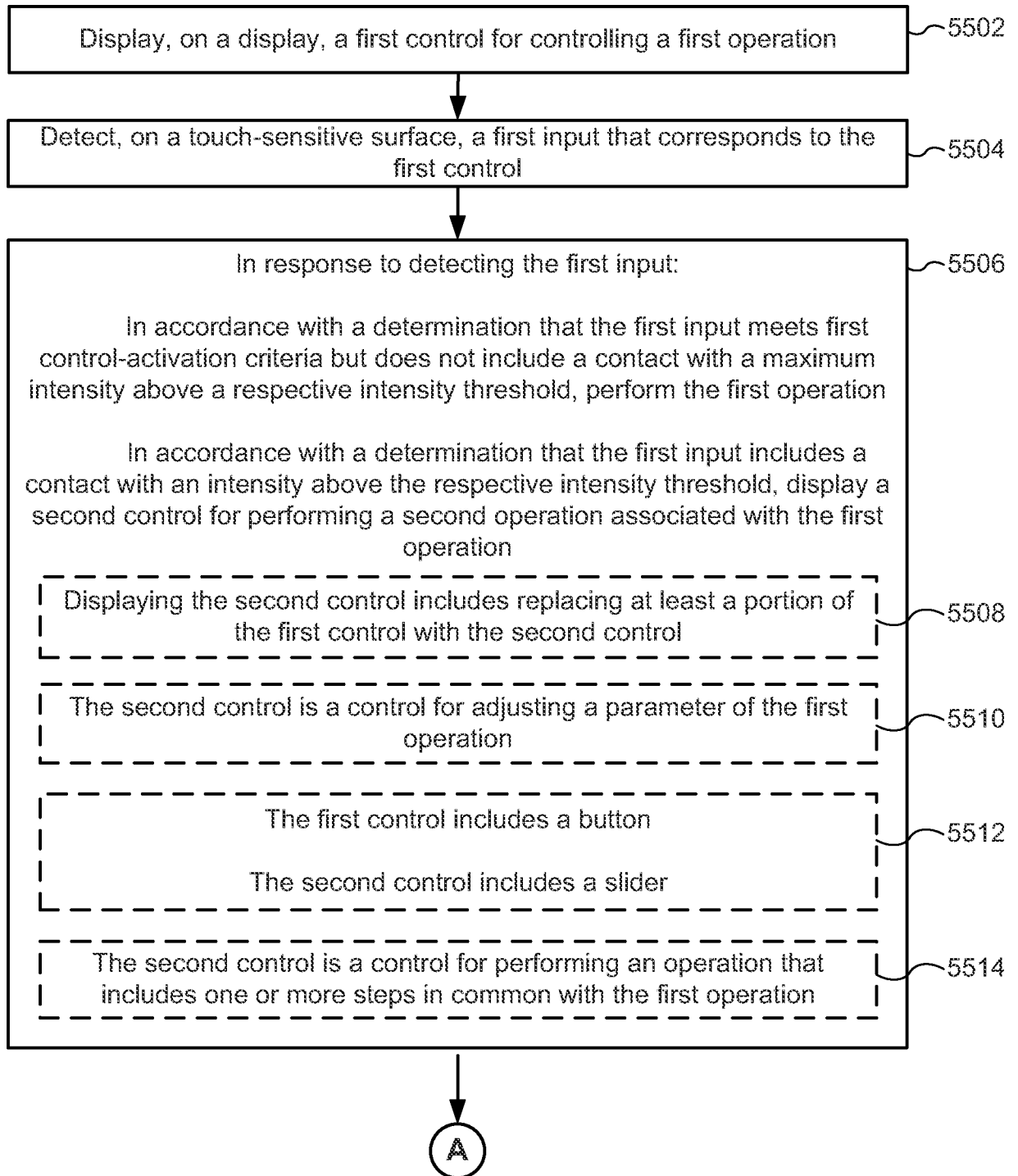
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Figure 12A

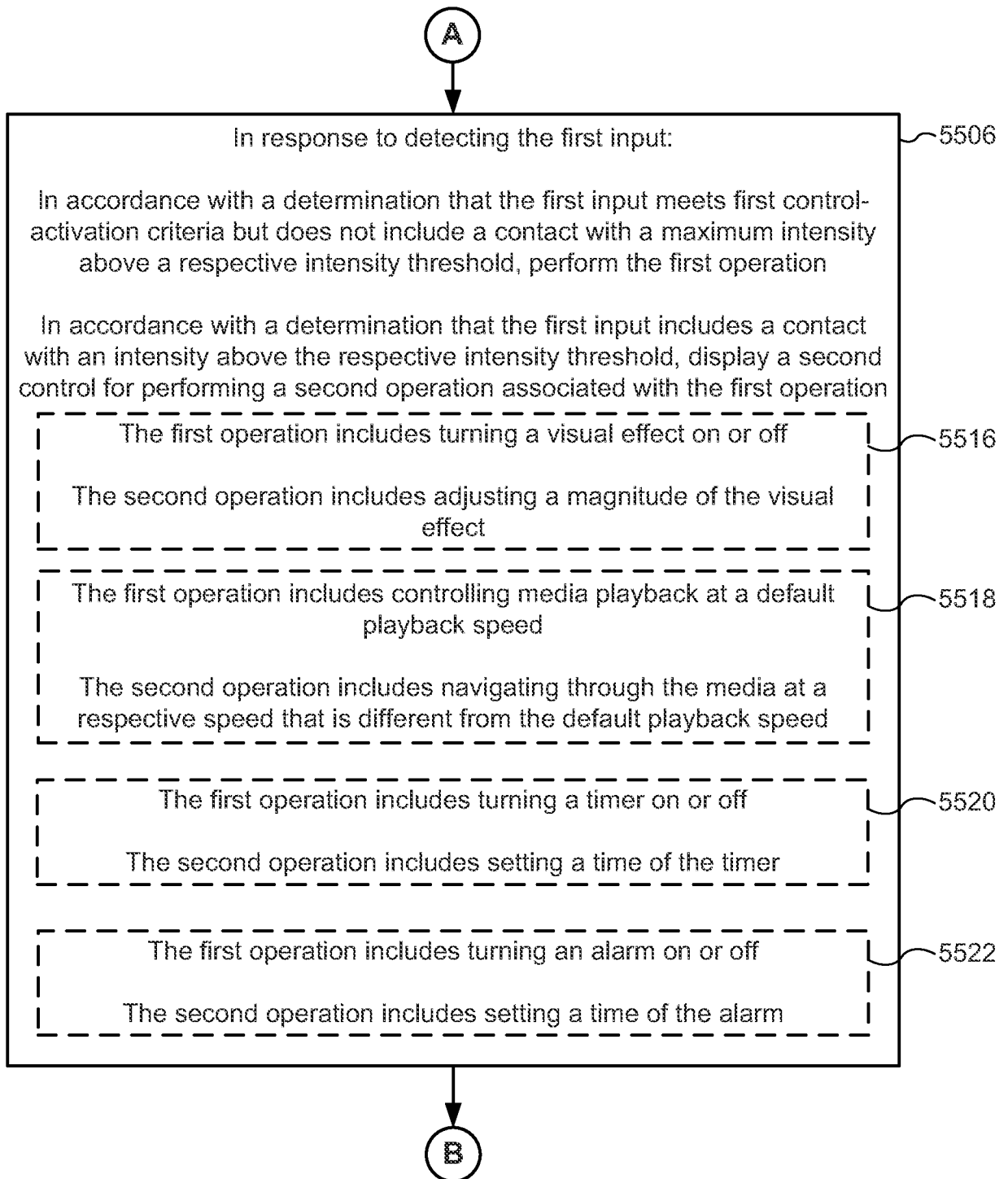


Figure 12B

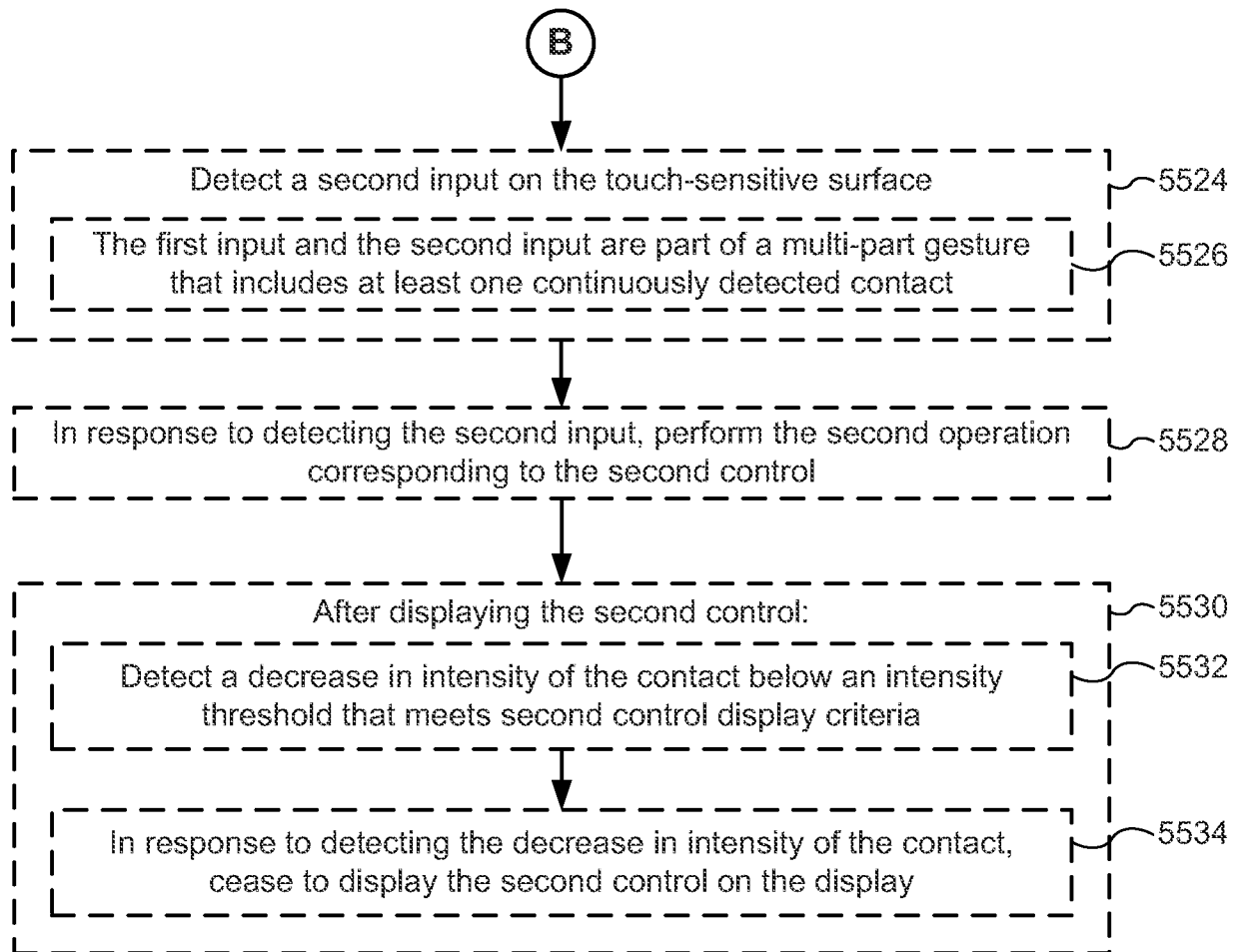


Figure 12C

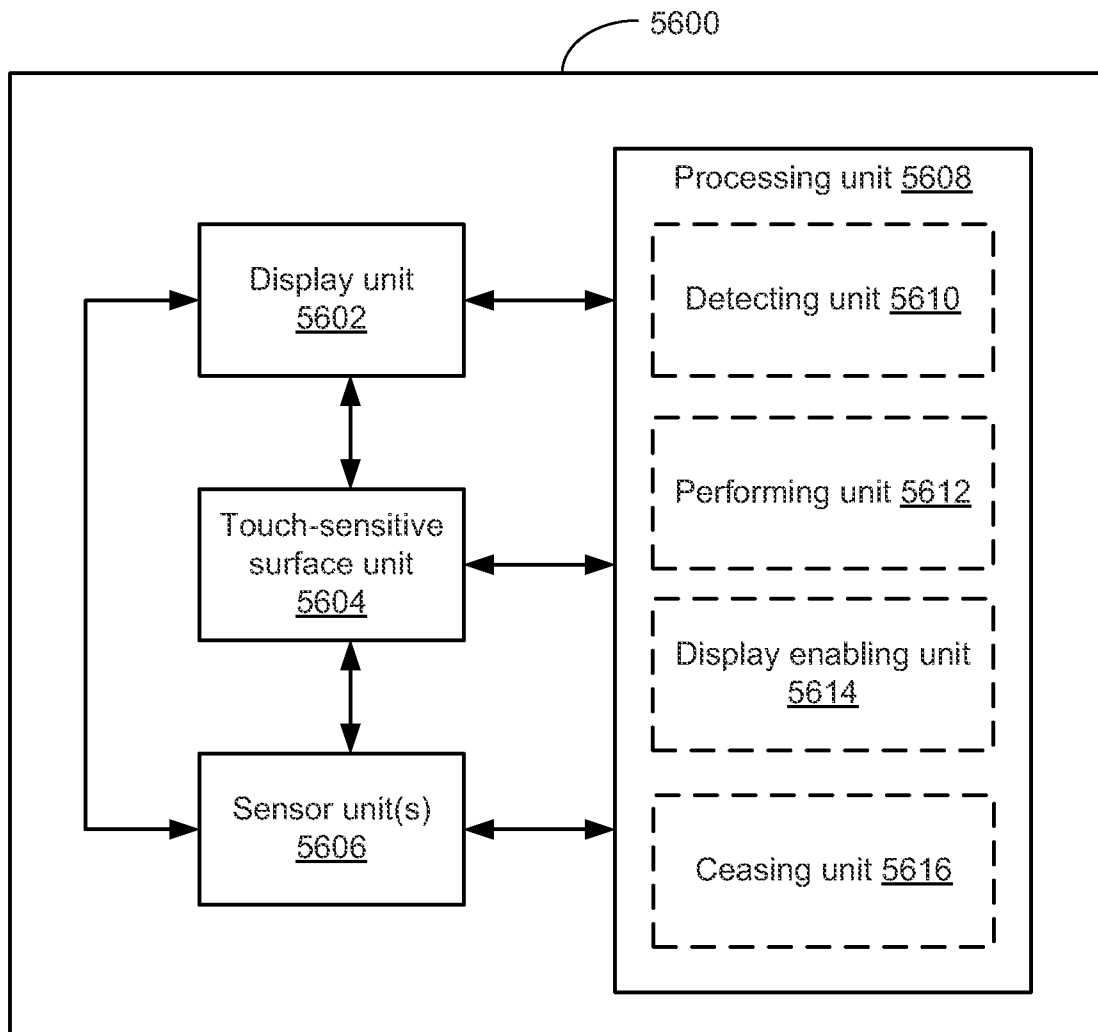


Figure 13

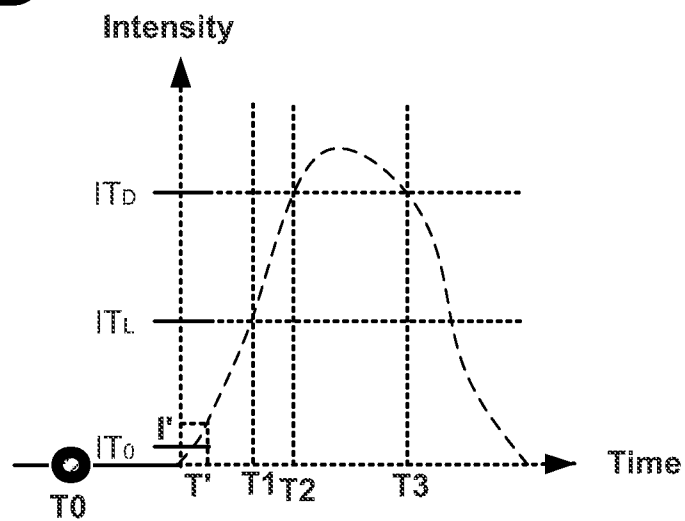
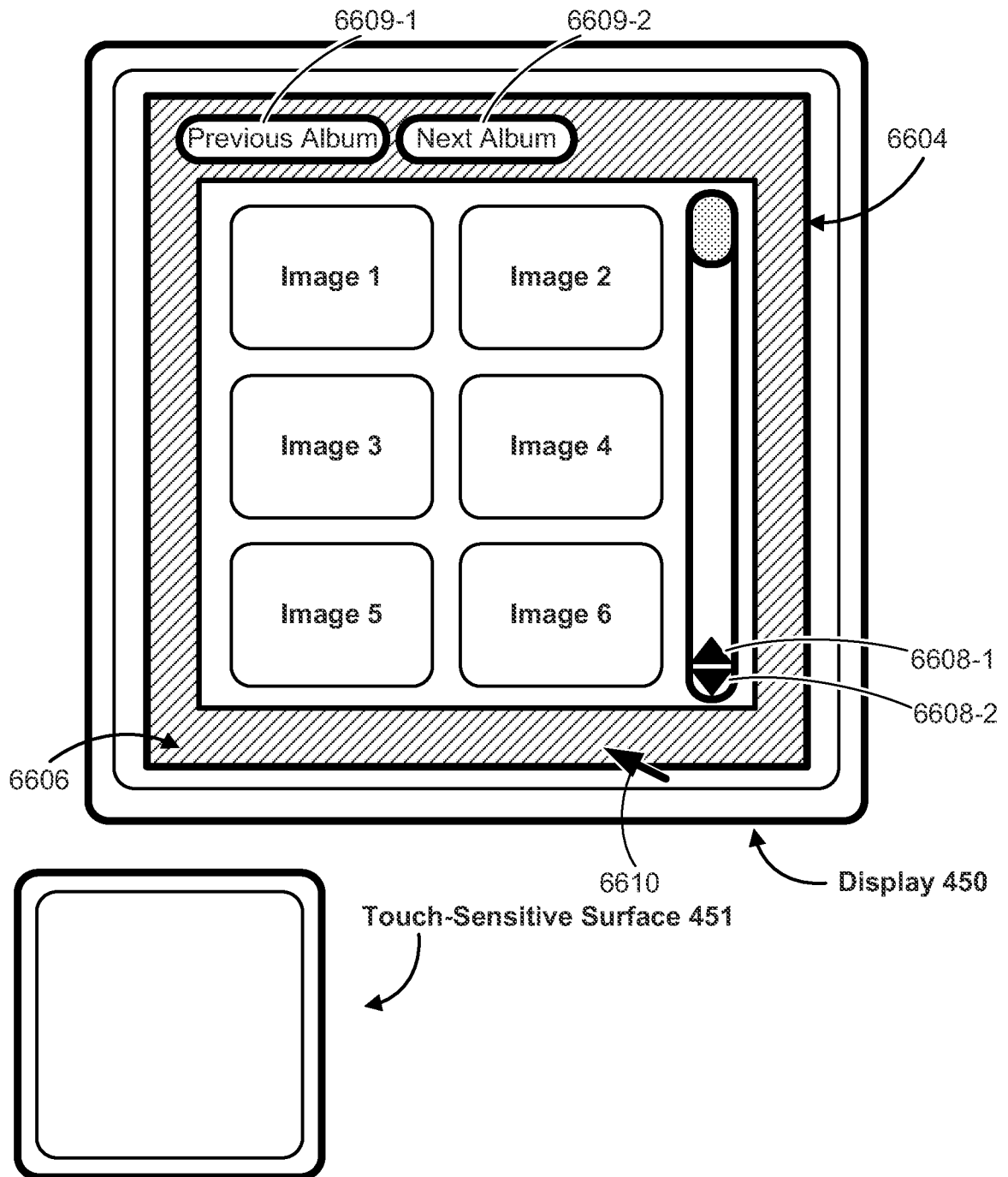


Figure 14A

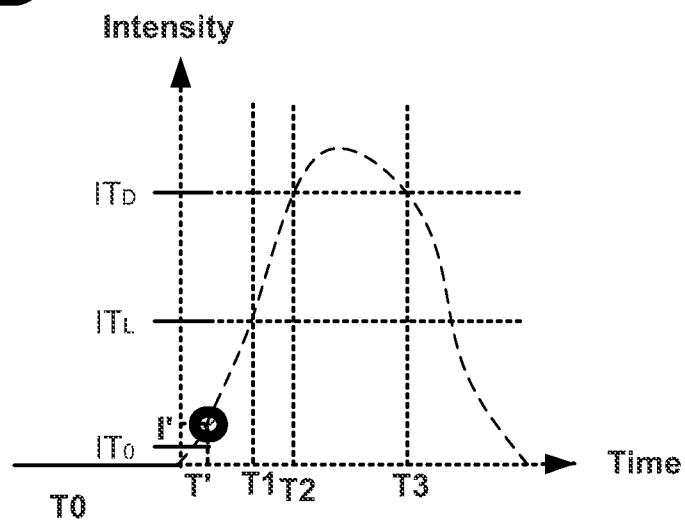
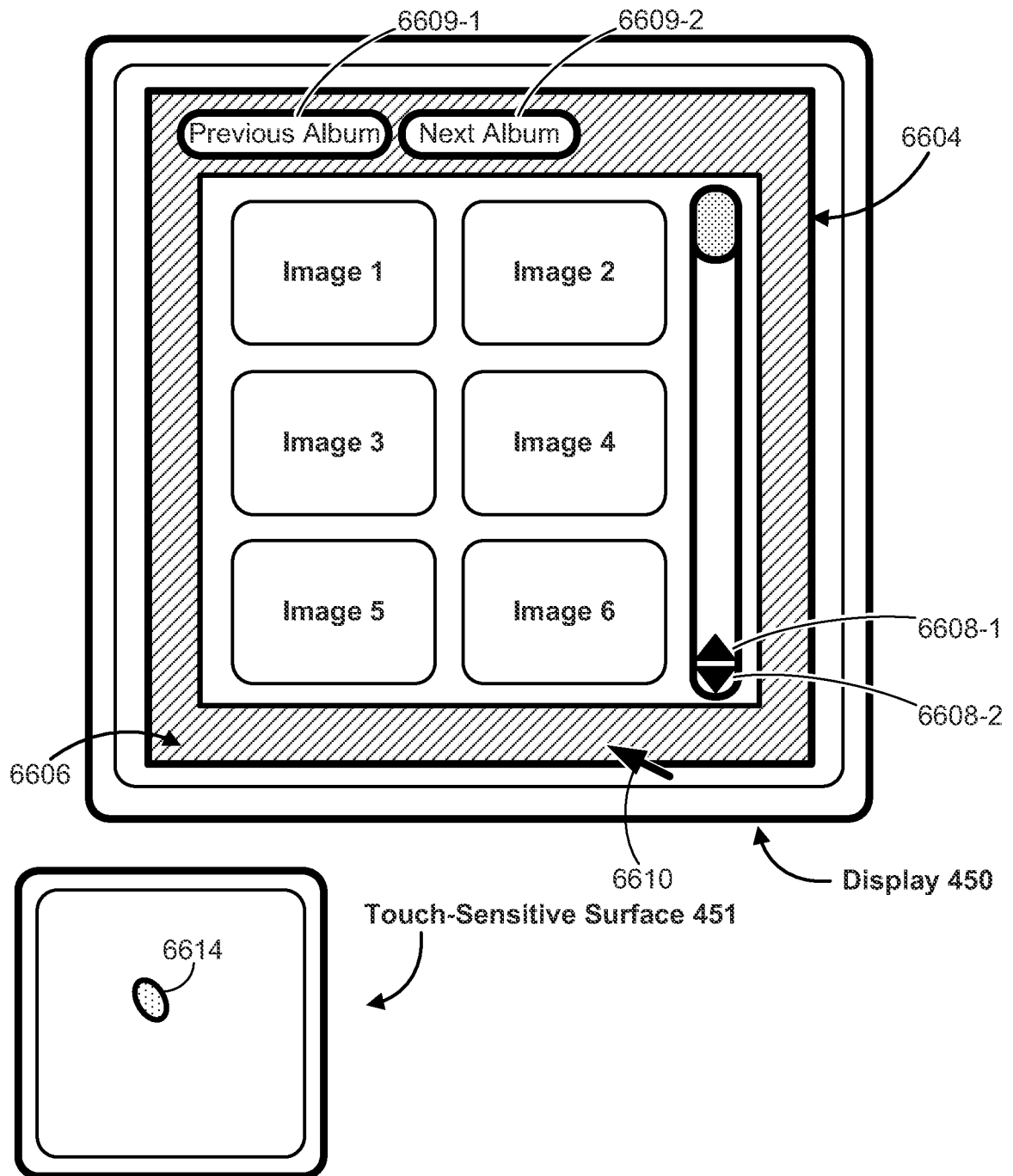


Figure 14B

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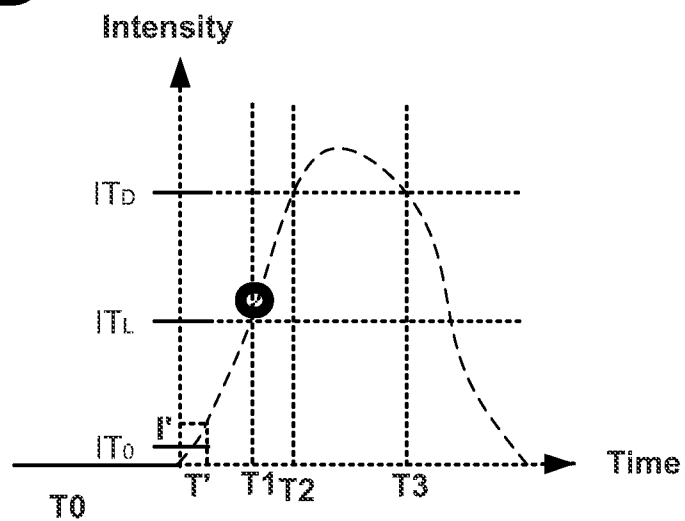
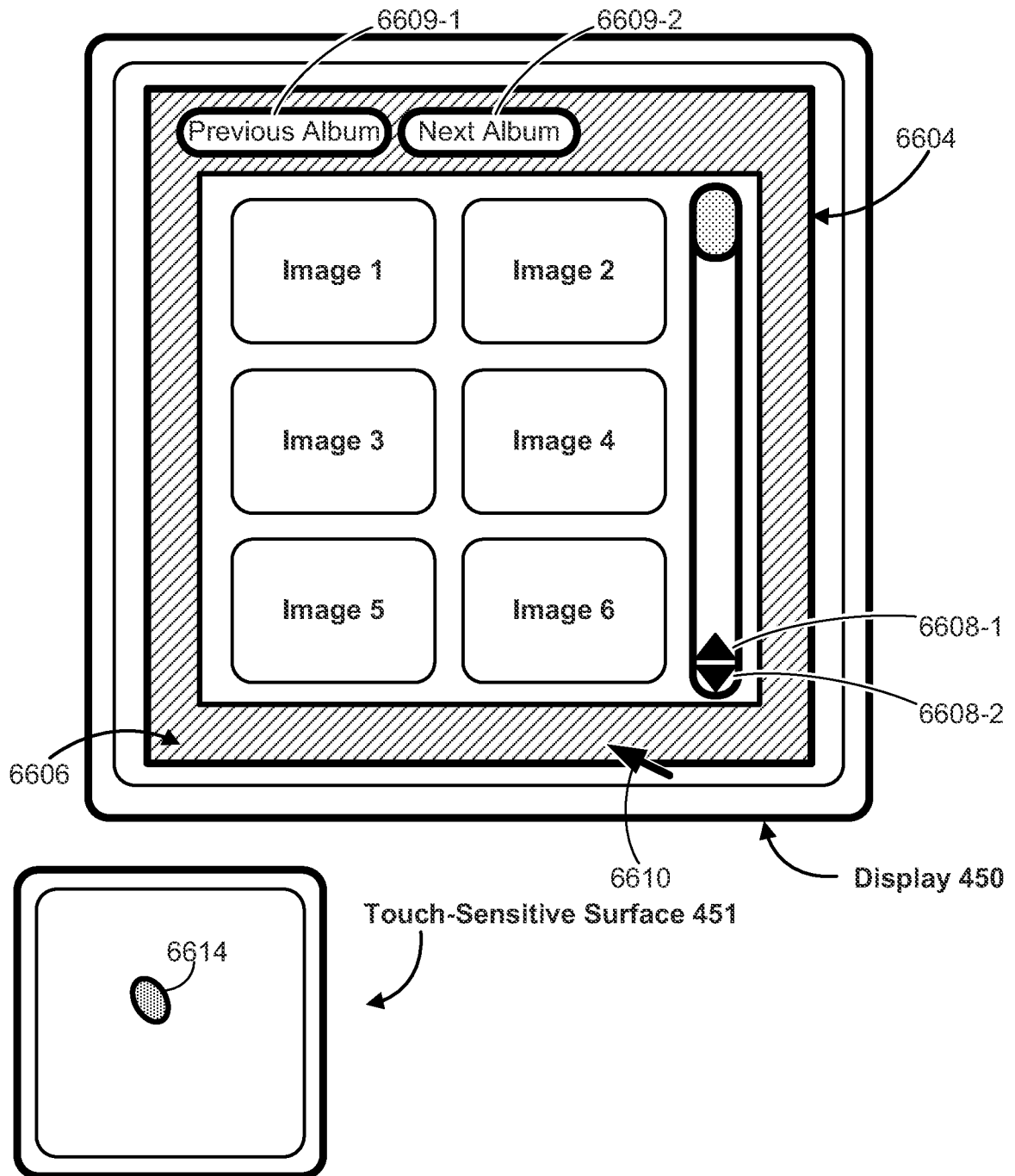


Figure 14C

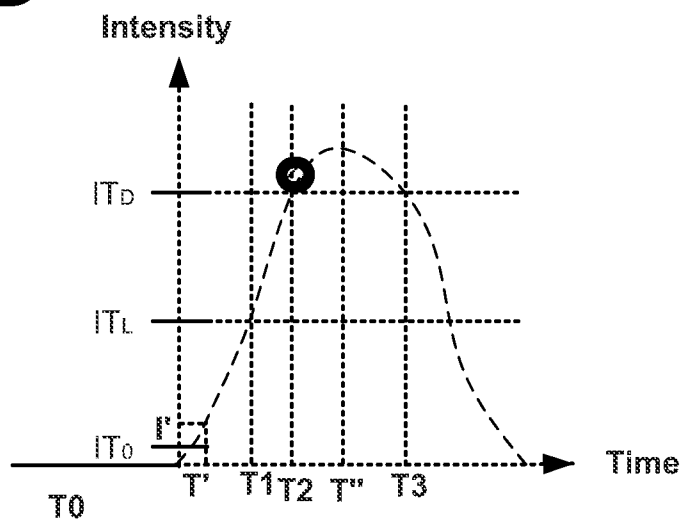
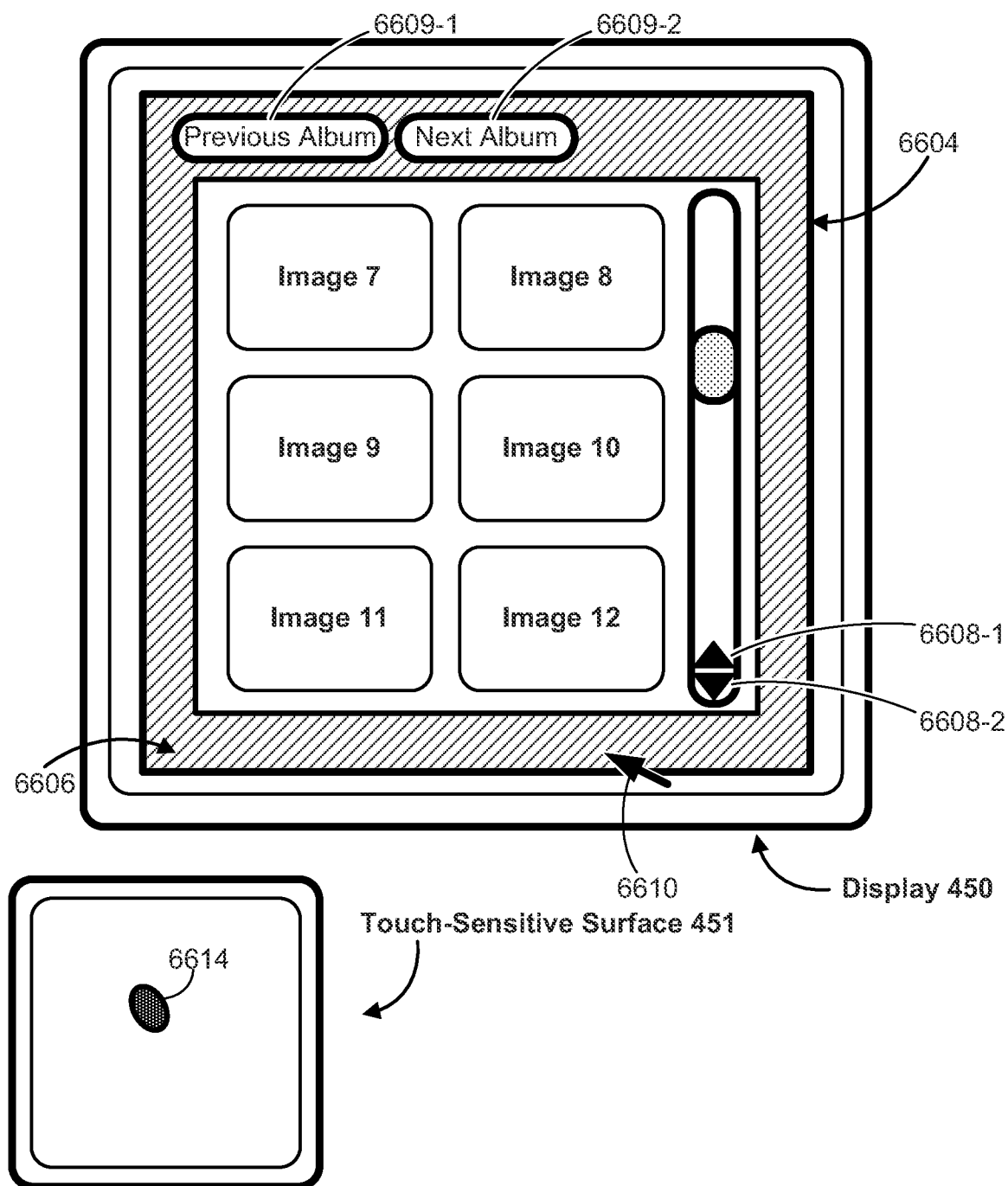


Figure 14D

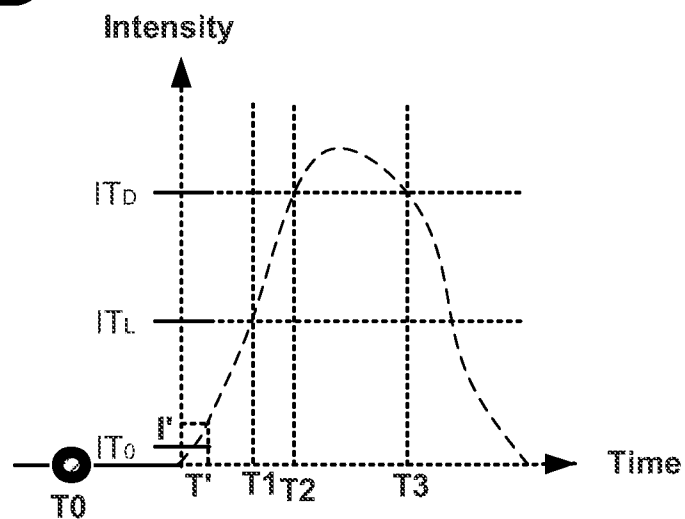
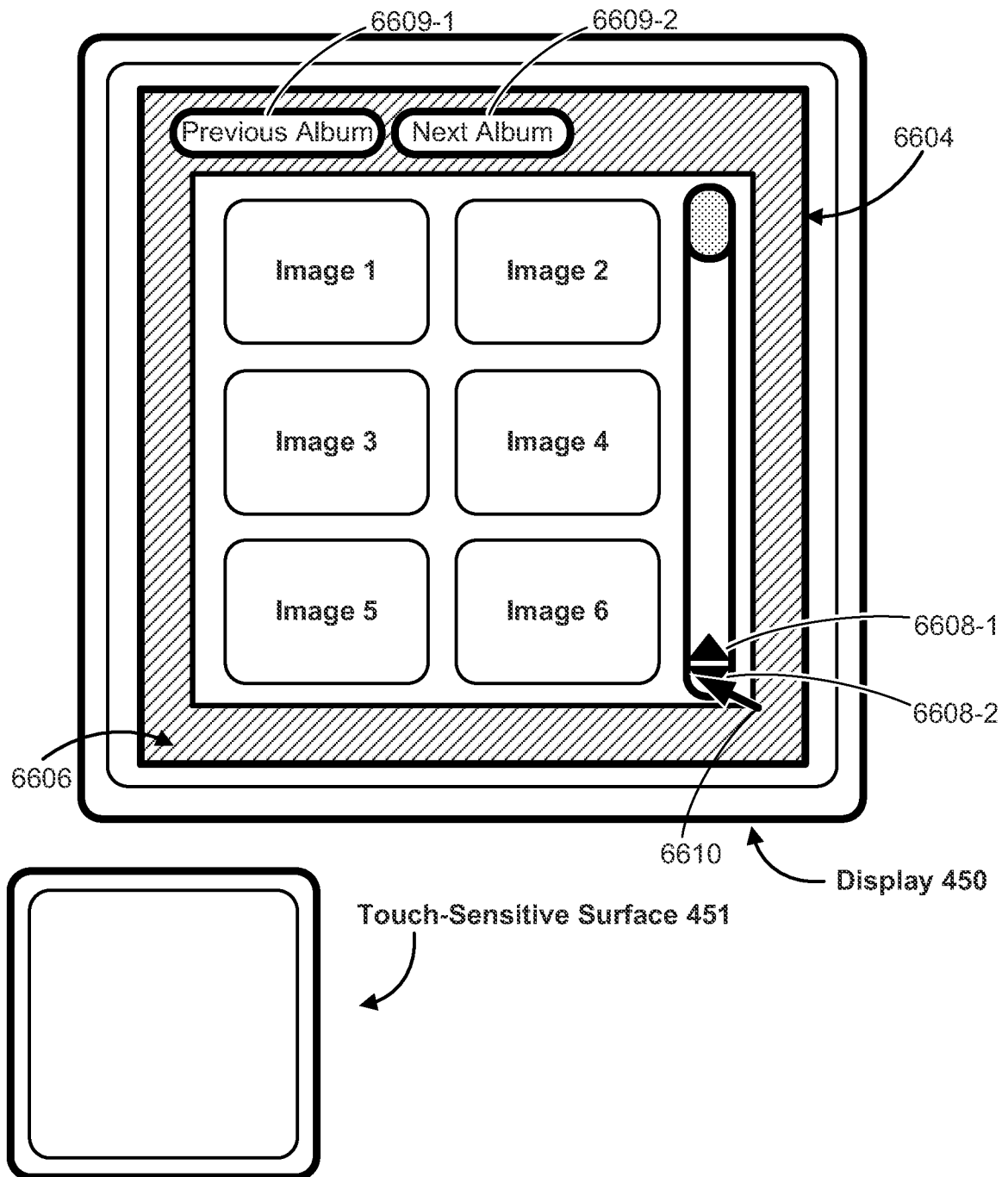


Figure 14E

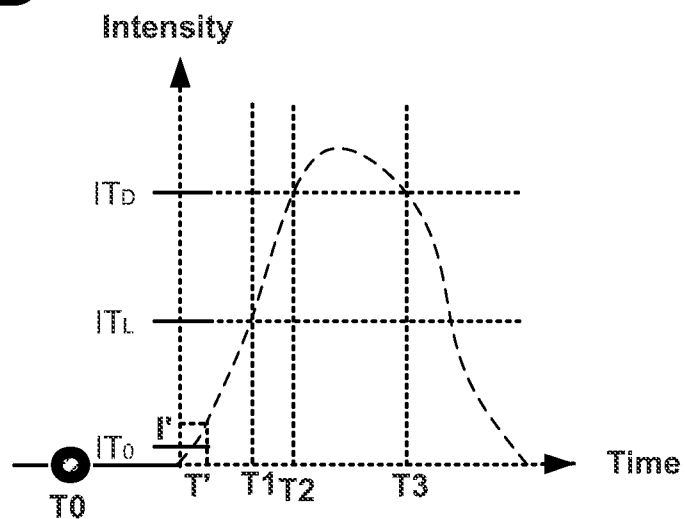
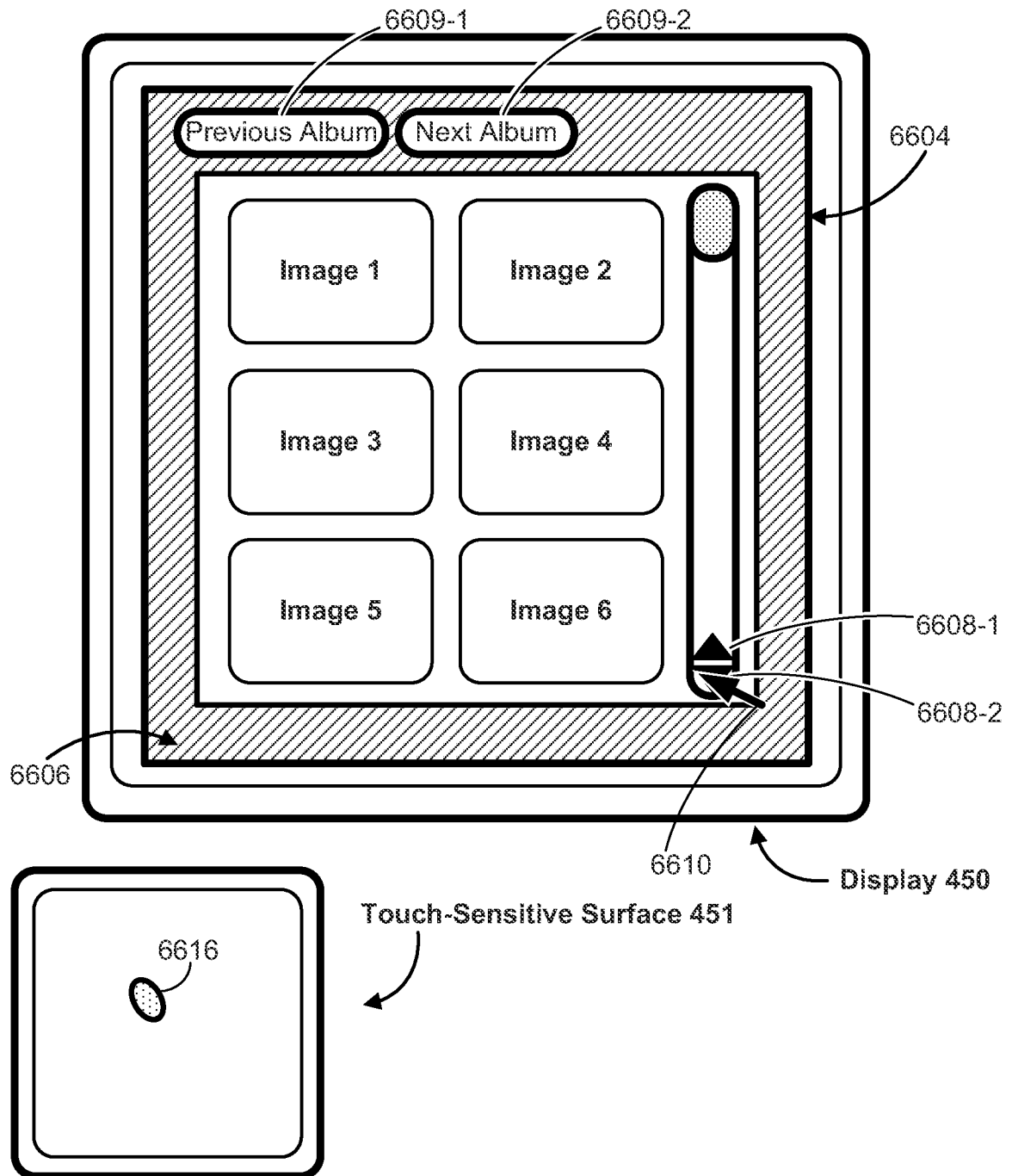


Figure 14F

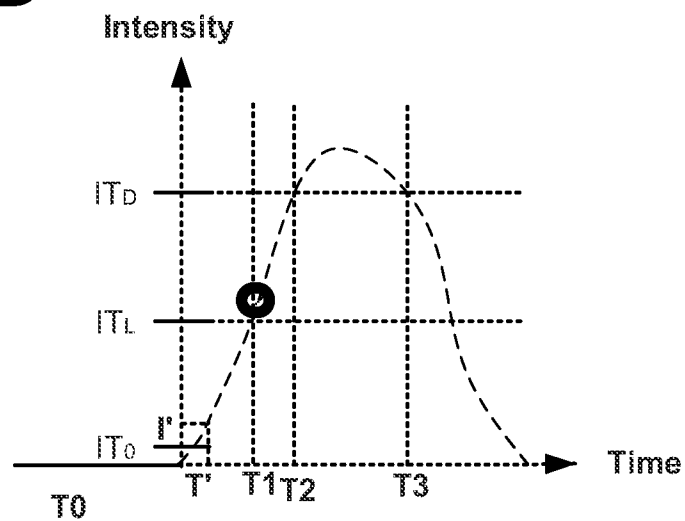
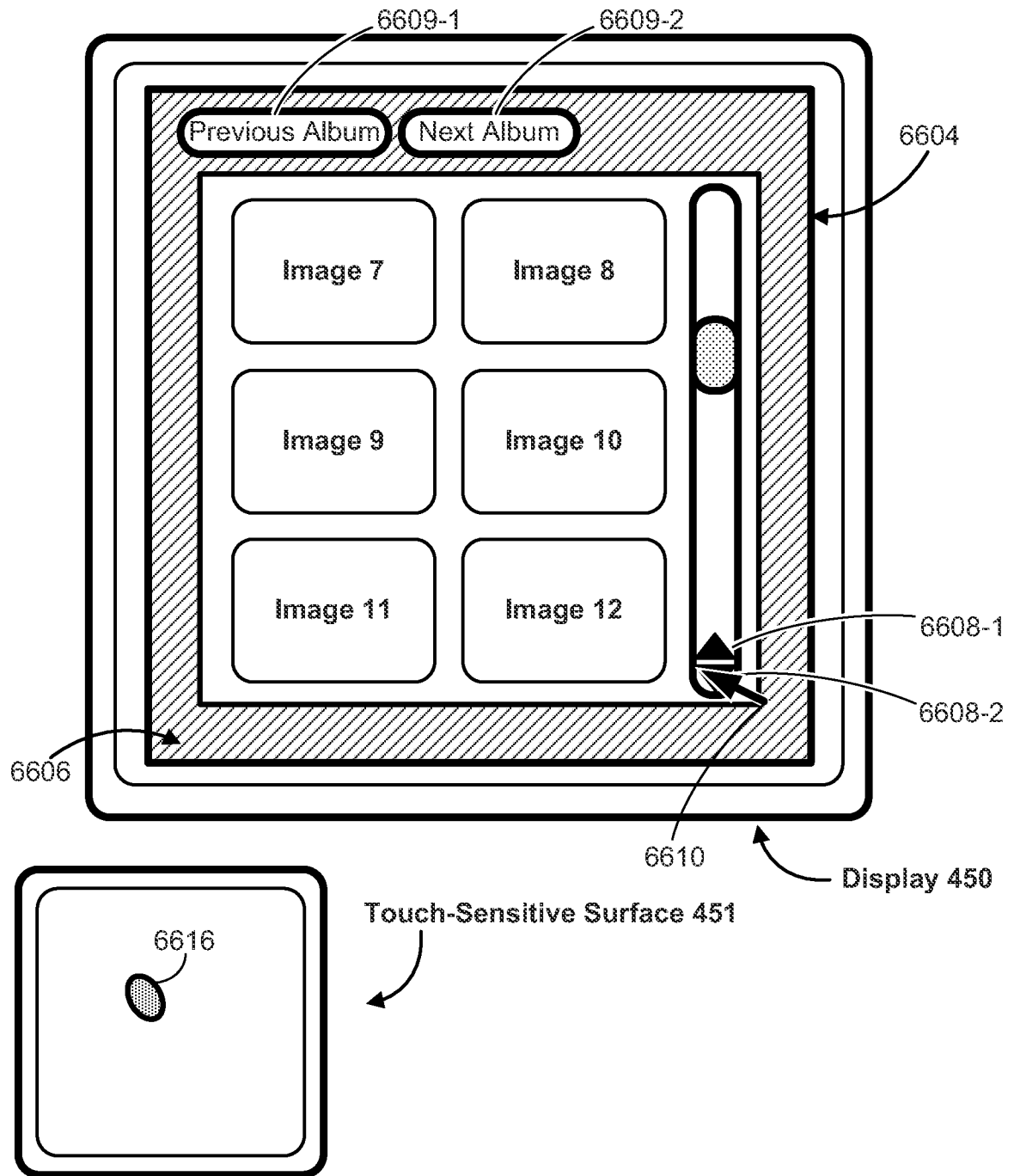


Figure 14G

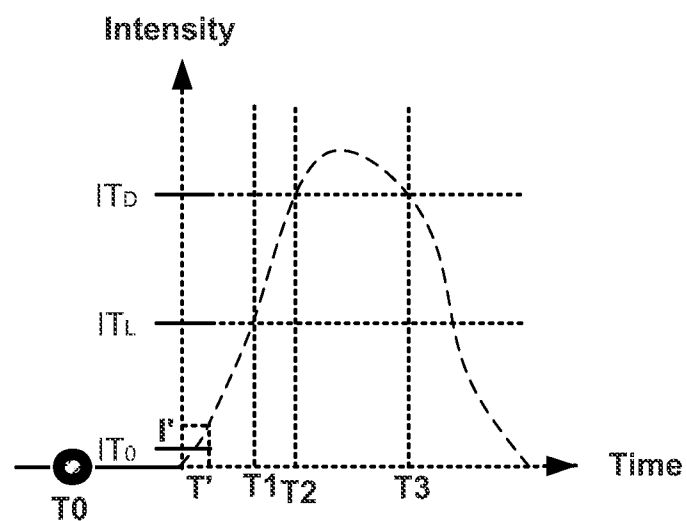
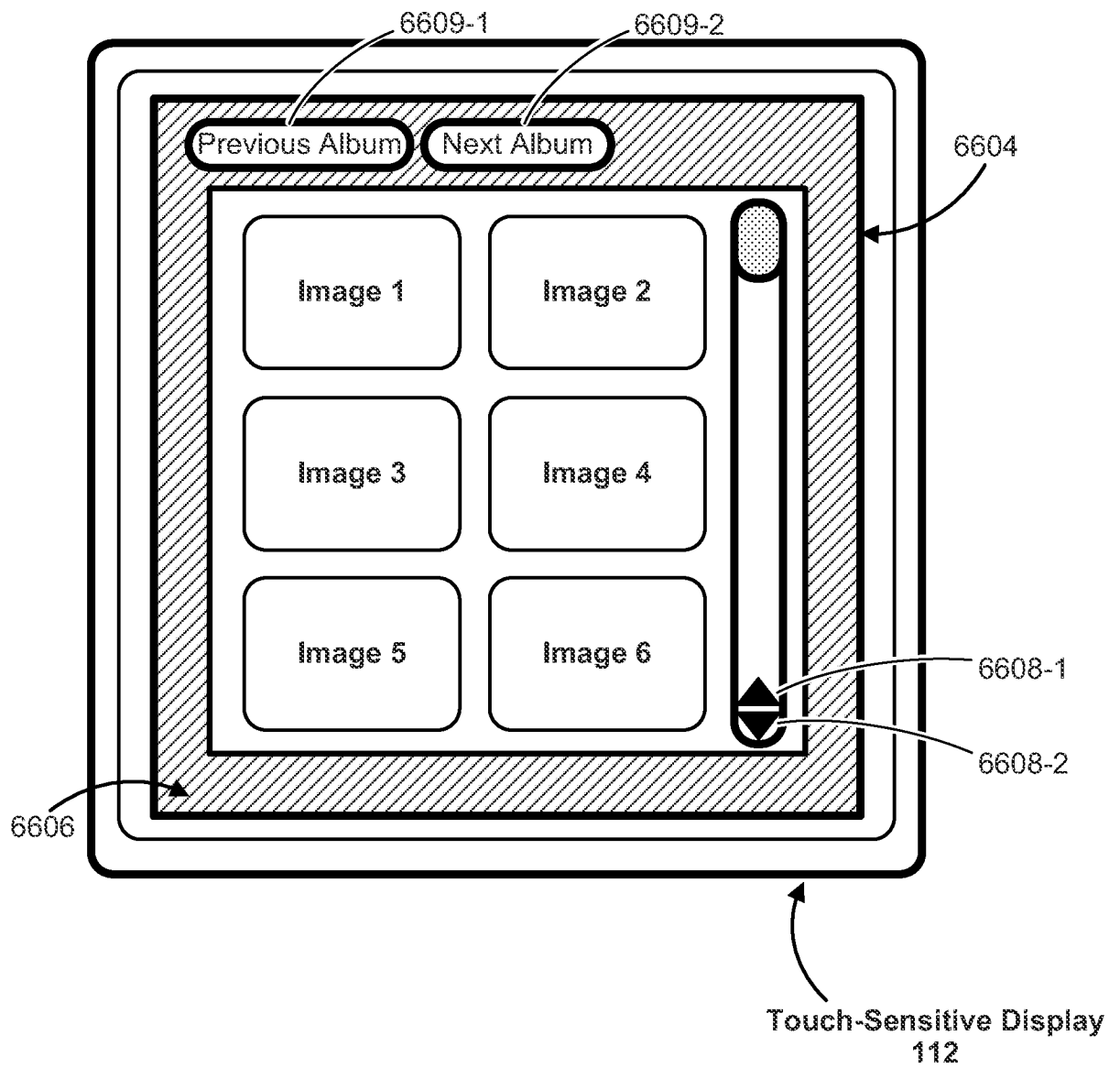


Figure 14H

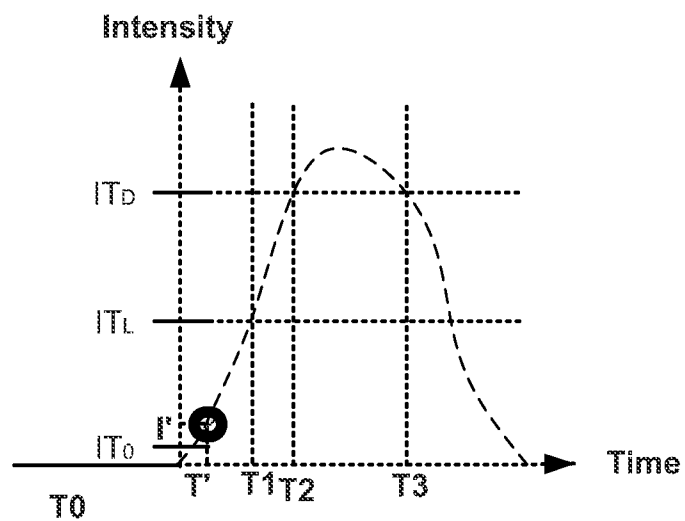
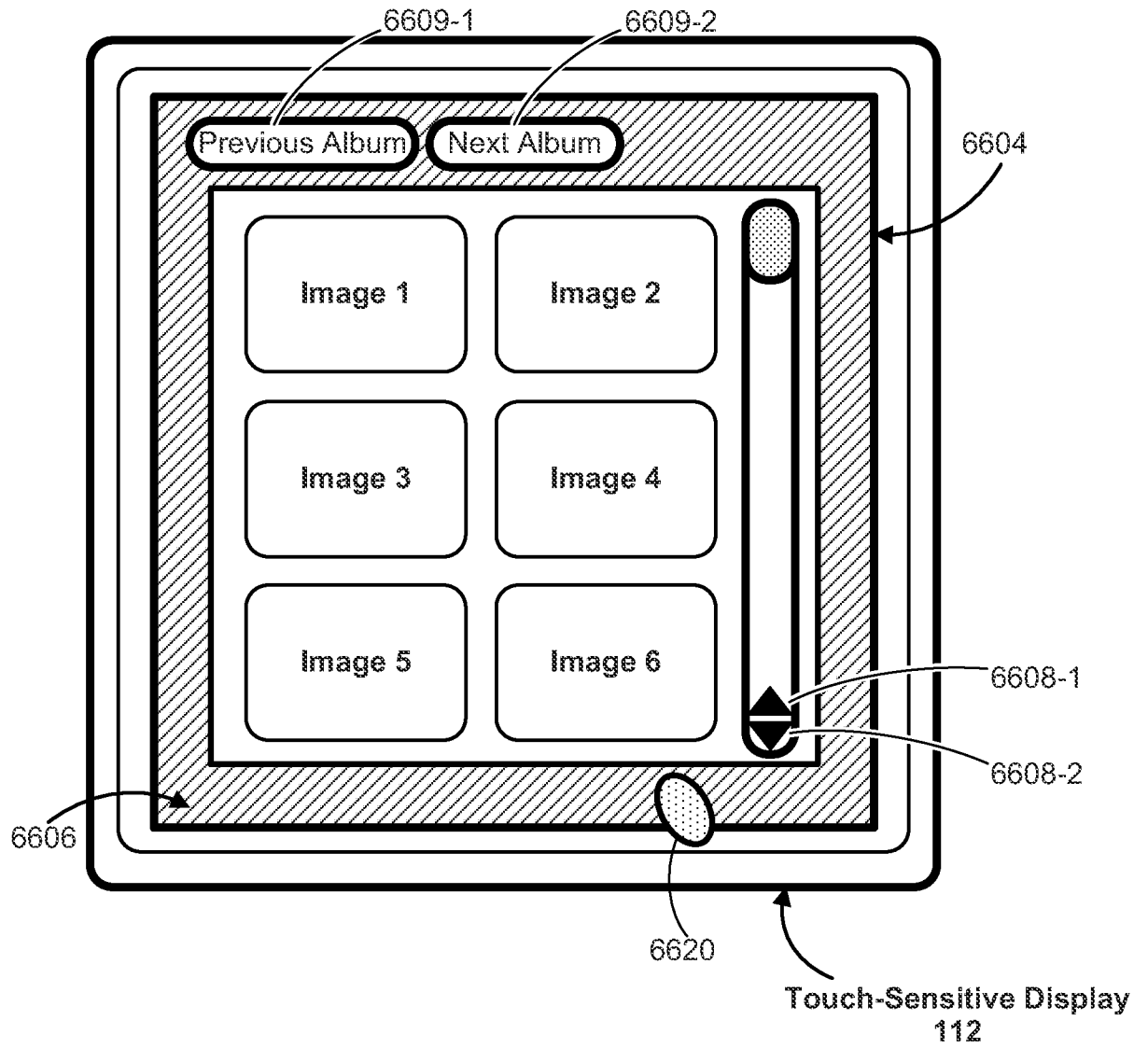


Figure 14I

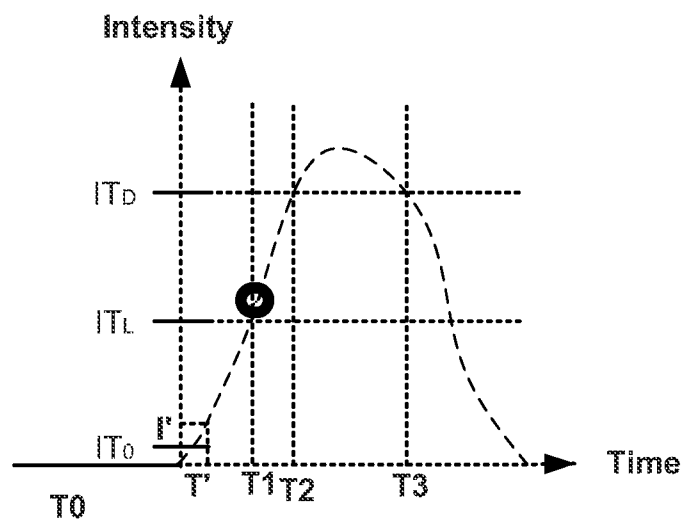
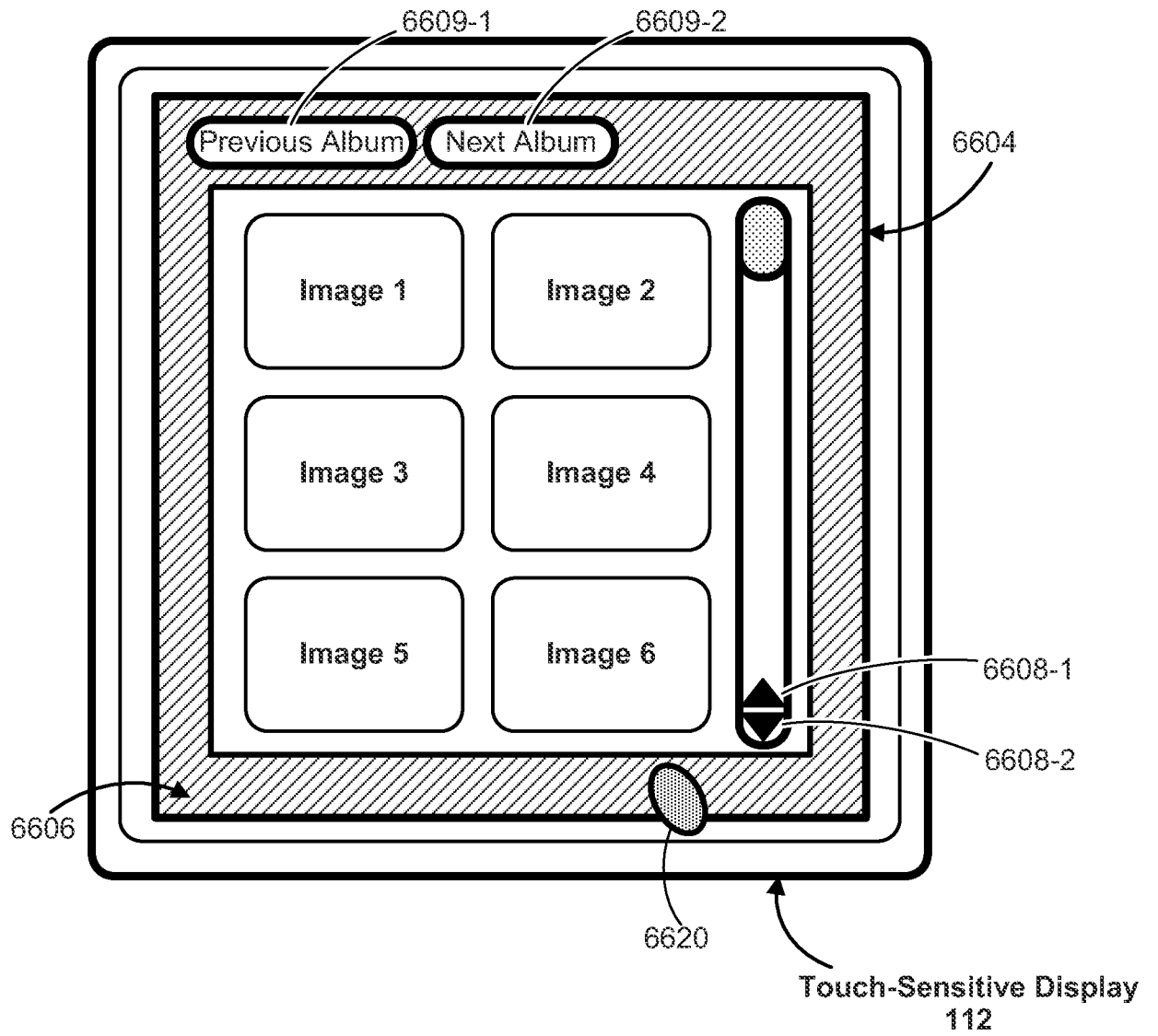


Figure 14J

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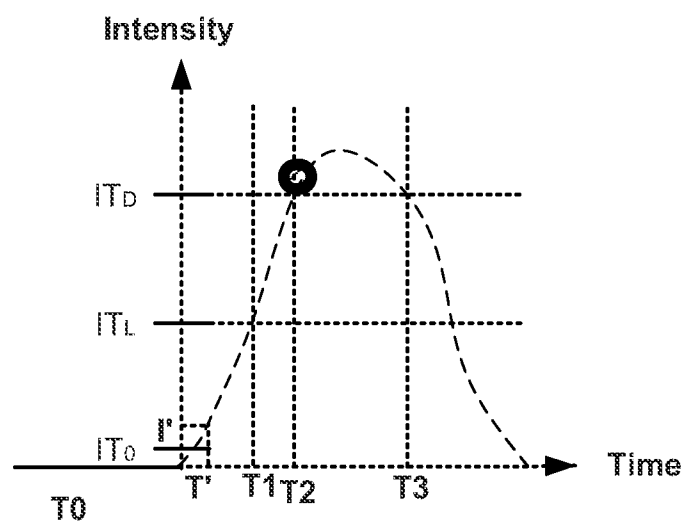
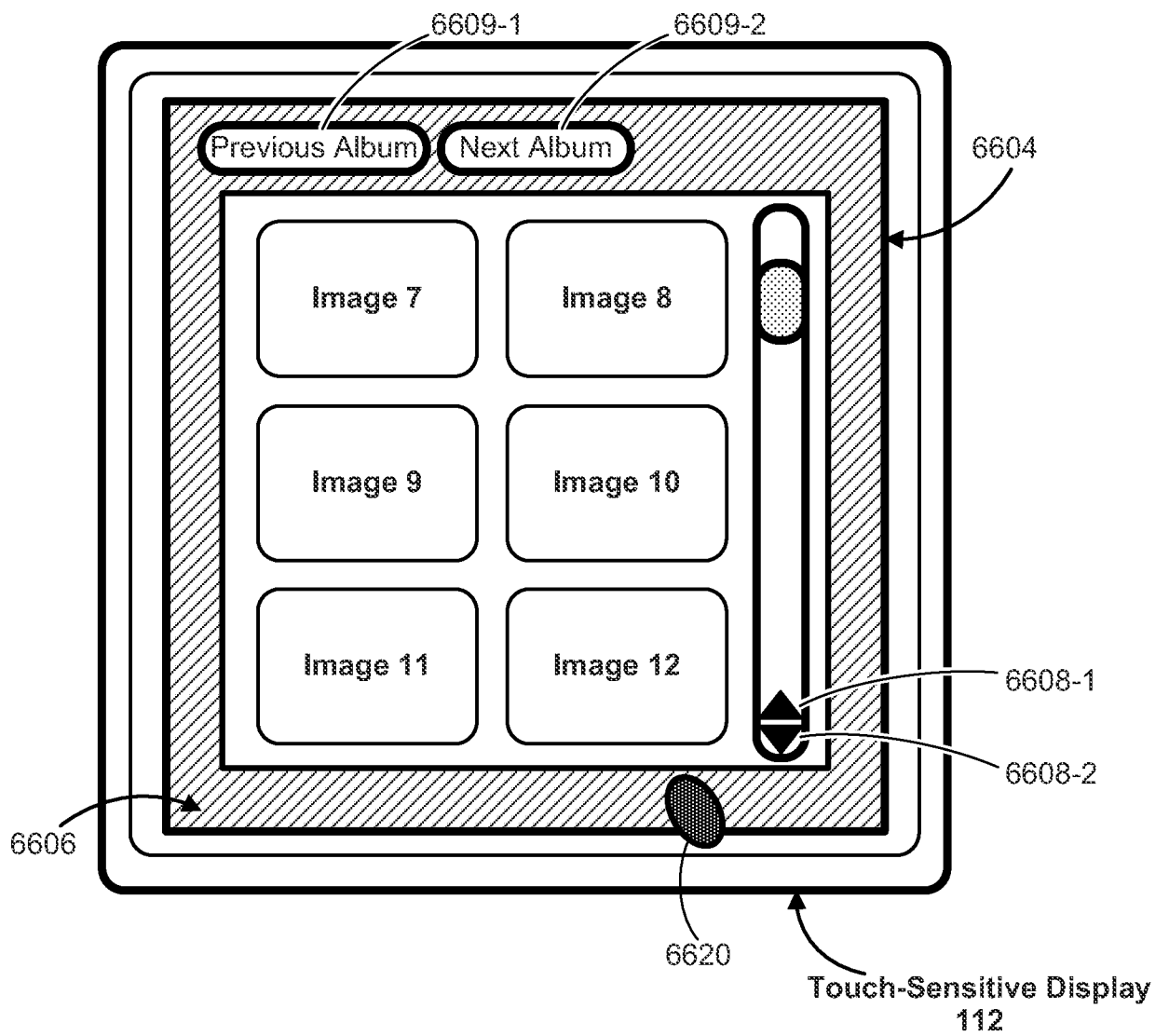


Figure 14K

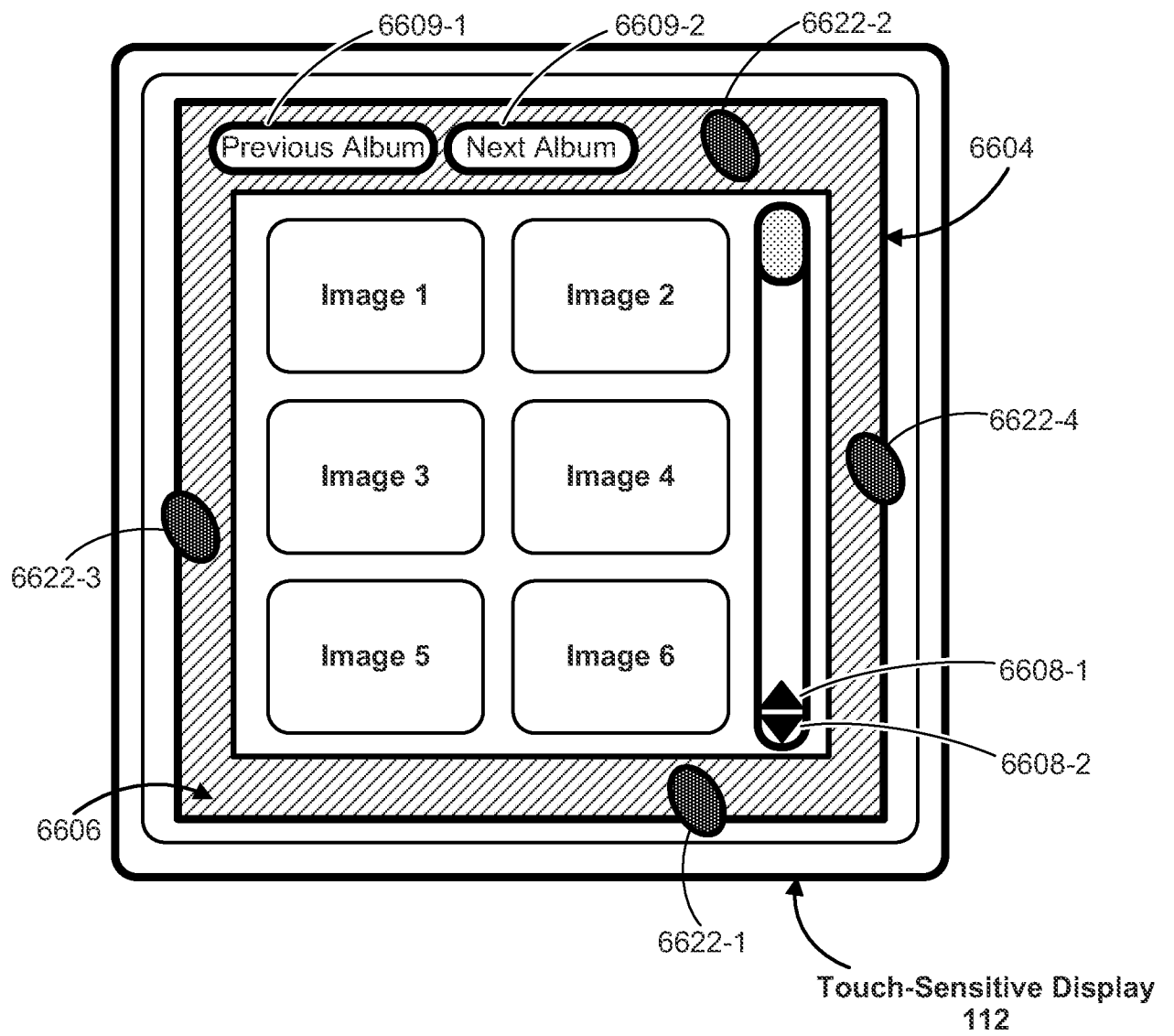


Figure 14L

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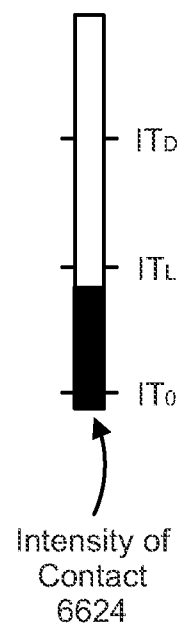
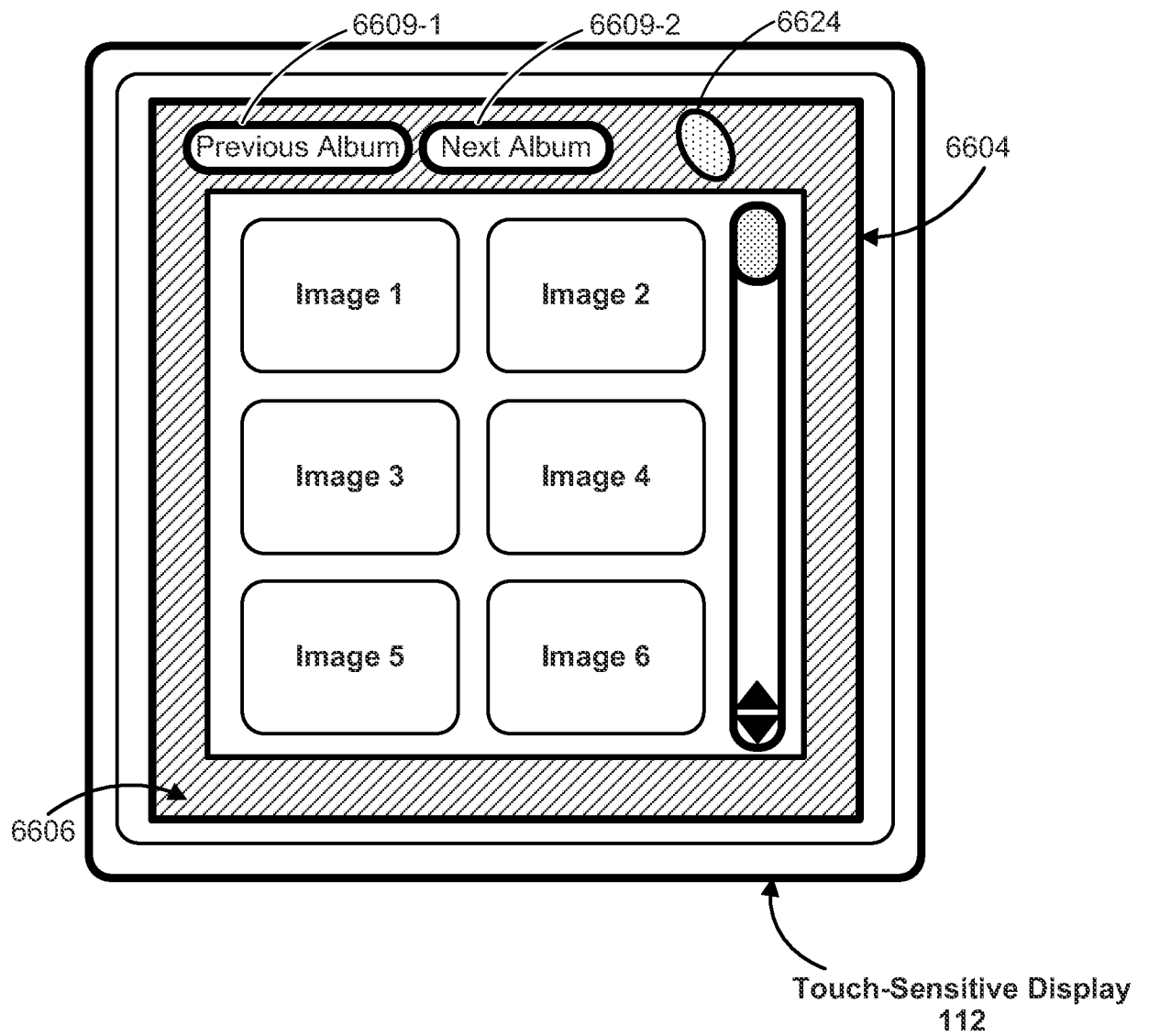


Figure 14M

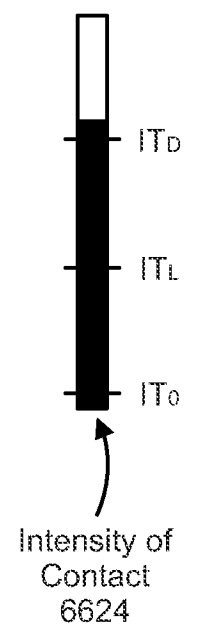
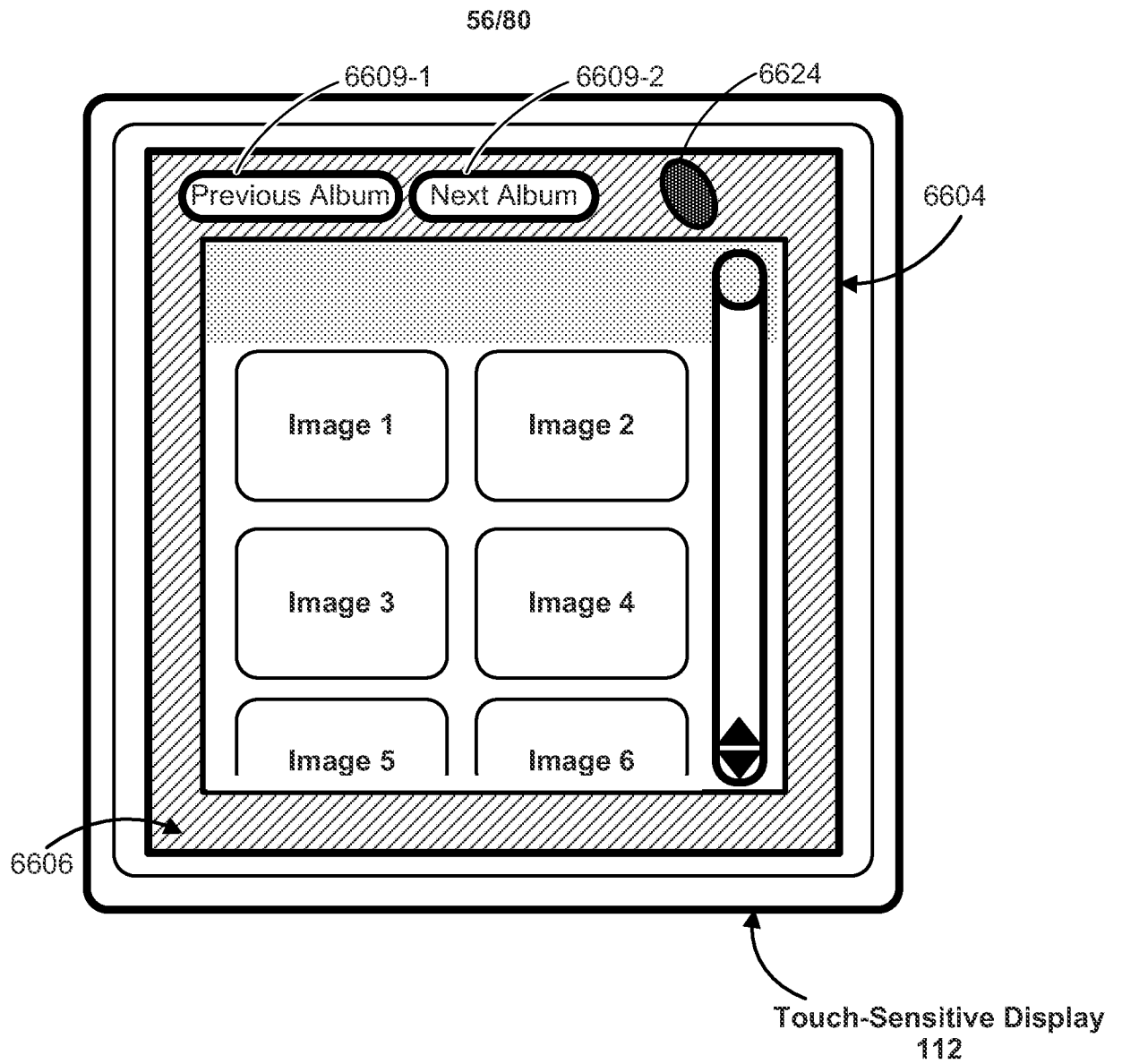


Figure 14N

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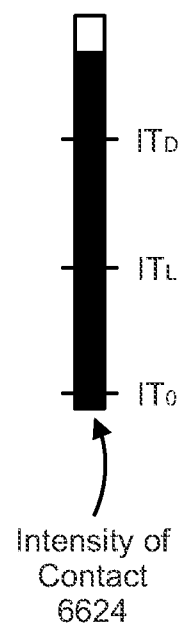
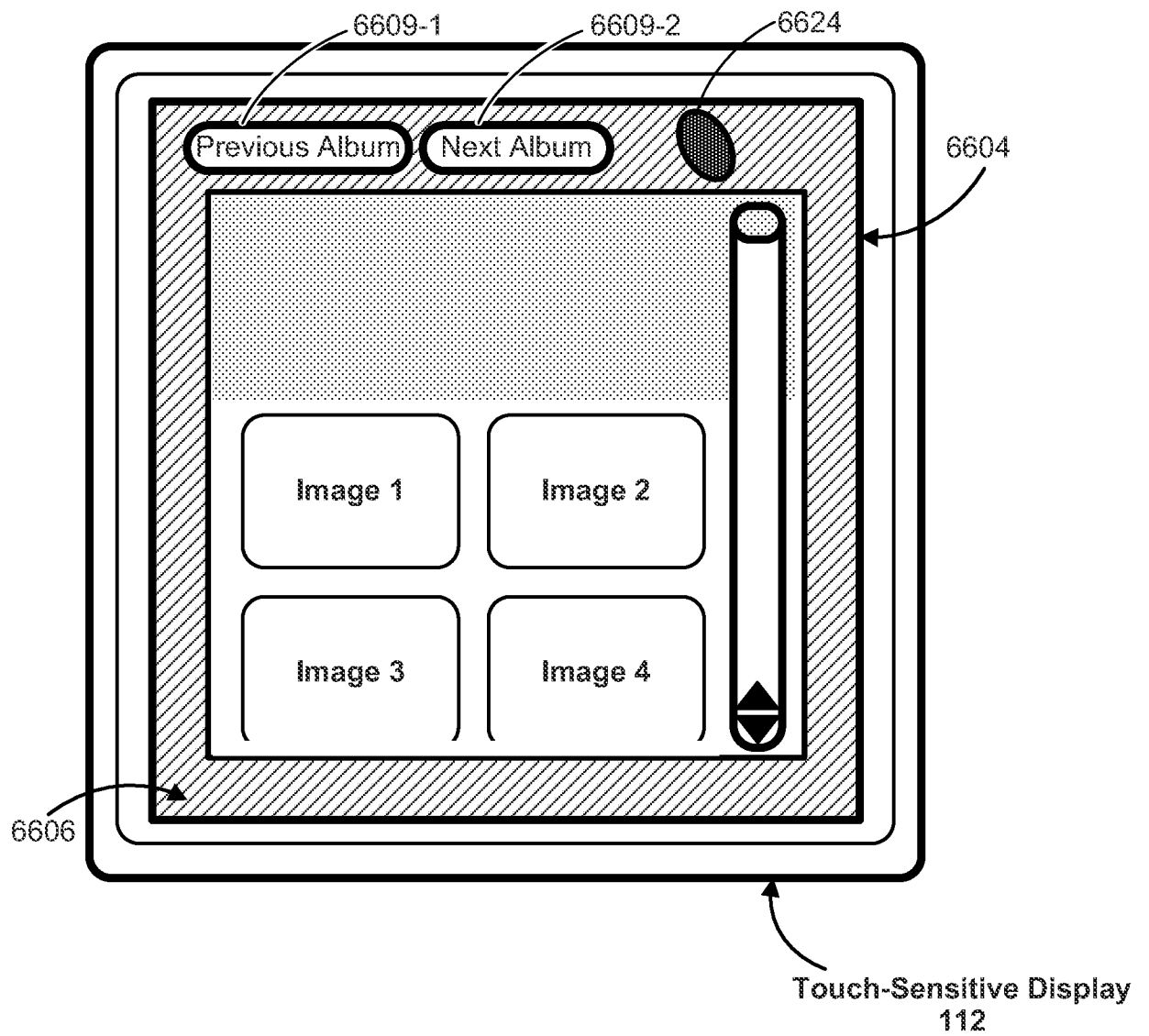


Figure 140

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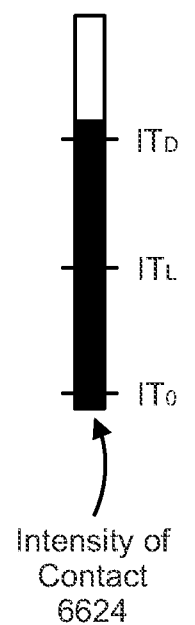
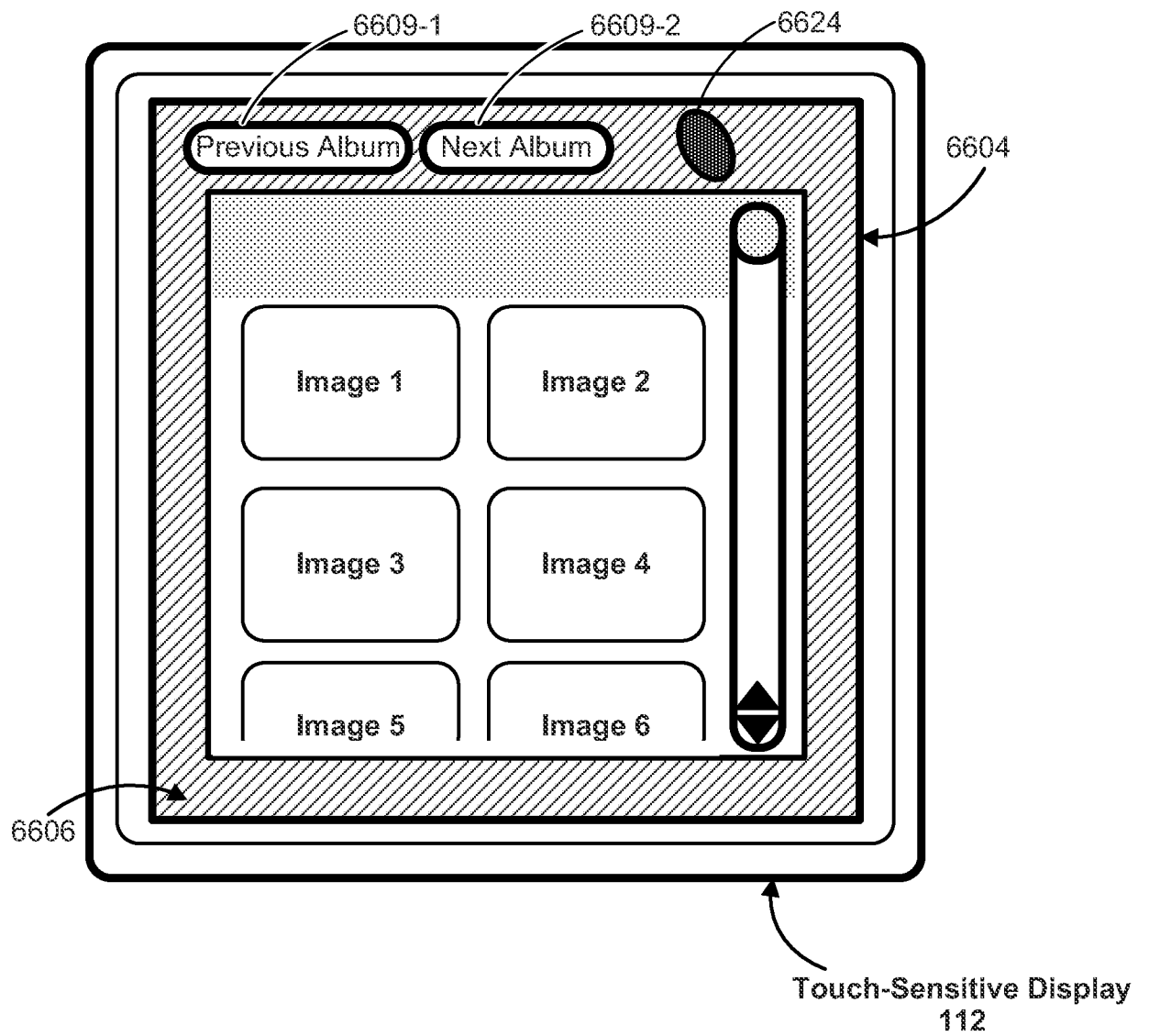


Figure 14P

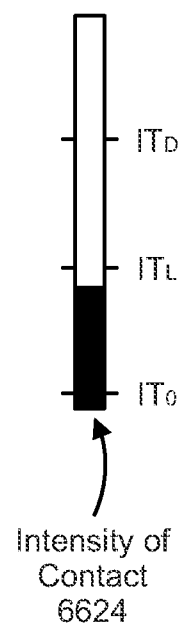
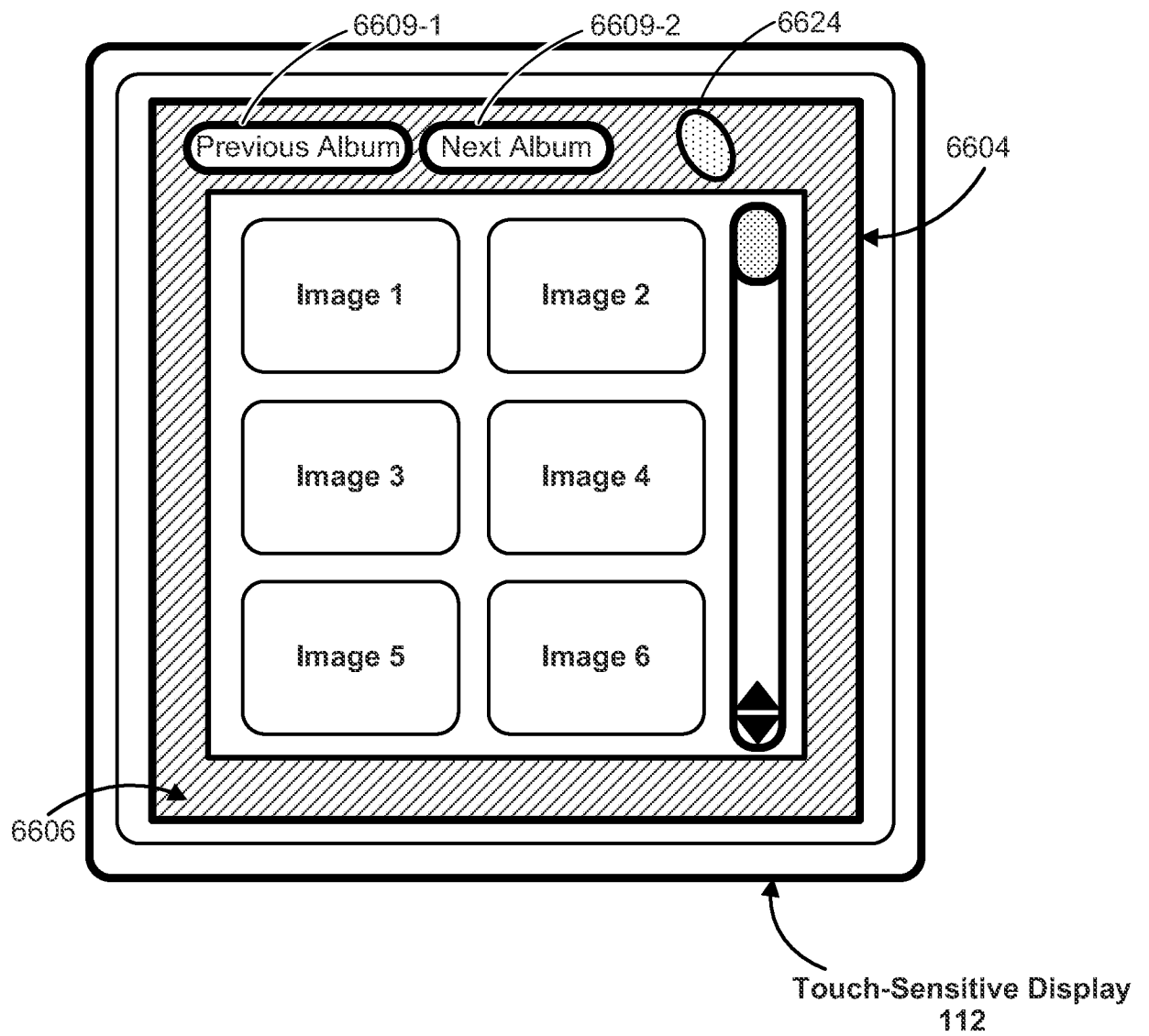


Figure 14Q

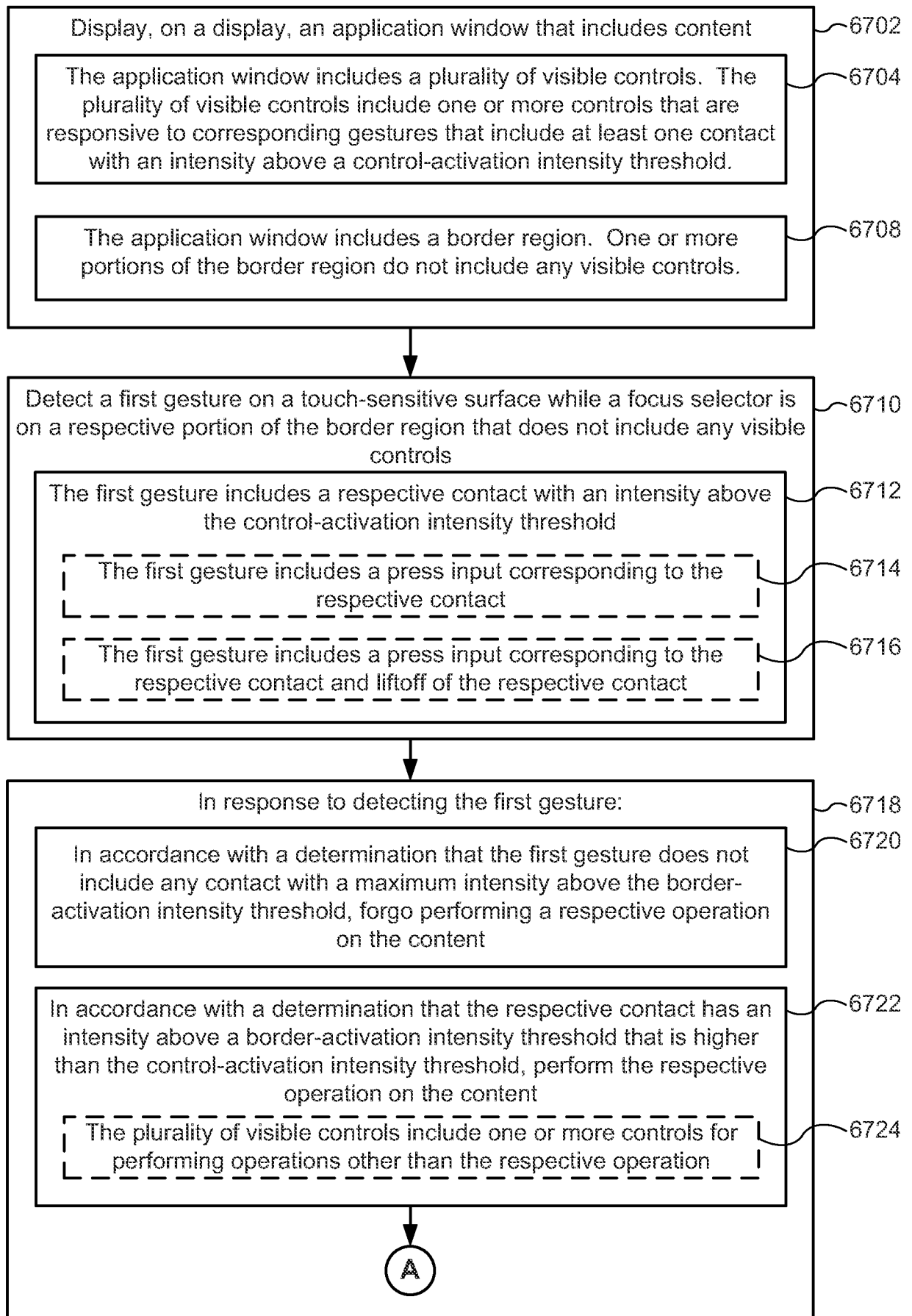


Figure 15A

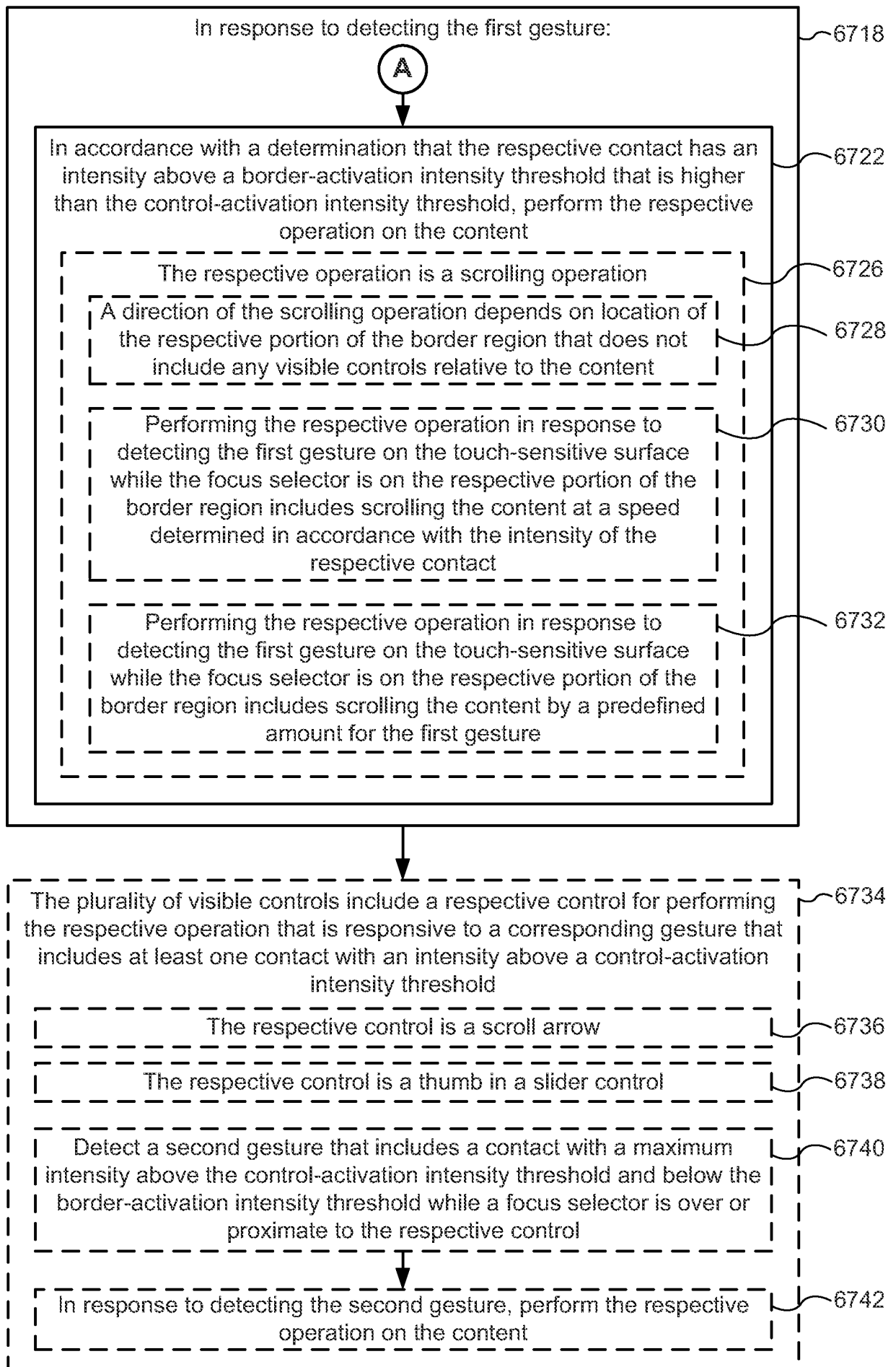


Figure 15B

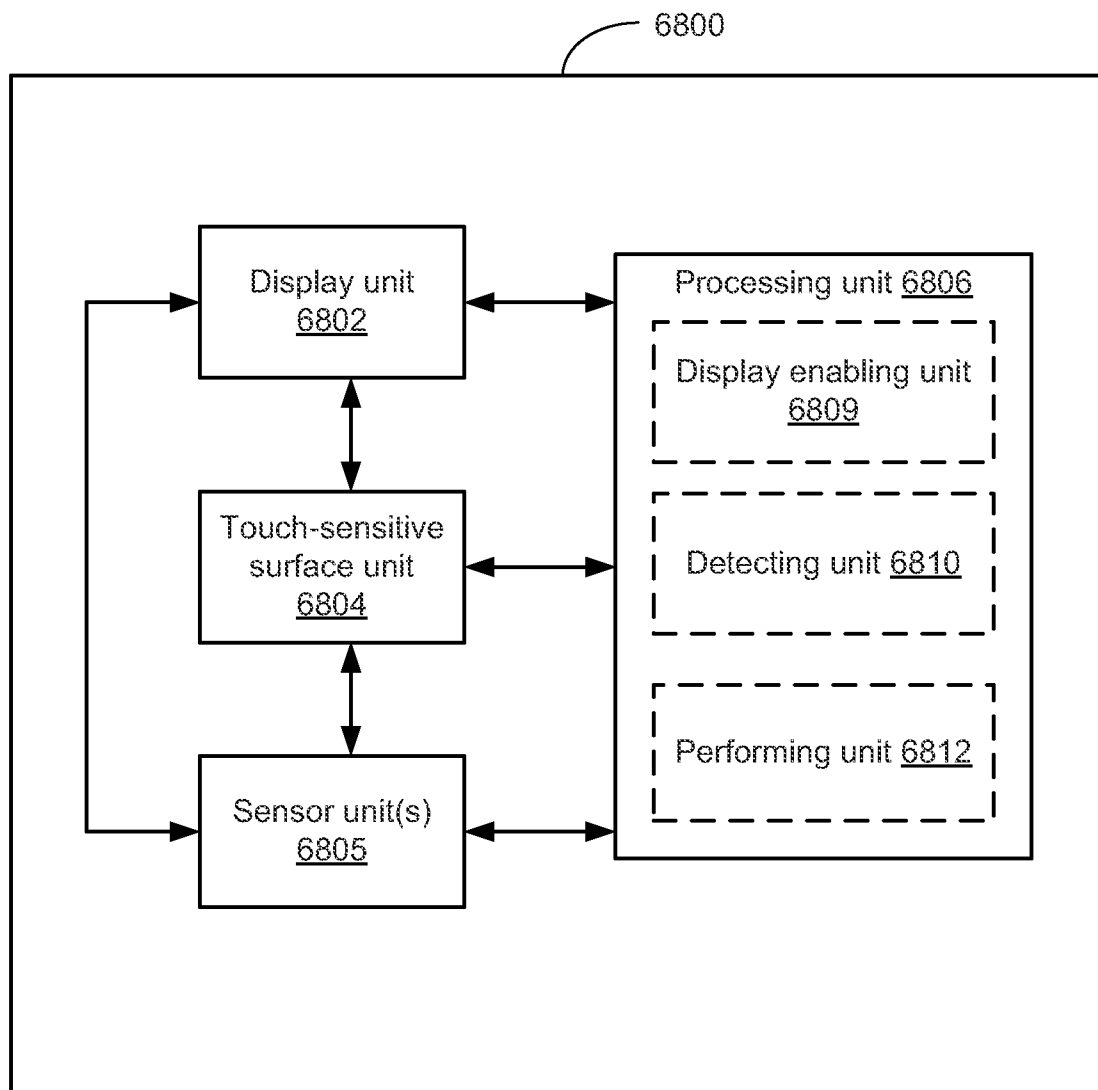


Figure 16

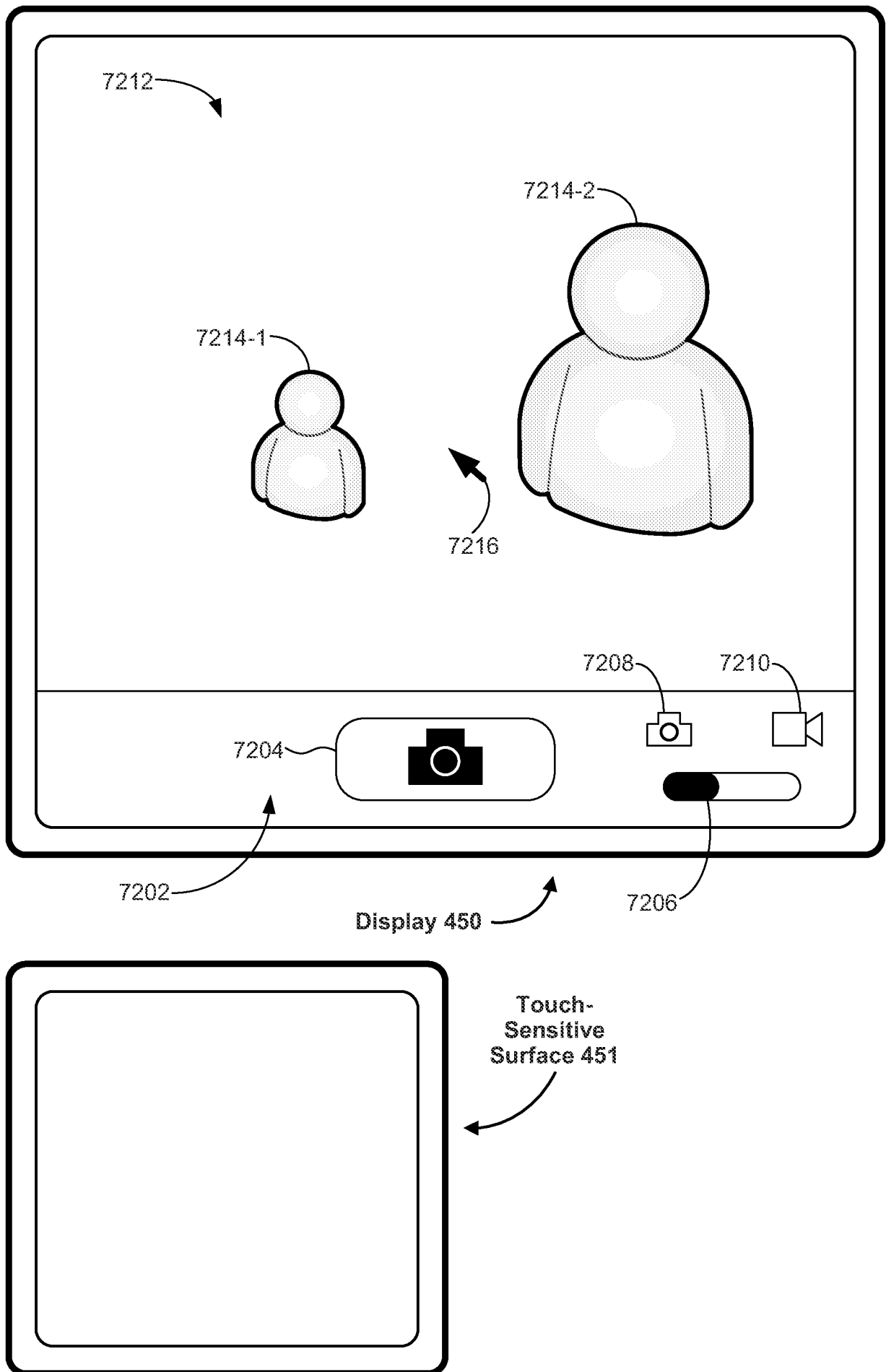
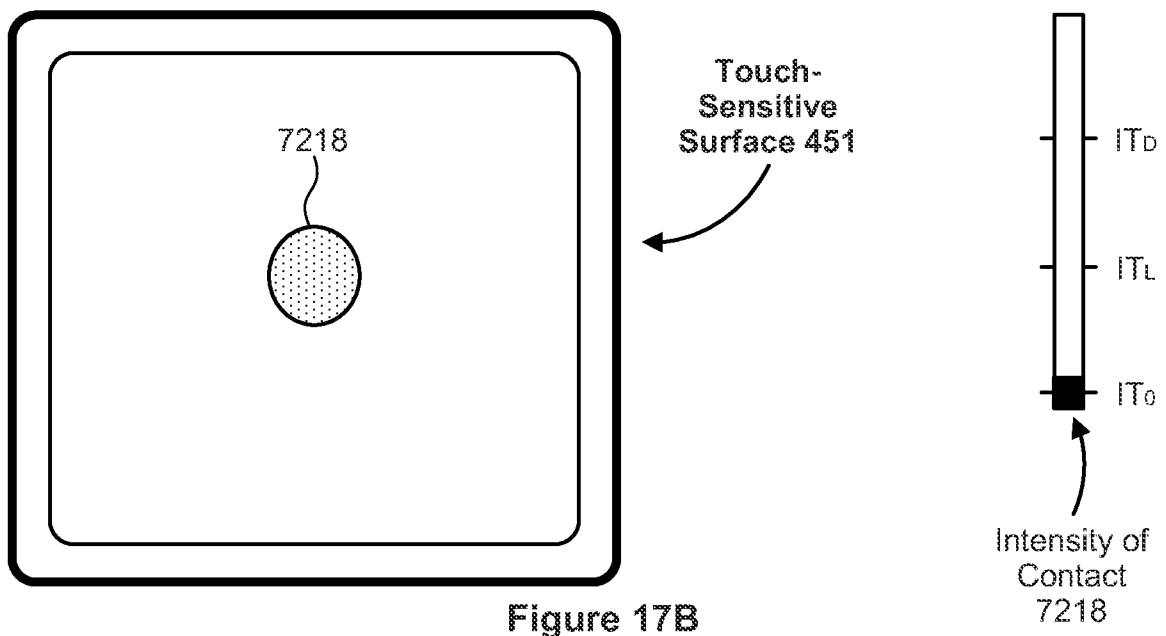
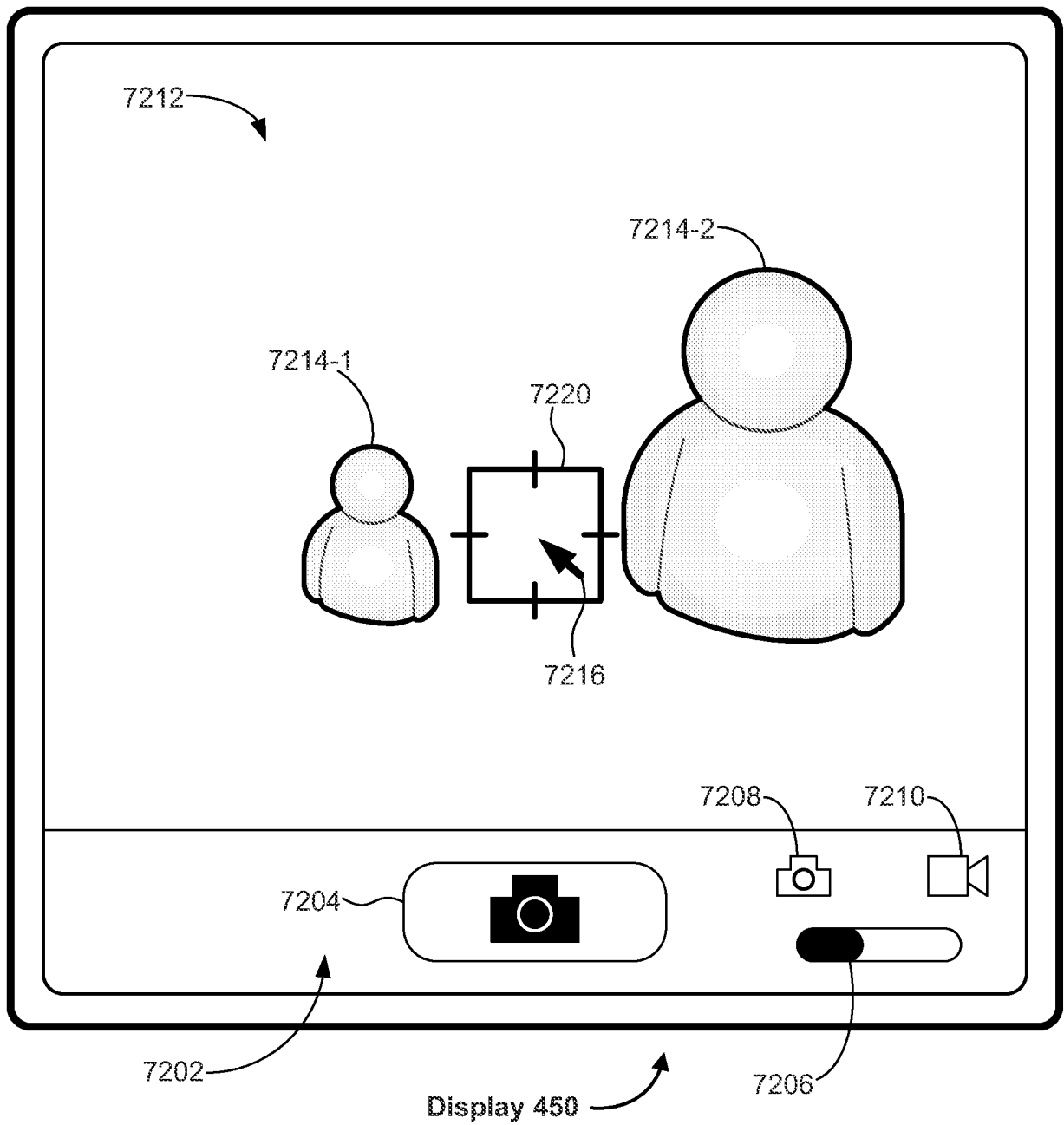
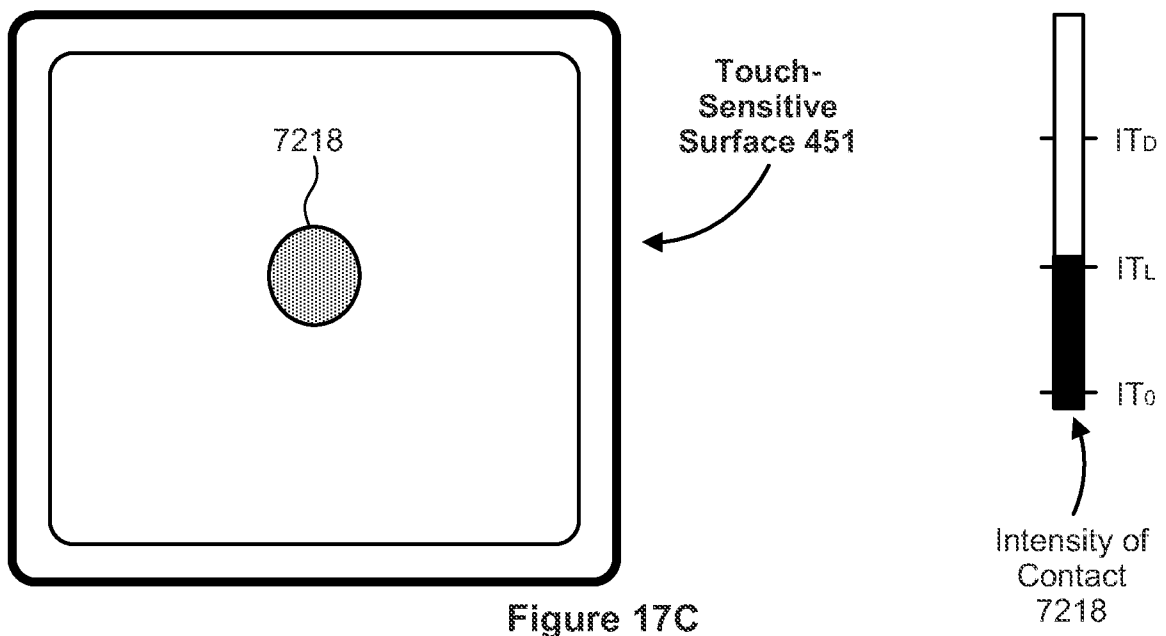
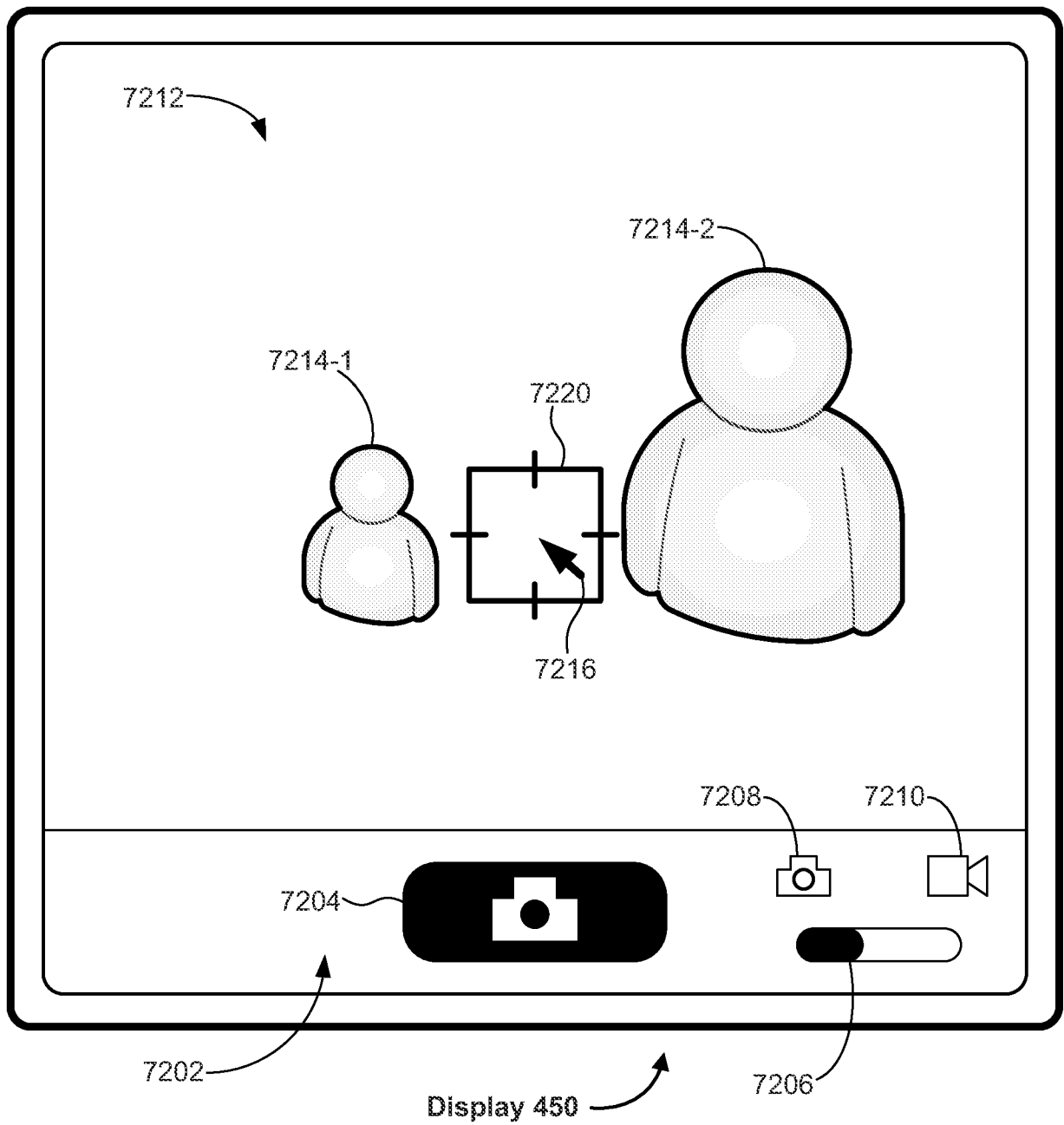
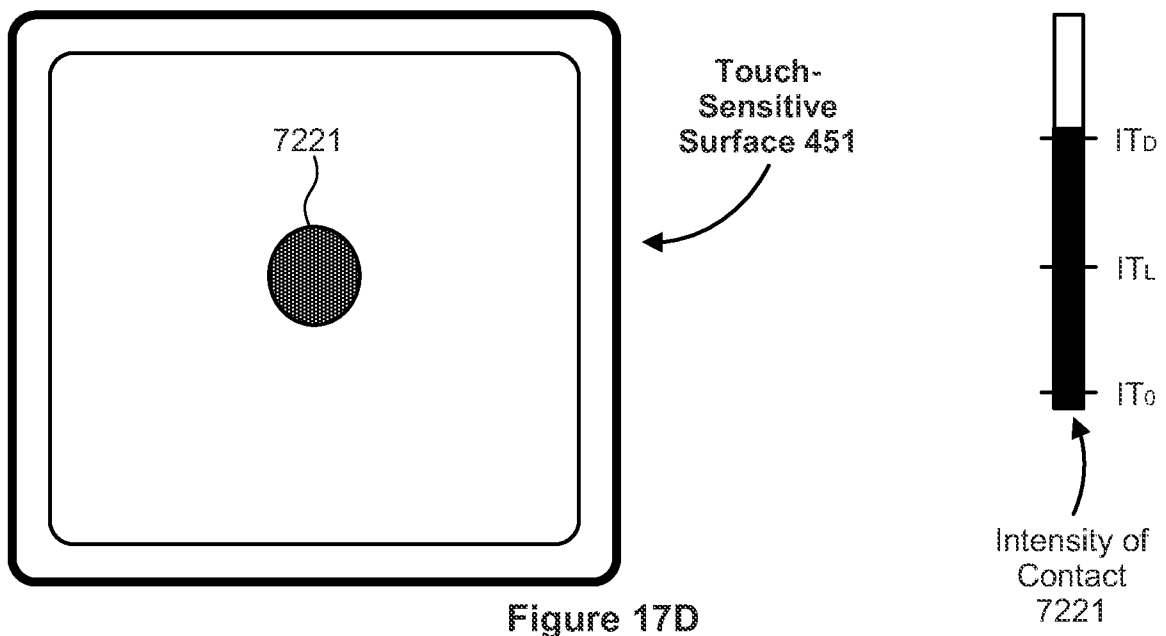
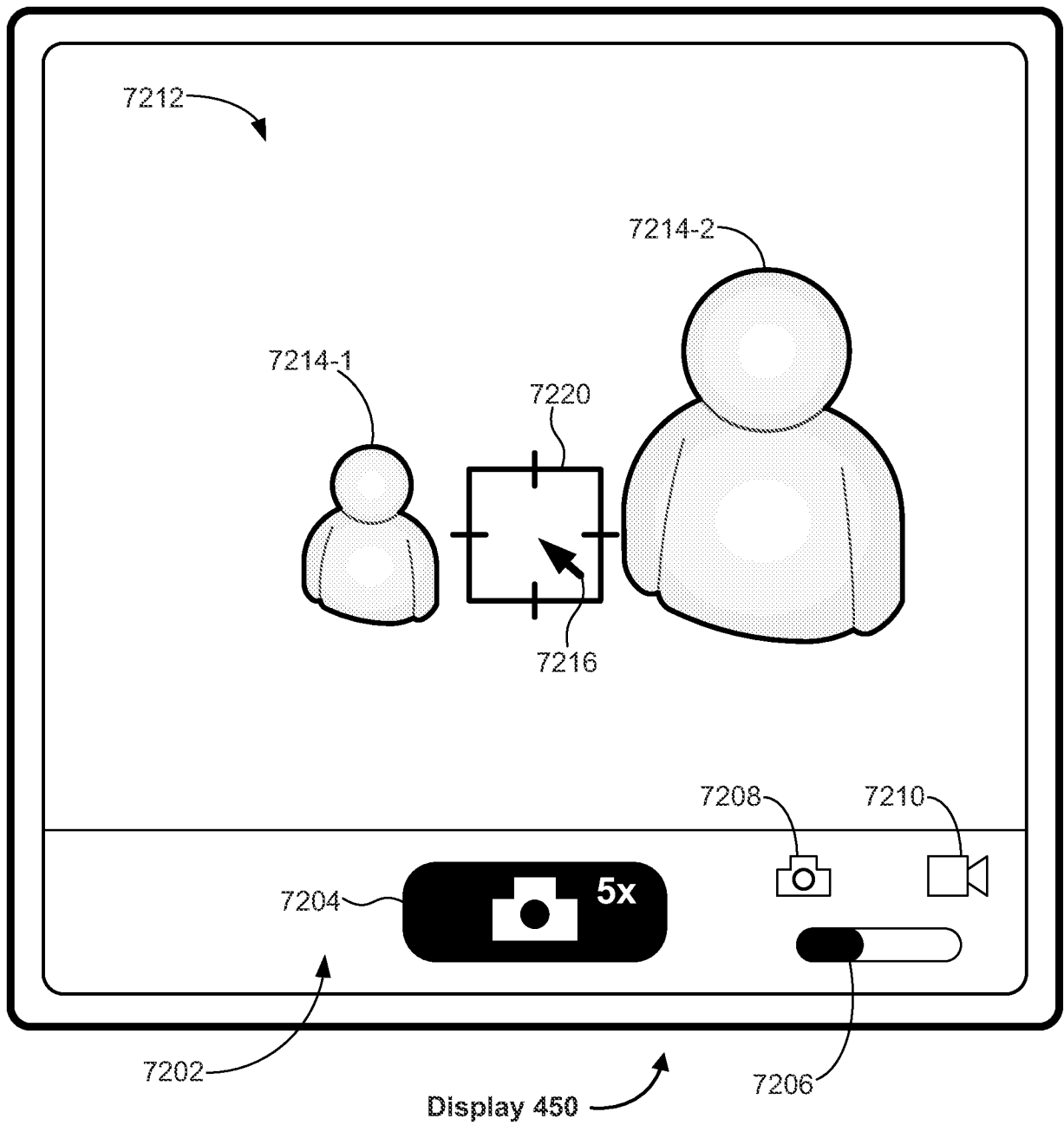
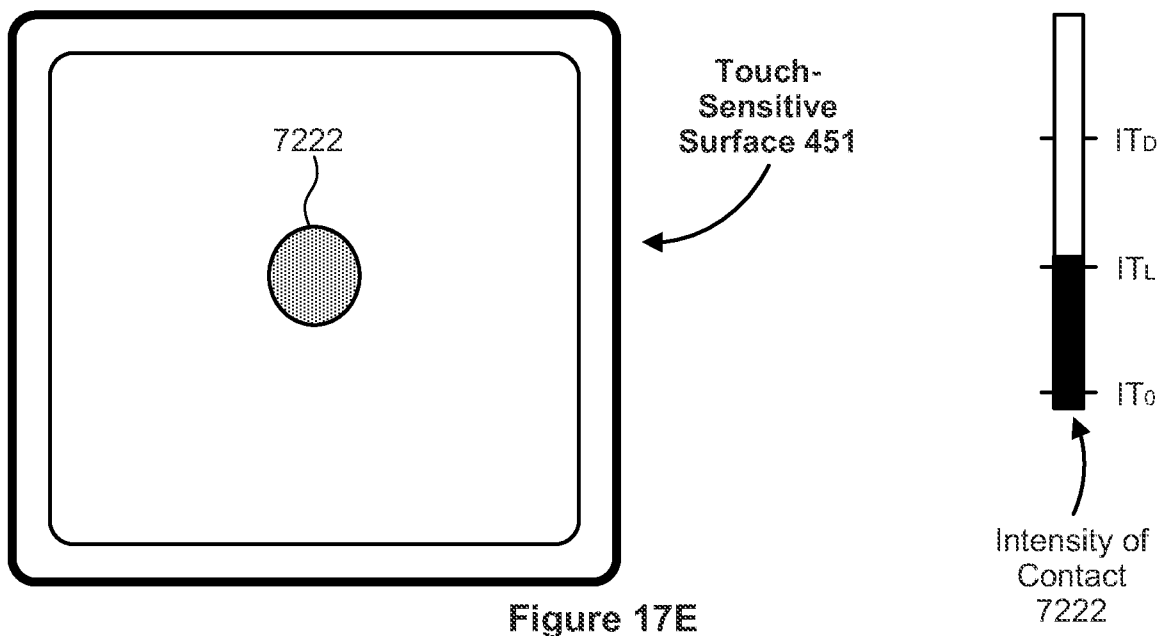
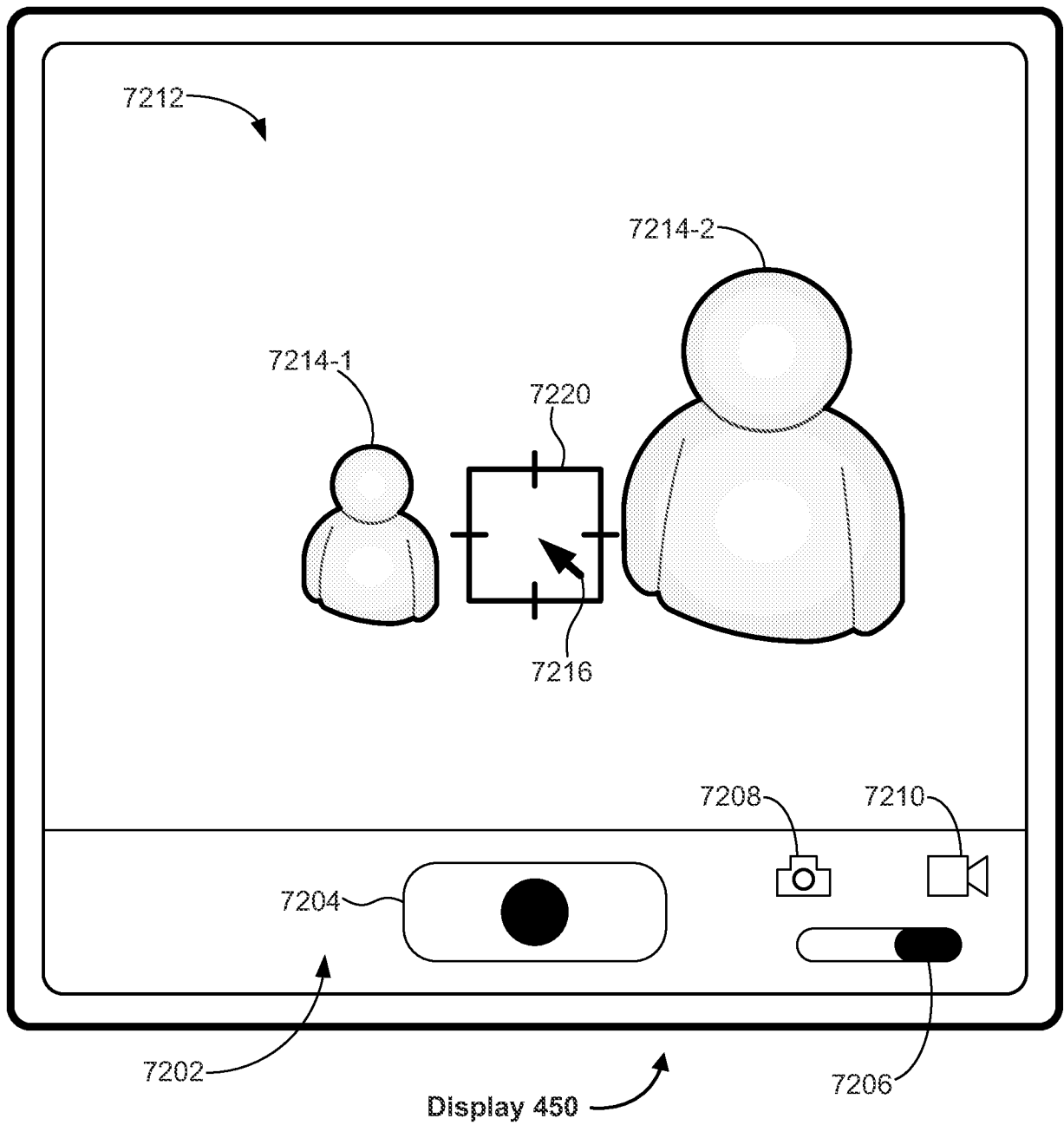


Figure 17A









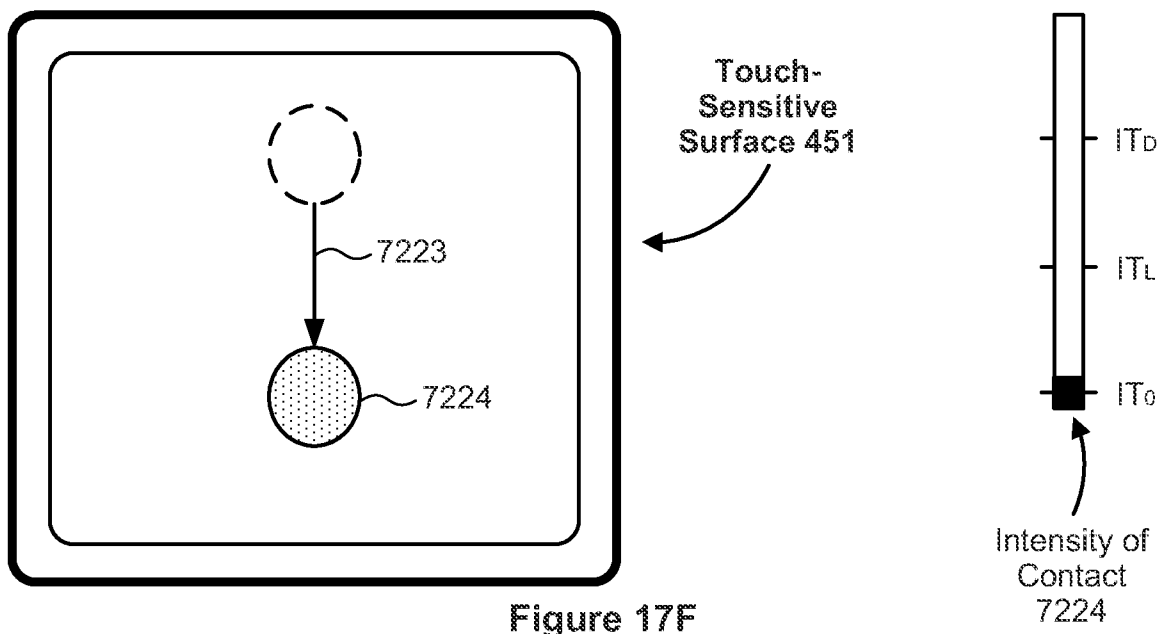
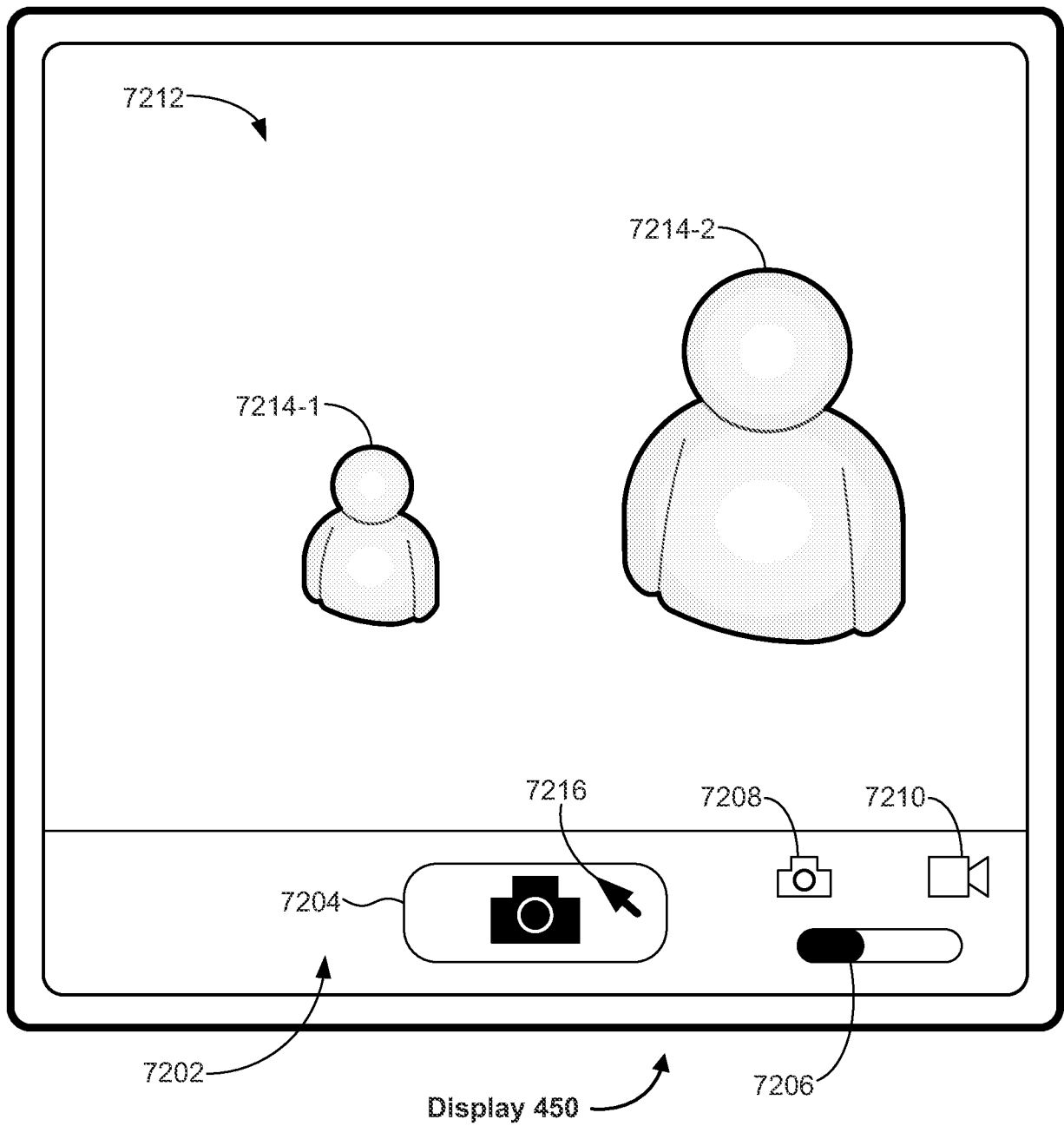


Figure 17F

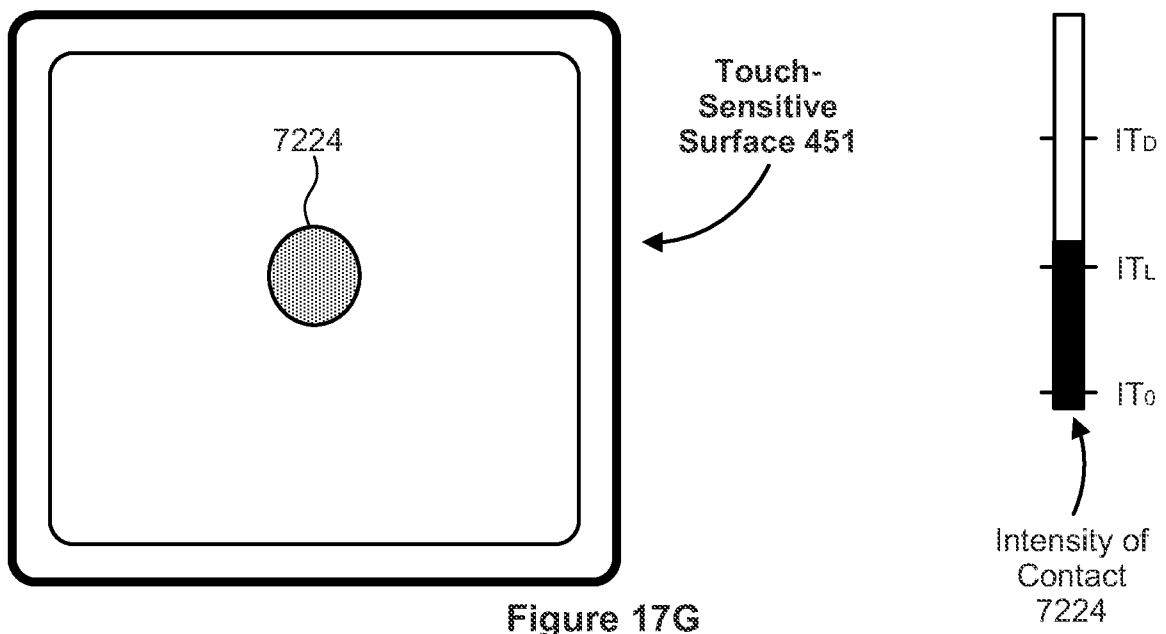
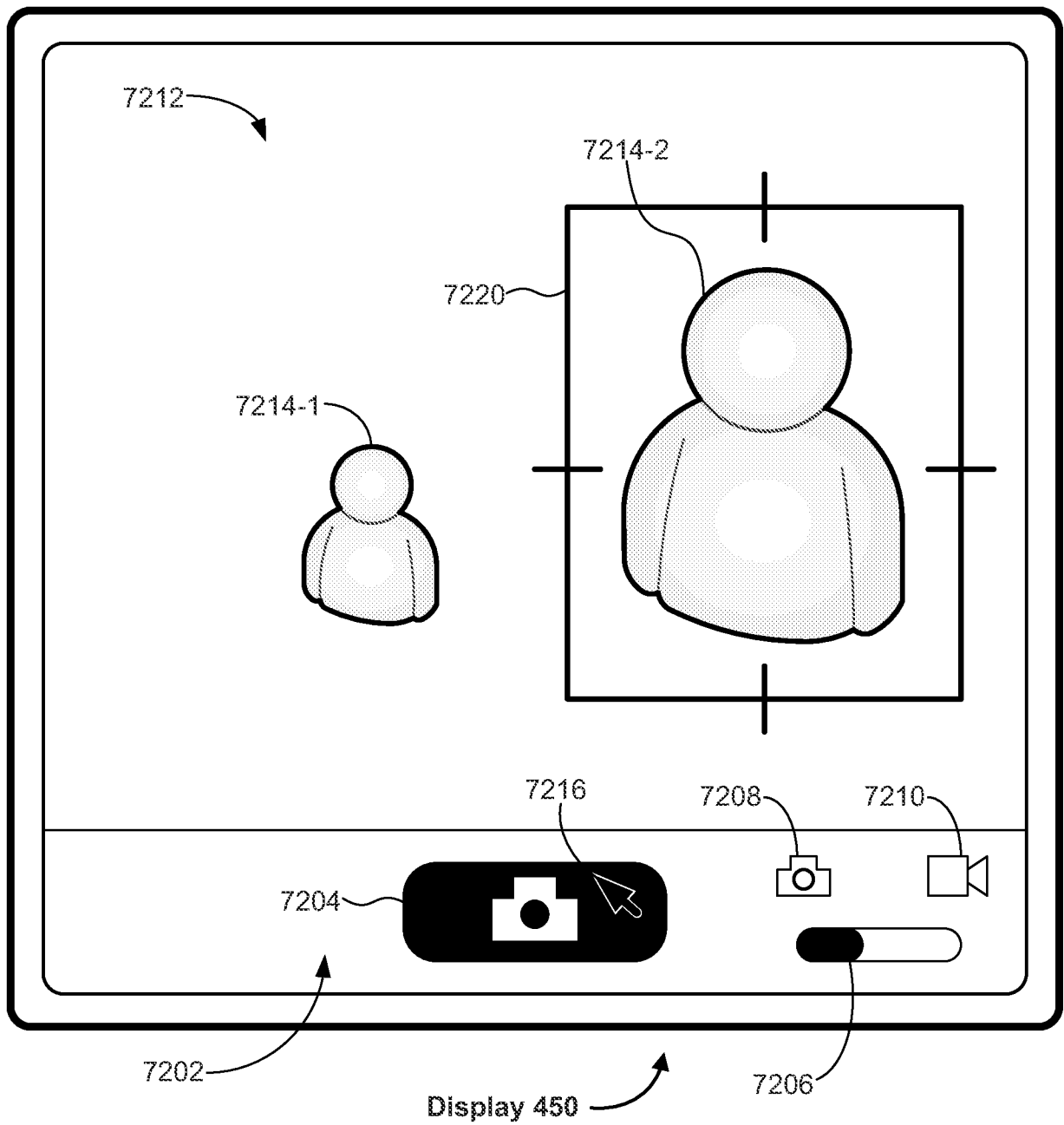


Figure 17G

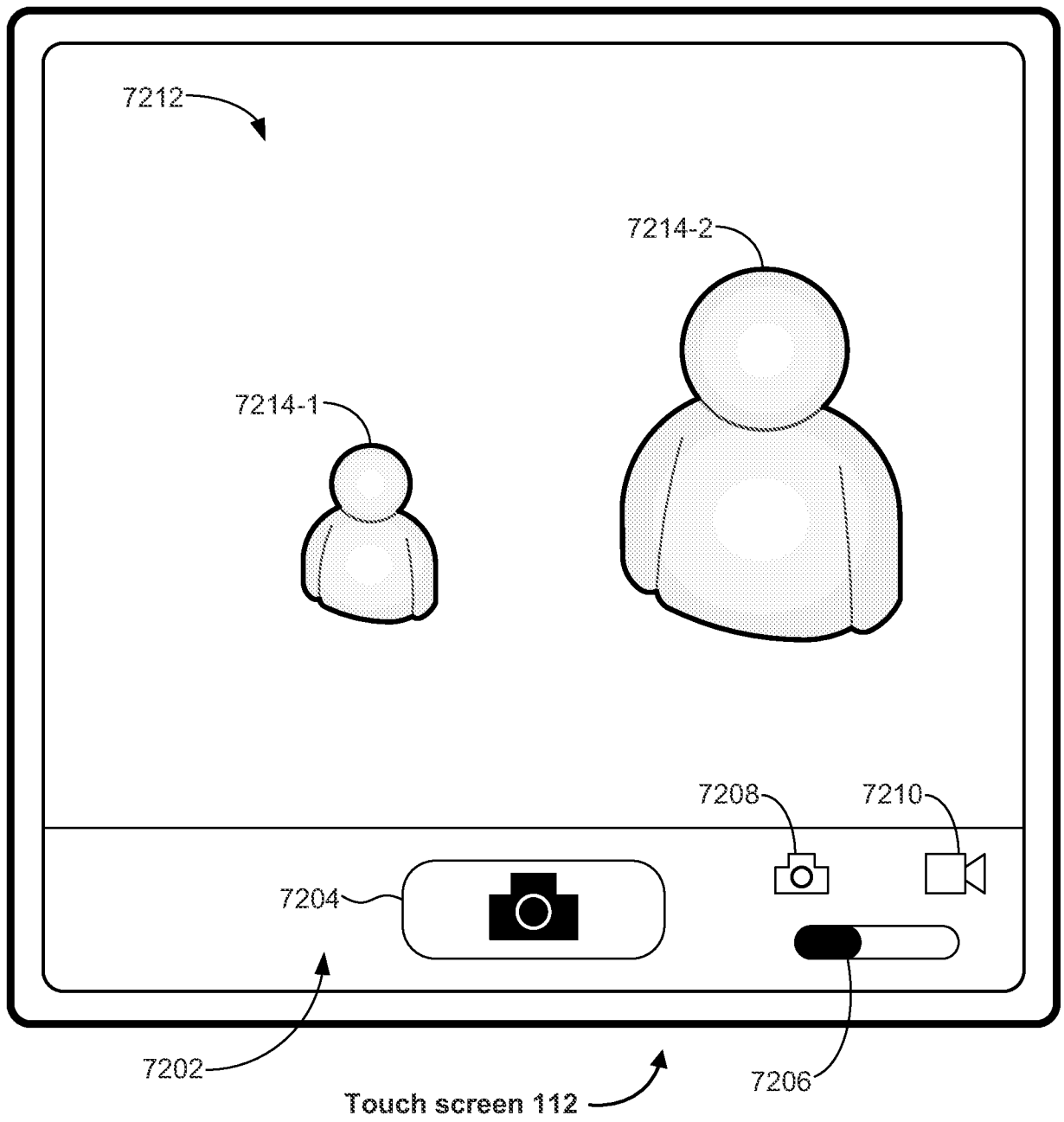


Figure 17H

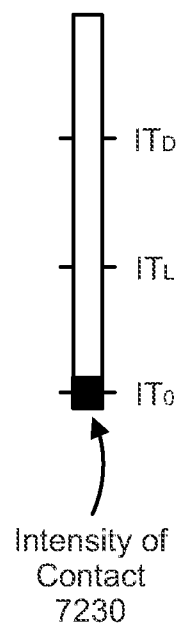
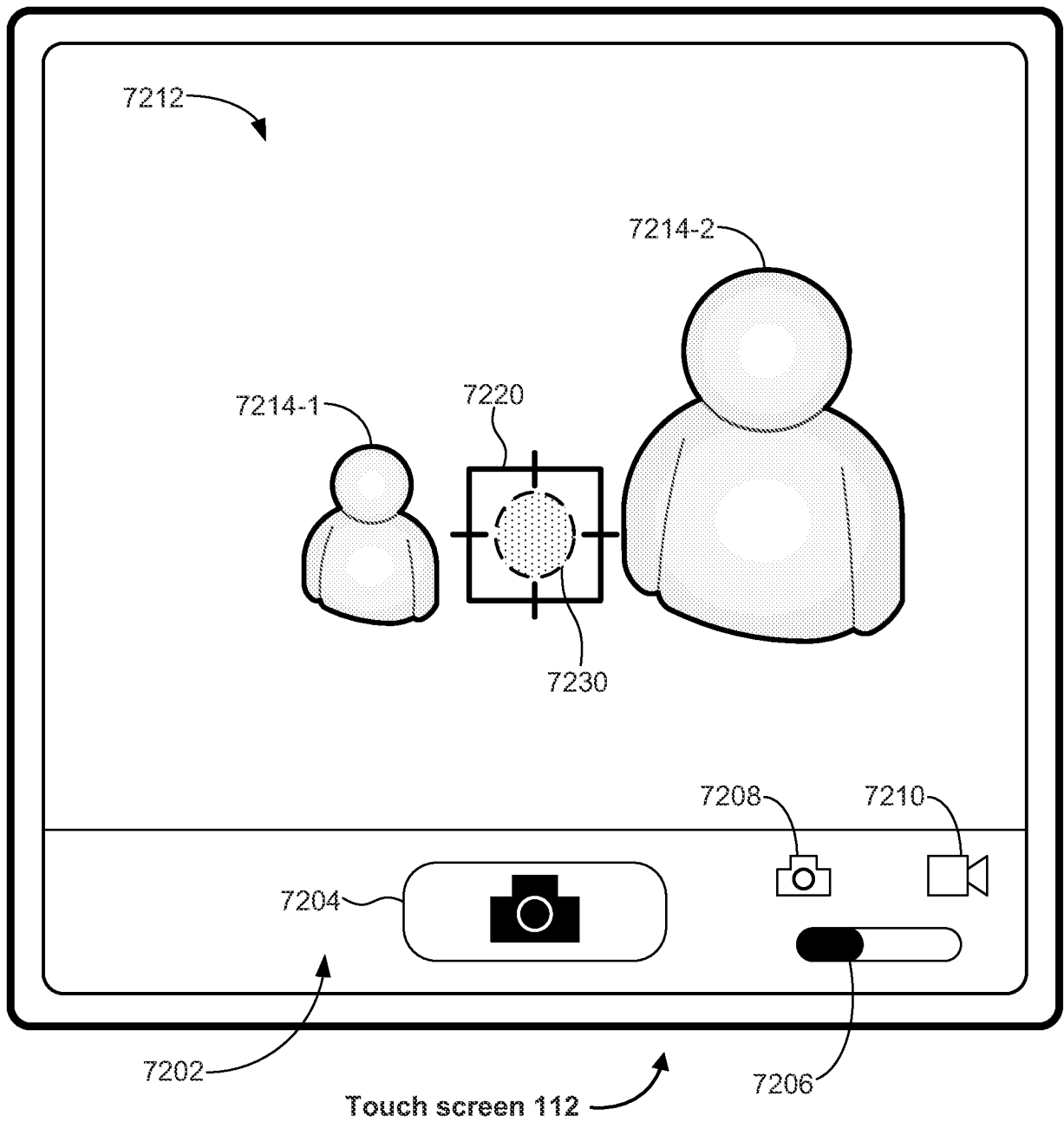


Figure 171

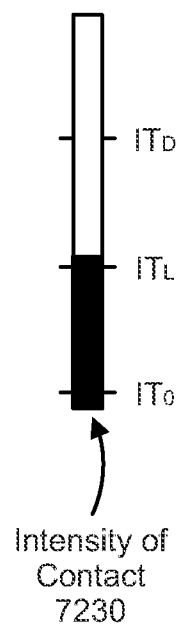
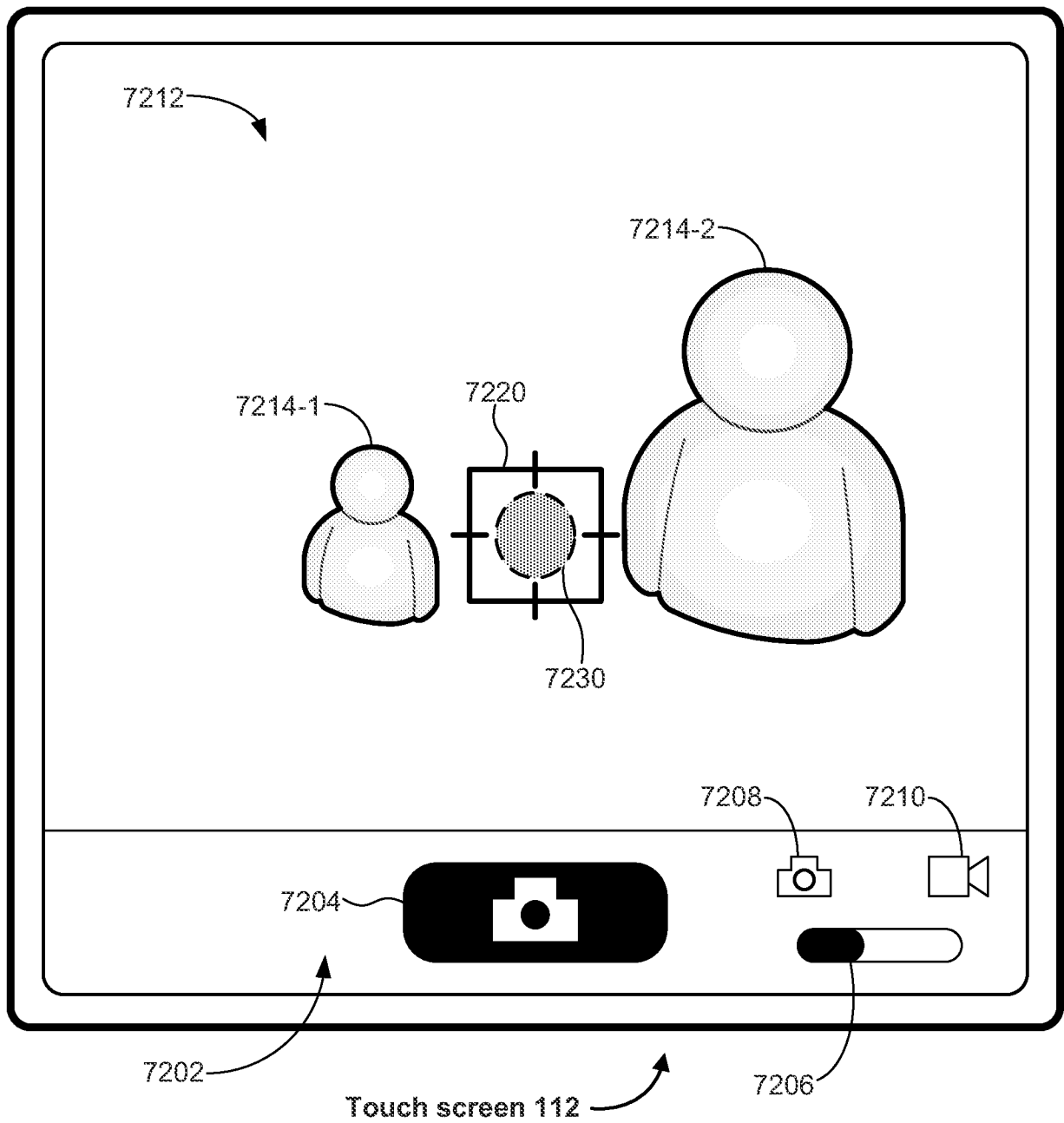


Figure 17J

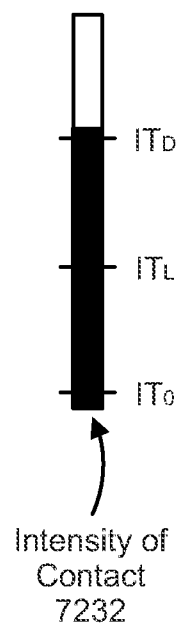
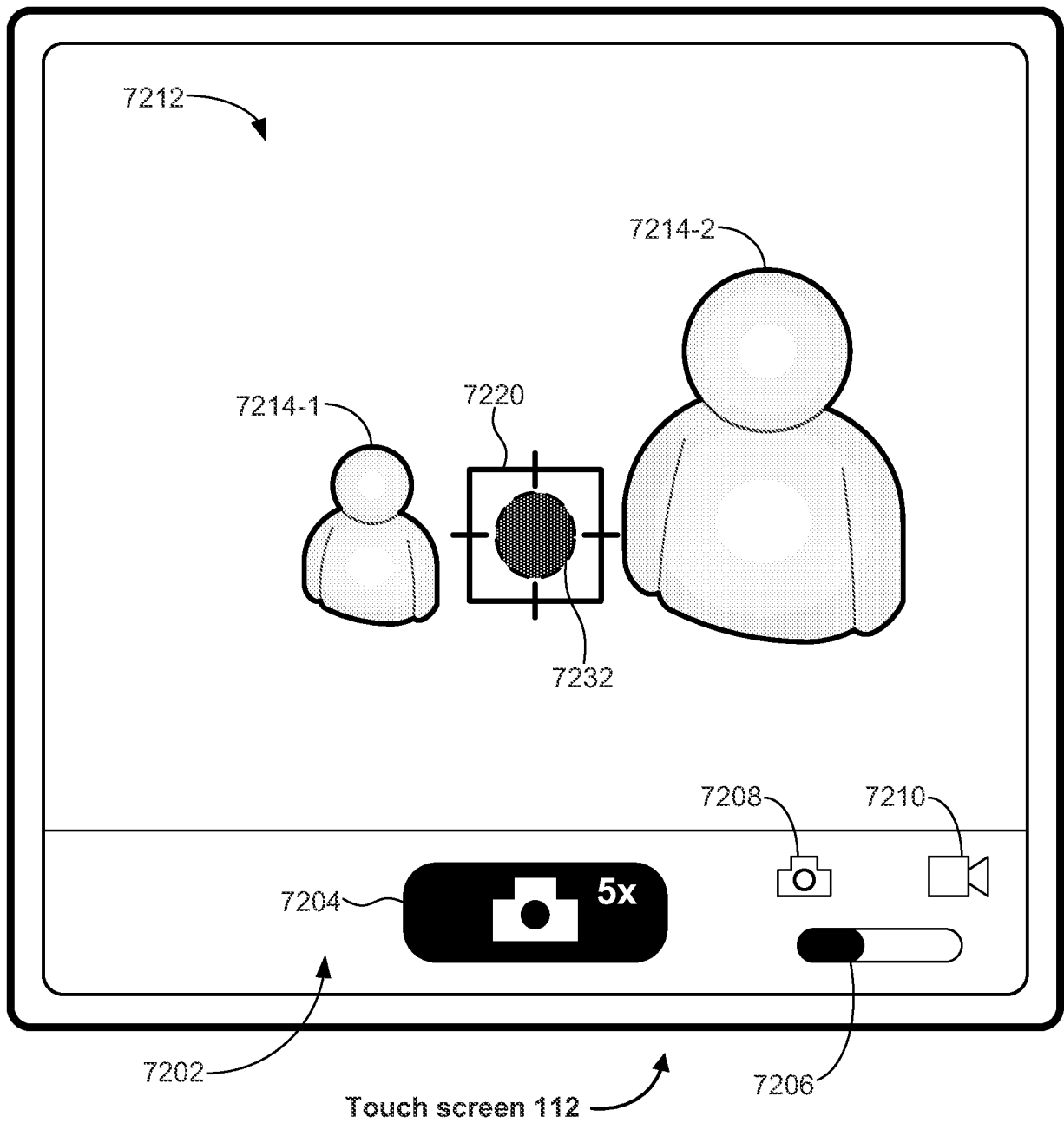


Figure 17K

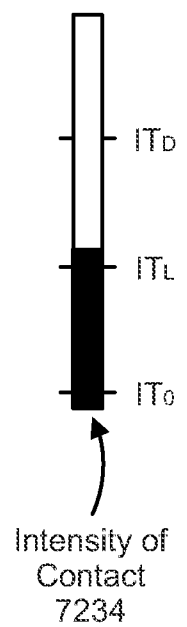
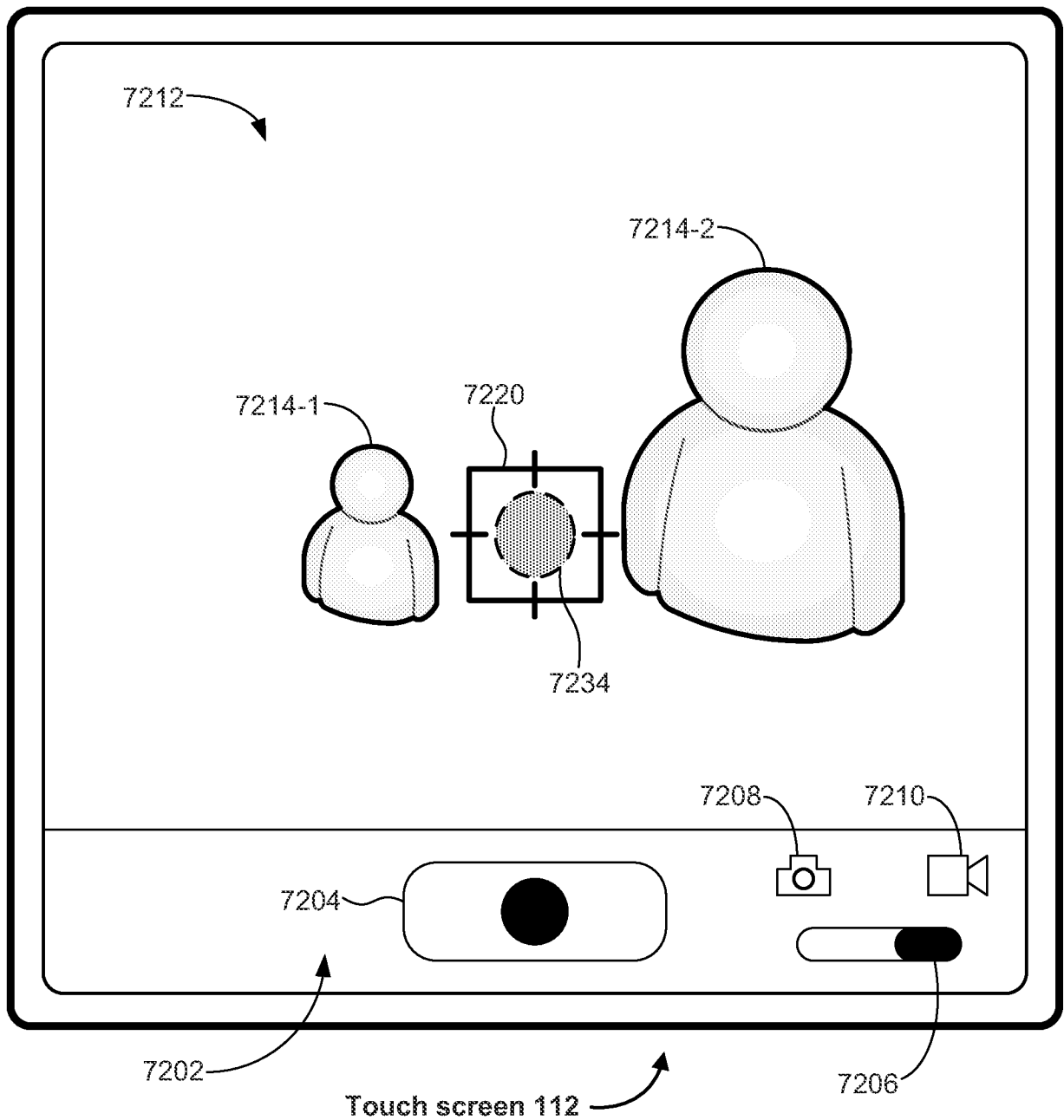


Figure 17L

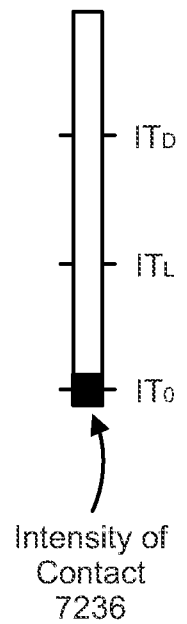
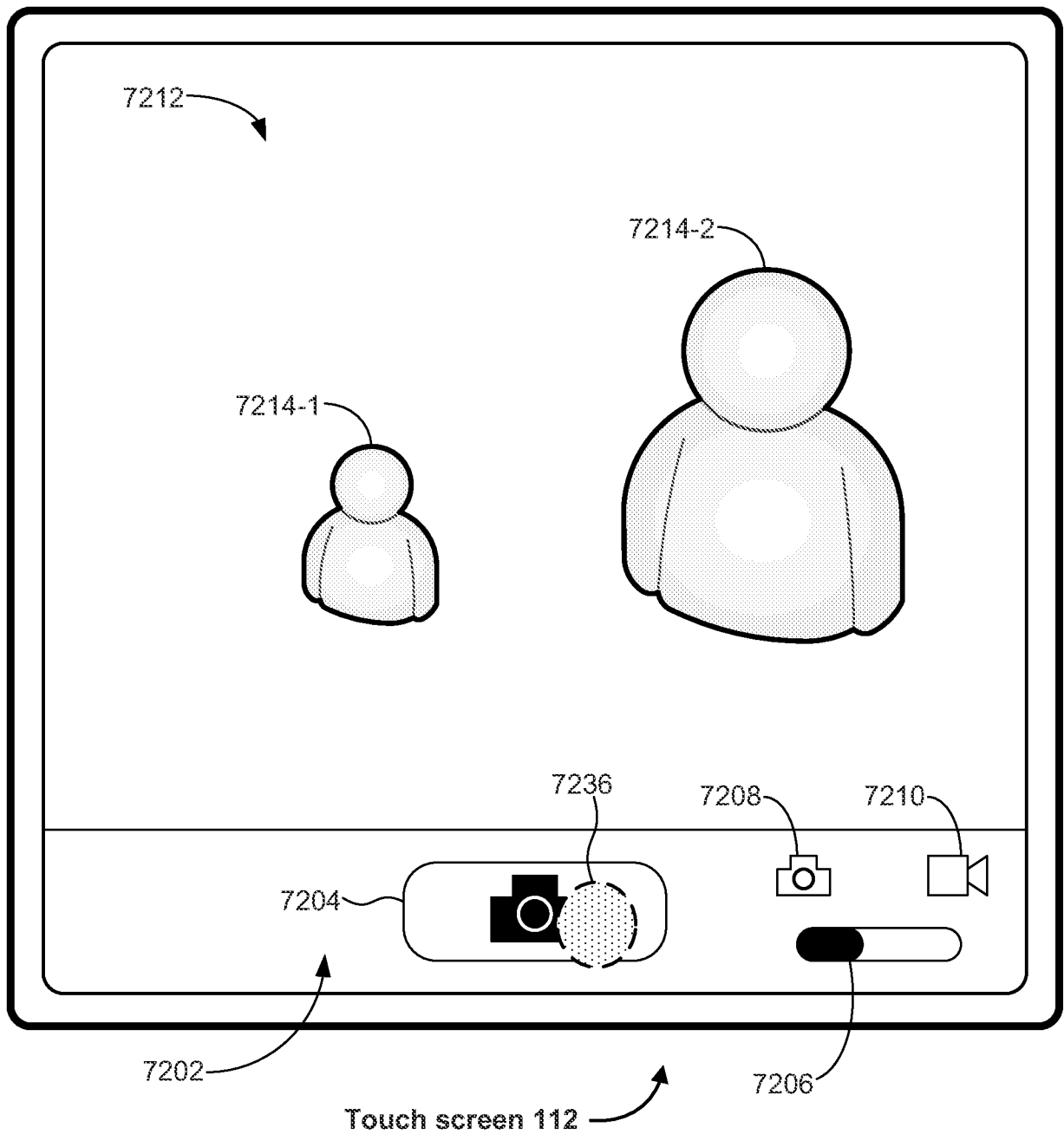


Figure 17M

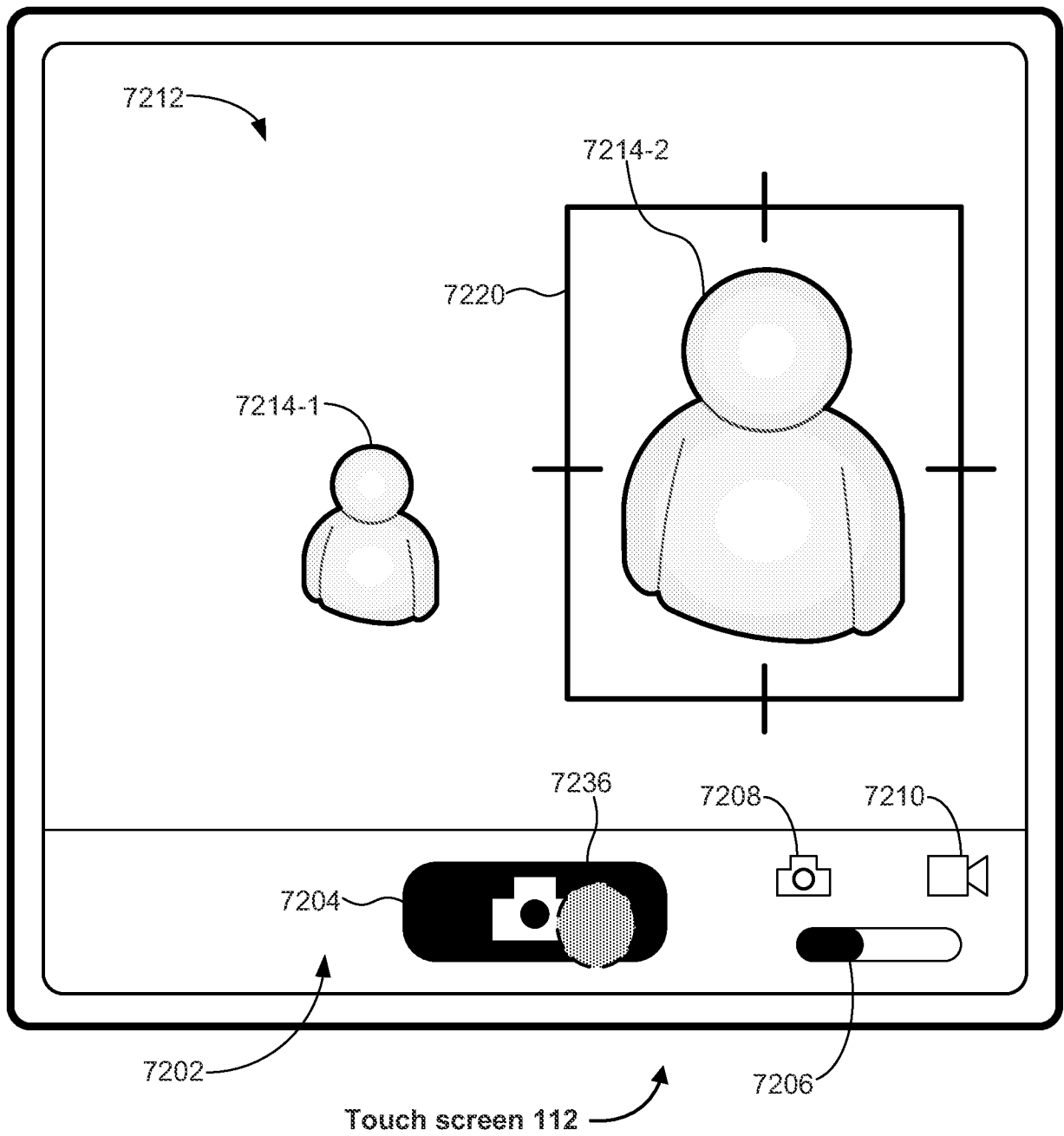
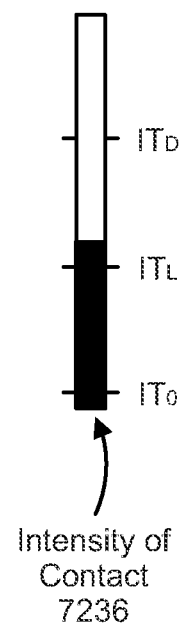


Figure 17N



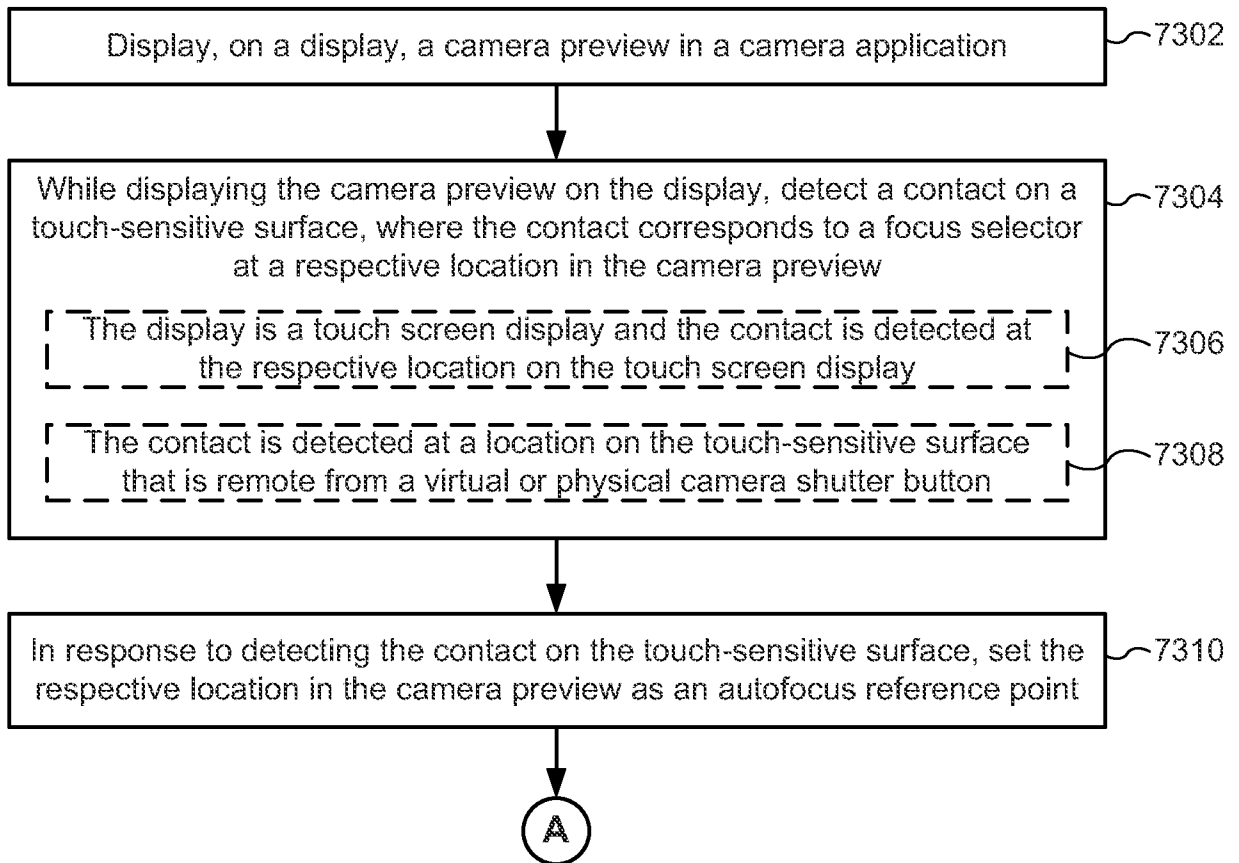
7300

Figure 18A

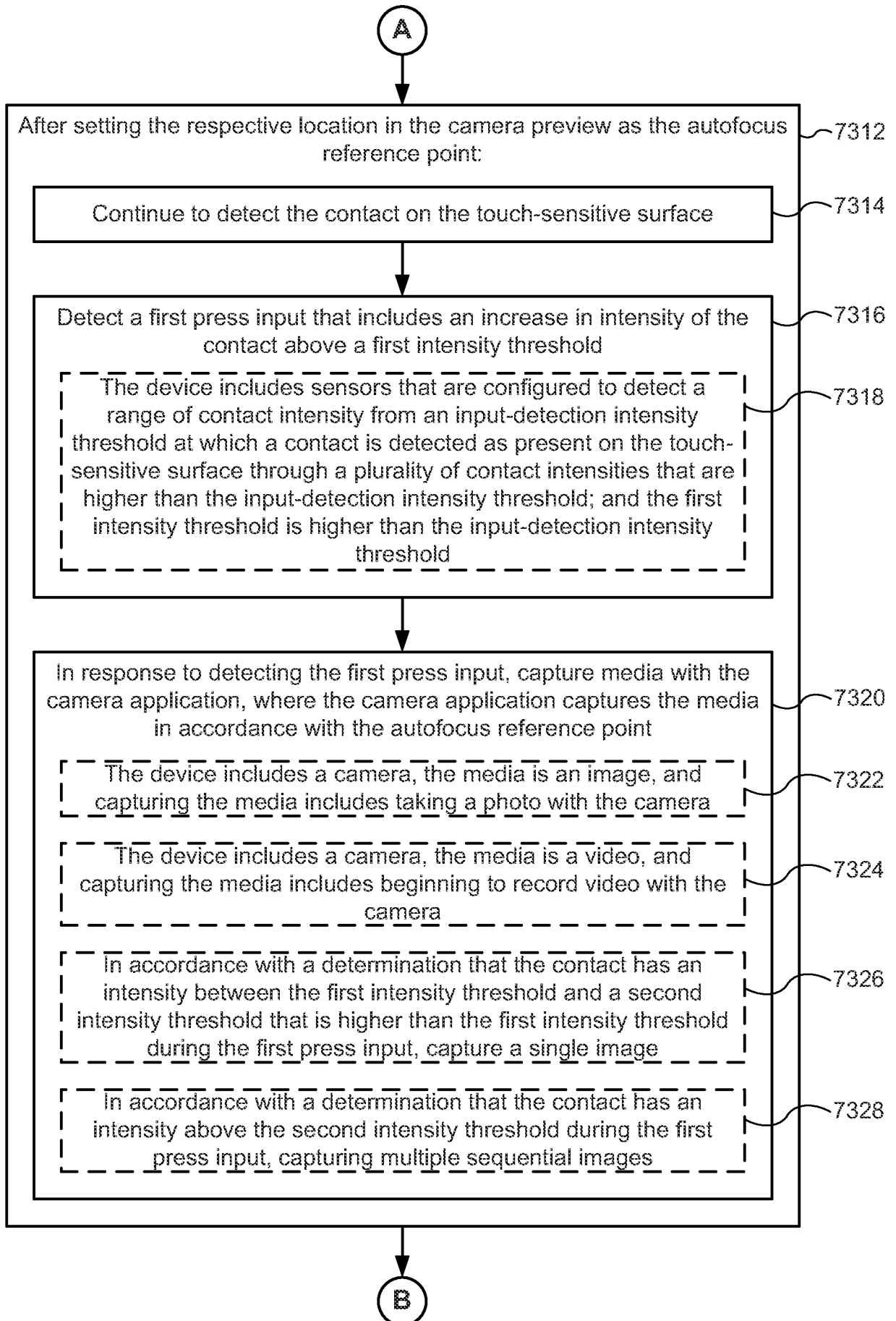


Figure 18B

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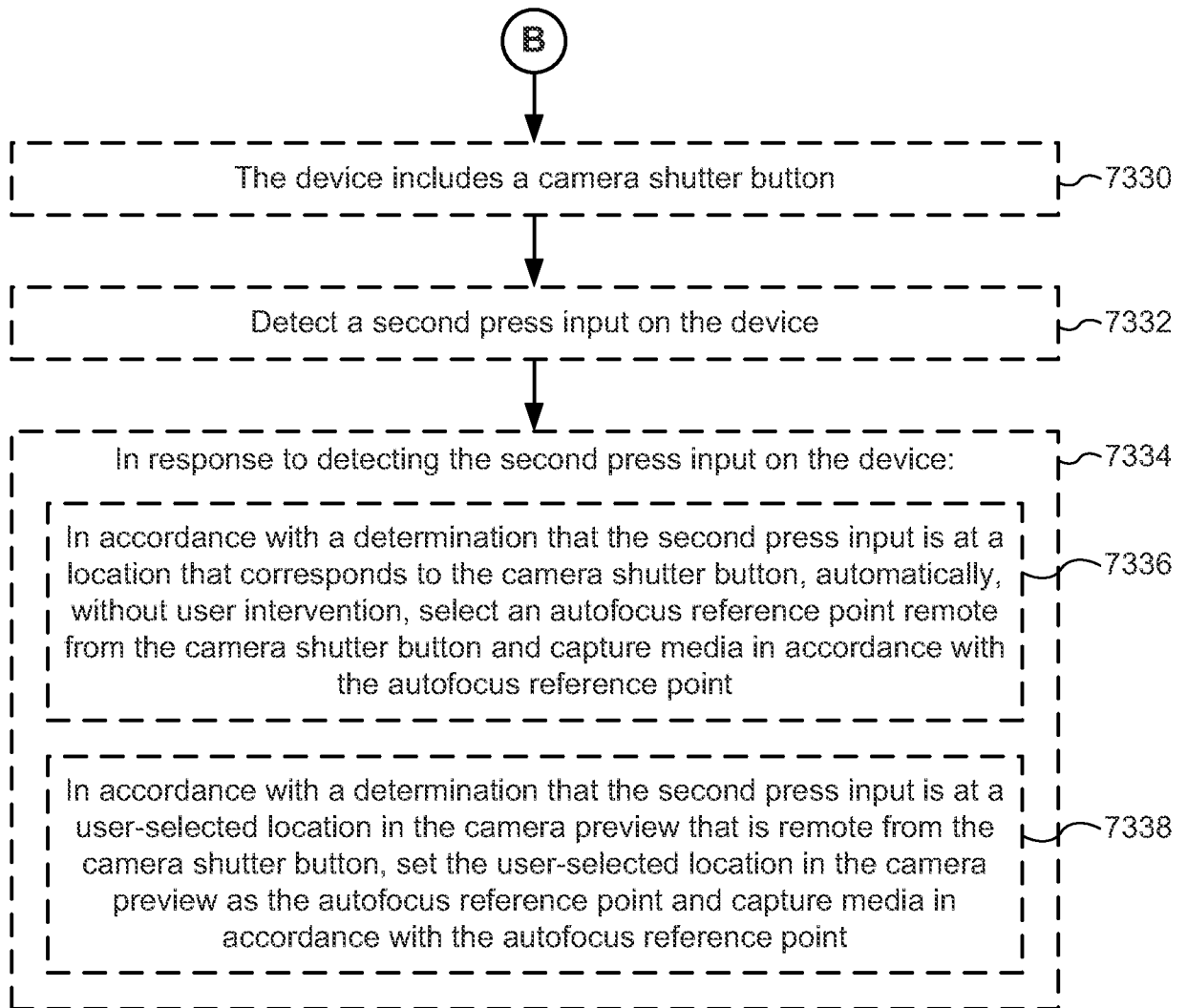


Figure 18C

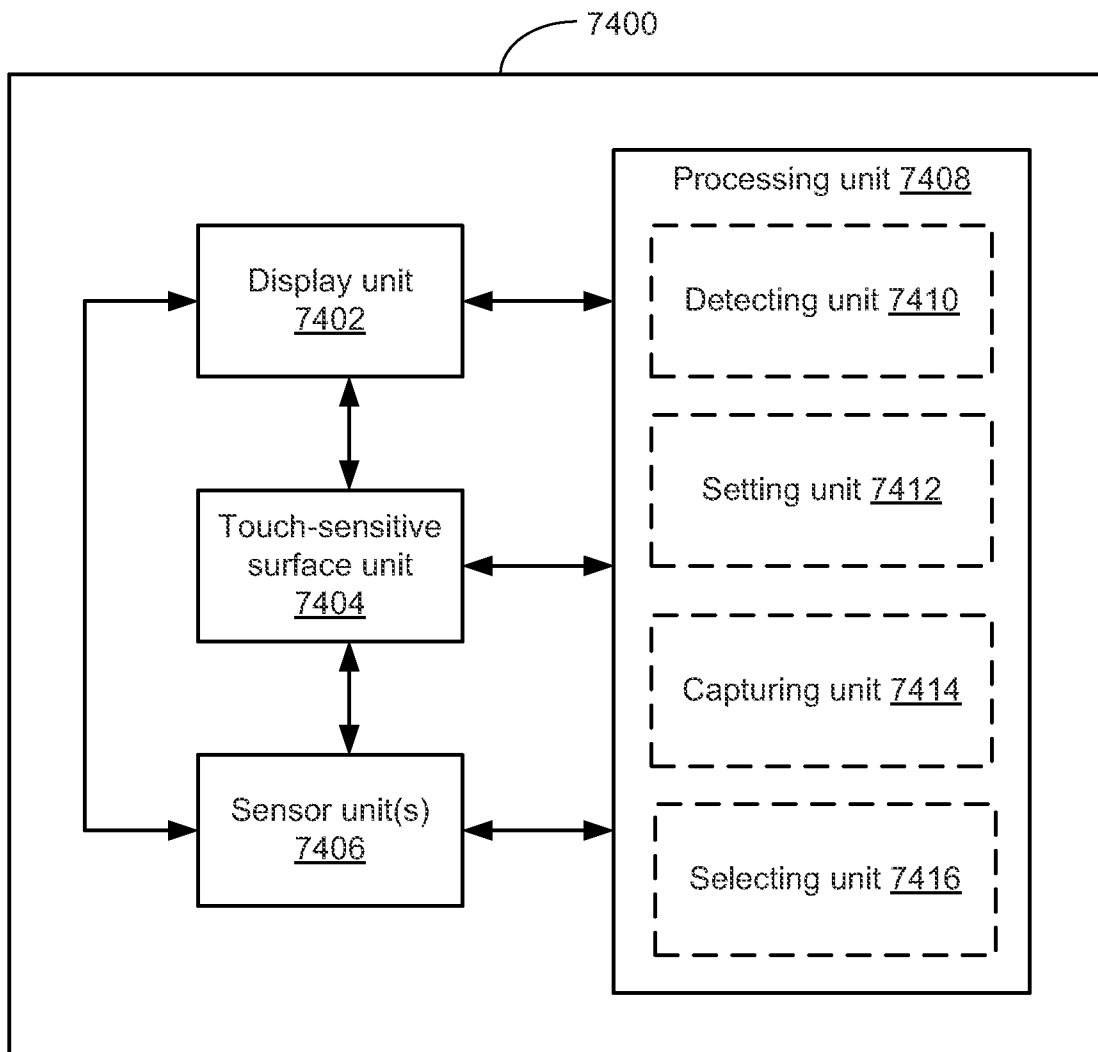


Figure 19