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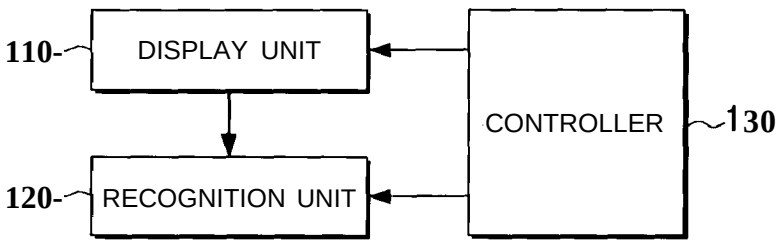
(54) Title: DISPLAY APPARATUS AND IMAGE REPRESENTATION METHOD USING THE SAME



(57) Abstract: A display apparatus is provided. The display apparatus includes: a display unit which displays a content on a screen, a recognition unit which, if a user touch is input on the screen, recognizes an object corresponding to a touch trajectory, and a controller which controls the display unit to change a page of the content displayed on the screen in accordance with the object. Accordingly, it is possible to change the page of the electronic content swiftly and manipulate the electronic apparatus easily, and user convenience is improved by reflecting intuitive user experience on the interface.

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Description

Title of Invention: DISPLAY APPARATUS AND IMAGE REPRE¬ SENTATION METHOD USING THE SAME

Technical Field

[1] Methods and apparatuses consistent with exemplary embodiments relate to a display apparatus and an image representation method using the same, and more particularly, to a display apparatus which receives and processes touch input of a user, thereby outputting a resulting image, and an image representation method using the same.

Background Art

[2] The development of input-output apparatuses in the computer started with a system that is equipped with an input apparatus and an output apparatus separately. In this system, the output apparatus could only identify output. The computer in the initial stage was a configuration that puts a definite functional limit to the output apparatus. Therefore, the output apparatus could identify only a result of calculating if input data such as a punch card is separately set and input. After that, thanks to the development of technology, an electronic apparatus that can identify input and output through a terminal apparatus, which is an output apparatus, such as a personal computer, has come into existence. However, since users still had to input on a sentence basis through an input apparatus such as a keyboard at that time, general users except for an expert who uses a programming language rarely used the computer. In 1990, the age of the computer, in which users can identify input and output through a single apparatus and anyone can easily handle the computer in their daily lives by clicking an icon of an image format through a simple input apparatus called a mouse, has arrived. The computer started to affect daily lives as an important tool for human civilization.

[3] The recent widespread use of smart phones and tablet PCs is regarded as the innovation of the human civilization beyond advancement in the digital apparatuses. It is not too much to say that a touch screen apparatus, which suggests a new paradigm for realizing a user-centric interface through analogue sensitivity, lies at the core of the innovation.

[4] The touch screen apparatus is designed to recognize a touch position if a person's hand or an object touches a character or a specific position appearing on a screen, and perform a specific process using stored software. The touch screen apparatus employs a graphic-based window system, which was commonly used in 1990, and incorporates input-output apparatuses into a single apparatus, thereby maximizing user convenience.

[5] Input ways through such a touch screen apparatus may be divided into simple data

input and command input. The simple data input refers to a way that receives input of data in a format understandable only by a person and simply stores the data. For example, the touch screen apparatus may receive input of text data or graphic data and store it. On the other hand, the command input refers to a way in which the touch screen apparatus understands and processes input and outputs a resulting image. For example, the command input is executing a program by flicking a specific icon or moving an icon to a certain position by dragging. However, the command input puts a limit to performing only a simple command. That is, the user may be required to input flicking or dragging several times to obtain a finally desirable result. Of course, the related-art touch screen apparatus can input a complicated command by displaying a keyboard screen on a screen of the touch screen apparatus. However, this way is far away from our aim to realize a simple input-output apparatus. The touch screen apparatus should be progressed towards a user experience-based simple interface so that the user can use complicated functions of the apparatus with ease.

Disclosure of Invention

Technical Problem

[6] One or more exemplary embodiments may overcome the above disadvantages and other disadvantages not described above. However, it is understood that one or more exemplary embodiment are not required to overcome the disadvantages described above, and may not overcome any of the problems described above.

[7] One or more exemplary embodiments provide a display apparatus that is driven in accordance with an object corresponding to touch input of a user if the user touches a screen, and displays a resulting image on the screen.

Solution to Problem

[8] According to an aspect of an exemplary embodiment, there is provided a display apparatus, including: a display unit which displays a content on a screen, a recognition unit which, if a user touch is input on the screen, recognizes an object corresponding to a touch trajectory, and a controller which controls the display unit to change a page of the content displayed on the screen in accordance with the object.

[9] If the object recognized by the recognition unit is a figure, the controller may control the display unit to change the page to a page corresponding to the figure and display the page, and, if the object recognized by the recognition unit is a letter, the controller may control the display unit to change the page to a page including a paragraph corresponding to the letter and display the page.

[10] If the object recognized by the recognition unit is a symbol, the controller may control the display unit to change the page to a previous page or a next page in accordance with the symbol, and display the page.

[11] If a plurality of objects are recognized by the recognition unit, the controller may combine the plurality of objects and may control the display unit to change the page to a page corresponding to the combined objects.

[12] If a plurality of pages correspond to the object, the controller may display a list of the plurality of pages and may control the display unit to change the page to a page that is selected from among the plurality of pages.

[13] If a plurality of objects are recognized by the recognition unit, the controller may display a list of pages of contents corresponding to the plurality of objects, respectively, and may control the display unit to change the page to a page that is selected from among the plurality of pages.

[14] If one object is recognized and then another object is recognized within a predetermined time, the controller may recognize the objects as a plurality of objects.

[15] If the object recognized by the recognition unit is an end symbol, the controller may end object recognition and may control the display unit to change the page of the content displayed on the screen in accordance with the object recognized until then.

[16] According to an aspect of another exemplary embodiment, there is provided an image representation method, including: sensing user touch input on a screen, recognizing an object corresponding to a touch trajectory of the user, and changing a page of a content displayed on the screen in accordance with the object.

[17] The changing the page may include, if the recognized object is a figure, changing the page to a page corresponding to the figure, and, if the recognized object is a letter, changing the page to a page including a paragraph corresponding to the letter.

[18] The changing the page may include, if the recognized object is a symbol, changing the page to a previous page or a next page in accordance with the symbol.

[19] The changing the page may include, if a plurality of objects are recognized, combining the plurality of objects and changing the page to a page corresponding to the combined objects.

[20] The changing the page may include, if a plurality of pages correspond to the object, displaying a list of the plurality of pages and changing the page to a page that is selected from among the plurality of pages.

[21] The changing the page may include, if a plurality of objects are recognized, displaying a list of pages of contents corresponding to the plurality of objects, respectively, and changing the page to a page that is selected from among the plurality of pages.

[22] The recognizing the object may include, if one object is recognized and then another object is recognized within a predetermined time, recognizing the objects as a plurality of objects.

[23] The changing the page may include, if the recognized object is an end symbol,

ending object recognition and changing the page of the content displayed on the screen in accordance with the object recognized until then.

Advantageous Effects of Invention

[24] According to the exemplary embodiments described above, it is possible to change the page of the electronic content swiftly and manipulate the electronic apparatus easily, and user convenience is improved by reflecting intuitive user experience on the interface.

Brief Description of Drawings

[25] The above and/or other aspects will be more apparent by describing in detail exemplary embodiments, with reference to the accompanying drawings, in which:

[26] FIG. 1 is a block diagram illustrating a display apparatus according to an exemplary embodiment;

[27] FIG. 2 is a flowchart illustrating a process of the display apparatus of FIG. 1 of recognizing an object corresponding to a touch trajectory of a user and changing a page of a content;

[28] FIG. 3 is a concept view illustrating a case in which a user inputs an object figure '89' and a display unit goes to page 89 of the content;

[29] FIG. 4 is a concept view illustrating change of a page if an object is a letter;

[30] FIG. 5 is a concept view illustrating change of a page if an object is a symbol;

[31] FIG. 6 is a concept view illustrating a case in which, if an object is a plurality of Roman numerals 'IV, 'IV is recognized by combining the objects T and 'V, and the display unit displays a corresponding page of an e-book;

[32] FIG. 7 is a concept view illustrating a case in which the display unit displays a list of pages if a plurality of pages correspond to an object figure '5' ;

[33] FIG. 8 is a concept view illustrating a case in which, if a plurality of objects 'A', 'B', and 'C are input, a list of pages of contents corresponding to the plurality of objects, respectively, is displayed;

[34] FIG. 9 is a concept view illustrating different processes performed by the controller 130 according to a delay time, after one object is input, until another object is input;

[35] FIG. 10 is a concept view illustrating end of input of an object by displaying '.' after inputting the object; and

[36] FIG. 11 is a concept view illustrating touch input to execute a function of a touch screen apparatus according to another exemplary embodiment.

Best Mode for Carrying out the Invention

[37] Hereinafter, exemplary embodiments will be described in greater detail with reference to the accompanying drawings.

[38] In the following description, same reference numerals are used for the same elements

when they are depicted in different drawings. The matters defined in the description, such as detailed construction and elements, are provided to assist in a comprehensive understanding of exemplary embodiments. Thus, it is apparent that exemplary embodiments can be carried out without those specifically defined matters. Also, functions or elements known in the related art are not described in detail since they would obscure the exemplary embodiments with unnecessary detail.

[39] FIG. 1 is a block diagram illustrating a display apparatus 100 according to an exemplary embodiment, FIG. 2 is a flowchart illustrating a process of the display apparatus 100 of FIG. 1 of recognizing an object corresponding to a touch trajectory of a user and changing a page of a content, FIG. 3 is a concept view illustrating a case in which a user inputs an object figure '89' and a display unit 110 goes to page 89 of the content, FIG. 4 is a concept view illustrating change of a page if an object is a letter, and FIG. 5 is a concept view illustrating change of a page if an object is a symbol.

[40] Referring to FIGS. 1 and 2, the display apparatus 100 according to an exemplary embodiment includes a display unit 110, a recognition unit 120 that recognizes an object if there is a touch on a screen, and a controller 130 that controls the display unit 110 to change a page of a content in accordance with the recognized object.

[41] The display unit 110 displays a content on the screen and may include a liquid crystal display panel to display an image and a backlight unit to supply light to the liquid crystal display panel. The display unit 110 is controlled by the controller 130, which will be described later. To achieve this, the controller 130 may further include a display driving circuit and a signal processing circuit. That is, the controller 130 drives the backlight unit to supply light to the liquid crystal display panel and signal-processes an input content and applies an electrode to the liquid crystal display panel. As a result, the display unit 110 displays a page of the input content (for example, an electronic book (e-book)) on the screen.

[42] The display unit 110 may be realized in the form of a touch pad or an inter-layered touch screen. In this case, the display unit 110 may be used as not only an output apparatus but also a user interface.

[43] The recognition unit 120 is a touch screen apparatus that recognizes an object if there is a touch on the screen. Specifically, if a user performs input by touching the screen of the display apparatus 100, the recognition unit 120 recognizes an input object (S210). The touch may include various ways such as flicking and dragging, and the object includes a character including a letter, a symbol, and a figure, and an image. If the display unit 110 displays a page of a content, the user may write a page number that the user wishes to go to by dragging on the screen. The recognition unit 120 analyzes a trajectory of the touch input by the user and recognizes a page number of the content corresponding to the object (S220), and the display unit 100 displays a content corre-

sponding to the page number on the screen. Referring to FIG. 3, if the content is an e-book and the user writes '89', which is the page of the e-book that the user wishes to read, by dragging on the screen of the display apparatus 100, the display unit 110 displays page 89 of the e-book.

[44] Pattern matching may be used as a method of analyzing a trajectory of touch input and recognizing an object. The pattern matching sets a unique pattern according to different types of objects, and, if an input object is consistent with an already set object pattern, regards the objects as the same object and performs a corresponding process. In the case of a relatively simple pattern such as a figure, the pattern setting method defines a coordinate characteristic in advance and checks whether a coordinate characteristic of an input object is consistent with the already existing coordinate characteristic. This method can recognize a comparatively simple object such as a figure easily and swiftly, but may cause a great error. Another method is sampling various scripts regarding the same object and matching all coordinate characteristics. This method increases accuracy but has a disadvantage of requiring complicated calculation and resources. In order to increase the accuracy of the pattern matching, various heuristic methods such as a method for psychologically limiting a size of an object by limiting an input area and a method for searching and suggesting several similar objects and guiding selection of the user may be used. In the above exemplary embodiment of FIG. 3, if the user writes the figures '8' and '9' by touching and dragging on the screen, the recognition unit 120 determines coordinates of a trajectory of touch input by the user and determines a coordinate characteristic by distinguishing between a touch portion and a non-touch portion, thereby recognizing that the input object is '89'. The controller 130 recognizes that the user wishes to go to page 89 of the content and controls the display apparatus 100. It is obvious to an ordinary skilled person in the related-art that various object recognizing methods may be used to embody the present disclosure and the present disclosure does not exclude other embodiments.

[45] The controller 130 controls an overall operation of the display apparatus 100, and in particular, if the recognition unit 120 recognizes an object input by touching on the screen, controls the display unit 110 to change a page of the content in accordance with the recognized object (S230). That is, the controller 130 signal-processes new content data, inputs the new content data to the liquid crystal display panel, supplies light to the liquid crystal display panel by driving the backlight unit, and displays a changed page of the content through the display unit 110. If the object recognized by the recognition unit 120 is a figure, the controller 130 may control the display unit 110 to change the page to a page corresponding to the figure and displays the page. If the object is a letter, the controller 130 may control the display unit 110 to change the page to a page including a paragraph corresponding to the letter and display the page. If the

object is a symbol, the controller 130 may control the display unit 110 to change the page to a previous page (for example, a symbol '-') or a next page (for example, a symbol '+') and display the page. FIG. 3 illustrates the case in which the display unit 110 is controlled to display page 89 of the e-book if the object is the figure '89'. FIG. 4 illustrates the case in which the display unit 110 is controlled to display a page including a paragraph corresponding to 'TOPIC A' of the e-book if the object is the letter 'A'. (1) of FIG. 5 illustrates the case in which the display unit 110 is controlled to display a next page of the e-book if the object input by the user is the symbol '+', and (2) of FIG. 5 illustrates the case in which the display unit 110 is controlled to display a previous page of the e-book if the object is the symbol '-'.

[46] FIG. 6 illustrates a case in which, if an object is a plurality of Roman numerals 'IV, 'IV is recognized by combining the objects T and 'V, and the display unit 110 displays a corresponding page of the e-book.

[47] Specifically, referring to FIG. 6, if a plurality of objects are recognized by the recognition unit 120, the controller 130 of the display apparatus 100 according to another exemplary embodiment combines the plurality of objects and controls the display unit 110 to change the page to a page corresponding to the combined objects. The plurality of objects may be determined by determining whether there is an overlapping area in the input object or not. For example, as shown in FIG. 4, the English alphabet 'A' has overlapping lines to form the letter and thus is recognized as a single object. However, as shown in FIG. 3, a curve forming each of the figures '8' and '9' has an independently connected form and thus each of the figures may be recognized as a single object. Also, since there is no overlapping area between the figures '8' and '9', the figures '8' and '9' are recognized as separate objects. In this case, the controller 130 combines the figures '8' and '9' in consideration of locations of the figures '8' and '9' recognized by the recognition unit 120 and controls the display unit 110 to display page 89 of the e-book corresponding to the combined figure '89' on the display unit 110. Likewise, as shown in FIG. 6, the recognition unit 120 recognizes the Roman numerals T and 'V, which are two objects, respectively, and the controller 130 combines the two objects and displays a page corresponding to the combined Roman numeral 'IV on the display unit 110. However, if the Roman numerals T and 'V are input in a connected form unlike the embodiment of FIG. 6, the Roman numeral 'IV may be recognized directly without going through the above-described process.

[48] FIG. 7 is a concept view illustrating a case in which the display unit 110 displays a list of pages if a plurality of pages correspond to an object figure '5'.

[49] Referring to FIG. 7, if a plurality of pages correspond to an object recognized by the recognition unit 120, the controller 130 of the display apparatus 100 according to

another exemplary embodiment may control the display unit 110 to display a list of the plurality of pages and change the page to a page that is selected from among the plurality of pages. If the user inputs the figure '5' by dragging on the screen, pages 'CHAP.5' and 'PAGE 5' of the e-book correspond to the figure '5' and thus the display unit 110 may display a list of the pages. The user may select a page item from the displayed list by flicking and the controller 130 controls the display unit 110 to display contents of the selected page on the display unit 110.

[50] FIG. 8 is a concept view illustrating a case in which, if a plurality of objects 'A', 'B', and 'C are input, a list of pages of contents corresponding to the plurality of objects, respectively, is displayed.

[51] Specifically, referring to FIG. 8, if a plurality of objects are recognized by the recognition unit 120, the controller 130 of the display apparatus 100 according to another exemplary embodiment may control the display unit 110 to display a list of pages of contents corresponding to the plurality of objects, respectively, and change the page to a page that is selected from among the plurality of pages. As shown in FIG. 8, if the user inputs the English alphabets 'A', 'B', and 'C on the screen (since there is no overlapping area among the letters 'A', 'B', and 'C as described above, they are recognized as separate objects), pages 'TOPIC A', 'TOPIC B', and 'TOPIC C of the e-book correspond to the letters 'A', 'B', and 'C, respectively. Therefore, the display unit 110 displays a list containing these pages. The user may select a page item from the displayed page list by flicking and the controller 130 may control the display unit 110 to display contents of the selected page on the display unit 110.

[52] FIG. 9 is a concept view illustrating different processes performed by the controller 130 according to a delay time, after one object is input, until another object is input.

[53] Specifically, referring to FIG. 9, if one object is recognized and then another object is recognized within a predetermined time, the controller 130 of the display apparatus 100 according to another exemplary embodiment may recognize a plurality of objects. Several objects may be input in sequence when the user wishes to change the content page continuously. This case has no difference from the case in which the plurality of objects are input. Therefore, the two cases need to be distinguished. Accordingly, if one object is recognized and then another object is recognized within a predetermined time (for example, 1 second), the controller 130 may recognize input of a plurality of objects. In this case, the controller 130 may instruct the display unit 110 to combine the plurality of objects and change the page or may control the display unit 110 to display a list of pages of contents corresponding to the plurality of objects, respectively. On the other hand, if one object is recognized and then another object is recognized after a predetermined time, the objects are recognized as continuous input of objects having separate purposes and the page is changed to pages corresponding to

the objects in sequence. As shown in (1) of FIG. 9, if the user inputs the figure '7' and then inputs the figure '5' before a predetermined time (one second) elapses, the two objects are combined and page 75 is displayed on the display unit 110. On the other hand, as shown in (2) of FIG. 9, if the user inputs the figure '7' and then inputs the figure '5' after the predetermined time elapses, the controller 130 determines the objects as continuous input of objects having different purposes. Therefore, the controller 130 goes to page 7 of the e-book first and then goes to page 5 of the e-book, and finally displays page 5 of the e-book on the display unit 110.

[54] FIG. 10 is a concept view illustrating end of input of an object by displaying '.' after inputting the object.

[55] Specifically, referring to FIG. 10, if an object recognized by the recognition unit 120 is an end symbol, the controller 130 of the display apparatus 100 according to another exemplary embodiment ends recognition of the object and controls the display unit 110 to change the page of the content displayed on the screen in accordance with the object recognized until then. That is, the user may inform that object input ends by putting a period '.' after inputting the figures '1' and '9' continuously as shown in FIG. 10. The recognition unit 120 recognizes this and the controller 130 does not wait for input of an object anymore, and may control the display unit 110 to combine the plurality of input objects and display page 19 of the e-book or to display a list of pages of the e-book corresponding to the figures T and '9', respectively, on the screen. The user ends the entire input by putting the period so that, if the number of input objects is distinguished according to a time difference, a psychological burden to determine whether to input an object or not within a predetermined time can be reduced, and unintended page change caused by a delay in continuous input can be prevented.

[56] Hereinafter, another exemplary embodiment will be described briefly with reference to FIG. 11. FIG. 11 is a concept view illustrating touch input to execute a function of a touch screen apparatus according to another exemplary embodiment.

[57] The present disclosure may be used to execute the function of the touch screen apparatus besides changing the page of the content. That is, if the user inputs an object by touching on the screen, the function of the touch screen apparatus corresponding to the input object may be performed. Today, since an electronic apparatus including a touch screen such as a smart phone includes a complicated function, users should go through a complicated process of selecting many menus to set a system such as setting a screen, Bluetooth, or Wi-Fi or execute a lot of applications installed in the apparatus. However, by including the above-describe configuration, the present disclosure can allow the user to directly control settings of the electronic apparatus or easily execute an installed application by inputting an object through the touch screen apparatus. For example, in a smart phone, an application that is frequently used by the user is

displayed on a wall paper along with its icon, but an application that is infrequently used by the user appears only on a separate window in which icons of all of the applications are collected. The user should often search all of the applications to execute a certain application and thus may feel it difficult to use the smart phone or may regard searching as a tiresome job. The user of the smart phone may write an initial of an application that the user wishes to execute on the screen. Specifically, if the user wishes to search through the Google search engine and inputs 'G' on the screen 140 as shown in FIG. 11, the controller 130 controls the display unit 110 to display a list of applications 150 staring with 'G' on the screen. The user selects the application 'GOOGLE SEARCH' and execute it instantly, and enjoys web surfing.

[58] According to the exemplary embodiments described above, it is possible to change the page of the electronic content swiftly and manipulate the electronic apparatus easily, and user convenience is improved by reflecting intuitive user experience on the interface.

[59] The foregoing exemplary embodiments and advantages are merely exemplary and are not to be construed as limiting the present inventive concept. The exemplary embodiments can be readily applied to other types of apparatuses. Also, the description of the exemplary embodiments is intended to be illustrative, and not to limit the scope of the claims, and many alternatives, modifications, and variations will be apparent to those skilled in the art.

Claims

[Claim 1] A display apparatus comprising:
a display unit which displays a content on a screen;
a recognition unit which, if a user touch is input on the screen, recognizes an object corresponding to a trajectory of the user touch; and
a controller which controls the display unit to change a page of the content displayed on the screen in accordance with the object.

[Claim 2] The display apparatus as claimed in claim 1, wherein, if the object recognized by the recognition unit is a figure, the controller controls the display unit to change the page of the content into a page corresponding to the figure and display the changed page,
wherein, if the object recognized by the recognition unit is a letter, the controller controls the display unit to change the page of the content into a page including a paragraph corresponding to the letter and display the changed page.

[Claim 3] The display apparatus as claimed in claim 1, wherein, if the object recognized by the recognition unit is a symbol, the controller controls the display unit to change the page of the content into a previous page or a next page in accordance with the symbol, and display the changed page.

[Claim 4] The display apparatus as claimed in claim 1, wherein, if a plurality of objects are recognized by the recognition unit, the controller combines the plurality of objects and controls the display unit to change the page of the content into a page corresponding to the combined objects.

[Claim 5] The display apparatus as claimed in claim 1, wherein, if a plurality of pages correspond to the object, the controller displays a list of the plurality of pages and controls the display unit to change the page of the content into a page that is selected from among the plurality of pages.

[Claim 6] The display apparatus as claimed in claim 1, wherein, if a plurality of objects are recognized by the recognition unit, the controller displays a list of pages of contents corresponding to the plurality of objects, respectively, and controls the display unit to change the page of the content into a page that is selected from among the list of pages of contents.

[Claim 7] The display apparatus as claimed in claim 1, wherein, if one object is

recognized and then another object is recognized within a predetermined time, the controller recognizes the objects as a plurality of objects.

[Claim 8] The display apparatus as claimed in claim 1, wherein, if the object recognized by the recognition unit is an end symbol, the controller ends object recognition and controls the display unit to change the page of the content displayed on the screen in accordance with the object recognized until then.

[Claim 9] An image representation method comprising:

sensing user touch input on a screen;

recognizing an object corresponding to a trajectory of the user touch input; and

changing a page of a content displayed on the screen in accordance with the object.

[Claim 10] The image representation method as claimed in claim 9, wherein the changing the page comprises, if the recognized object is a figure, changing the page to a page corresponding to the figure, and, if the recognized object is a letter, changing the page to a page including a paragraph corresponding to the letter.

[Claim 11] The image representation method as claimed in claim 9, wherein the changing the page comprises, if the recognized object is a symbol, changing the page to a previous page or a next page in accordance with the symbol.

[Claim 12] The image representation method as claimed in claim 9, wherein the changing the page comprises, if a plurality of objects are recognized, combining the plurality of objects and changing the page to a page corresponding to the combined plurality of objects.

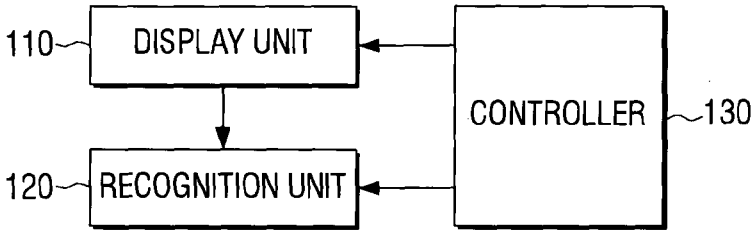
[Claim 13] The image representation method as claimed in claim 9, wherein the changing the page comprises, if a plurality of pages correspond to the object, displaying a list of the plurality of pages and changing the page to a page that is selected from among the list of the plurality of pages.

[Claim 14] The image representation method as claimed in claim 9, wherein the changing the page comprises, if a plurality of objects are recognized, displaying a list of pages of contents corresponding to the plurality of objects, respectively, and changing the page to a page that is selected from among the list of pages of contents.

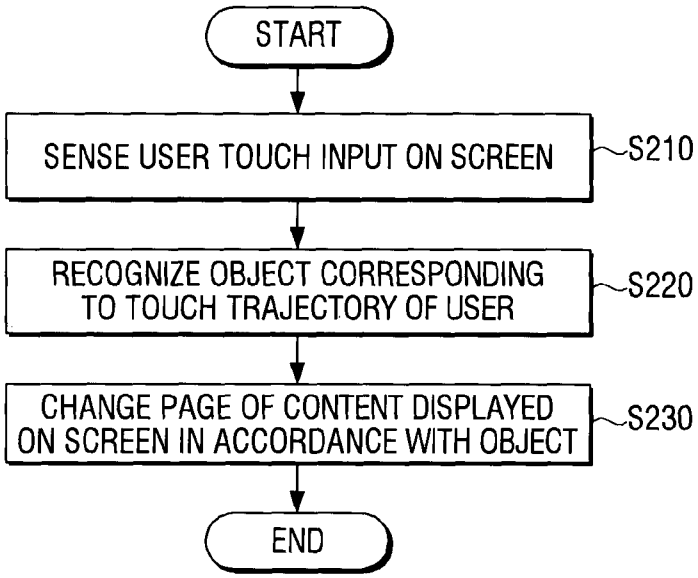
[Claim 15] The image representation method as claimed in claim 9, wherein the recognizing the object comprises, if one object is recognized and then

another object is recognized within a predetermined time, recognizing the objects as a plurality of objects.

[Fig. 1]


110
DISPLAY UNIT
120
RECOGNITION UNIT
CONTROLLER
130

[Fig. 2]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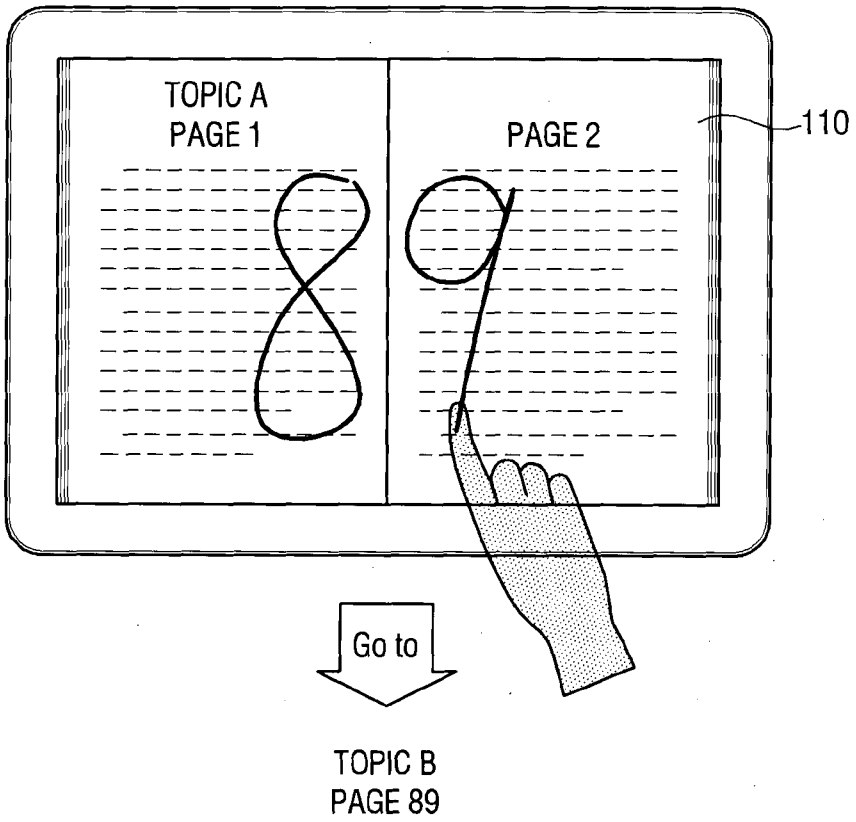
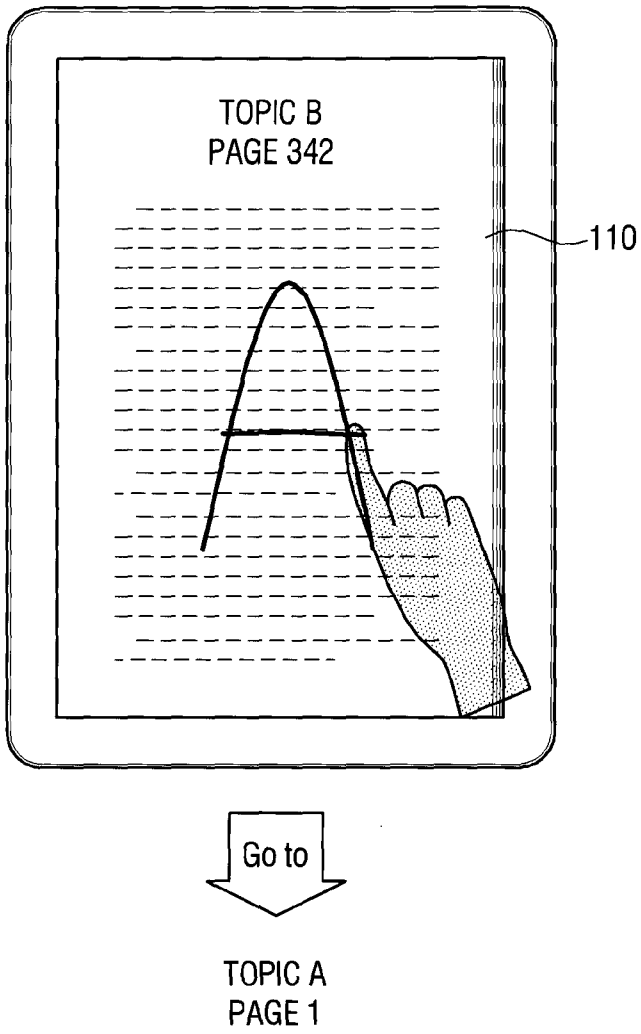
SENSE USER TOUCH INPUT ON SCREEN
S210
RECOGNIZE OBJECT CORRESPONDING TO TOUCH TRAJECTORY OF USER
S220
CHANGE PAGE OF CONTENT DISPLAYED ON SCREEN IN ACCORDANCE WITH OBJECT
S230
END

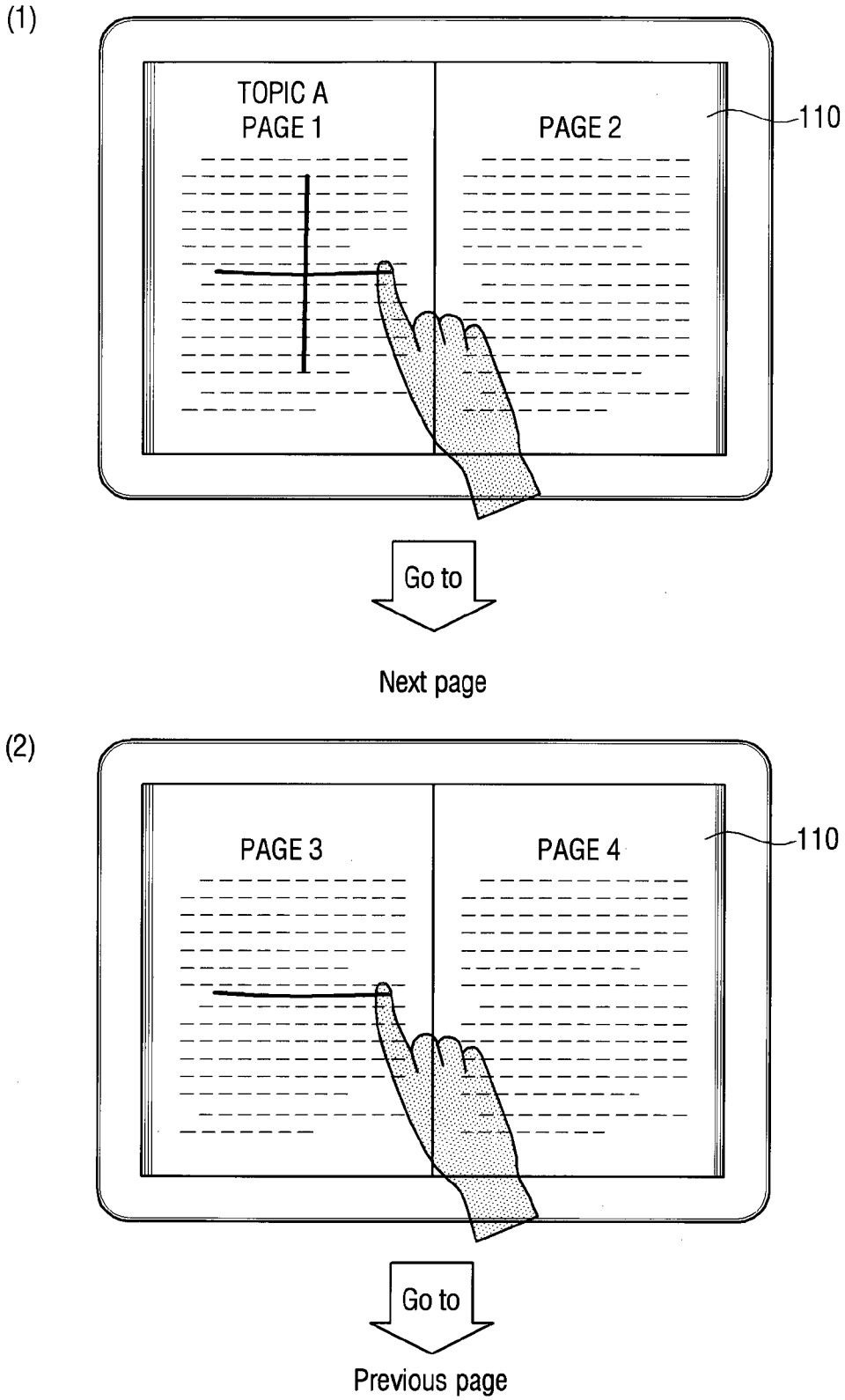
[Fig. 3]



[Fig. 4]



[Fig. 5]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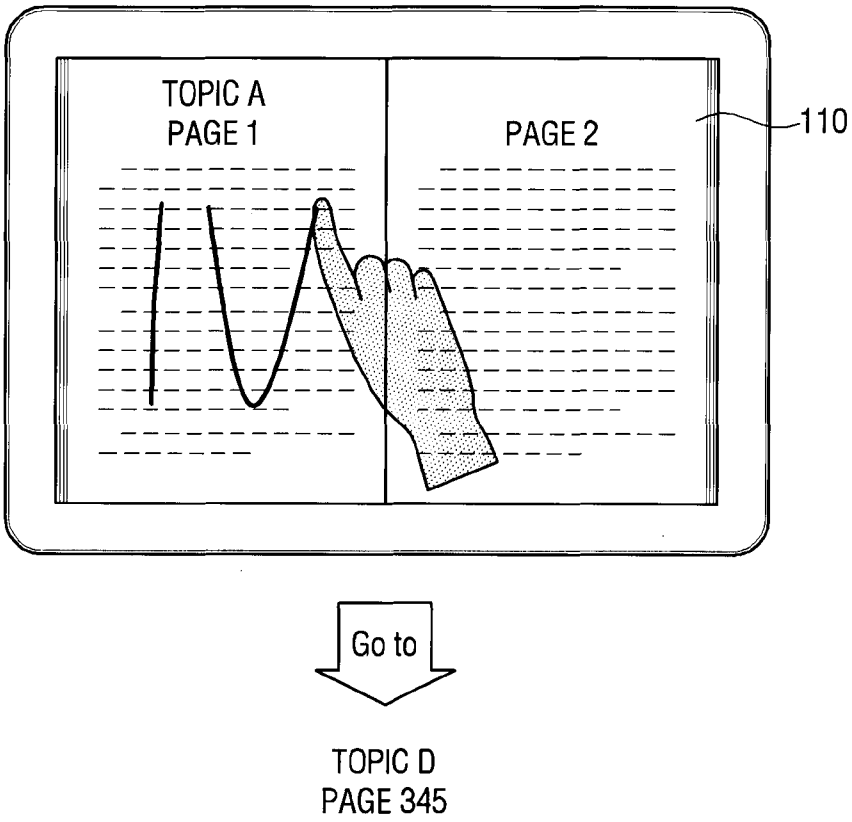
[Fig. 6]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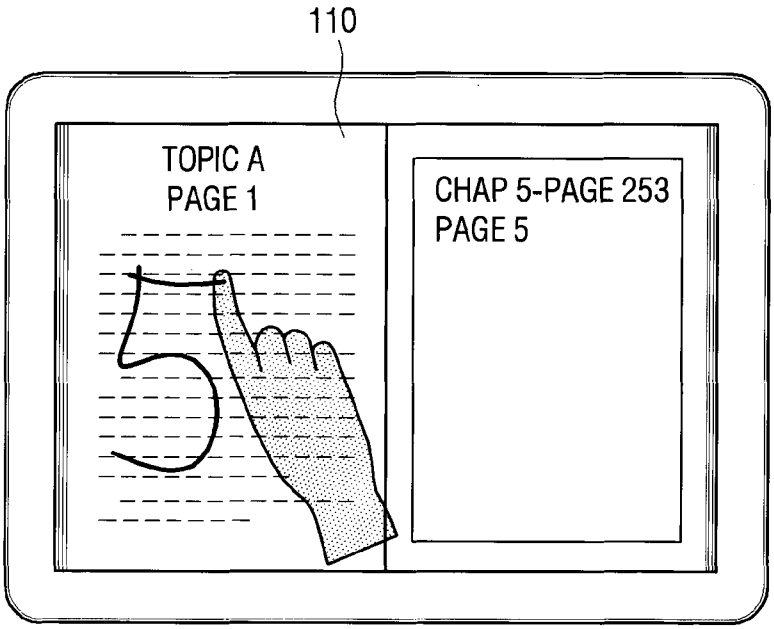
[Fig. 7]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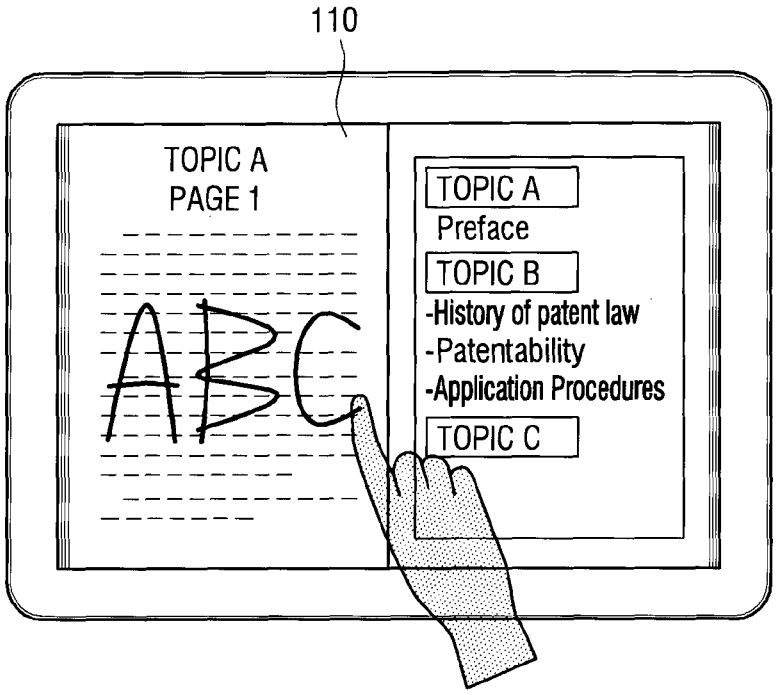
PAGE 5

[Fig. 8]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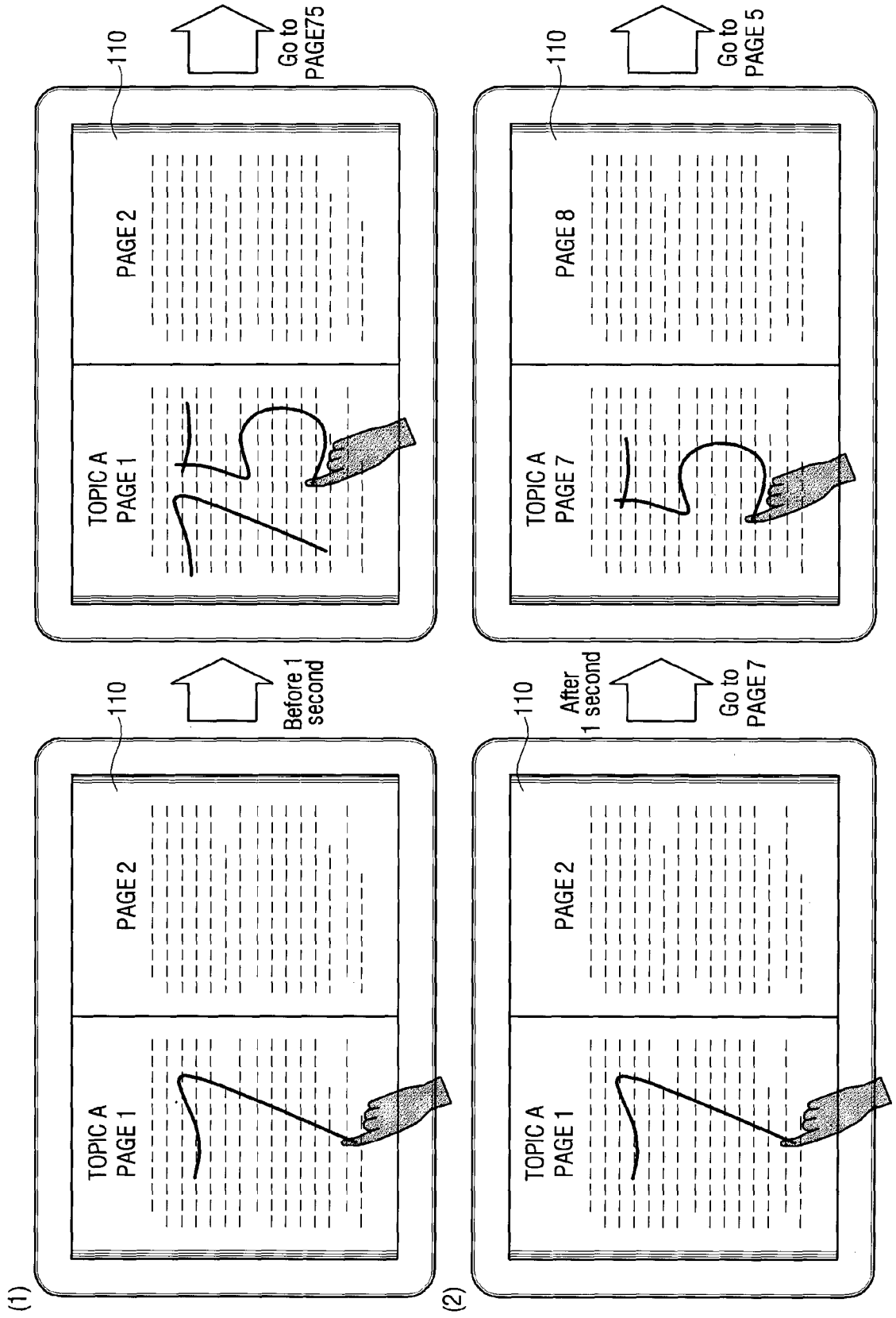
Preface
TOPIC B
-History of patent law
-Patentability
-Application Procedures
TOPIC C

[Fig. 9]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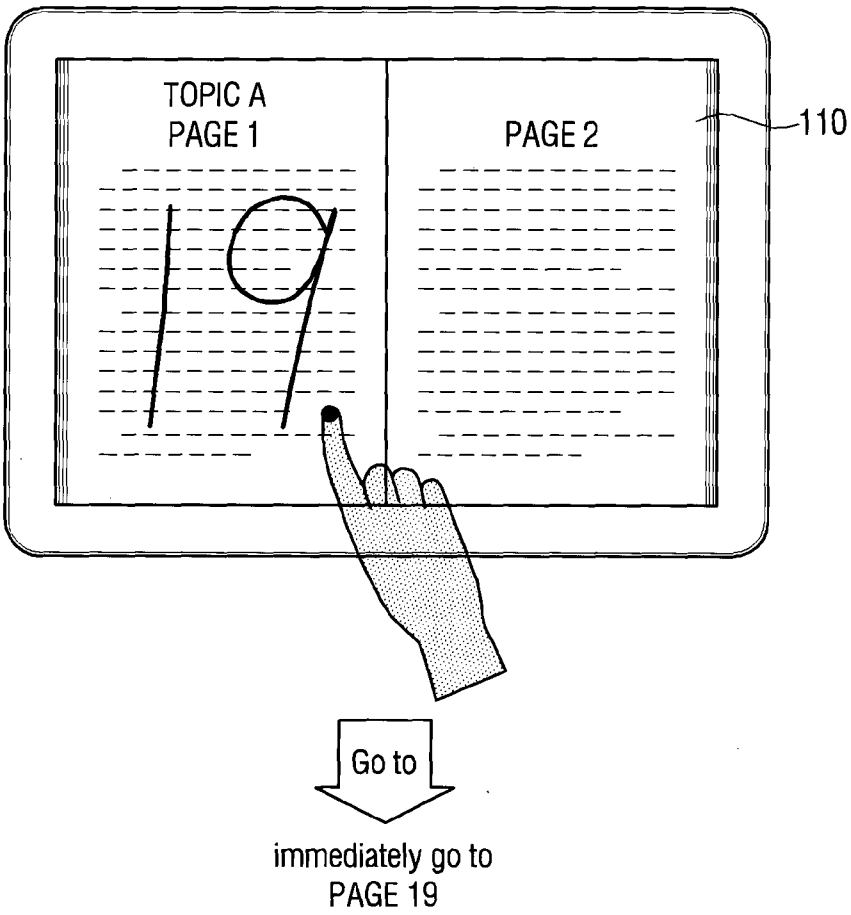
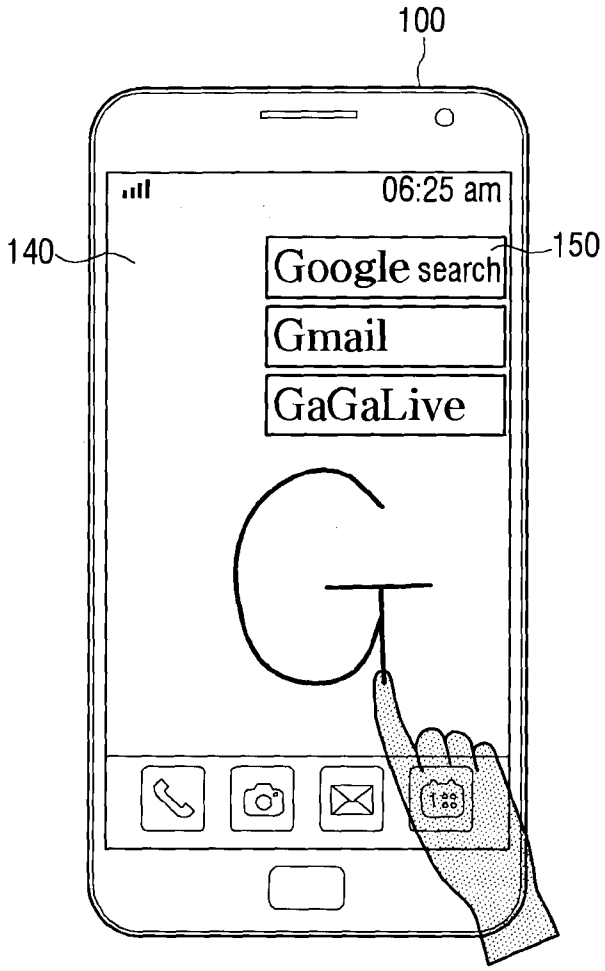
[Fig. 10]



[Fig. 11]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR20 12/0 11790

A. CLASSIFICATION OF SUBJECT MATTER

G06F 3/01(2006.01)i, G06F 3/14(2006.01)i

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 3/01; G06F 3/048; G06F 3/033; G06F 3/041

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: handwriting, trajectory, gesture, object, recognize, detect, page-flip

c. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 2011-0041102 Al (JONG HWAN KIM) 17 February 2011 See paragraphs [0085] , [0093] ; and figure 2A.	1-3 ,9-11 4-8 ,12-15
Y	US 2010-0175018 Al (GE0RG PETSCHNIGG et al.) 08 July 2010 See paragraph [0025] ; and figure 4.	1-3 ,9-11
A	US 2010-0192108 Al (CHUN TING LIU et al.) 29 July 2010 See paragraphs [0028]-[0029] ; and figures 5-6.	1-15
A	US 2010-0229090 Al (JOHN DAVID NEWTON et al.) 09 September 2010 See paragraphs [0019] , [0041H0045] ; and figures 1, 3.	1-15
A	US 2011-0083089 Al (MICHEL PAHUD et al.) 07 April 2011 See paragraphs [0033]-[0034] ; and figure 5.	1-15

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
30 April 2013 (30.04.2013)	**30 April 2013 (30.04.2013)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-70 1, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer HWANG, Yun Koo Telephone No. 82-42-481-5715

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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