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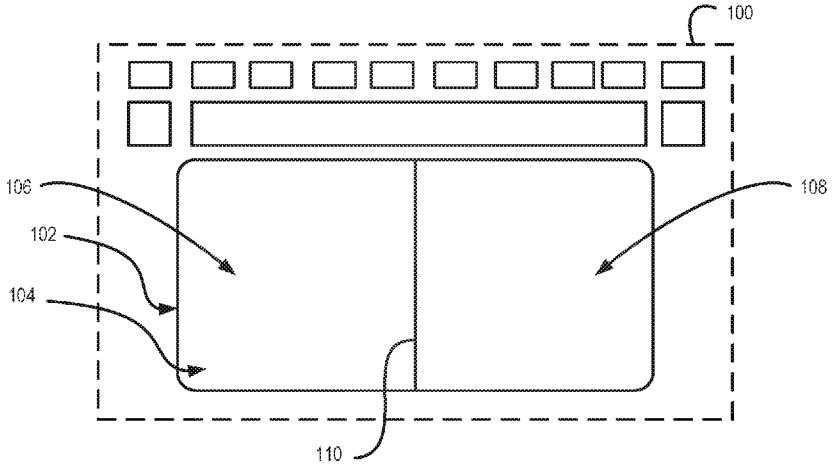

Figure 1

(57) **Abstract:** Example implementations relate to delineation boundary adjustments. In some examples, a processor of a computing device can receive an input from an input device of the computing device, where the input device includes a surface including a first input zone and a second input zone separated by a delineation boundary, and adjust a location of the delineation boundary to modify a size of the first input zone and a size of the second input zone in response to the input.

WO 2022/039713 A1

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DELINEATION BOUNDARY ADJUSTMENTS

Background

[0001] Some users of computing devices may utilize their computing devices in different environments. Certain computing devices can be portable to allow a user to carry or otherwise bring with the computing device while in a mobile setting. A computing device can allow a user to utilize computing device operations for work, education, gaming, multimedia, and/or other general use in a mobile setting.

Brief Description of the Drawings

[0002] Figure 1 illustrates an example of a computing device including an input device for delineation boundary adjustments consistent with the disclosure.

[0003] Figure 2 illustrates an example of a menu with a slide adjustment to adjust a delineation boundary displayed on a display device for delineation boundary adjustments consistent with the disclosure.

[0004] Figure 3 illustrates an example of a computing device including an input device for delineation boundary adjustments consistent with the disclosure.

[0005] Figure 4 illustrates an example of a computing device including an input device to receive an input that is unintentional and an input for delineation boundary adjustments consistent with the disclosure.

[0006] Figure 5 illustrates an example of a computing device including an input device to receive an input that is unintentional and an input separated by a distance for delineation boundary adjustments consistent with the disclosure.

[0007] Figure 6 illustrates an example of a computing device including an input device to receive an input that is intentional and an input for delineation boundary adjustments consistent with the disclosure.

[0008] Figure 7 illustrates an example of a computing device including an input device to receive an input that is intentional and an input that corresponds

to a scroll event for delineation boundary adjustments consistent with the disclosure.

[0009] Figure 8 illustrates an example of a computing device including an input device and a heat map for delineation boundary adjustments consistent with the disclosure.

[0010] Figure 9 illustrates an example of a computing device including an input device and a delineation boundary adjusted based on a heat map for delineation boundary adjustments consistent with the disclosure.

[0011] Figure 10A illustrates an example of a computing device including an input device including a first input zone and a second input zone separated by a vertical delineation line and a heat map for delineation boundary adjustments consistent with the disclosure.

[0012] Figure 10B illustrates an example of a computing device including an input device including a first input zone and a second input zone separated by an angled delineation line and a heat map for delineation boundary adjustments consistent with the disclosure.

[0013] Figure 11A illustrates an example of a computing device including an input device including a first input zone and a second input zone separated by a vertical delineation line for delineation boundary adjustments consistent with the disclosure.

[0014] Figure 11B illustrates an example of a computing device including an input device including a first input zone having a first shape and a second input zone having a second shape separated by a boundary for delineation boundary adjustments consistent with the disclosure.

[0015] Figure 12 illustrates a block diagram of an example system for delineation boundary adjustments consistent with the disclosure.

Detailed Description

[0016] A user may utilize a computing device for various purposes, such as for business and/or recreational use. As used herein, the term "computing device" refers to an electronic system having a processing resource, memory resource, and/or an application-specific integrated circuit (ASIC) that can

process information. A computing device can be, for example, a laptop computer, a notebook, a tablet, and/or a mobile device, among other types of computing devices.

[0017] A computing device may include an input device. As used herein, the term "input device" refers to a device to provide a signal to an information processing system. For example, an input device can be utilized to input information into a computing device.

[0018] An input device can include a touchpad. As used herein, the term "touchpad" refers to an input device utilizing a tactile sensor and a specialized surface that can translate the motion and position of a user's finger relative to a position on an operating system of a computing device that is made to output to a display device. For example, a user can utilize the touchpad to move a cursor around a display area of a display device. In some examples, the touchpad may include the ability to be depressed to receive an input. For instance, a user may press down on the touchpad to cause an input to the computing device. Such an input may cause a menu to be generated, a selection from the generated menu or otherwise to be made, etc.

[0019] In some examples, the touchpad can be divided so that one input zone of the touchpad can perform one input type when depressed and another input zone of the touchpad can perform a different input type when depressed. As used herein, the term "input zone" refers to an area distinguished for a particular type of input relative to another area. For instance, an input to a first input zone may cause a menu to be generated, and an input to a second input zone may cause a selection to occur. A user may move their finger to one input zone or the other input zone depending on an input type the user may intend to cause.

[0020] A user may intend to cause an input to a first input zone but cause an input to a second input zone. For example, a first input zone may cause a menu to be generated and a second input zone may cause a selection to occur. The user may intend to cause a selection to occur via the first input zone, but mistakenly caused an input to the second input zone which may generate a menu. Such an unintended input to the first input zone may have been caused

by the user as a result of the user pressing down on the touchpad near a delineation boundary of the touchpad. As used herein, the term "delineation boundary" refers to a border that separates one area from another area. For example, the delineation boundary of the touchpad can separate the first input zone from the second input zone.

[0021] An unintentional input to the wrong input zone can cause wasted time for a user. Additionally, a user may become frustrated when an unintentional input occurs, especially in situations where the unintentional input is reoccurring. Such frustrations may be exacerbated as a result of the user having a dominant hand (e.g., being right-handed or left-handed), as the user may have to reach farther to one input zone or the other input zone with the dominant hand.

[0022] As described below, a location of a delineation boundary that separates input zones of an input device can be modified. For example, a location of the delineation boundary on the input device can be adjusted. Such an adjustment of the location of the delineation boundary can provide a more efficient input zone setup for a user which can reduce the occurrence of unintentional inputs, as compared with previous approaches.

[0023] Figure 1 illustrates an example of a computing device 100 including an input device 102 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 1, the input device 102 can include a surface 104, an input zone 106, an input zone 108, and a delineation boundary 110.

[0024] As illustrated in Figure 1, the computing device 100 can include an input device 102. As described above, the input device 102 can include a touchpad. The input device 102 can include a surface 104. As used herein, the term "surface" refers to an outer face of a device. For example, the surface 104 can be a surface on which a user can move their finger where the input device 102 can translate the motion and position of the user's finger relative to a position on an operating system of the computing device 100 that is made to output to a display device.

[0025] The input device 102 can be depressed by a user to cause an input to occur to the computing device 100. For example, when the input device 102 is depressed by a finger of a user, the input device 102 can translate the location of the user's finger relative to a position on an operating system of the computing device 100 that is made to output to a display device. That is, a user can press the input device 102 which can cause a particular input to occur and which may cause an output to be made to a display device, where the particular input that occurs and the output that is made can be based on a location on the input device 102 at which the user depressed the input device 102, as is further described herein.

[0026] The input device 102 can include an input zone 106 and an input zone 108. The input zone 106 and the input zone 108 can be separated by a delineation boundary 110. The delineation boundary can be a boundary defined by coordinates of the input device 102. For example, a set of coordinates can define the delineation boundary 110 such that a processor (e.g., not illustrated in Figure 1) can determine, based on a coordinate location of an input to the input device 102, whether the input is in the input zone 106 or the input zone 108, as is further described in connection with Figure 5. As illustrated in Figure 5, the delineation boundary 110 can divide the input zone 106 and the input zone 108 where the input zone 106 and the input zone 108 are the same size.

[0027] Although a processor is described above as determining a location of an input relative to the delineation boundary 110, examples of the disclosure are not so limited. For example, the computing device 100 may determine a location of an input relative to the delineation boundary 110 utilizing firmware of the input device 102, firmware of the computing device 100, etc.

[0028] The input zone 106 can be an area which can cause a particular type of input to the computing device 100 when depressed that can be a different type of input from the input zone 108. For example, when a user presses the input device 102 at a location in the input zone 106, a particular type of input to the computing device 100 can occur that may be different than when a user presses the input device 102 at a location in the input zone 106.

[0029] As illustrated in Figure 1, the input zone 106 can be on a left side of the input device 102 and the input zone 108 can be on a right side of the input device 102. As described above, the input zone 106 may cause an input to the computing device 100 that is different than the input from the input zone 108. For example, the input zone 108 can receive an input and in response, the computing device 100 can cause a menu generation event to occur. As used herein, the term "menu generation event" refers to an occurrence in which a computing device causes a list of options or commands to be generated and output to a display device. For instance, a user may intend to access a list of commands to perform a particular task utilizing the computing device 100 and depress the input device 102 in the input zone 108. The input zone 108 can receive the input and the computing device 100 can cause the menu generation event to occur.

[0030] The input zone 106 can receive an input and in response, the computing device 100 can cause a selection event to occur. As used herein, the term "selection event" refers to an occurrence in which a computing device causes an option or command to be selected and/or executed. For instance, a user may depress the input device 102 in the input zone 108 to cause the list of commands to be generated, and the user may depress the input device 102 in the input zone 106 to select a command from the list of commands. The input zone 106 can receive the input to cause the selection event (e.g., the selection of a command from the list of commands) to occur.

[0031] In some examples, a user may wish to adjust a location of the delineation boundary 110. Adjusting the location of the delineation boundary can be done to modify a size of the input zone 106 and a size of the input zone 108. For example, a user may wish to make the size of the input zone 106 larger and the size of the input zone 108 smaller. In some examples, a user can utilize a menu to adjust the location of the delineation boundary 110, as is further described in connection with Figure 2. In some examples, the computing device 100 can adjust the location of the delineation boundary 110 based on a training model, as is further described in connection with Figures 3-11.

[0032] Figure 2 illustrates an example of a menu 212 with a slide adjustment 214 to adjust a delineation boundary displayed on a display device for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 2, the menu 212 can include a slide adjustment 214.

[0033] As previously described in connection with Figure 1, a user may wish to adjust the location of the delineation boundary 210 of an input device. A user can, in some examples, access a menu 212. As used herein, the term "menu" refers to a list of commands to perform a particular task. The menu 212 can be generated and output to a display device (e.g., not illustrated in Figure 2). A user can utilize and/or interact with the menu 212 to adjust a location of the delineation boundary 210, as is further described herein.

[0034] As illustrated in Figure 2, the menu 212 can include a slide adjustment 214. As used herein, the term "slide adjustment" refers to a graphical control element which a user can interact with to set a value by moving an indicator. For example, a user can set a location of the delineation boundary 210 by adjusting the slide adjustment 214 left or right. The menu 212 can display the location of the delineation boundary 210 via a graphical element included in the menu 212, where the graphical element is illustrated as a larger version to the right of menu 212 as illustrated in Figure 2.

[0035] Adjustment of the slide adjustment 214 can correspondingly adjust the location of the delineation boundary 210. Adjustment of the delineation boundary 210 can increase the size of input zone 206 and decrease the size of input zone 208, as illustrated in Figure 2. However, examples of the disclosure are not so limited. For instance, in some examples a user may increase the size of input zone 208 and decrease the size of input zone 206.

[0036] Adjusting the location of the delineation boundary 210 via the menu 212 can cause the set of coordinates that define the delineation boundary 210 for the computing device to be modified. For example, as illustrated in Figure 2, the delineation boundary 210 can be moved to the right to increase a size of input zone 206 and decrease a size of input zone 208, and the set of coordinates for the delineation boundary can be correspondingly updated such that a processor or firmware of the computing device can determine, based on a

coordinate location of an input to the input device, whether the input is to the input zone 206 or to the input zone 208.

[0037] Accordingly, a user may adjust the delineation boundary 210 using a menu 212. Such an adjustment can allow for a more efficient input zone setup for the user. In some examples, a computing device can automatically adjust the location of the delineation boundary, as is further described in connection with Figures 3-11.

[0038] Figure 3 illustrates an example of a computing device 300 including an input device 302 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 3, the computing device 300 can include an input device 302 and a processor 316. The input device 302 can include a surface 304, an input zone 306, an input zone 308, and a delineation boundary 310.

[0039] Similar to the computing device 100 previously described in connection with Figure 1, the computing device 300 can include an input device 302. The input device 302 can be, for example, a touchpad. The input device 302 can include an input zone 306 and an input zone 308 separated by a delineation boundary 310.

[0040] At 318, the processor 316 can generate a training model for the input device 302. As used herein, the term "training model" refers to a collection of information that can be utilized to cause an action to be performed. The training model can include inputs to the input device 302, where the inputs can be received by the input zone 306 and/or the input zone 308. The processor 316 can determine whether the inputs to the input zone 306 and/or to the input zone 308 are intentional or unintentional to generate the training model. As used herein, the term "intentional input" refers to an input to an input zone that was an intended input zone for the input. For example, a user may intend to depress the input device 302 in the input zone 306 to cause a selection event to occur. The input zone 306 can receive the input (e.g., as a result of a user depressing the input device 302 in the input zone 306) such that the input to the input zone 306 is an intentional input.

[0041] In some examples, an input to the input device 302 may be unintentional. As used herein, the term "unintentional input" refers to an input to an input zone that was not an intended input zone for the input. For example, a user may intend to depress the input device 302 in the input zone 306 to cause a selection event to occur. The input zone 308 can receive the input (e.g., as a result of a user depressing the input device 302 in the input zone 308) such that a menu generation event occurs instead of a selection event. The input to the input zone 308 can, accordingly, be an unintentional input.

[0042] As described above, the input device 302 can receive an input. The processor 316 can determine whether the input was an intentional input or an unintentional input, as is further described herein. The processor 316 can generate a training model utilizing the intentional and/or unintentional inputs, as is further described herein.

[0043] At 320, the processor 316 can adjust a size of the input zone 306 and the input zone 308 based on the training model. For example, the training model may indicate that unintentional inputs occur in a particular area of the input device 302 and as a result, the processor 316 can adjust a size of the input zone 306 and the input zone 308 based on the training model. An input can be determined to be intentional or unintentional in various ways, as is further described in connection with Figures 4-7.

[0044] Figure 4 illustrates an example of a computing device 400 including an input device 402 to receive an input 422 that is unintentional and an input 424 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 4, the computing device 400 can include an input device 402. The input device 402 can include a surface 404, an input zone 406, an input zone 408, and a delineation boundary 410.

[0045] As illustrated in Figure 4, the input zone 408 can receive an input 422 and the input zone 406 can receive an input 424. In some examples, the computing device 400 can determine the input 422 received at the input zone 408 is an unintentional input to the input zone 408 in response to input zone 406 receiving input 424 within a particular amount of time. For example, as indicated in Figure 4 by the numbers "1" and "2", the input 422 can be received

by the input zone 408 first (e.g., as indicated by the number "1") and the input 424 can be received by the input zone 406 second (e.g., as indicated by the number "2"). For example, a user may intend to provide an input to the input zone 406 but accidentally provide an input 422 to the input zone 408. The user may then provide the input 424 to the input zone 406 within a particular amount of time (e.g., 3 seconds). In response, the computing device 400 can determine that the input 422 is an unintentional input. The input 422 that is unintentional can be indicated in Figure 4 as an "X" icon, and the input 424 that is intentional can be indicated in Figure 4 as a "circle" icon.

[0046] In some examples, when the input zone 406 receives an input, the computing device 400 can cause a selection event to occur and when the input zone 408 receives an input, the computing device 400 can cause a menu generation event to occur. A user may enter an input but not intend for a menu generation event to occur. For example, an input 422 can be received by input zone 408 and the computing device 400 can cause a menu to be generated (e.g., a menu generation event) in response to receiving the input 422. The input 424 may be received by input zone 406 and the computing device 400 can determine the input 422 is unintentional in response to the input 424 corresponding to a selection outside of the generated menu. For example, a user may provide an input 422 and the computing device 400 can generate a menu. The user may then provide an input 424 that does not select a list of options or commands included in the menu. Accordingly, the computing device 400 can determine that the input 422 is an unintentional input.

[0047] Figure 5 illustrates an example of a computing device 500 including an input device 502 to receive an input 522 that is unintentional and an input 524 separated by a distance 526 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 5, the computing device 500 can include an input device 502. The input device 502 can include a surface 504, an input zone 506, an input zone 508, and a delineation boundary 510.

[0048] As previously described above, the input device 502 can receive an input. Each input can be associated with metadata. As used herein, the

term "metadata" refers to a set of data that describes other data. The metadata associated with an input to the input device 502 can include a coordinate location on the input device 502. As used herein, the term "coordinate location" refers to a position on a surface defined by a set of letters and/or numbers. For example, the surface 504 of the input device 502 may be defined by a grid where each point on the grid is characterized by a particular set of letters and/or numbers. Accordingly, when an input is received by the input device 502, the computing device 500 can characterize a location of the input on the surface 504 of the input device 502 with a coordinate location in metadata associated with the input, as is further described herein.

[0049] As illustrated in Figure 5, the input zone 508 can receive an input 522 and subsequently the input zone 506 can receive an input 524. The input 522 can be associated with metadata that defines a coordinate location of the input 522 on the surface 504 of the input device 502. Similarly, the input 524 can be associated with metadata that defines a coordinate location of the input 524 on the surface 504 of the input device 502. For example, the coordinate location of the input 522 can allow the computing device 500 to determine the input 522 is located in an upper and left portion of the input zone 508 and the coordinate location of the input 524 can allow the computing device 500 to determine the input 524 is located in an upper and central portion of the input zone 506 (e.g., as illustrated in Figure 5).

[0050] The computing device 500 can determine that the input 522 is an unintentional input in response to a distance 526 between the coordinate location of the input 522 and the coordinate location of the input 524 exceeding a threshold distance. For example, a user may intend to provide an input to the input zone 506 but accidentally provide an input 522 to the input zone 508. A user may provide input 524 to the input zone 506, where a distance 526 between the coordinate location of the input 522 and the coordinate location of the input 524 exceeds a threshold distance. Accordingly, the computing device 500 can determine the input 522 is an unintentional input.

[0051] Figure 6 illustrates an example of a computing device 600 including an input device 602 to receive an input 622 that is intentional and an

input 624 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 6, the computing device 600 can include an input device 602. The input device 602 can include a surface 604, an input zone 606, an input zone 608, and a delineation boundary 610.

[0052] As previously described in connection with Figure 4, the computing device 600 can generate a menu when the input zone 608 receives an input 622. Accordingly, the computing device 600 can cause a menu generation event to occur to generate a menu in response to receiving input 622 by input zone 608. A user may intend to cause a menu generation event to occur. The computing device 600 can determine the input 622 is an intentional input in response to receiving input 624 that corresponds to a selection from the menu generated in response to the input 622 being received by the input zone 608. For example, the menu may present a list of options or commands, and the input 624 may select one of the options or commands included in the menu. In response, the computing device 600 can determine the input 622 is an intentional input.

[0053] Figure 7 illustrates an example of a computing device 700 including an input device 702 to receive an input 722 that is intentional and an input 724 that corresponds to a scroll event for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 7, the computing device 700 can include an input device 702. The input device 702 can include a surface 704, an input zone 706, an input zone 708, and a delineation boundary 710.

[0054] As previously described in connection with Figure 4, the computing device 700 can generate a menu when the input zone 708 receives an input 722. Accordingly, the computing device 700 can cause a menu generation event to occur to generate a menu in response to receiving input 722 by input zone 708. A user may intend to cause a menu generation event to occur. The computing device 700 can determine the input 722 is an intentional input in response to receiving input 724 that corresponds to a scrolling event in the menu. As used herein, the term “scrolling event” refers to an occurrence in which a computing device causes a graphical element displayed on a display

device to slide relative to a point on the display device. For example, the menu may present a list of options or commands, and the input 724 may cause the list of options or commands to scroll up or down. In response to the scrolling event occurring (e.g., as a result of input 724), the computing device 700 can determine the input 722 is an intentional input.

[0055] In some examples, the computing device may additionally receive input 728. Input 728 may correspond to a selection event to select an option or command from the list of options or commands generated in response to input 722. In response to the scrolling event occurring (e.g., as a result of input 724) and as a result of a selection event occurring (e.g., as a result of input 728), the computing device 700 can determine the input 722 is an intentional input.

[0056] Figure 8 illustrates an example of a computing device 800 including an input device 802 and a heat map 830 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 8, the computing device 800 can include an input device 802 and a processor 816. The input device 802 can include a surface 804, an input zone 806, an input zone 808, and a delineation boundary 810.

[0057] As previously described in connection with Figures 3-7, the processor 816 can generate a training model by determining whether an input to an input zone is an intentional input or an unintentional input. For example, the processor 816 can receive a first set of inputs 832 to the input zone 808 and the second set of inputs 834 to the input zone 806. The first set of inputs 832 and the second set of inputs 834 may be received over a period of time (e.g., a day, a week, a month, etc.).

[0058] The processor 816 can determine which of the inputs from the first set of inputs 832 were intentional inputs and which of the inputs from the first set of inputs 832 were unintentional inputs. For example, as illustrated in Figure 8, the processor 816 can determine inputs from the first set of inputs 832 to input zone 808 which were intentional (e.g., intended to be input to input zone 808, indicated in Figure 8 by a “star” shape and the letter “R”) and inputs from the first set of inputs 832 which were unintentional (e.g., intended to be input to input zone 806, indicated in Figure 8 by an “X” shape and the letter “L”).

[0059] Similarly, the processor 816 can determine which of the inputs from the second set of inputs 834 were intentional inputs and which of the inputs from the second set of inputs 834 were unintentional inputs. For example, the processor 816 can determine inputs from the second set of inputs 834 to input zone 806 which were intentional (e.g., intended to be input to input zone 806, indicated in Figure 8 by a "star" shape and the letter "L") and inputs from the second set of inputs 834 which were unintentional (e.g., intended to be input to input zone 806, indicated in Figure 8 by an "X" shape and the letter "R").

[0060] The processor 816 can generate a heat map 830 of the input device 802. As used herein, the term "heat map" refers to a representation of data in the form of a map or diagram in which data values are represented by particular icons and/or colors. The heat map 830 of the input device 802 can include the first set of inputs 832 and the second set of inputs 834 and can graphically illustrate which of the first set of inputs 832 are intentional or unintentional and can illustrate which of the second set of inputs 834 are intentional or unintentional, as described above.

[0061] The heat map 830 can include intentional inputs and unintentional inputs to the input zone 808. For instance, as illustrated in Figure 8, the heat map 830 can indicate the input zone 808 received three intentional inputs (e.g., three inputs intended to be input to input zone 808) and three unintentional inputs (e.g., three inputs intended to be input to input zone 806 but were unintentionally input to input zone 808).

[0062] The heat map 830 can include intentional inputs and unintentional inputs to the input zone 806. For instance, as illustrated in Figure 8, the heat map 830 can indicate the input zone 806 received four intentional inputs (e.g., four inputs intended to be input to input zone 806) and one unintentional input (e.g., one input intended to be input to input zone 808 but was unintentionally input to input zone 806).

[0063] As illustrated in Figure 8, the input zone 808 received more unintentional inputs (e.g., six) than input zone 806, indicating that a user may unintentionally be providing inputs to input zone 808 more than unintentionally providing inputs to input zone 806. The processor 816 can accordingly adjust a

location of the delineation boundary 810 to modify a size of the input zone 806 and the input zone 808 based on the heat map 830. For example, the processor can adjust the location of the delineation boundary 810 to increase the size of input zone 806 and decrease the size of input zone 808, as is further described in connection with Figure 9.

[0064] Figure 9 illustrates an example of a computing device 900 including an input device 902 and a delineation boundary 910 adjusted based on a heat map 930 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 9, the computing device 900 can include an input device 902 and a processor 916. The input device 902 can include a surface 904, an input zone 906, an input zone 908, and a delineation boundary 910.

[0065] As previously described in connection with Figure 8, the heat map 930 can indicate a user may unintentionally be providing inputs to input zone 908 more than unintentionally providing inputs to input zone 906. Accordingly, the processor 916 can adjust a location of the delineation boundary 910 to modify a size of the input zone 908 and the size of the input zone 906 based on the heat map 930. For example, as illustrated in Figure 9, the processor 916 can adjust the location of the delineation boundary 910 such that the inputs 936 that would have previously been unintentional inputs would now be intentional inputs. For instance, inputs indicated with the "star" icon and the letter "L" previously were unintentional inputs to input zone 908 (e.g., as previously described in connection with Figure 8) but after adjusting the location of the delineation boundary 910, would now have become intentional inputs to input zone 906. Accordingly, as illustrated in the heat map 930, such inputs that would have been unintentionally input to input zone 908 would be intentional inputs to input zone 906. This can allow for a user to be more efficient with the user's touchpad activity, reducing an occurrence of unintentional inputs as compared with previous approaches.

[0066] In some examples, the processor 916 can adjust the location of the delineation boundary 910 based on a confidence level. As used herein, the term "confidence level" refers to probability that a value of an unknown

parameter is included within a proposed range of plausible values based on observed data. For example, the processor 916 can adjust the location of the delineation boundary 910 based on a 95% confidence level according to the heat map 930.

[0067] Figure 10A illustrates an example of a computing device 1000 including an input device 1002 including a first input zone 1006 and a second input zone 1008 separated by a vertical delineation line 1038 and a heat map 1030 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 10A, the computing device 1000 can include an input device 1002. The input device 1002 can include a surface 1004, an input zone 1006, an input zone 1008, and a vertical delineation line 1038.

[0068] As previously described in connection with Figures 1-9, the delineation boundary is illustrated as a vertical delineation line 1038. For example, a set of coordinates can define the delineation boundary as a vertical delineation line 1038. However, examples of the disclosure are not so limited. For example, as illustrated in the heat map 1030, a user may unintentionally be providing inputs to input zone 1008 in an upper left portion of the input zone 1008. The computing device 1000 can adjust the location of the vertical delineation line 1038 as is further described in connection with Figure 10B.

[0069] Figure 10B illustrates an example of a computing device 1000 including an input device 1002 including a first input zone 1006 and a second input zone 1008 separated by an angled delineation line 1040 and a heat map 1030 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 10, the computing device 1000 can include an input device 1002. The input device 1002 can include a surface 1004, an input zone 1006, an input zone 1008, and an angled delineation line 1040.

[0070] As previously described in connection with Figure 10A, the heat map 1030 may indicate a user unintentionally be providing inputs to input zone 1008 in an upper left portion of the input zone 1008. The computing device 1000 can adjust the location of the delineation boundary to be an angled delineation line 1040, as illustrated in Figure 10B. For example, as illustrated in Figure 10B, the computing device 1000 can adjust the location of the

delineation boundary to be an angled delineation line 1040 such that the inputs that would have previously been unintentional inputs would now be intentional inputs. Such an angled delineation line 1040 can be defined by another set of coordinates that may be different from the set of coordinates the define the vertical delineation line.

[0071] Figure 11A illustrates an example of a computing device 1100 including an input device 1102 including a first input zone 1106 and a second input zone 1108 separated by a vertical delineation line 1138 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 11A, the computing device 1100 can include an input device 1102. The input device 1102 can include a surface 1104, an input zone 1106, an input zone 1108, and a vertical delineation line 1138.

[0072] A set of coordinates can define the delineation boundary as a vertical delineation line 1138. However, examples of the disclosure are not so limited. For example, the vertical delineation line 1138 can be modified to be any other shape, as is further described in connection with Figure 11B.

[0073] Figure 11B illustrates an example of a computing device 1100 including an input device 1102 including a first input zone 1106 having a first shape and a second input zone 1108 having a second shape separated by a delineation boundary 1110 for delineation boundary adjustments consistent with the disclosure. As illustrated in Figure 11B, the computing device 1100 can include an input device 1102. The input device 1102 can include a surface 1104, an input zone 1106, an input zone 1108, and a delineation boundary 1110.

[0074] For example, as illustrated in Figure 11B, the delineation boundary 1110 can define the input zone 1106 to be a rectangle and the input zone 1108 to be a rectangle located within the rectangle of the input zone 1106. However, examples of the disclosure are not so limited. For example, the delineation boundary 1110 can define the input zone 1106 to be an oval, circle, square, triangle, etc., and the input zone 1106 to be a corresponding oval, circle, square, triangle, and/or any other shape.

[0075] Figure 12 illustrates a block diagram of an example system 1240 for delineation boundary adjustments consistent with the disclosure. In the example of Figure 12, system 1240 includes a computing device 1200 including a processor 1216 and a non-transitory machine-readable storage medium 1242. Although the following descriptions refer to a single processing resource and a single machine-readable storage medium, the descriptions may also apply to a system with multiple processors and multiple machine-readable storage mediums. In such examples, the instructions may be distributed across multiple machine-readable storage mediums and the instructions may be distributed across multiple processors. Put another way, the instructions may be stored across multiple machine-readable storage mediums and executed across multiple processors, such as in a distributed computing environment.

[0076] Processor 1216 may be a central processing unit (CPU), microprocessor, and/or other hardware device suitable for retrieval and execution of instructions stored in machine-readable storage medium 1242. In the particular example shown in Figure 12, processor 1216 may receive, determine, and send instructions 1244 and 1246. As an alternative or in addition to retrieving and executing instructions, processor 1216 may include an electronic circuit comprising a number of electronic components for performing the operations of the instructions in machine-readable storage medium 1242. With respect to the executable instruction representations or boxes described and shown herein, it should be understood that part or all of the executable instructions and/or electronic circuits included within one box may be included in a different box shown in the figures or in a different box not shown.

[0077] Machine-readable storage medium 1242 may be any electronic, magnetic, optical, or other physical storage device that stores executable instructions. Thus, non-transitory machine-readable storage medium 1242 may be, for example, Random Access Memory (RAM), an Electrically-Erasable Programmable Read-Only Memory (EEPROM), a storage drive, an optical disc, and the like. The executable instructions may be "installed" on the system 1240 illustrated in Figure 12. Machine-readable storage medium 1242 may be a portable, external or remote storage medium, for example, that allows the

system 1240 to download the instructions from the portable/external/remote storage medium. In this situation, the executable instructions may be part of an "installation package".

[0078] Receive instructions 1244, when executed by a processor such as processor 1216, may cause system 1240 to receive an input from an input device of a computing device. The input device can include a surface including a first input zone and a second input zone separated by a delineation boundary.

[0079] Adjust instructions 1246, when executed by a processor such as processor 1216, may cause system 1240 to adjust a location of a delineation boundary. Adjusting the location of the delineation boundary can modify a size of the first input zone and a size of the second input zone in response to the input.

[0080] In the foregoing detailed description of the disclosure, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of illustration how examples of the disclosure may be practiced. These examples are described in sufficient detail to enable those of ordinary skill in the art to practice the examples of this disclosure, and it is to be understood that other examples may be utilized and that process, electrical, and/or structural changes may be made without departing from the scope of the disclosure.

[0081] The figures herein follow a numbering convention in which the first digit corresponds to the drawing figure number and the remaining digits identify an element or component in the drawing. Similar elements or components between different figures may be identified by the use of similar digits. For example, 102 may reference element "02" in Figure 1, and a similar element may be referenced as 302 in Figure 3.

[0082] Elements illustrated in the various figures herein can be added, exchanged, and/or eliminated so as to provide a plurality of additional examples of the disclosure. In addition, the proportion and the relative scale of the elements provided in the figures are intended to illustrate the examples of the disclosure and should not be taken in a limiting sense. As used herein, "a

plurality of' an element and/or feature can refer to more than one of such elements and/or features.

What is claimed:

1. A non-transitory machine-readable storage medium including instructions that when executed cause a processor of a computing device to:

receive an input from an input device of the computing device, wherein the input device includes a surface including a first input zone and a second input zone separated by a delineation boundary; and

adjust a location of the delineation boundary to modify a size of the first input zone and a size of the second input zone in response to the input.

2. The non-transitory storage medium of claim 1, including instructions to cause the processor to adjust the location of the delineation boundary to increase the size of the first input zone.

3. The non-transitory storage medium of claim 1, including instructions to cause the processor to adjust the location of the delineation boundary to decrease the size of the second input zone.

4. The non-transitory storage medium of claim 1, including instructions to cause the processor to:

cause a selection event to occur in response to receiving the input from the first input zone; and

cause a menu generation event to occur in response to receiving the input from the second input zone.

5. A computing device, comprising:

an input device including a surface having a first input zone and a second input zone; and

a processor, wherein the processor is to:

generate a training model for the input device by determining whether a first input from the first input zone was an intentional input or an unintentional input; and

adjust a size of the first input zone and a size of the second input zone based on the training model.

6. The computing device of claim 5, wherein the processor is to determine the first input received at the first input zone is an unintentional input to the first input zone in response to a second input being received within a particular amount of time.

7. The computing device of claim 6, wherein the processor is to:

cause a menu to be generated in response to receiving the first input; and

determine the first input is the unintentional input in response to the second input corresponding to a selection outside of the menu.

8. The computing device of claim 5, wherein the processor is to receive a second input from the second input zone, wherein:

the first input is associated with metadata defining a first coordinate location of the first input on the input device; and

the second input is associated with metadata defining a second coordinate location of the second input on the input device.

9. The computing device of claim 8, wherein the processor is to determine that the first input is an unintentional input in response to a distance between the coordinate location of the second input and the coordinate location of the first input exceeding a threshold distance.

10. The computing device of claim 5, wherein the processor is to generate a menu in response to receiving the first input.

11. The computing device of claim 10, wherein the processor is to determine that the first input is an intentional input in response to receiving a second input that corresponds to a selection from the menu.

12. The computing device of claim 10, wherein the processor is to determine that the first input is an intentional input in response to receiving a second input that corresponds to a scrolling event in the menu.

13. A computing device, comprising:

a touchpad including a surface having a first input zone and a second input zone separated by a delineation boundary; and

a processor, wherein the processor is to:

receive a first set of inputs to the first input zone and a second set of inputs to the second input zone;

generate a heat map of the touchpad including the first set of inputs and the second set of inputs, wherein the heat map includes:

first intentional inputs and first unintentional inputs to the first input zone; and

second intentional inputs and second unintentional inputs to the second input zone; and

adjust a location of the delineation boundary to modify a size of the first input zone and a size of the second input zone based on the heat map.

14. The computing device of claim 13, wherein the processor is to adjust the location of the delineation boundary based on a confidence level.

15. The computing device of claim 13, wherein the delineation boundary is:

a vertical delineation line;

an angled delineation line; or

a boundary defining the first input zone to have a first shape and the second input zone to have a second shape.

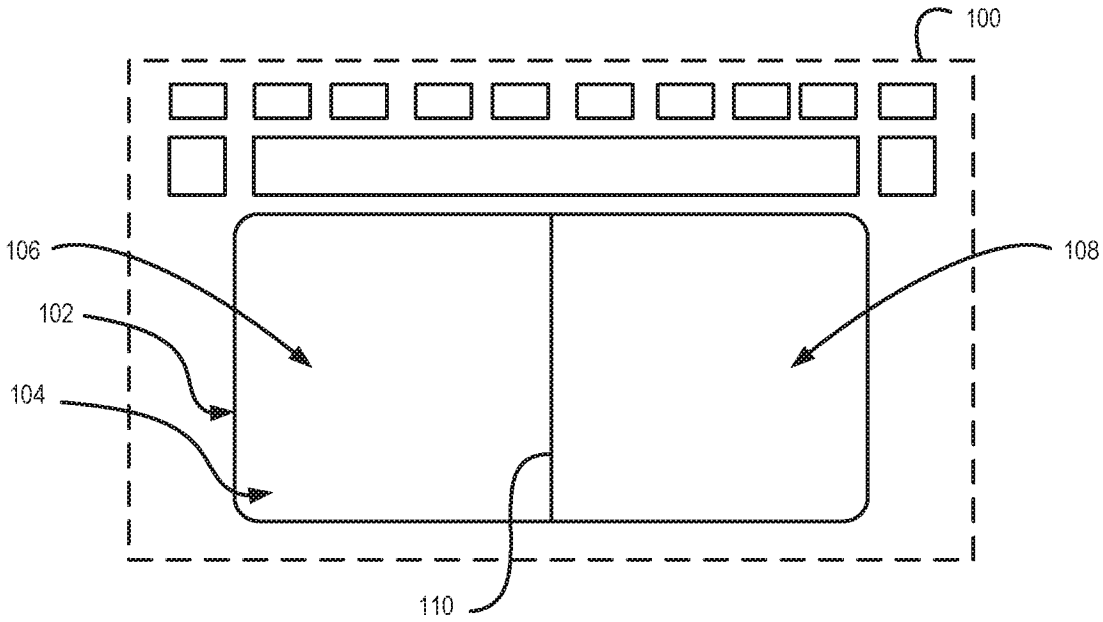

Figure 1

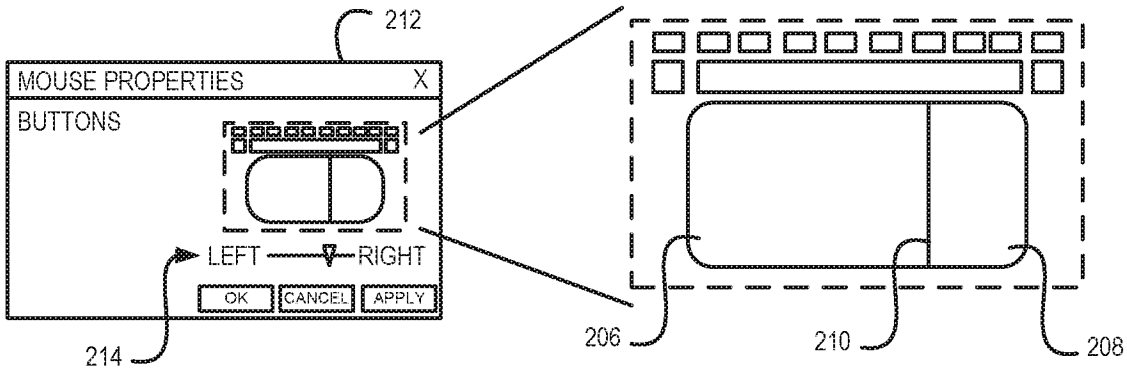

Figure 2

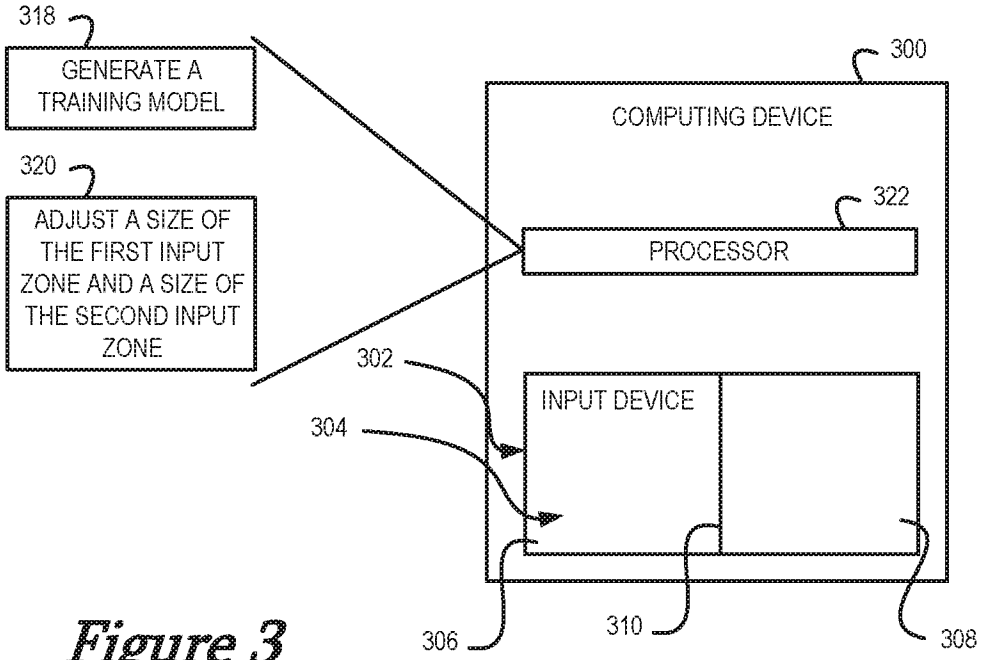

Figure 3

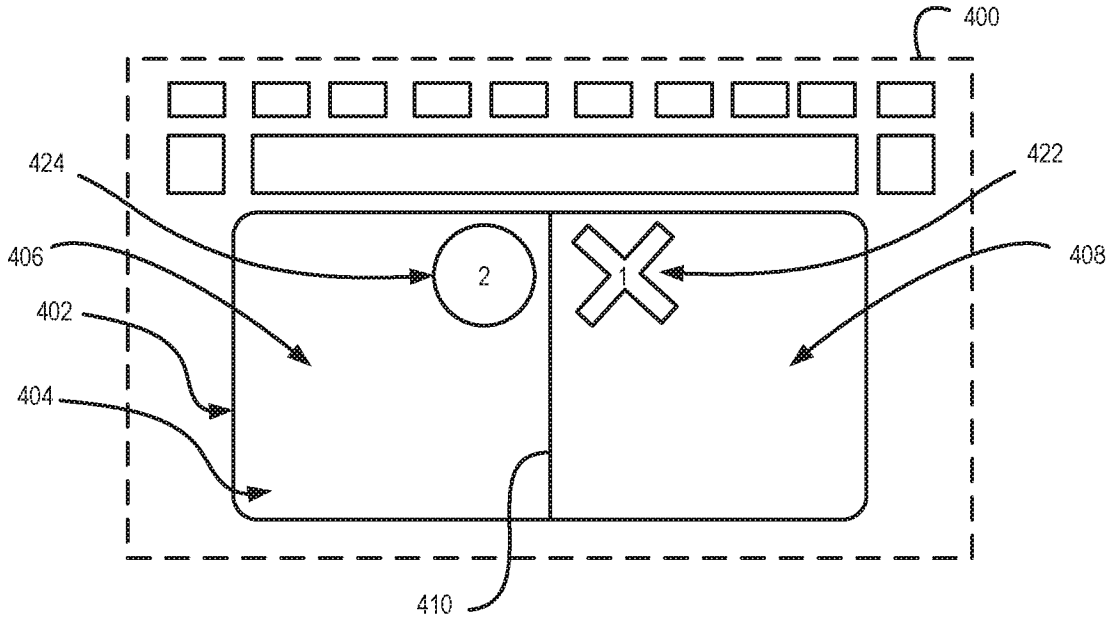

Figure 4

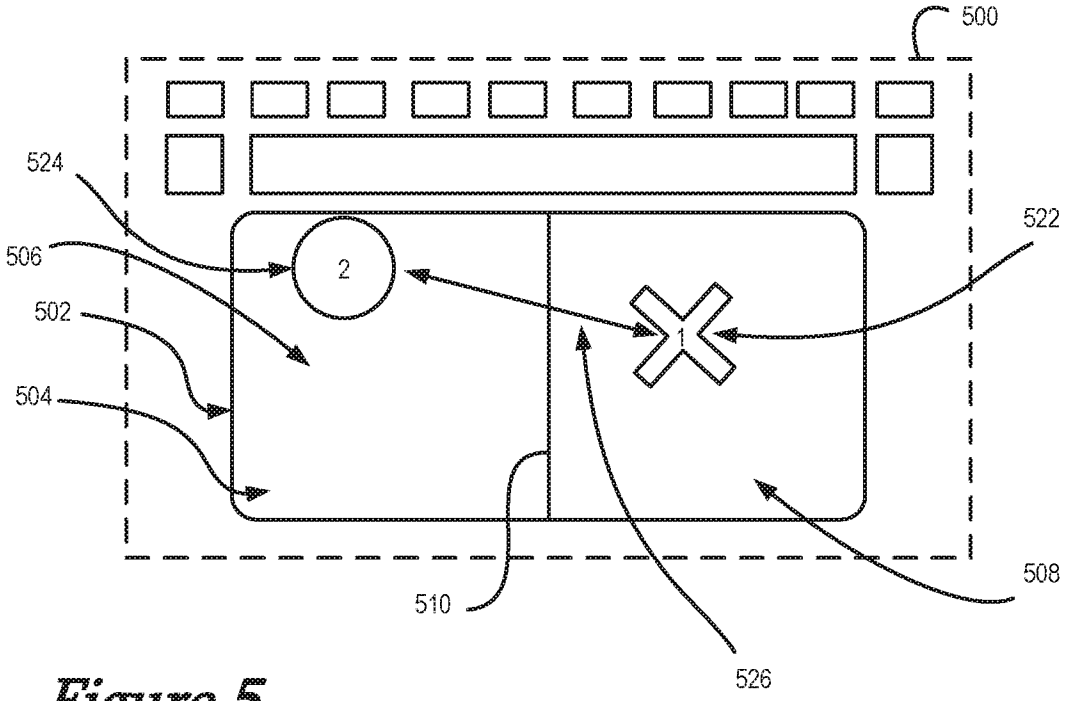

Figure 5

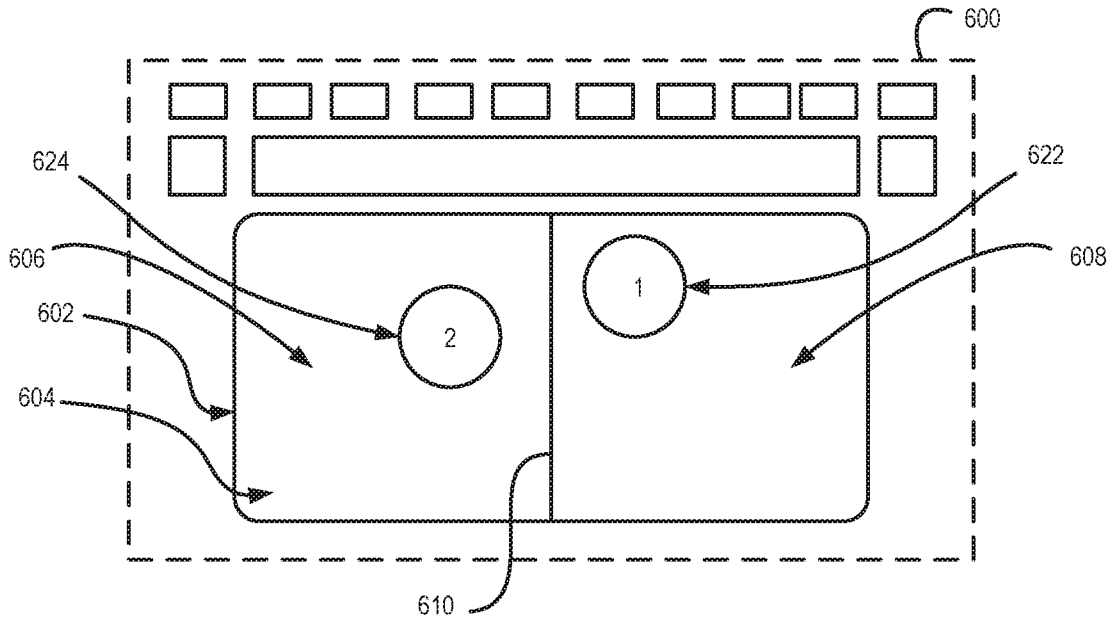

Figure 6

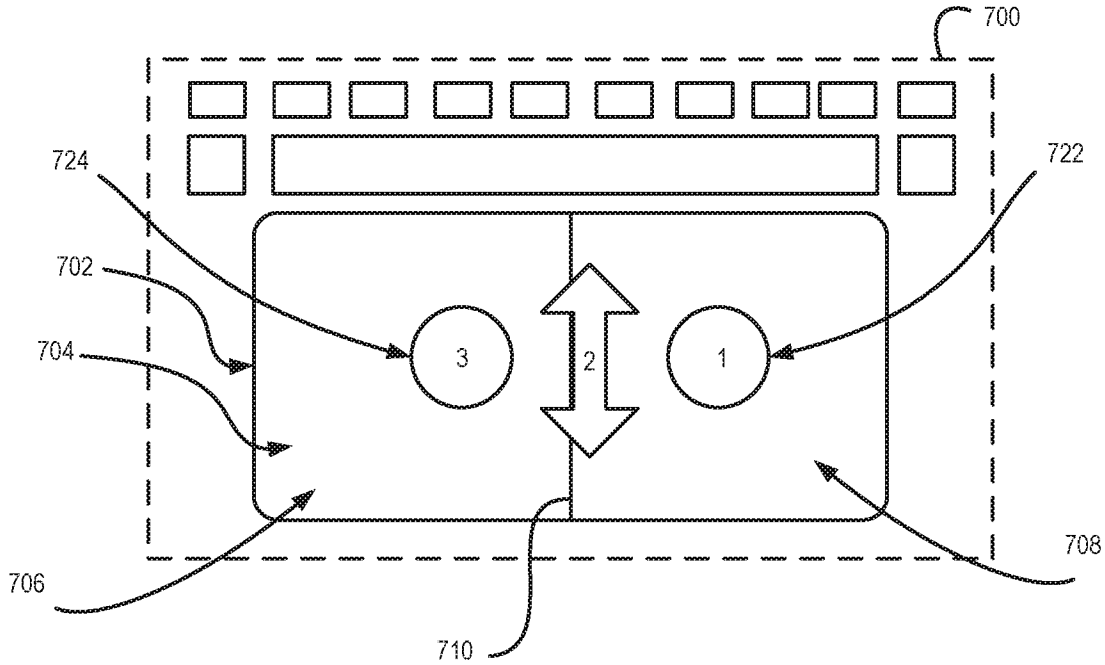

Figure 7

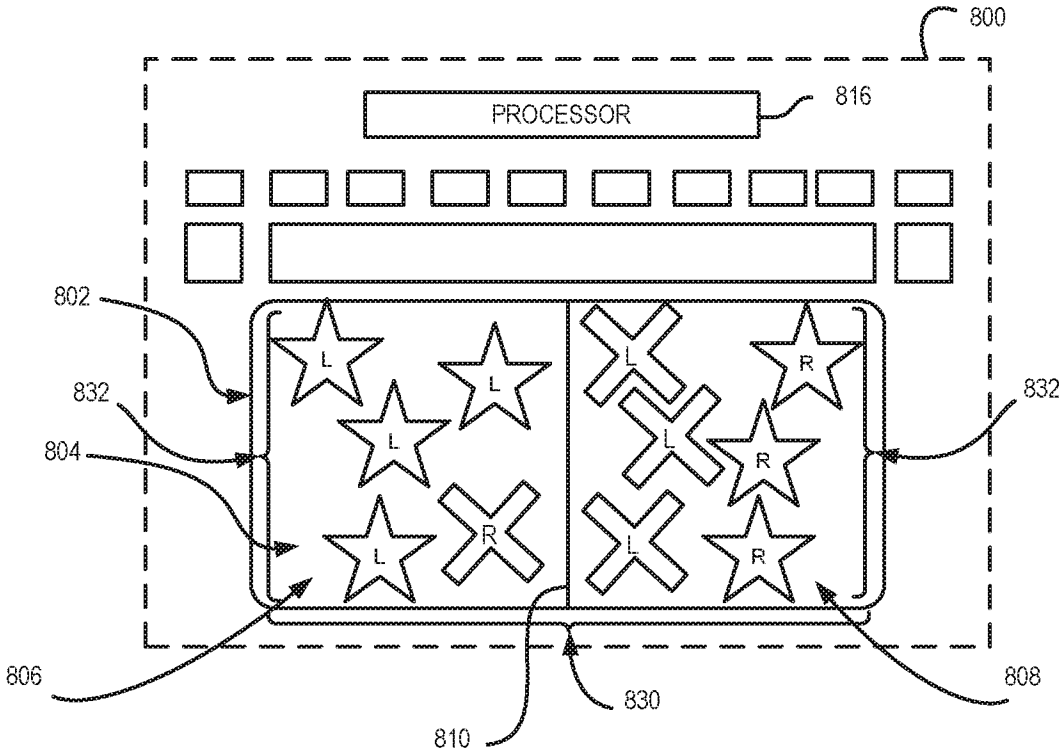

Figure 8

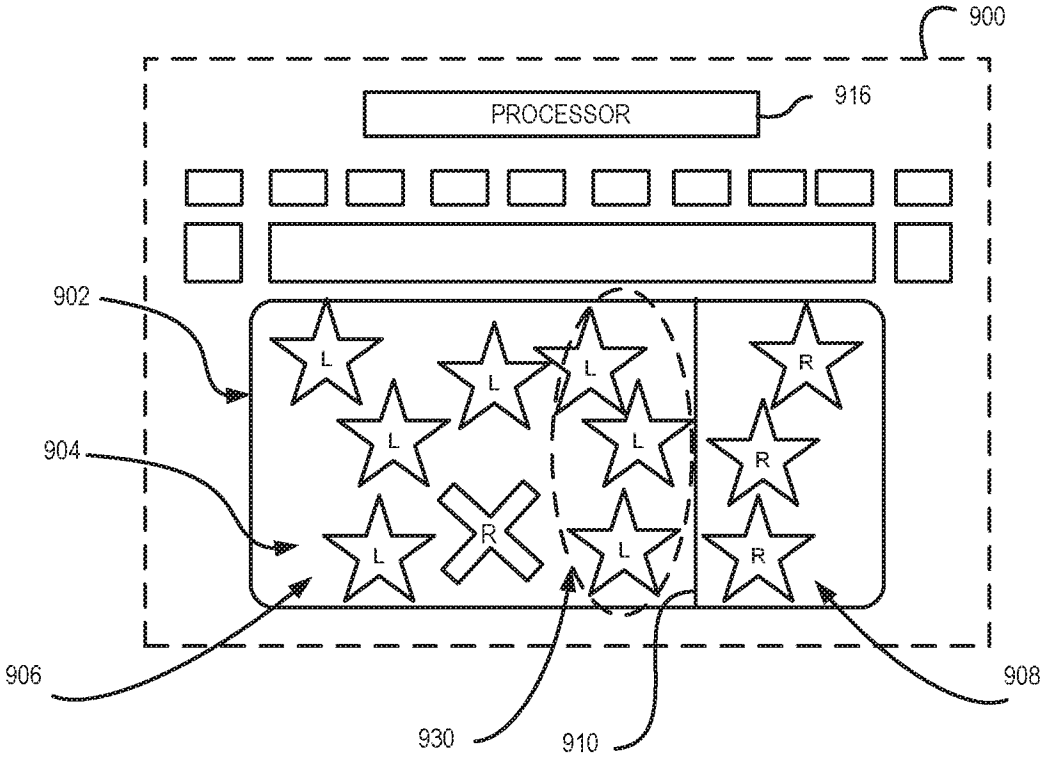

Figure 9

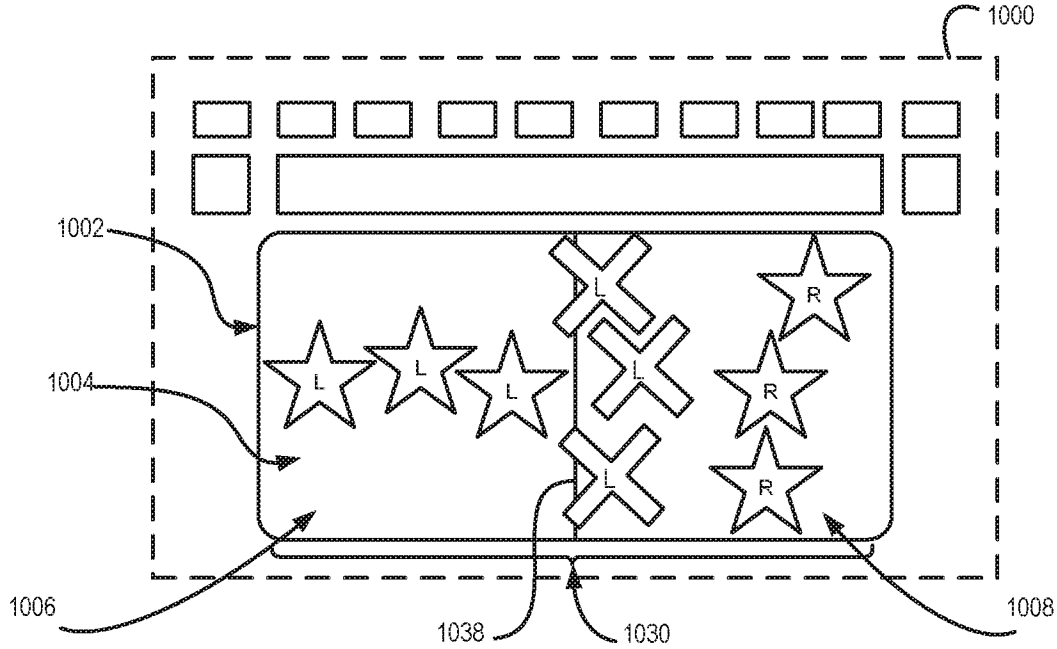

Figure 10A

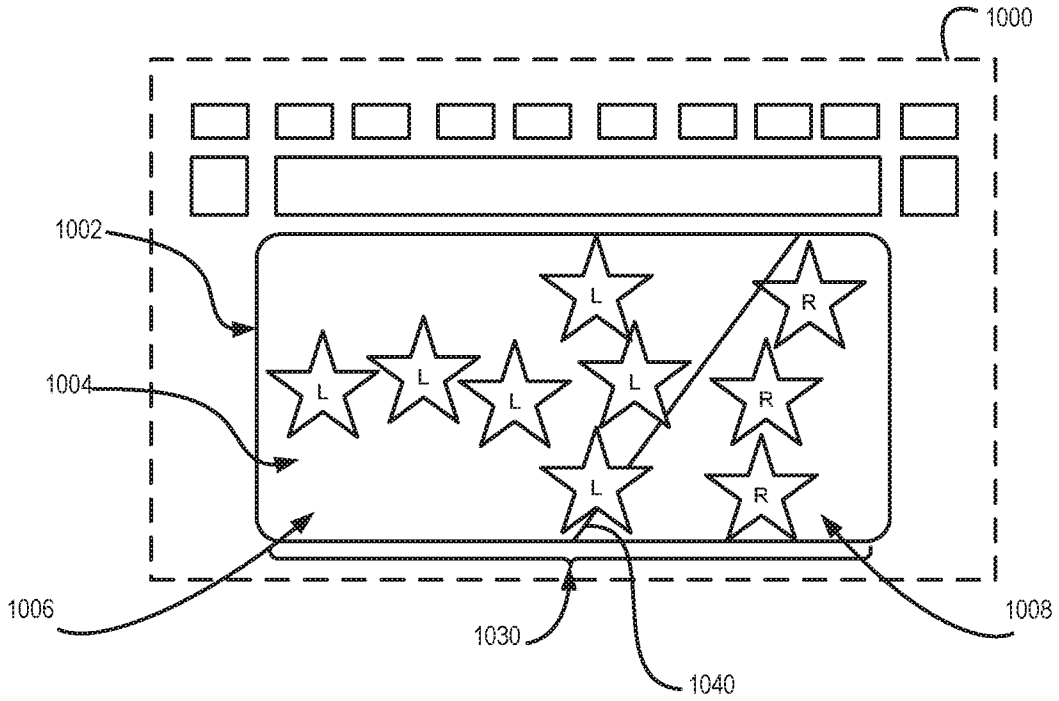

Figure 10B

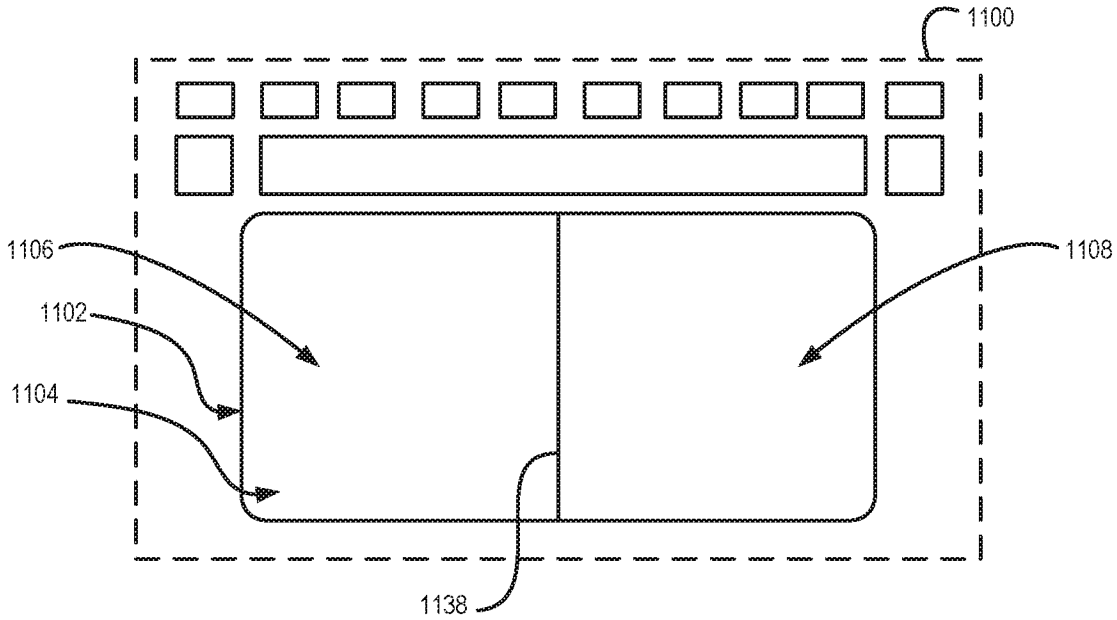

Figure 11A

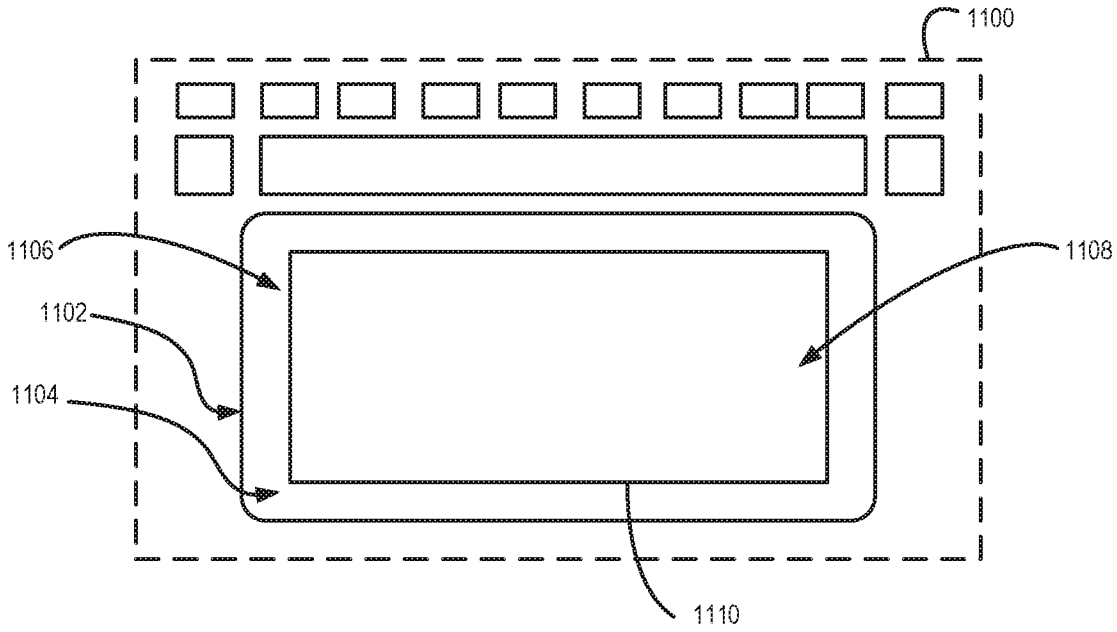

Figure 11B

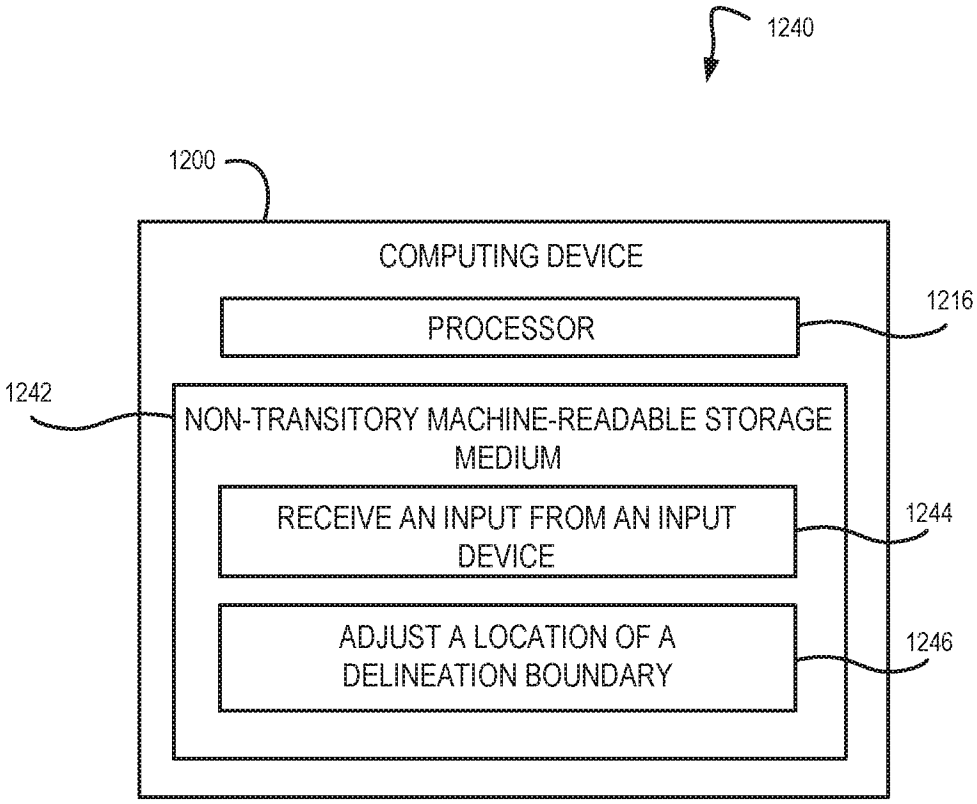
1240
1200
COMPUTING DEVICE
PROCESSOR
1216
1242
NON-TRANSITORY MACHINE-READABLE STORAGE MEDIUM
RECEIVE AN INPUT FROM AN INPUT DEVICE
1244
ADJUST A LOCATION OF A DELINEATION BOUNDARY
1246

Figure 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2020/046624

A. CLASSIFICATION OF SUBJECT MATTER

G06F 3/041 *(2006.01)*
G06F 3/0488 *(2013.01)*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06F 3/00, 3/01, 3/03, 3/041, 3/048, 3/0487, 3/0488, 3/0484, 3/03, 3/033, 3/0354, 1/00, 1/16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatSearch (RUPTO Internal), USPTO, PAJ, Espacenet, Information Retrieval System of FIPS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2018/0321841 A1 (LAPP JOSEPH T.) 08.11.2018, paragraphs [0123], [0130], [0139], [0213], [0215]-[0216], [0273], [0507]-[0510], [0530]-[0537], [0661], [0777], claim 27, figures 1, 7A-7N, 43A-43B, 46A-46F	1-6, 8-10, 13-14
Y		7, 11-12
Y	CN 110597405 A (XIAO HONGKAI) 20.12.2019, paragraphs [0111], [0117]	7, 11-12
A	US 2016/0103496 A1 (APPLE INC.) 14.04.2016	1-15
A	US 2020/0183580 A1 (CIRQUE CORPORATION) 11.06.2020	
A	US 2011/0069021 A1 (JARED C. HILL) 24.03.2011	

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"D" document cited by the applicant in the international application

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 April 2021 (16.04.2021)	22 April 2021 (22.04.2021)

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