

may generate a lock bar for setting a current screen state. The lock bar may be displayed on the left side (e.g., the side with the smaller bend angle) of the display unit 130, as shown in a state 103*b*. The lock bar may partially overlap a location where the touch event A is detected, so that the user can easily operate an activation or deactivation of the lock bar. The lock bar can be removed from the display unit 130 if the touch event A is released.

[0074] Referring to FIG. 10C, if the user moves the touch event A and thus a lock bar function is activated, the controller 160 may display an image corresponding to the activation of the lock bar function on one side, for example, above the lock bar or on one side of the content being displayed.

[0075] Referring to FIG. 10D, although a bend event does not occur in the flexible display device 100 as shown in a state 101*d*, the controller 160 may display a portion of other pages on the right side according to the lock bar function. As shown in state 103*d*, the controller 160 may also display symbols B1, B2, and B3 indicating pages having a bookmark in a certain area of the block width, thereby distinguishing between pages having a bookmark and other pages. Subsequently, if the user touches one of the symbols B1, B2, and B3, the controller 160 may display the page corresponding to the touched symbol.

[0076] FIG. 11 is a view illustrating a flexible display device 100 according to exemplary embodiments of the present invention.

[0077] Referring to FIG. 11, in some cases, the display unit 130 of the flexible display device 100 can be folded with respect to the center axis. That is, the display unit 130 may include a first display unit and a second display unit that can be connected to each other with respect to the center axis. The first display unit can be supported by the left hand and the right display unit can be supported by the right hand. If the second display unit is bent at a certain angle, the controller 160 may receive a bend signal from flexible sensors 150 and may perform a page turning function as described above, based on the bend event. The controller 160 may perform a page turning function by moving the page from the second display unit to the first display unit.

[0078] FIG. 12A and FIG. 12B are diagrams of a flexible display device 100 capable of supporting enlargement and reduction functions, according to exemplary embodiments of the invention.

[0079] Referring to FIG. 12A and FIG. 12B, in some cases, the flexible display device 100 may be bent in a sinusoidal waveform. The flexible sensors 150 may generate first and second bend signals based on bend events corresponding to different directions. The bend signals may be output to the controller 160. For example, the first bend signal may contain information that represents a bend where, for example, the left (or right) side of the display unit 130 with respect to the center axis of device 100 is bent upward. The second bend signal may contain information that represents a bend where the left (or right) side of the display unit 130 with respect to the center axis of device 100 is bent downward. When the controller 160 receives a plurality of bend signals having direction values differ from each other, the controller may enlarge or reduce a size of contents located in areas where bend events have occurred, respectively, and may then display the re-sized contents.

[0080] Referring to FIG. 12A, if the left side of the display unit 130 with respect to the center axis is bent upwards and the right side is bent downwards, the flexible sensors 150 may generate first and second bend signals indicating bend direc-

tions that differ from each other, and may output the bend signals to the controller 160. Additionally, the touch sensors 140 may also output, to the controller 160, information regarding locations on the display unit 130 that the user's fingers touched. The controller 160 may enlarge and display a content located on the left side of the display unit 130, according to the received touch signals and bend signals. For example, the controller 160 may zoom in on the content located at the left side of the display unit 130, and may enlarge and display the content. The controller may also simultaneously reduce and display a content located on the right side of the display unit 130. For example, the controller 160 may zoom out of the content located at the right side of the display unit 130, and may reduce and display the content.

[0081] Referring to FIG. 12B, if the left side of the display unit 130 with respect to the center axis is bent downwards and the right side of the display unit 130 is bent upwards, the flexible sensors 150 can generate first and second bend signals indicating bend directions that differ from each other, and may output the bend signals to the controller 160. Additionally, the touch sensors 140 may also output information, to the controller 160, regarding locations on the display unit 130 that the user's fingers touched. The controller 160 may then reduce and display a content located on the left side of the display unit 130, according to the received touch signals and bend signals. For example, the controller 160 may zoom out of the content located at the left side of the display unit 130, and may reduce and display the content. Simultaneously, the controller 160 may enlarge and display a content located at the right side of the display unit 130. For example, the controller 160 may zoom in on the content located at the right side of the display unit 130, and may enlarge and display the content.

[0082] As described above, two bend events whose bend directions differ from one another may be detected at the right and left sides of the display unit 130 with respect to the center axis. However, exemplary embodiments of the invention are not limited thereto. For example, the display unit 130 may be divided equally in three portions, so that both side portions are symmetrically bent in the same direction with respect to the center portion, and the center portion may be bent in an opposite direction to the bend direction of both side portions. The flexible sensors 150 may generate and output three bend signals to the controller 160. When the controller 160 receives the three bend signals, the controller 160 may reduce and display a content located at the portion(s) of the display unit 130 that is bent downwards. Simultaneously, the controller 160 may enlarge and display a content located in the portion(s) of the display unit 130 that is bent upwards.

[0083] In the foregoing description, exemplary embodiments have been described regarding the operations of the flexible display device 100 based on the touch events and bend events detected by the touch sensors and bend sensors, respectively. A method for displaying data in the flexible display device 100 is explained in detail with reference to FIG. 13.

[0084] FIG. 13 is a flow chart describing a method for displaying data in a flexible display device 100 according to exemplary embodiments of the present invention.

[0085] Referring to FIG. 13, when the flexible display device 100 is turned on, the controller 160 may perform multiple processes including a booting process, may output a standby screen on the display unit 130, and may activate the touch sensors 140 to detect touch events (101).