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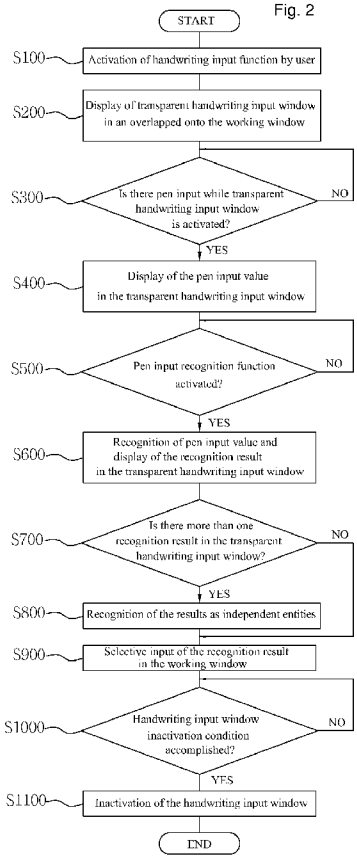
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(54) **Title:** EASY HANDWRITING USER INTERFACE SYSTEM AND METHOD FOR PEN-INPUT DISPLAY

Fig. 2



(57) Abstract: Provided are handwriting user interface system and method for pen-input display. When the handwriting input function is activated by user, a transparent handwriting input window is displayed overlapping the current working window. Then, the user's pen input value is inputted through a touch screen and the pen input value is recognized in response to the activation of the pen input recognition function. The recognition result is displayed in the transparent handwriting input window. In response to the activation of the recognition result input function, the recognition result is transferred to the working area of the working window. Consequently, a working window in which the user's pen input value is inputted in the working area is obtained. When there is two or more pen input values and they are recognized in order, each of the recognition results is preferably recognized as an independent entity. The handwriting user interface system and method for pen-input display enable easy handwriting input and allow various additional applications.

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Description

EASY HANDWRITING USER INTERFACE SYSTEM AND METHOD FOR PEN-INPUT DISPLAY

Technical Field

[1] The present invention relates to handwriting user interface system and method for pen-input display.

Background Art

[2] Various mobile electronic terminals such as Sony's UX™ and Samsung's Q1™ are on the market. Such mobile electronic terminals do not have character input devices like keyboard such that character input is typically performed through touch-screen pen input. Fig. 1 illustrates a typical handwriting user interface for the conventional pen-input display. Fig. 1(a) shows the user interface by which the user browses a particular working window (10). While the working window (10) is activated, an input of a particular character value may be requested through pen input at a working area (11). When the handwriting input function is activated by the user, a handwriting input window (20) is created and displayed. As illustrated in Fig. 1(b), the handwriting input window (20) is displayed in a partially overlapped manner with the lower part of the working window (10). The handwriting input window (20) is an opaque window and covers some part of the working window (10). When a particular character is input in the handwriting input window (20) through touch-screen pen input, the pen input value (21) is displayed in the handwriting input window (20). If no more pen input is carried out for a predetermined period of time or the "handwriting recognition" menu (23) is selected, the pen input recognition function is activated by handwriting management application equipped inside the mobile terminal. Then, as illustrated in Fig. 1(c), the recognition result (22) is displayed in the handwriting input window (20) replacing the pen input value (21). When the user selects the "recognition result input" menu (24), the recognition result (22) is inputted in the working area (11) of the working window (10).

[3] The problem of the conventional handwriting input is that it distracts the attention of the user. To be specific, a "jump of focus of attention" between the working window (10) and the handwriting input window (20) is required for the user. Although the handwriting recognition function is being improved, about 10 % of recognition failure is inevitable. In the conventional technique, the character value inputted in the handwriting input window (20) is recognized as a single operation value. Thus, the correction of errors is not easy and a delete key has to be activated for the correction. Further, at times, the handwriting input window (20) may be activated covering the

working area (11) of the working window (10). In this situation, the working window (10) has to be rearranged.

Disclosure of Invention

Technical Problem

[4] An object of the present invention is to provide handwriting user interface system and method for pen-input display which enable simple and efficient pen input without interrupting the user's browsing of the working window at all.

[5] Another object of the present invention is to provide handwriting user interface system and method for pen-input display which do not require the user's jump of focus of attention between the current working window and the handwriting input window during character input.

[6] Still another object of the present invention is to provide handwriting user interface system and method for pen-input display which enable convenient input of the handwriting recognition result in the working area of the working window.

[7] Yet another object of the present invention is to provide handwriting user interface system and method for pen-input display which enable selective input of the wanted character value in the working area when there is more than one recognition result.

Technical Solution

[8] In accordance with a preferred embodiment of the present invention, provided is a handwriting character input method for pen-input display which comprises the steps of a) in response to user's activation of a handwriting input function, displaying a transparent handwriting input window in an overlapped manner with a current working window, b) receiving pen input of the user through a touch screen and, in response to activation of a pen input recognition function, recognizing the pen input, c) displaying the recognition result in the handwriting input window and d) in response to activation of the recognition result input function, transferring the recognition result to a working area of the working window.

Advantageous Effects

[9] The handwriting user interface system and method for pen-input display according to the present invention provide the following advantages.

[10] First, the handwriting recognition area and the working area are overlapped without interrupting the user's visual recognition of the working area. Accordingly, the user's attention can be focused. In the conventional technique, the user's jump of focus of attention between the working area and the handwriting recognition area is required. But, it is unnecessary in the present invention.

[11] Second, more than one pen input value and recognition result thereof are recognized as independent entities. Accordingly, the user can control them more conveniently. The

recognition error can be simply corrected by re-input and two or more recognition results can be selectively controlled.

[12] Third, the recognition result can be controlled more conveniently by transferring the recognition result to the working window through drag and drop. This further simplifies the selective input from two or more recognition results.

[13] Fourth, the transparent handwriting input window remains activated if the activation button is pressed and becomes inactivated if the button is depressed. This enables more efficient handwriting input.

Brief Description of the Drawings

[14] Fig. 1 illustrates a typical example of the conventional handwriting user interface for pen-input display.

[15] Fig. 2 is a flowchart illustrating a preferred embodiment of the handwriting user interface for pen-input display in accordance with the present invention.

[16] Figs. 3 to 5 illustrate a preferred embodiment of the handwriting user interface for pen-input display in accordance with the present invention.

[17] Fig. 6 is a perspective view illustrating a preferred embodiment of a mobile electronic terminal equipped with the handwriting user interface for pen-input display in accordance with the present invention.

Mode for the Invention

[18] Fig. 2 is a flowchart illustrating a preferred embodiment of the handwriting user interface for pen-input display in accordance with the present invention and Figs. 3 to 5 illustrate preferred embodiments of the handwriting user interface for pen-input display in accordance with the present invention.

[19] Hereinafter, the present invention will be more fully illustrated referring to Figs. 2 to 5. User may select a handwriting input function for character inputs (e.g., keyword) in the working area (101) while the current working window (100) is displayed on a mobile electronic terminal (S100). In response to the activation of the handwriting input function, a transparent handwriting input window (200) is displayed onto the working window (100) in an overlapped manner as illustrated in Fig. 3 (S200). The handwriting input function may be assigned to a particular button (500 in Fig. 6) or a menu of the mobile electronic terminal (1). Preferably, the handwriting input function is assigned to a particular button (500 in Fig. 6). In this case, the handwriting input function is activated if the button (500 in Fig. 6) is pressed and is inactivated if the button (500 in Fig. 6) is depressed.

[20] The handwriting input window (200) is a transparent intermediate window. As used herein, "transparent" means that the text and/or image in the working window (100) can be visually recognized even if it is overlapped by the activated handwriting input

window (200). Usually, the transparency can be adjusted within the range from 100 to 50 %. In this range, the content in the working window (100) can be sufficiently recognized visually. Consequently, the content in the working window (100) can be visually recognized even when the transparent handwriting input window (200) is arranged on the working window (100). And, by depressing the handwriting input function button (500 in Fig. 6), the user can resume the browsing of the working window (100) at any time. Preferably, the transparent handwriting input window (200) has a size identical to that of the working window (100). If so, the transparent handwriting input window (200) covers the working window (100) entirely. The reference numerals 205 and 206 in Fig. 3 are close menu and size control menu of the transparent handwriting input window (200), respectively. The menus 205 and 206 are optional.

[21] As illustrated in Fig. 4, the user can input a particular character through the touch screen (400 in Fig. 6) while the transparent handwriting input window (200) is activated (S300). The pen input value (201a, 201b and 201c, collectively "201") is displayed in the transparent handwriting input window (200) (S400). The user may input more than one pen input value in order. The pen input values "Garden" (201a) and "House" (201b and 201c) are examples of the pen input values. If there is no more pen input for a predetermined period of time (typically, 1 to 3 seconds) after the pen input of "Garden" (201a), the pen input recognition function is activated by the handwriting management application equipped inside the mobile electronic terminal (S500). Alternatively, the pen input recognition function may be activated by selecting the "handwriting recognition" menu (203) provided at the bottom of the transparent handwriting input window (200). The recognition result (202a) for the pen input value "Garden" (201a) is displayed near the pen input value (S600). The user may determine that "House" is a better keyword than the pen input value "Garden" (201a). In this case, the user inputs "House" through the pen input. After a predetermined time, the pen input value "House" (201b) is recognized and the recognition result (202b) is displayed at side of the pen input value (201b). Of course, recognition error may occur. The recognition result (202b) shows that the pen input value (201b) is recognized as "Hauze." In the conventional technique, such a recognition error may be corrected by correcting the pen input value (201b). However, in accordance with the present invention, it can be simply corrected by inputting "House" (201c) again more clearly. The correct recognition result (202c) is displayed near the pen input value "House" (201c). If there is more than one recognition result (S700), each of the recognition results is displayed in the handwriting input window (200) as an independent entity (S800). Specifically, the recognition results "Garden" (202a), "Hauze" (202b) and "House" (202c) are displayed in the handwriting input window (200) as independent

entities.

[22] By activating the recognition result input function, the user can select the wanted recognition result from the recognition results (202a, 202b and 202c, totally "202") and input it in the working area (101) of the working window (100) (S900). For example, the user can select the recognition result "House" (202c) using a mouse or a pen and transfer the recognition result "House" (202c) to the working area (101) by selecting the "recognition result input" menu (204) positioned at the bottom of the transparent handwriting input window (200). More preferably, the activation of the recognition result input function is performed by dragging and dropping the recognition result displayed as an independent entity to the working area of the working window using a mouse. That is, the recognition result "House" (202c) is transferred to the working area (101) by simple drag-and-drop action of the mouse. When the recognition result (202) is dragged and dropped, the handwriting management application can automatically perform the transfer of the corresponding recognition result to the working window (100). If necessary, the handwriting input window (200) may be closed automatically under the control of the handwriting management application when the drag and drop is completed. As an alternative, the handwriting input window (200) may be closed when the handwriting input button (500 in Fig. 6) is depressed. After handwriting input window (200) has closed by the drag and drop or by the depressing of the handwriting input button (500 in Fig. 6) (S1000), a working window (100) in which the recognition result "House" (202c) is inputted in the working area (101) is activated, as illustrated in Fig. 5.

[23] Fig. 6 is a perspective view illustrating a preferred embodiment of a mobile electronic terminal equipped with the handwriting user interface for pen-input display in accordance with the present invention. As illustrated in Fig. 6, the mobile electronic terminal (1) is equipped with a handwriting input application (300), a touch screen (400), and a button to which the handwriting input function is assigned (500). In addition, a middleware (e.g., Window OS) is equipped in the mobile electronic terminal (1). When the user presses the handwriting input button (500), the handwriting input application (300) is executed and the transparent handwriting input window (200) is displayed overlapping the current working window (100). In accordance with a preferred embodiment of the present invention, the activated status is maintained while the button (500) is pressed and the handwriting input function is inactivated when the button is depressed. This ensures more efficient handwriting input.

[24] In Fig. 6, the transparent handwriting input window (200) is illustrated as partially overlapping the current working window (100). However, this is for the convenience of understanding and it may overlap whole of the current working window (100). As

described earlier, the handwriting input window (200) is a transparent intermediate window and does not disturb the user's browsing of the working window (100) at all. While the handwriting input window (200) is activated, the pen input value (201) through the touch screen (300) and the recognition result (202) thereof are displayed on the transparent handwriting input window (200). The recognition result (202) is transferred to the working area (101) of the working window (100), for example, by drag and drop. Then, the transparent handwriting input application (200) becomes in-activated and the wanted keyword is inputted in the working window (100). This process is carried out by the handwriting management application (300). For this purpose, the handwriting management application (300) performs the following functions of:

[25] i) in response to the activation of the handwriting input function by the user, displaying the transparent handwriting input window in an overlapped manner onto the current working window;

[26] ii) displaying the user's touch-screen pen input value in the handwriting input window;

[27] iii) performing the recognition of the pen input value if there is no more pen input for a predetermined period of time and displaying the recognition result in the handwriting input window; and

[28] iv) in response to the activation of the recognition result input function, transferring the recognition result to the working area of the working window.

[29] In addition to these functions, the handwriting management application (300) preferably performs the function of, when there is more than one recognition result, recognizing each of the recognition results as an independent entity. And, more preferably, it further performs the function of automatically transfer the recognition result to the working window (100) through the drag-and-drop of a mouse.

Claims

[1] A handwriting character input method for pen-input display which comprises the steps of:
a) in response to user's activation of a handwriting input function, displaying a transparent handwriting input window in an overlapped manner with a current working window;
b) receiving pen input of the user through a touch screen and, in response to activation of a pen input recognition function, recognizing the pen input;
c) displaying the recognition result in the handwriting input window; and
d) in response to activation of a recognition result input function, transferring the recognition result to a working area of the working window.

[2] The method as set forth in claim 1, wherein the activation of the pen input recognition function in the step (b) is performed in a case that there is no pen input for a predetermined period of time.

[3] The method as set forth in claim 1, wherein, if there is two or more recognition results in the step (c), each of the recognition results is displayed in the transparent handwriting input window as an independent entity.

[4] The method as set forth in claim 3, wherein the activation of the recognition result input function in the step (d) is performed by dragging and dropping the recognition result, which is displayed as an independent entity, to the working area of the working window.

[5] The method as set forth in claim 1, wherein the steps (a) to (d) are performed while a button for activating the handwriting input function is pressed.

[6] The method as set forth in claim 5, wherein the handwriting input window is closed by depressing the button for activating the handwriting input function.

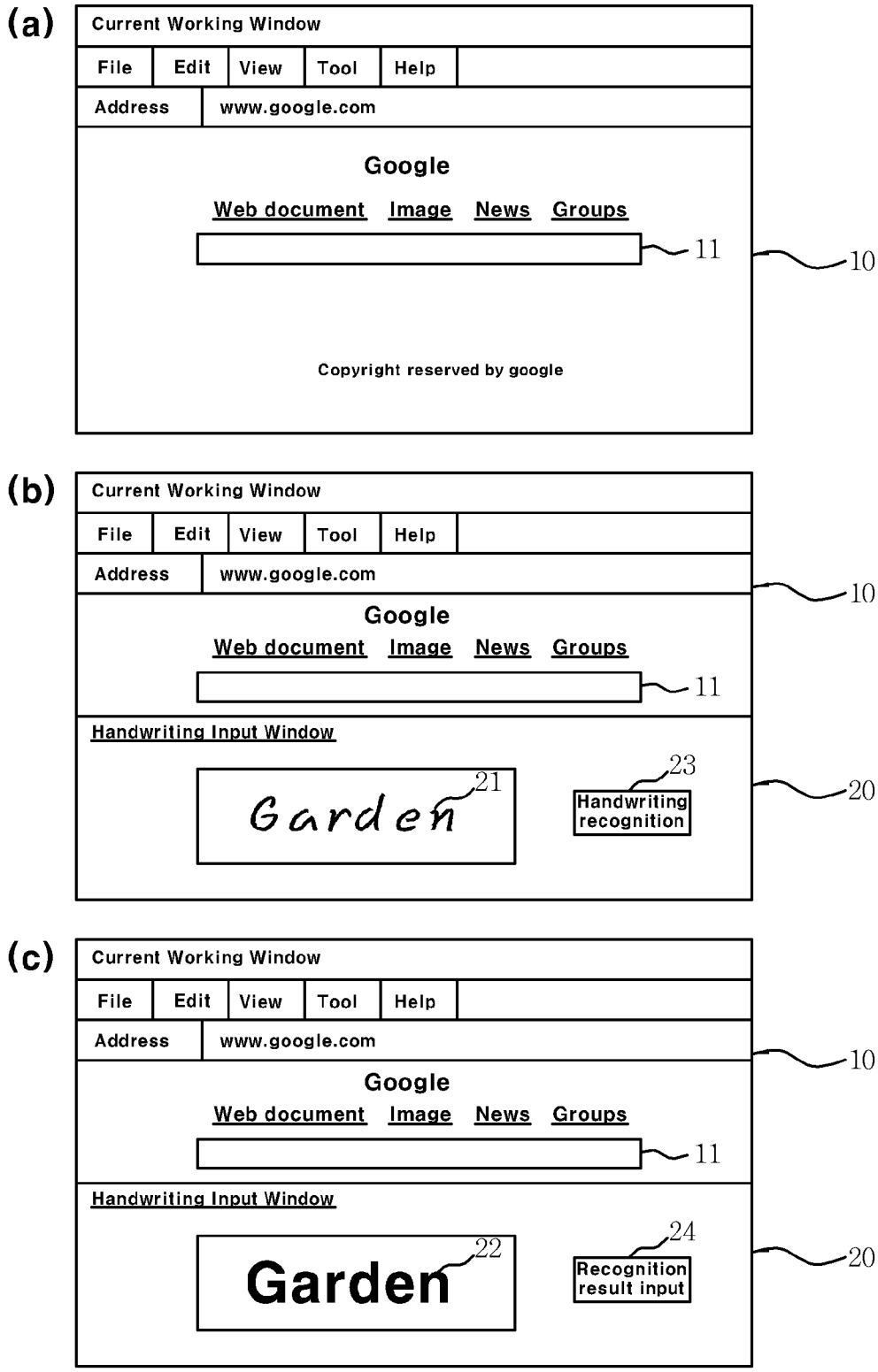
[7] A handwriting user interface for pen-input display system which comprises:
a button for activating the handwriting input function;
a touch screen for pen input; and
a handwriting management application which performs functions of, in response to activation of a handwriting input function, displaying a transparent handwriting input window overlapping a current working window, displaying a user's touch-screen pen input value in the handwriting input window, performing recognition of the pen input value if there is no more pen input for a pre-determined period of time and displaying the recognition result in the handwriting input window and, in response to activation of a recognition result input function, transferring the recognition result to a working area of the working window.

[8] The handwriting user interface for pen-input display system as set forth in claim 7, wherein the handwriting management application further performs the function of, when there is more than one recognition result, recognizing each of the recognition results as an independent entity.

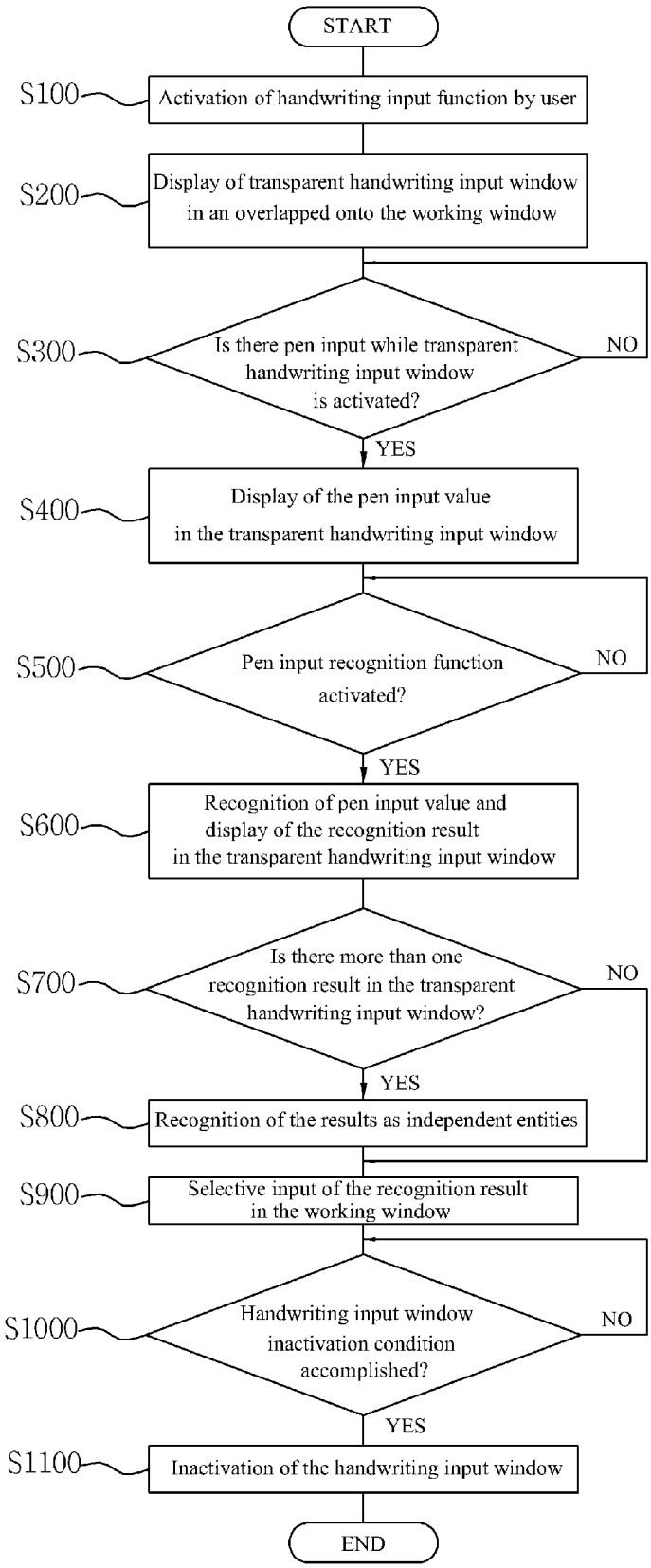
[9] The handwriting user interface for pen-input display system as set forth in claim 7, wherein the handwriting management application further performs the function of automatically transferring the recognition result to the working area of the working window through drag and drop.

[10] The handwriting user interface for pen-input display system as set forth in claim 7, wherein the handwriting input window is activated when the button for activating the handwriting input function is pressed and is inactivated when the button for activating the handwriting input function is depressed.

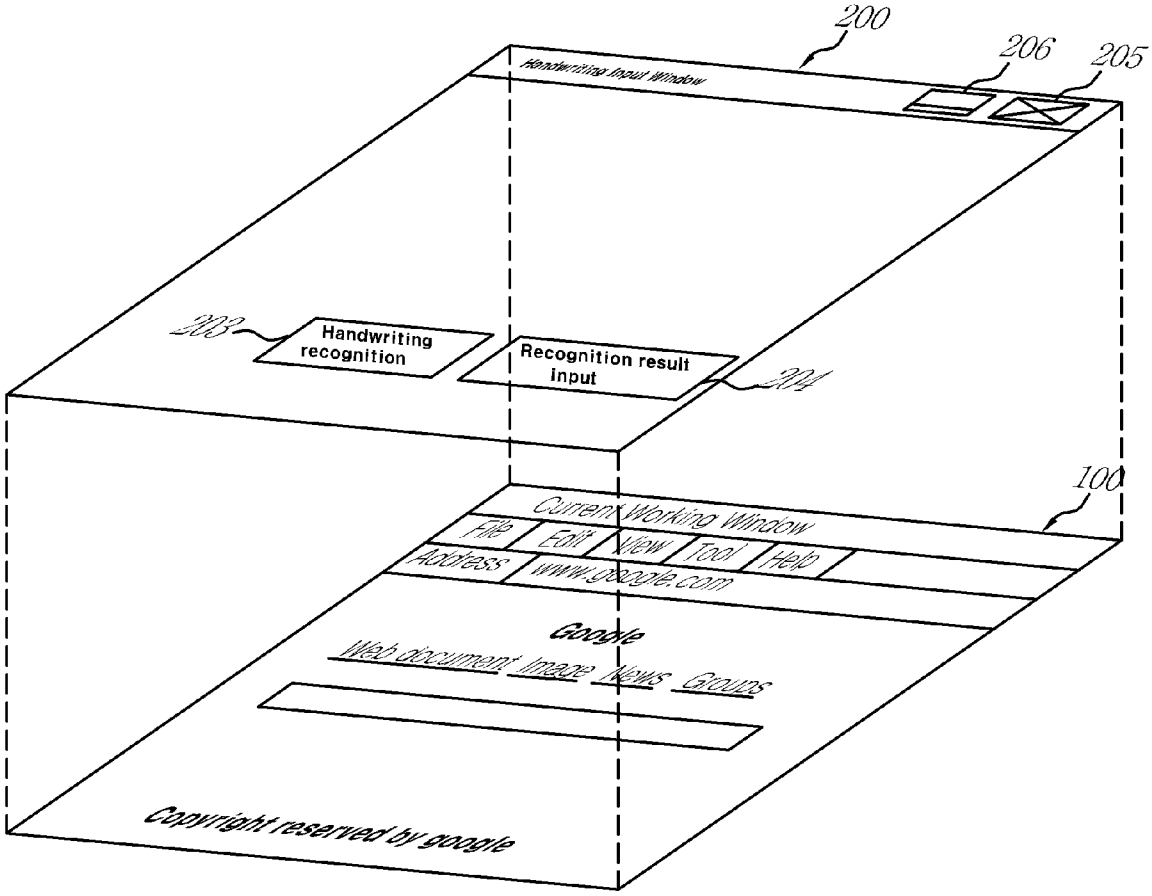
[Fig. 1]


(a)
Current Working Window
File
Edit
View
Tool
Help
Address
www.google.com
Google
Web document
Image
News
Groups
11
10
Copyright reserved by google
(b)
Current Working Window
File
Edit
View
Tool
Help
Address
www.google.com
10
Google
Web document
Image
News
Groups
11
Handwriting Input Window
Garden
21
23
Handwriting recognition
20
(c)
Current Working Window
File
Edit
View
Tool
Help
Address
www.google.com
10
Google
Web document
Image
News
Groups
11
Handwriting Input Window
Garden
22
24
Recognition result input
20

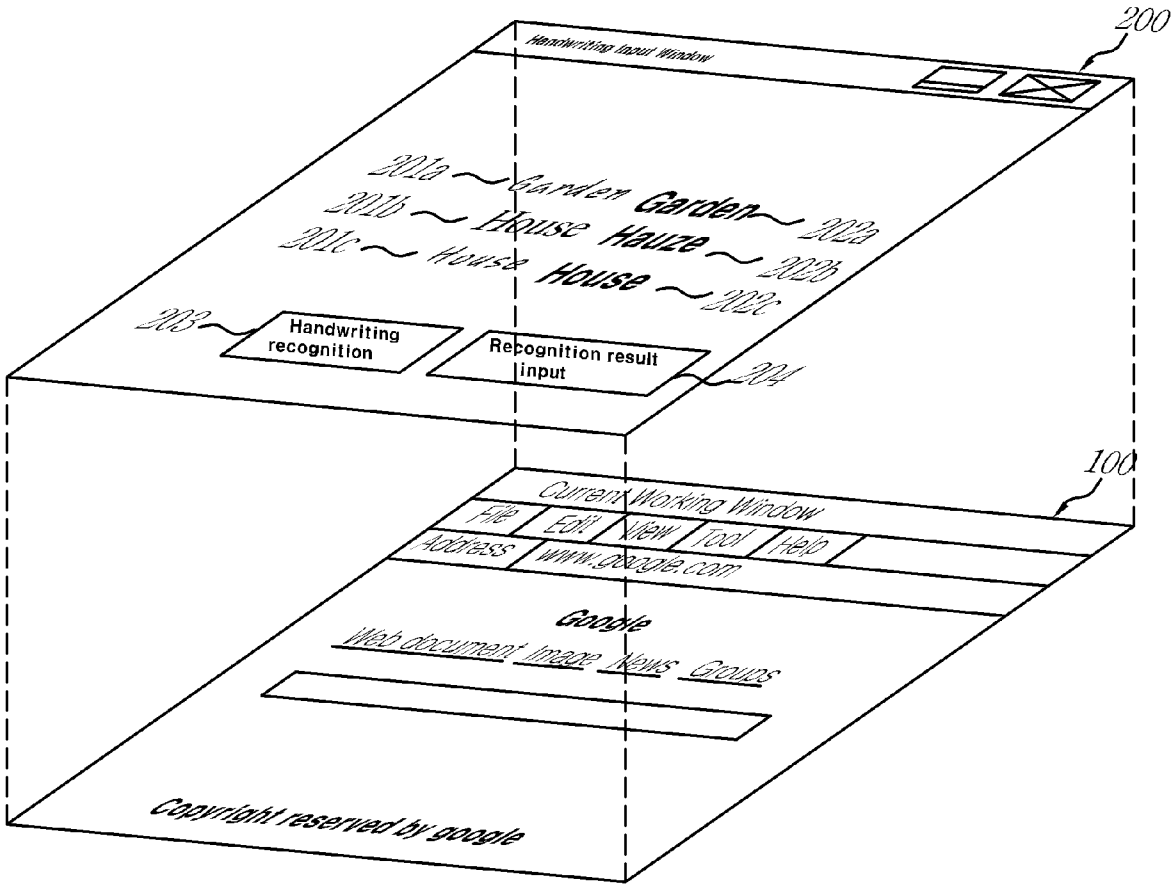
[Fig. 2]


START
S100
Activation of handwriting input function by user
S200
Display of transparent handwriting input window in an overlapped onto the working window
S300
Is there pen input while transparent handwriting input window is activated?
NO
YES
S400
Display of the pen input value in the transparent handwriting input window
S500
Pen input recognition function activated?
NO
YES
S600
Recognition of pen input value and display of the recognition result in the transparent handwriting input window
S700
Is there more than one recognition result in the transparent handwriting input window?
NO
YES
S800
Recognition of the results as independent entities
S900
Selective input of the recognition result in the working window
S1000
Handwriting input window inactivation condition accomplished?
NO
YES
S1100
Inactivation of the handwriting input window
END

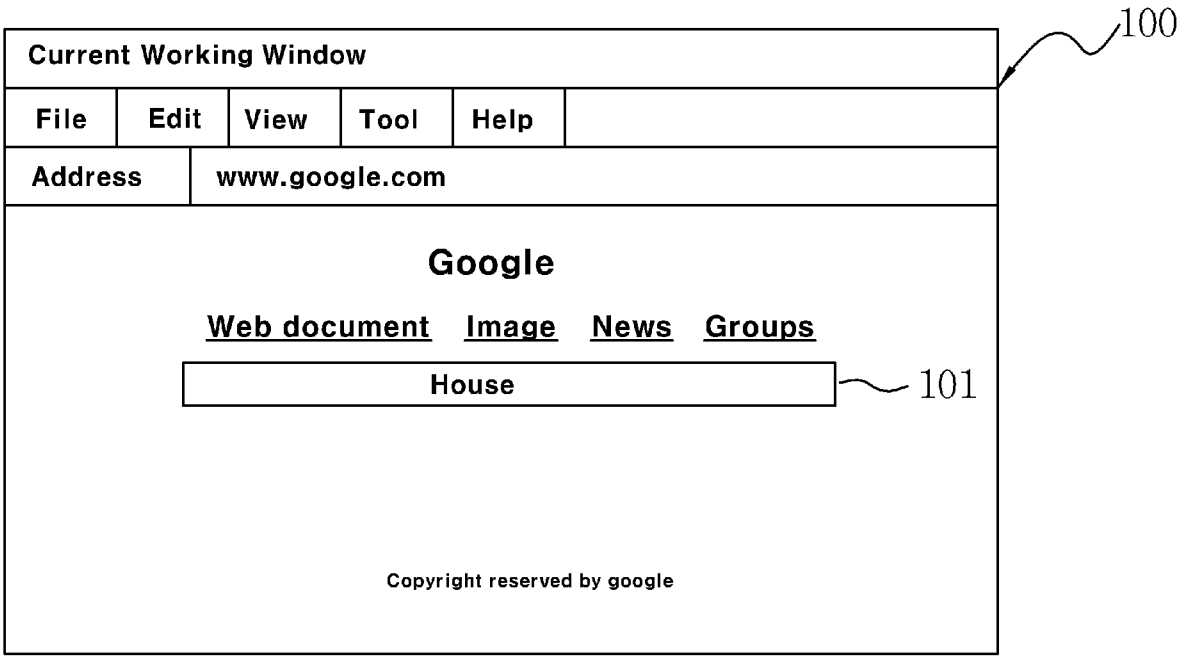
[Fig. 3]


200
206
205
Handwriting input Window
203
Handwriting recognition
Recognition result input
204
100
Current Working Window
File
Edit
View
Tool
Help
Address
www.google.com
Google
Web document Image News Groups
Copyright reserved by google

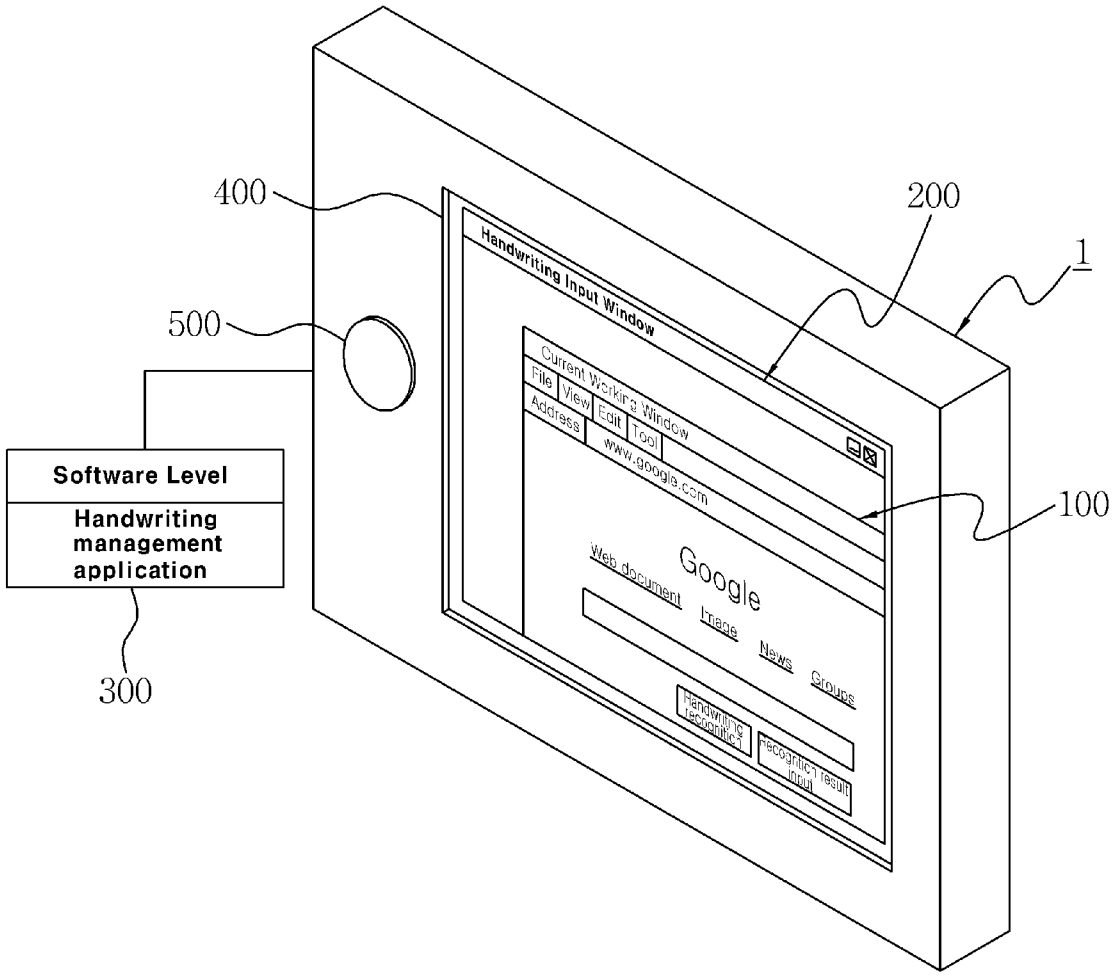
[Fig. 4]


200
Handwriting input Window
201a
Garden
Garden
202a
201b
House
Hause
202b
201c
House
House
202c
203
Handwriting recognition
Recognition result input
204
100
Current Working Window
File
Edit
View
Tool
Help
Address
www.google.com
Google
Web document Image News Groups
Copyright reserved by google

[Fig. 5]


Current Working Window
File
Edit
View
Tool
Help
Address
www.google.com
Google
Web document
Image
News
Groups
House
Copyright reserved by google
100
101

[Fig. 6]


400
200
1
500
Handwriting Input Window
Current Working Window
File
View
Edit
Tool
Address
www.google.com
Google
Web document
Image
News
Groups
100
Software Level
Handwriting management application
300

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2007/002058

A. CLASSIFICATION OF SUBJECT MATTER

G06F 3/033(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)

IPC 8 G06F, G06K

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 since 1975
Japanese Utility Models and Applications for Utility Models since 1975

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

eKIPASS (KIPO intenational) " Keyword : (hand*), (writing*, written*), (character*, word*), (recogni*, input*), (window*), (transparent*) "

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP2005-258882 A (AOKI NORIYUKI) 22 sep. 2005 See Abstract, Claims 1-6, Figs.1,4-6, paragraphs <1>-<5>	1,2,5-7,10
A		3,4,8,9
A	JP1983-078226 A (NAKAZAWA TAMOTSU) 11 May 1983 See Abstract, Claim 1	1-10
A	JP1987-052630 A (SAKAMOTO HIROYUKI) 07 Mar. 1987 See Abstract, Claims 1,2	1-10
A	JP2000-123114 A (ONO JUNJI , OTANI HIDEO) 28 Apr. 2000 See Abstract, Claims 1,2,4,6,8, Figs.16,17, paragraphs [0064],[0065]	1-10

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

☒ See patent family annex.

* Special categories of cited documents:
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Date of the actual completion of the international search	Date of mailing of the international search report
29 NOVEMBER 2007 (29.11.2007)	**30 NOVEMBER 2007 (30.11.2007)**

Name and mailing address of the ISA/KR	Authorized officer
Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	CHUN, Dae Sik Telephone No. 82-42-481-5871

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2007/002058

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JP2000-123114 A	28.04.2000	None	