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(54) Title of Invention

INFORMATION-PROCESSING APPARATUS, CONTROL METHOD FOR THE
INFORMATION-PROCESSING APPARATUS, INFORMATION-PROCESSING
APPARATUS CONTROL PROGRAM, AND STORAGE MEDIUM

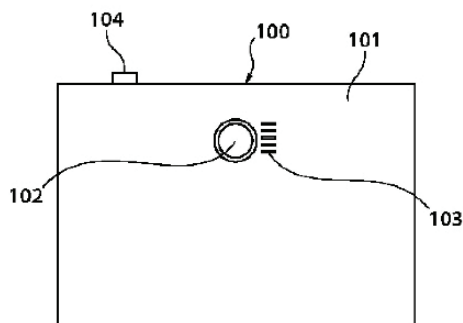
(57) Abstract

Problem

Provided are an information-processing apparatus, a control method for the information-processing apparatus, a control program for the information-processing apparatus, and a storage medium that make it possible to improve display screen visibility and ease of operation.

Solution

Provided is a CPU 801 that performs control such that: a partial preview of the contents of a function menu, which is sorted into a plurality of categories, is partially displayed; the function menu displayed on a display screen in this partially displayed state is scrolled through by sliding the input device in a direction parallel to the selected edge; and the function menu is executed by directly manipulating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.



CLAIMS

1. An information-processing apparatus configured to display a function menu, which contains various functions, on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, the apparatus being provided with a control means that performs control such that: a partial preview of the contents of the function menu, which is sorted into a plurality of categories, is partially displayed; the function menu displayed on the display screen in this partially displayed state is scrolled through by sliding the input device in a direction parallel to the selected edge; and the function menu is executed by directly manipulating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

2. The information-processing apparatus according to claim 1, wherein the control means performs control such that the function menu is displayed on the display screen by maintaining the state in which the edge has been selected by the indicating means.

3. The information-processing apparatus according to claim 1 or 2, wherein the control means performs control such that using the input device to select the four corners of the display screen serves as a trigger to stand by for the display of an infrequently used function menu, and sliding the input device from this state toward a center portion of the display screen causes the infrequently used function menu to be displayed on the display screen.

4. The information-processing apparatus according to any one of claims 1–3, wherein the control means performs control such that the function menu is sorted into four categories, and basic functions are assigned, in order, to the left, the top, the bottom, and the right in order of frequency of use.

5. The information-processing apparatus according to claim 4, wherein the function menu being sorted into four categories means being sorted into categories for search functions, text input functions, processing/editing functions, and saving/organizing functions.

6. The information-processing apparatus according to any of claims 1–3, wherein the input device is a pointing device.

7. The information-processing apparatus according to any one of claims 1–3, wherein the input device is a stylus.

8. The information-processing apparatus according to claim 1, wherein the selection means is a soft-touch button.

9. The information-processing apparatus according to any one of claims 1–8, wherein the information-processing apparatus is a mobile information-processing terminal.

10. An information-processing apparatus comprising:

a control means that performs control such that a partial preview of a function menu, which is displayed on a rectangular display screen of a displaying means comprising the display screen, is displayed on the display screen;

a scrolling means for scrolling through the contents of the function menu by sliding an input device along a plurality of edges surrounding the display screen, as is, when the partial preview of the function menu is displayed on the display screen; and

an indicating means for executing the function menu by directly indicating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

11. The information-processing apparatus according to claim 10, wherein the function menu is sorted into four categories: search functions, text input functions, processing/editing functions, and saving/organizing functions.

12. The information-processing apparatus according to claim 10 or 11, wherein the input device is a pointing device.

13. The information-processing apparatus according to claim 10 or 11, wherein the input device is a stylus.

14. The information-processing apparatus according to claim 10, wherein the selection means is a soft-touch button.

15. The information-processing apparatus according to any one of claims 10–14, wherein the information-processing apparatus is a mobile information-processing terminal.

16. A control method for controlling an information-processing apparatus configured to display a function menu, which contains various functions, on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, the method being provided with a control step that performs control such that: a partial preview of the contents of the function menu, which is sorted into a plurality of categories, is partially displayed; the function menu displayed on the display screen in this partially displayed state is scrolled through by sliding the input device in a direction parallel to the selected edge; and the function menu is executed by directly manipulating a selection means displayed on the display screen without displaying a function tool of the function menu on the display screen.

17. The information-processing apparatus control method according to claim 16, wherein, in the control step, control is performed such that the function menu is displayed on the display screen by maintaining the state in which the edge has been selected by the indicating means.

18. The information-processing apparatus control method according to claim 16 or 17, wherein, in the control step, control is performed such that using the input device to select the four corners of the display screen serves as a trigger to

stand by for the display of an infrequently used function menu, and sliding the input device from this state toward a center portion of the display screen causes the infrequently used function menu to be displayed on the display screen.

19. The information-processing apparatus control method according to any one of claims 16-18, wherein, in the control step, control is performed such that the function menu is sorted into four categories, and basic functions are assigned, in order, to the left, the top, the bottom, and the right in order of frequency of use.

20. The information-processing apparatus control method according to claim 19, wherein the function menu being sorted into four categories means being sorted into categories for search functions, text input functions, processing/editing functions, and saving/organizing functions.

21. The information-processing apparatus control method according to any one of claims 16-18, wherein the input device is a pointing device.

22. The information-processing apparatus control method according to any one of claims 16-18, wherein the input device is a stylus.

23. The information-processing apparatus control method according to claim 16, wherein the selection means is a soft-touch button.

24. The information-processing apparatus control method according to any one of claims 16-23, wherein the information-processing apparatus is a mobile information-processing terminal.

25. A control method for controlling an information-processing apparatus configured to display a function menu, which contains various functions, on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, the method comprising:

a control step in which control is performed such that a partial preview of the function menu, which is displayed on the display screen, is displayed on the display screen;

a scrolling step in which the contents of the function menu are scrolled through by sliding the input device along the plurality of edges surrounding the display screen, as is, when the partial preview of the function menu is displayed on the display screen; and

an indicating step in which the function menu is executed by directly indicating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

26. The information-processing apparatus control method according to claim 25, wherein the function menu is sorted into four categories: search functions, text input functions, processing/editing functions, and saving/organizing functions.

27. The information-processing apparatus control method according to claim 25 or 26, wherein the input device is a pointing device.

28. The information-processing apparatus control method

according to claim 25 or 26, wherein the input device is a stylus.

29. The information-processing apparatus control method according to claim 25, wherein the selection means is a soft-touch button.

30. The information-processing apparatus control method according to any one of claims 25-29, wherein the information-processing apparatus is a mobile information-processing terminal.

31. A computer-readable control program for controlling an information-processing apparatus configured to display a function menu, which contains various functions, on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, wherein the program is composed of program code for causing a computer to perform a control step that performs control such that: a partial preview of the contents of the function menu, which is sorted into a plurality of categories, is partially displayed; the function menu displayed on the display screen in this partially displayed state is scrolled through by sliding the input device in a direction parallel to the selected edge; and the function menu is executed by directly manipulating a selection means displayed on the display screen without displaying a function tool of the function menu on the display screen.

32. The information-processing apparatus control program according to claim 31, wherein, in the control step, control is performed such that the function menu is displayed on the display screen by maintaining the state in which the edge has been selected by the indicating means.

33. The information-processing apparatus control program according to claim 31 or 32, wherein, in the control step, control is performed such that using the input device to select the four corners of the display screen serves as a trigger to stand by for the display of an infrequently used function menu, and sliding the input device from this state toward a center portion of the display screen causes the infrequently used function menu to be displayed on the display screen.

34. The information-processing apparatus control program according to any one of claims 31-33, wherein, in the control step, control is performed such that the function menu is sorted into four categories, and basic functions are assigned, in order, to the left, the top, the bottom, and the right in order of frequency of use.

35. The information-processing apparatus control program according to claim 34, wherein the function menu being sorted into four categories means being sorted into categories for search functions, text input functions, processing/editing functions, and saving/organizing functions.

36. The information-processing apparatus control program according to any one of claims 31-33, wherein the input device is a pointing device.

37. The information-processing apparatus control program

according to any one of claims 31-33, wherein the input device is a stylus.

38. The information-processing apparatus control program according to claim 31, wherein the selection means is a soft-touch button.

39. The information-processing apparatus control program according to any one of claims 31-38, wherein the information-processing apparatus is a mobile information-processing terminal.

40. A computer-readable control program for controlling an information-processing apparatus configured to display a function menu, which contains various functions, on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, the control program being composed of program code for causing a computer to execute:

a control step in which control is performed such that a partial preview of the function menu, which is displayed on the display screen, is displayed on the display screen;

a scrolling step in which the contents of the function menu are scrolled through by sliding the input device along the plurality of edges surrounding the display screen, as is, when the partial preview of the function menu is displayed on the display screen; and

an indicating step in which the menu function is executed by directly indicating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

41. The information-processing apparatus control program according to claim 40, wherein the function menu is sorted into four categories: search functions, text input functions, processing/editing functions, and saving/organizing functions.

42. The information-processing apparatus control program according to claim 40 or 41, wherein the input device is a pointing device.

43. The information-processing apparatus control program according to claim 40 or 41, wherein the input device is a stylus.

44. The information-processing apparatus control program according to claim 40, wherein the selection means is a soft-touch button.

45. The information-processing apparatus control program according to any one of claims 40-44, wherein the information-processing apparatus is a mobile information-processing terminal.

46. A storage medium wherein the information-processing apparatus control program according to claims 31-45 is stored.

47. The storage medium according to claim 46, wherein the information-processing apparatus is a mobile information-processing terminal.

DETAILED DESCRIPTION OF THE INVENTION

[0001]

TECHNICAL FIELD PERTAINING TO THE INVENTION

The present invention relates to: an information-processing apparatus that is capable of displaying various types of information, such as accumulated images, text, and the like; a control method for controlling the information-processing apparatus; a control program for controlling the information-processing apparatus; and a storage medium, in which the control program is stored.

[0002]

RELATED ART

Conventional information-processing apparatuses of this type are generally provided with a function called balloon help that, as a means of confirming what function an icon button processes before the function is executed, explains that function in a balloon-like frame, and that explanatory information is generally expressed through text alone.

[0003] In addition, in PCs (personal computers) and the like, menu displays based on a style called "pull-down menus" are generally used; these assume manipulation with an input device, such as a mouse or a pointing device, and thus have generally been displayed in accordance with indications, i.e., pulling the input device downward from the top of the display screen or upward from the bottom of the display screen.

[0004]

PROBLEMS TO BE SOLVED BY THE INVENTION

However, in the conventional example described above, a plurality of menu buttons is laid out in advance surrounding the display screen of the display and displayed even when there is no need to display a function menu, thus requiring that a certain amount of display surface area always be reserved, and that, for example, the display-region size for the main content one wishes to display be made small, a key sheet be separately laid out, printed, and displayed around the perimeter of a liquid-crystal display, or a fixed area be reserved on the display screen in order to continuously display a key for a menu entry point. In particular, compact mobile information-processing terminals, the displays of which have small display surface areas, have the problem of ease of operation becoming poor owing to the reduced display surface area of the display.

[0005] In addition, in the situation in which one simply wishes to view only the reproduced image information, if some sort of function button is displayed somewhere on the display screen, then it creates a visually intrusive impression as superfluous information.

[0006] In addition, when attempting to simultaneously display a plurality of display screens as tiles or overlapping one another on a compact mobile information-processing terminal, because the size of the display screen of the display is small to begin with, there are problems in that, even if the display is high-definition, the display undesirably becomes small, it is difficult to adjust the display region to prioritize whatever the user wishes to view, at-a-glance visibility is poor, and the display is difficult to view.

[0007] In addition, for users who are not proficient in operating PCs, methods in which information is displayed in an overlapping manner undesirably become a cause of confusion.

[0008] In addition, in displays that are small and have limited display surface area, there is the problem in that, in the situation in which there are many function key options, creating a layout in which a plurality of buttons is displayed as a list completely changes the display screen and undesirably hides the main image upon which a function is to be executed; furthermore, when processing a function, the difficulty in keeping track of the process becomes a factor that impedes the flow of manipulation and degrades ease of operation.

[0009] Furthermore, in the conventional art described above, a plurality of buttons is generally laid out near each other as tiles, and there is also the problem that, when making a selection with a stylus while holding the device in one hand, as in compact mobile information-processing terminals, it becomes easy to mistakenly press an adjacent button, and ease of operation thus becomes poor.

[0010] The present invention was created in order to solve the problems in the conventional art described above, and has an object of providing an information-processing apparatus, a control method for the information-processing apparatus, an information-processing apparatus control program, and a storage medium that make it possible to improve display screen visibility and ease of operation.

[0011] MEANS FOR SOLVING THE PROBLEMS

To achieve the above-mentioned object, the information-processing apparatus of the present invention is an information-processing apparatus configured to display a function menu, which contains various functions on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, the apparatus being provided with: a control means that performs control such that: a partial preview of the contents of the function menu, which is sorted into a plurality of categories, is partially displayed; the function menu displayed on the display screen in this partially displayed state is scrolled through by sliding the input device in a direction parallel to the selected edge; and the function menu is executed by directly manipulating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

[0012] In addition, to achieve the above-mentioned object, the information-processing apparatus of the present invention is characterized by comprising: a control means that performs control such that a partial preview of a function menu, which is displayed on a rectangular display screen of a displaying means comprising the display screen, is displayed on the display screen; a scrolling means for scrolling through the contents of the function menu by sliding an input device along a plurality of edges surrounding the display screen, as is, when the partial preview of the function menu is displayed on the display screen; and an indicating means for executing the function menu by directly indicating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

[0013] In addition, to achieve the above-mentioned object, a control method for an information-processing apparatus according to the present invention is characterized by being a control method for controlling an information-processing apparatus configured to display a function menu, which contains various functions, on a rectangular display screen of a displaying means, which comprises the display screen and

is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, the method being provided with a control step that performs control such that: a partial preview of the contents of the function menu, which is sorted into a plurality of categories, is partially displayed; the function menu displayed on the display screen in this partially displayed state is scrolled through by sliding the input device in a direction parallel to the selected edge; and the function menu is executed by directly manipulating a selection means displayed on the display screen without displaying a function tool of the function menu on the display screen.

[0014] In addition, to achieve the above-mentioned object, a control method for an information-processing apparatus of the present invention is characterized by being a control method for controlling an information-processing apparatus configured to display a function menu, which contains various functions on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, the method comprising: a control step in which control is performed such that a partial preview of the function menu, which is displayed on the display screen, is displayed on the display screen; a scrolling step in which the contents of the function menu are scrolled through by sliding the input device along the plurality of edges surrounding the display screen, as is, when the partial preview of the function menu is displayed on the display screen; and an indicating step in which the function menu is executed by directly indicating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

[0015] In addition, to achieve the above-mentioned object, a program for controlling an information-processing apparatus of the present invention is characterized by being a computer-readable control program for controlling an information-processing apparatus configured to display a function menu, which contains various functions, on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, wherein the program is composed of program code for causing a computer to perform a control step that performs control such that: a partial preview of the contents of the function menu, which is sorted into a plurality of categories, is partially displayed; the function menu displayed on the display screen in this partially displayed state is scrolled through by sliding the input device in a direction parallel to the selected edge; and the function menu is executed by directly manipulating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

[0016] In addition, to achieve the above-mentioned object, a program for controlling an information-processing apparatus of the present invention is characterized by being a computer-readable control program for controlling an information-processing apparatus configured to display a function menu, which contains various functions on a rectangular display screen of a displaying means, which comprises the display screen and is provided in an information-processing-apparatus main body, by using an input device to select a plurality of edges surrounding the display screen, the control program being composed of

program code for causing a computer to execute: a control step in which control is performed such that a partial preview of the function menu, which is displayed on the display screen, is displayed on the display screen; a scrolling step in which the contents of the function menu are scrolled through by sliding the input device along the plurality of edges surrounding the display screen, as is, when the partial preview of the function menu is displayed on the display screen; and an indicating step in which the function menu is executed by directly indicating a selection means displayed on the display screen without a function tool of the function menu being displayed on the display screen.

[0017] Furthermore, to achieve the above-mentioned object, a storage medium of the present invention is characterized by containing the control program of the information-processing apparatus according to claims 27-39.

[0018] MODES FOR CARRYING OUT THE INVENTION

Embodiments of the present invention will be described in detail below on the basis of the drawings.

[0019] (First Embodiment) First, a first embodiment of the present invention will be described using FIG. 1 to FIG. 18.

[0020] FIG. 1 is a front view showing the overall configuration of an information-processing apparatus according to the present embodiment, FIG. 2 is a plan view of the same, FIG. 3 is a rear view of the same, and FIG. 4 is a cross-sectional view taken along line IV-IV in FIG. 3.

[0021] The information-processing apparatus according to the present embodiment is a notebook-sized mobile information-processing terminal that is equipped with a display (displaying means) having a function of displaying full-color image information in high definition and that primarily relies on coordinate indications made using a stylus-type input device (pen-type pointing device).

[0022] However, the size of the mobile information-handling terminal described in the present embodiment is not limited to being notebook size, and the present embodiment is also applicable to information-processing apparatuses comprising large-screen displays having other pointing devices as manipulation means, ocular viewfinders, and the like, albeit with some differences in manipulation methods.

[0023] In FIG. 1 to FIG. 4, 100 is an information-processing apparatus, and a camera part 102 and a mic (microphone) 103 for taking in audio data are provided on a front-surface center upper portion of an exterior cover 101 thereof, as shown in FIG. 1.

[0024] In addition, a shutter button 104 is provided at a one-side portion on an upper surface of the exterior cover 101, as shown in FIG. 1 to FIG. 3. This shutter button 104 has a switch that is pressable in two stages and causes an image-capture standby state to be entered and viewfinder-image information to be displayed on a display (displaying means) 105 (described below) when pressed to the first stage, and causes an image-capture state to be entered and an image to be captured and recorded when pressed to the second stage.

[0025] In addition, the display (displaying means) 105, which is oblong in shape, is provided on a rear-surface side of the exterior cover 101, as shown in FIG. 3. A touch panel sensor 106 is provided on an upper surface of the display

105, as shown in FIG. 3 and FIG. 4. Furthermore, when a user uses the apparatus, coordinates are indicated with the touch panel sensor 106 on the display 105, primarily using a stylus-type input device (pen-type pointing device) 107, as shown in FIG. 4, to issue commands to execute various functions.

[0026] In addition, speakers 108 located to both sides of the display 105 are provided on a rear-surface side of the exterior cover 101, as shown in FIG. 3.

[0027] A step part 109 is provided in a frame at a boundary portion between the exterior cover 101 and the display 105, as shown in FIG. 3 and FIG. 4. This step part 109 has an auxiliary function when specifying a "drawer menu display-triggering area" or the like (described below). That is, as shown in FIG. 4, when a tip portion of the input device 107 is pressed against the step part 109 of the frame of the exterior cover 101, which abuts the edges surrounding the display 105, coordinates can be indicated for a region precisely in a "drawer menu display-triggering area"; in this way, care has been taken so that the user's intention is reflected even in inputs made using the input device 107, even if the latter is low-precision.

[0028] The step part 109 of the frame of the exterior cover 101 has an auxiliary function when specifying coordinates for respective areas A, B, C, and D in FIG. 5 to FIG. 7 (described below), when activating an "infrequently used advanced menu" such as described below using FIG. 24 to FIG. 27, and when scrolling within drawer menu partial preview help such as described below using FIG. 46 to FIG. 48.

[0029] FIG. 5 to FIG. 7 are drawings showing examples of coordinate definitions for "drawer menu display-triggering areas" on the display 105 and are enlarged views of only the portion corresponding to the display 105 shown in FIG. 3.

[0030] As shown in FIG. 5 to FIG. 7, functions that have been pre-sorted into four broad categories, i.e., A, B, C, and D, are assigned to the edges of the oblong display 105 in a layout resembling virtual drawers. Hereinafter, these functions will be referred to as "drawer menus."

[0031] Contemplated examples of what is laid out in the "drawer menus" are lists of function buttons based on icons or displayed text, combinations of icons and text, and the like, depending on the specifications and product concept of the present information-processing apparatus.

[0032] For example, in FIG. 5 to FIG. 7, category A, which is a bundle of functions for procedures performed before an image is displayed on the display screen, is on the left side of the display screen the display 105, and search functions, for example, are assigned to this category-A menu. In addition, categories B and C, which are bundles of additional functions that can be applied to a displayed image, are on the upper and lower sides of the display screen; text input functions, for example, are assigned to the category-B menu on the upper side of the display screen and processing/editing functions, for example, are assigned to the category-C menu on the lower side of the display screen. In particular, it is appropriate, as shown in FIG. 7, to lay out the

category-B menu at a location such that the image will not be hidden by the input device 107 or by a hand even when writing text onto the image with the menu in a slid-in state, as shown in FIG. 7, or when selecting the menu.

Furthermore, a category D, which is a bundle of functions for specifying destinations for processed image data, is on the right side of the display screen; saving/organizing functions or the like, for example, are assigned to this category-D menu, and a list of icons or the like for processing various related functions is displayed therein.

[0033] The user can display the menus for the respective categories by performing an operation resembling pulling out from the edges of the display 105 according to the required function. With repeated use, it is possible to memorize the display triggers for the major categories at the locations of the four edges relative to the display 105.

[0034] FIG. 7 shows a state in which the category-B menu is being displayed (a stored image of the drawer menu). That is, a state is shown in which the "drawer menu" for category B is displayed via a manipulation means, wherein coordinates within the category-B region shown in FIG. 5 are indicated by the dedicated input device (pen-type pointing device) 107 and, in that state, sliding the input device 107 in the direction of arrow E toward the center of the display screen.

[0035] In addition, the definitions of the respective display-triggering areas are determined by, for example, the shape of the pen tip of the input device 107, and are defined by the ranges, with some extra margin, within which the tip of the input device 107 is detected when pressed against the step part 109 of the frame of the exterior cover 101. In addition, coordinate information for each activation area is pre-registered in ROM (read-only memory), which is described below; when coordinate information inputted using the input device 107 is detected, the coordinates are mapped and, if the coordinates map to an area such as shown in the drawings, then the respective activation standby state is entered; furthermore, the menu contents can be slid out and displayed through scrolling by sliding the input device 107 toward the center of the display screen.

[0036] As shown in FIG. 7, a plurality of function buttons 701, which are formed from icons and characters and have functions corresponding to their respective categories, is laid out in the drawers on the sides of the display screen.

[0037] Note that, although the number the function buttons 701 shown in FIG. 7 is laid out for convenience of explanation, the number of function buttons 701 in the layout will vary according to the size of the display screen and is not limited to that shown in FIG. 7.

[0038] In addition, it is possible to set, as necessary, a setting method in which display-triggering areas are displayed in advance and a setting method in which display-triggering areas are usually not displayed and the selection state is displayed with emphasis only when defined coordinate inputs by the input device 107 are detected, thereby enabling switching between the methods.

[0039] With regard to the means for identifying the

drawers for the four categories A-D, the drawers are made identifiable by, for example, changing the patterns or colors of the bars on the edges of the display screen.

[0040] Although an example in which text inputs, illustrations, and the like are written over image information is described in the present embodiment, text-only sentences or mixed displays of text and images can also be displayed by performing similar display processing.

[0041] Note that, in the following explanation, the horizontal direction of the display screen of the display 105 is designated the X axis and the vertical direction thereof is designated the Y axis, as shown in FIG. 5, and slide-in amounts are designated x and y, respectively.

[0042] FIG. 8 is a block diagram showing the system configuration of the information-processing apparatus according to the present embodiment. In the same diagram, 801 is a CPU (central processing unit), 802 is a CCD (image-capturing device, corresponding to the camera part 101 in FIG. 1), 803 is an image-displaying display (corresponding to the display 105 in FIG. 1), 804 is RAM (random-access memory), 805 is flash memory, 806 is a mic (corresponding to the mic in FIG. 1), 807 is a shutter switch (corresponding to the shutter button 104 in FIG. 1 to FIG. 3), 808 is a touch panel sensor (corresponding to the touch panel sensor 106 in FIG. 3 and FIG. 4), 809 is ROM (read-only memory), 810 is a battery, and 811 is a speaker (corresponding to the speakers 108 in FIG. 3).

[0043] A soft-touch button displayed on the display screen of the image-displaying display 803 is indicated by touching the button with the input device 107, and various functions based on an operating system stored in the ROM 809 are executed via the coordinate information detected by the touch panel sensor 808. In addition, image information and audio information inputted from the CCD 802 and the mic 806 are stored in the flash memory 805 by turning the shutter switch 807 ON and are organized in accordance with various rules programmed in the ROM 809. The information stored in the flash memory 805 can subsequently be reproduced on the image-displaying display 803 or through the speaker 811, and the required image or audio can be reproduced via a plurality of search means based on GUI (graphical user interface) manipulations indicated using coordinates on the touch panel sensor 808 inputted with the input device 107.

[0044] Reproduced image information is edited/processed through various methods, such as arbitrarily marking up the image using the ROM 804 and adding text using a word processing (word processor) function.

[0045] Next, the overall function operation of the information-processing apparatus according to the present embodiment will be described using FIG. 9.

[0046] FIG. 9 is a flow chart showing the flow of the overall function operation of the information-processing apparatus according to the present embodiment.

[0047] In FIG. 9, first, in step S901, it is determined whether main power has been turned ON; this continues until

the main power is turned ON. Then, when the main power is turned ON, a state in which photographs taken in the past are reproduced as an album and displayed on the image-displaying display 803 is entered in a next step S902. Next, in step S903, it is determined whether it is a mechanical (mechanical) button (or key) manipulation. Next, if it is determined that it is a mechanical-button manipulation, then operation advances to step S904, in which the details of the button manipulated in step S903 are determined.

[0048] Next, if it is determined in step S904 that the button that was manipulated is power OFF (OFF), then operation advances to step S905, in which the power is turned OFF, after which the present processing operation is ended.

[0049] In addition, if it is determined in step S904 that the button that was manipulated is a shutter switch (shutter SW1), then operation advances to step S906, in which the shutter switch (shutter SW1) is turned ON and an image-capture standby state is entered. Next, operation advances to step S907, in which a subject image is displayed in a viewfinder, and, in a subsequent step S908, a shutter switch (shutter SW2) is turned ON and an image-capture state is entered. Next, in step S909, the image information captured in step S908 is saved to the flash memory 805, after which operation returns to step S902.

[0050] In addition, if it is determined in step S904 that the button that was manipulated is an arrow key, then operation advances to step S910, in which a process corresponding to the arrow key is performed, after which the present processing operation is ended.

[0051] In addition, if it is determined in step S904 that the button that was manipulated is an audio recording key, then operation advances to step S911, in which an audio recording process is performed, after which the present processing operation is ended.

[0052] Meanwhile, if it is determined in step S903 that a mechanical-button manipulation was not performed, then operation advances to step S912, in which GUI operations are performed; through these GUI operations, a search process is performed in step S913, a text input process is performed in step S914, a processing/editing process is performed in step S915, and a saving/organizing process is performed in step S916, after which operation returns to step S902.

[0053] That is, when the main power is turned ON, a state is entered in which images captured in the past are reproduced as an album and displayed on the image-displaying display 803. From there, for functions that are used especially frequently, hard-key manipulations (or mechanical-button manipulations) are used to turn the power OFF, to perform processes such as image capturing by the shutter switch 807, and to save captured-image information to the flash memory 805.

[0054] Apart from these, various applied functions performed on images are performed by selecting GUI buttons and manipulating them with gestures using the input device 107, such as a stylus or the like.

[0055] The gist of the present invention particularly

relates to various indicating means, indication-recognizing means, processing means, storing means, and displaying means related to: processes such as selecting functions from displayed menus housing "search processes" (step S913), "text input processes" (step S914), "processing/editing processes" (step S915), "saving/organizing processes" (step S916), and the like, which are performed through GUI operations during reproduction in step S902 or during the viewfinder display in step S907; and processes such as closing menus.

[0056] Next, an activation operation for displaying a drawer menu in the information-processing apparatus according to the present invention will be described using FIG. 10 to FIG. 12.

[0057] FIG. 10 is a diagram showing a screen display example of an activation operation for displaying a drawer menu in the information-processing apparatus according to the present embodiment, and FIG. 11 and FIG. 12 are flow charts showing the operational flow of the activation operation for displaying a drawer menu in the information-processing apparatus according to the present embodiment.

[0058] In FIG. 10, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0059] As described using FIG. 5 to FIG. 7, defined coordinates on the touch panel sensor 106 for display-triggering areas of the various function tools are pre-registered in the ROM 809. Then, if the interior of any of these regions is detected, then the respective coordinate data are mapped, a trigger area of a drawer is selected according to the operation status thereof, a standby state is entered, and, as the coordinates are continuously updated toward the center portion of the display screen of the image-displaying display 803, the display region of the drawer is slid in the indicated direction. Furthermore, when detection information is turned OFF, the display state is also maintained.

[0060] Below, the category-B menu will be described as an example using FIG. 10 to FIG. 12.

[0061] First, in FIG. 11, the state in which a photographic image or the like is displayed using the entire display screen of the image-displaying display 803 (a full-screen image view state) is entered in step S1101. Next, in step S1102, arbitrary coordinates are detected. Next, in step S1103, it is determined whether coordinates have been detected within the "drawer menu display-triggering area" for category-B tools shown in FIG. 6. Next, if it is determined that no coordinates have been detected within the "drawer menu display-triggering area," then operation advances to step S1104, in which it is determined whether to remain on coordinate input standby until a defined area is entered. Then, if it is determined not to remain on coordinate input standby until a defined area is entered, then operation returns to step S1101; in addition, if it is determined to remain on coordinate input standby until the defined area is entered, then operation returns to step S1103.

[0062] Meanwhile, if it is determined in step S1103 that coordinates have been detected in a "drawer menu display-

triggering area," then operation advances to step S1105, in which it is determined whether the area that was detected in step S1103 is A, B, C, or D. Then, if it is determined that it is A or D, then operation advances to step S1106; if it is determined that it is B or C, then operation advances to step S1113 in FIG. 12 (described below).

[0063] In step S1106, it is determined whether the trigger area is highlighted and a buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S1101; if the determination result is affirmative (YES), then, in a next step S1107, operation stands by to receive X-coordinate information and ignores the Y coordinate, and, in a next step S1108, the bar display position is continuously updated in accordance with the X-coordinate information.

[0064] Next, in step S1109, it is determined whether the slide-in amount x is less than a defined amount. Then, if the determination result is negative (NO), then operation returns to step S1101; if the determination result is affirmative (YES), then, in a next step S1110, it is determined whether the slide-in amount x is greater than the defined amount. Then, if the determination result is negative (NO), then operation advances to step S1113, in which the display state is maintained, after which the present processing operation is ended; if the determination result is affirmative (YES), then operation advances to a next step S1111, in which it is determined whether to stop at an X-axis maximum slide-in amount position. Then, if the determination result is negative (NO), then operation advances to step S1113, in which the display state is maintained, after which the present processing operation is ended; if the determination result is affirmative (YES), then operation advances to a next step S1112, any further updates to the detected coordinates in the X-axis direction are ignored, and the input device (pen) 107 is moved away from the touch panel 106 and the display state is maintained, after which the present processing operation is ended.

[0065] Next, in FIG. 12, first, in step S1114, it is determined whether the trigger area is highlighted and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S1101 in FIG. 11; if the determination result is affirmative (YES), then, in a next step S1115, operation stands by to receive Y-coordinate information and ignores the X coordinate, and, in a next step S1116, the bar display position is continuously updated in accordance with the Y-coordinate information.

[0066] Next, in step S1117, it is determined whether the slide-in amount y is less than a defined amount. Then, if the determination result is negative (NO), then operation returns to step S1101; if the determination result is affirmative (YES), then, in a next step S1118, it is determined whether the slide-in amount y is greater than the defined amount. Then, if the determination result is negative (NO), then operation advances to step S1113 in FIG. 11 and the display state is maintained; if the determination result is affirmative (YES), then operation advances to a next step S1119 and it is determined whether to stop at a Y-axis maximum slide-in amount position. Then, if the determination result is negative (NO), then operation advances to step S1113 in FIG. 11 and

the display state is maintained; if the determination result is affirmative (YES), then operation advances to a next step S1119, any further updates to the detected coordinates in the extension direction are ignored, and the input device (pen) 107 is moved away from the touch panel 106 and the display state is maintained, after which the present processing operation ends.

[0067] That is, first, when arbitrary coordinates are detected in the state in which a photographic image or the like is being displayed using the entire display screen of the image-displaying display 803 (a full-screen image view state: 1000 in the screen display examples in FIG. 10), coordinates in the "drawer menu display-triggering area" for category-B tools shown in FIG. 6 are detected. This detection comes in two varieties: situations in which coordinates are directly detected within the trigger area; and situations in which coordinates are detected in an area other than the trigger area, after which coordinate information is continuously updated without being turned OFF, after which coordinates within the "drawer menu display-triggering area" are detected. In the latter situation, in which coordinates within the "drawer menu display-triggering area" are detected, any previously detected continuous coordinate information is nullified (1001-1002 in the screen display examples in FIG. 10).

[0068] Through this method, it becomes possible to display the target menu with an imprecise manipulation feel, even if the user does not carefully aim for the interior of the defined area. One conceivable method for notifying the user of this selected state is to combine means such as highlighting the trigger area with a selected color and, simultaneously, causing the buzzer to emit an electronic sound, such as a "beep," as a keypress sound.

[0069] Next, in this state, the input device 107 is brought into and kept in contact with the touch panel sensor 106 while being slid toward the center portion of the display screen of the image-displaying display 803, whereupon a toolbox slides open like a drawer as the input device 107 moves (1003-1006 in the screen display examples in FIG. 10). Because the trigger area for the category-B menu is detected in this instance, X-axis information is ignored and only Y-axis information is reflected in the process.

[0070] Even if the user does not consciously pull down the menu precisely in the perpendicular direction, the user's intent can be reflected by sliding the input device 107 generally downward.

[0071] In general, there tends to be a slight inclination relative to the perpendicular direction depending on whether the user is right-handed or left-handed. For example, in the case of a right-handed user, the user will scroll slightly leftward in the perpendicular direction, i.e., along a vector from the upper right to the lower left. This is reversed in the case of a right-handed user, who will scroll along a vector from the upper left to the lower right.

[0072] However, by adopting a method that reflects only changes in the value of Y-axis information, it becomes possible to reflect the intent of the user without being affected by the dominant hand as described above.

[0073] In the screen display examples in FIG. 10, the

amount of the menu that is displayed is updated in accordance with the Y-coordinate information inputted using the input device 107. While the definition of the maximum slide-in amount can vary depending on specifications, in the present embodiment, the maximum slide-in amount is defined as the center position of the display area, as shown by 1006 in the screen display examples in FIG. 10.

[0074] Once a menu slide-in amount y greater than a predefined arbitrary defined amount has been secured, if coordinate detection is subsequently turned OFF at an arbitrary location, then the drawer menu is fixed at a midway position and can be used as is. If, at this time, coordinate information is turned OFF at a slide-in amount that is less than the defined amount, then the menu slide-in function is canceled midway through and the screen returns to the initial screen state (1000 in the screen display examples in FIG. 10).

[0075] Alternatively, if detected coordinates continue to vary even after the drawer has been slid in (in the situation in which indications are further updated in the drawer slide-in direction while maintaining the state in which the input device 107 is not moved away from the touch panel 106), these detected coordinates continue to be ignored until the trigger area is detected once again. If there is a return to the slide-in direction after re-detection, the coordinates are once again updated in accordance with the coordinate information (1003–1009 in the screen display examples in FIG. 10).

[0076] Alternatively, in addition to the aforementioned means, the amount of change in coordinates updated within a defined length of time from 1002 to 1004 in the screen display examples in FIG. 10 is calculated, a distinction is made between situations in which the user has made a high-speed indication and situations in which the user has made a low-speed indication; if a high-speed indication has been made (i.e., 1000–1004 in the screen display examples in FIG. 10 are performed within a defined length of time), then, even if coordinate indication is turned OFF in 1004 in the screen display examples in FIG. 10, the menu is displayed at the maximum displayed amount (the state in 1007 in the screen display examples in FIG. 10) rather than being displayed as in 1005 in the screen display examples in FIG. 10.

[0077] Next, an operation process performed when closing a drawer menu in the information-processing apparatus according to the present embodiment will be described using FIG. 13 to FIG. 15.

[0078] FIG. 13 is a diagram showing a screen display example of closing a drawer menu in the information-processing apparatus according to the present embodiment, and FIG. 14 and FIG. 15 are flow charts showing the flow of an operation process when closing a drawer menu in the information-processing apparatus according to the present embodiment.

[0079] In FIG. 13, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0080] As a prerequisite, the process shown in FIG. 14 and FIG. 15 starts from the state in which a "drawer menu" is displayed at the maximum displayed amount, as in 1301 in the screen display example in FIG. 13.

[0081] First, in FIG. 14, a drawer menu display state is entered in step S1401, and arbitrary coordinates are detected in a next step S1402. Next, in step S1403, it is determined whether the coordinate information detected in step S1402 is in a trigger-area-defining area. Then, if it is determined that

the coordinate information is not in a trigger-area-defining area, then operation advances to step S1404, in which it is determined whether a GUI function button has turned ON. Then, if it is determined that a GUI function button is not turned ON, then operation returns to step S1403; if it is determined that a GUI function button has turned ON, then operation advances to step S1405, in which the function process is executed, after which the present processing operation is ended.

[0082] Meanwhile, if it is determined in step S1403 that the coordinate information detected in step S1402 is for a trigger-area-defining area, then operation advances to step S1406, in which it is determined whether the detected area is A, B, C, or D. Operation then advances to step S1407 if it is determined that it is A or D, or to step S1414 in FIG. 15 (described below) if it is determined that it is B or C.

[0083] In step S1407, the trigger area is highlighted and the buzzer is turned ON, and, in a next step S1408, operation stands by to receive X-coordinate information and ignore the Y coordinate. Next, in step S1409, it is determined whether to continuously update the bar display position in accordance with the X-coordinate information. Then, if the determination result is negative (NO), then operation advances to step S1412, in which the display state is maintained, after which the present processing operation is ended; if the determination result is affirmative (YES), then operation advances to a next step S1410, in which it is determined whether the slide-in amount x is greater than a defined amount. Then, if the determination result is negative (NO), then operation advances to step S1412, in which the display state is maintained; if the determination result is affirmative (YES), then operation advances to a next step S1411, in which it is determined whether the slide-in amount x is less than a defined amount. Then, if the determination result is negative (NO), then operation advances to step S1413, in which the drawer menu display is turned OFF (OFF), after which the present processing operation is ended; if the determination result is affirmative (YES), then the present processing operation is ended.

[0084] Next, in FIG. 15, in step S1414, it is determined whether the trigger area is highlighted and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S1403 in FIG. 14; if the determination result is affirmative (YES), then operation advances to a next step S1415, in which it is determined whether to stand by to receive Y-coordinate information and ignore the X coordinate. Then, if the determination result is negative (NO), then operation returns to step S1403 in FIG. 14; if the determination result is affirmative (YES), then operation advances to a next step S1416.

[0085] In step S1416, it is determined whether to continuously update the bar display position in accordance with the Y-coordinate information. Then, if the determination result is negative (NO), then operation advances to step S1412 in FIG. 14, in which the display state is maintained; if the determination result is affirmative (YES), then operation

advances to a next step S1417, in which it is determined whether the slide-in amount y is greater than a defined amount. Then, if the determination result is negative (NO), then operation advances to step S1412 in FIG. 14, in which the display state is maintained; if the determination result is affirmative (YES), then operation advances to a next step S1418, in which it is determined whether the slide-in amount y is less than a defined amount. Then, if the determination result is negative (NO), then operation advances to step S1413 in FIG. 14, in which the drawer menu display is turned OFF; if the determination result is affirmative (YES), then the present processing operation is ended.

[0086] That is, in the state in which the "drawer menu" is being displayed at the maximum displayed amount, if detected coordinate information is within the "display-triggering area" of the slid-in menu (1303 in the screen display examples in FIG. 13), then a bar in the selection area is highlighted and a buzzer sound is also outputted to provide feedback to the user indicating that the bar in the selection area has been selected and activated, and a drawer movement reception standby state is entered. Alternatively, in the situation in which the initially detected coordinate information is not within a drawer menu display-triggering area, the reception standby state persists and only the coordinate information changes, and, if the coordinate information enters a drawer menu display-triggering area, then the information up to that point is ignored, and the reception standby state is entered from there on (1301–1303 in the screen display examples in FIG. 13). This is a method for the intent of the user to be reliably accepted even when an imprecise manipulation is performed.

[0087] Alternatively, it goes without saying that, if a specific function button in a menu is detected, then that function is processed, as shown in 1302 in the screen display examples in FIG. 13.

[0088] If there is a further change in the detected coordinates, any changes to the X-coordinate information are ignored, and only indications in the direction of the category-B tool collapsed location are accepted. If any indication is detected in a direction such as shown in 1304 in the screen display examples in FIG. 13, then it is ignored. In addition, every time the coordinates are updated, the displayed amount is also updated, as in 1305–1309 in the screen display examples in FIG. 13. If it is turned OFF when the slide-in amount y is equal to or greater than a defined amount, then that state is maintained (1306 in the screen display examples in FIG. 13). When it enters within a certain defined amount (1307 in the screen display examples in FIG. 13), the user is assumed to have the intention to clear the display, and even if it is turned OFF midway, the drawer menu display is still turned OFF.

[0089] Note that, apart from situations in which the user closes a drawer menu via a scrolling method as described in the present embodiment, a conceivable alternative method for closing a drawer menu is to also provide a button that has a function such that all menus can be cleared at once simply by clicking the button.

[0090] Furthermore, in addition to a means for closing a drawer menu similar to that used when activating a drawer menu, the amount of change in coordinates updated within a defined length of time in the period from 1301 to 1305 in the screen display examples in FIG. 13 is calculated, and a distinction is made between situations in which the user has made a high-speed indication and situations in which the user has made a low-speed indication; if a high-speed indication

has been made (if 1301–1305 in the screen display examples in FIG. 13 are performed within a defined length of time at high speed), then, even if coordinate indication is turned OFF in 1305 in the screen display examples in FIG. 13, the entire menu may be collapsed rather than being displayed as in 1306 in the screen display examples in FIG. 13.

[0091] Next, a method for listing the tools in a drawer menu according to slide-in amount in the information-processing apparatus according to the present embodiment will be described using FIG. 16 and FIG. 17.

[0092] FIG. 16 is a diagram showing a process of laying out the interior of a drawer menu according to the amount that the menu has been slid in in the information-processing apparatus according to the present embodiment, and FIG. 17 is a flow chart showing the operational flow of the process of laying out the interior of a drawer menu according to the amount the menu has been slid in in the information-processing apparatus according to the present embodiment.

[0093] In FIG. 16, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user. In addition, in FIG. 16, category-A tools and category-B tools are described as examples.

[0094] In FIG. 17, after going through the same process as in step S1401 and step S1402 in FIG. 14, in step S1701, it is determined whether coordinate information detected in a process step of a prior stage is in a trigger-area-defining area. Then, if it is determined that the coordinate information is not in a trigger-area-defining area, then the same process as in step S1404 in FIG. 14 is performed.

[0095] Meanwhile, if it is determined in step S1701 that the coordinate information detected in a step of a prior stage is in a trigger-area-defining area, then operation advances to step S1702, in which it is determined whether the detected area is A, B, C, or D. Operation then advances to step S1703 if the area is determined to be A or D, or to step S1707 if the area is determined to be B or C.

[0096] In step S1703, operation stands by to receive X-coordinate information and ignores the Y coordinate. Next, in step S1704, an image is displayed that has been scaled, in accordance with the X-coordinate information, in the horizontal direction by the ratio of the amount of X to the maximum slide-in amount shown in 1604 in the screen display examples in FIG. 16. Next, in step S1705, the in-menu image ratio is updated as the X-coordinate information is updated. Next, in step S1706, sliding-in is stopped at the X-axis maximum slide-in position (X/2), after which the present processing operation is ended.

[0097] Meanwhile, in step S1707, operation stands by to receive Y-coordinate information and ignores the X coordinate. Next, in step S1708, an image is displayed that has been scaled, in accordance with the Y-coordinate information, in the vertical direction by the ratio of the amount of X to the maximum slide-in amount shown in 1608 in the screen display examples in FIG. 16. Next, in step S1709, the in-menu image ratio is updated as the Y-coordinate information is updated. Next, in step S1710,

sliding-in is stopped at the Y-axis maximum slide-in amount position (Y/2), after which the present processing operation is ended.

[0098] That is, in the situation of the category-A menu, the method by which the interior of the drawer is displayed relative to the slide-in amount is to display such rescaled/downscaled by the ratio of the position of the X coordinate relative to the layout of the menu when at the maximum displayed amount. For example, in the situation in which the position of the X coordinate shown in 1603 in the image display examples in FIG. 16 is 3/4 that of the position of the X coordinate shown 1604 in the image display examples in FIG. 16, the display of the content of the tools in 1603 in the image display examples in FIG. 16 is displayed as image information in which all the Y coordinates are the same but the images are distorted by 3/4 in the X-direction, the functional regions of the function buttons are also commensurately scaled down in the horizontal direction, and the display ratio is also updated as position information for the X coordinate changes.

[0099] In addition, in accordance with the displayed amount x of the category-A menu, the display style changes, such as, for example, the contents of the drawer tools consisting solely of icons, or the contents of the drawer tools consisting of a combination of icons and text. When the input device 107 is moved away from the touch panel sensor 108 at an intermediate position, the display state is fixed at that position. Alternatively, the in-menu image ratio is updated to the maximum slide-in amount, and the respectively applied coordinates are defined.

[0100] Note that the flow when closing a "drawer menu" is the reverse of the flow described above.

[0101] FIG. 18 includes images of the collapsed positions of "drawer menus." In FIG. 18, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0102] The slide-in directions from each of the four sides surrounding the display 803 are as shown in FIG. 18. The indication direction necessary to slide the menu in, the received coordinate information, and the direction of the image processing by which the in-menu layout is rescaled/downscaled differ according to the position of the detected menu-triggering area.

[0103] In the screen display examples in FIG. 18, 1801 shows the edge that is selected to slide in the category-A tools and the direction in which the tools are slid in, and 1802 shows the state in which the category-A tools have been fully slid in. In addition, 1803 shows the edge that is selected to slide in the category-B tools and the direction in which the tools are slid in, and 1804 shows the state in which the category-B tools have been fully slid in. In addition, 1805 shows the edge that is selected to slide in the category-C tools and the direction in which the tools are slid in, and 1806 shows the state in which the category-C tools have been fully slid in. In addition, 1807 shows the edge that is selected to slide in the category-D tools and the direction in which the tools are slid in, and 1808 shows the state in which the category-D tools have been fully slid in.

[0104] The screen display examples shown in FIG. 18 are explanatory examples; the number and size of the icons in the drawers will differ according to the number of functions in each and the size of the display 803.

[0105] The method and process of closing the respective tools are the same as in the method already described using the category-B tools as an example, and the rule that the position of the edge determines which detected coordinates are reflected is also the same.

[0106] In addition, the same rules as those described using FIG. 5 to FIG. 10 apply to details such as the process by which the various tools are displayed and the method by which the tools are closed.

[0107] According to the information-processing apparatus according to the present embodiment, as described above, in a menu display method in which there are no keys whatsoever around the perimeter of the display 803 for performing specific functions and in which the four edges of the display 803 are display triggers, it is possible to specifically ascertain the types of function tools contained in the menus, which are categorized as top-level items, without scaling down the entire main image; furthermore, commands can be issued more quickly by directly selecting a target button.

[0108] (Second Embodiment) Next, a second embodiment of the present invention will be described using FIG. 19 to FIG. 21.

[0109] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0110] FIG. 19 is a diagram showing image display examples of a situation in which a display is performed in stages according to function priority in the information-processing apparatus according to the present embodiment, FIG. 20 is a diagram showing display ranges in a situation in which a display is performed in stages according to function priority in the information-processing apparatus according to the present embodiment, and FIG. 21 is a flow chart showing a flow of operation in a situation in which a display is performed in stages according to function priority in the information-processing apparatus according to the present embodiment.

[0111] In FIG. 19, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0112] Depending on specifications and the target user, there may be a situation in which the number of items that can be listed at one time in a menu is too great, leading to hesitation in making selections and poor usability. In contemplation of such a scenario, the present embodiment is configured so as to limit the quantity of functions that can be listed and to display functions in two or three stages, starting with higher-priority functions.

[0113] The interior of each drawer menu is displayed with the contents laid out in order of descending frequency of use, starting from nearest the drawer bar. For users who want the simplest user experience and for frequently used items, an arbitrary function can be selected simply by sliding in the first row/column.

[0114] The numbers in the drawer menu in the screen display examples in FIG. 19 indicate the layout order, which corresponds to the respective frequency of use. That is, the tools displayed in 1902 in the image display examples in FIG. 19 are those that are in the front of the drawer and most

often used, and the tools displayed in 1903 in the screen display examples in FIG. 19 are those that are in the back of the drawer and used less frequently than the tools displayed in 1902 in the screen display examples in FIG. 19; in this manner, tools can be organized and used as they would be in an ordinary drawer.

[0115] Fixed positions for the slide-in amount are predefined according to the maximum number of tool contents that can be displayed. While a scenario in which a maximum of six items can be displayed is contemplated here as an example, this will vary according to the size of the screen and the functions of the icons. Three rows by ten columns of function buttons are contemplated for category-C tools; a layout of this sort can be contemplated for functions such as color palettes. In addition, in such a situation, there are three steps, in accordance with the number of rows.

[0116] In the flow chart in FIG. 21, category-A tools are shown as an example. The range of coordinates in which indications made with the input device 107 were detected, and fixed positional information for a toolbar corresponding thereto, are defined and stored in the ROM 809 in advance. While indications made with the input device 107 are being detected, only the position of the bar is updated as the Y-coordinate information changes; when the detection information is turned OFF, the contents of the drawer are re-laid out and displayed in a fixed manner at the stage corresponding to a position that corresponds to the coordinate change immediately before the detection information was turned OFF.

[0117] In FIG. 21, after going through the same process as in step S1401 and step S1402 in FIG. 14, in step S2101, it is determined whether coordinate information detected in a previous step is in a trigger-area-defining area. Then, if it is determined that the coordinate information is not in a trigger-area-defining area, then the same process as in step S1404 in FIG. 14 is performed.

[0118] Meanwhile, if it is determined in step S2101 that the coordinate information detected in the previous step is in a trigger-area-defining area, then operation advances to step S2102, in which it is determined whether the detected area is A, B, C, or D. Then, operation advances to step S2103 if it is determined to be A or D, or a process similar to that in step S1707 to step S1710 in FIG. 17 is executed if it is determined to be B or C.

[0119] In step S2103, operation stands by to receive X-coordinate information and ignores the Y coordinate. Next, in step S2104, it is determined whether the X coordinate is within range a in FIG. 20. Then, if it is determined that the X coordinate is not within range a in FIG. 20, then operation advances to step S2107 and returns to the state in which nothing is displayed (the image state of 1901 in the screen display examples in FIG. 19), after which the present processing operation is ended.

[0120] In addition, if it is determined in step S2104 that the X coordinate is within range a in FIG. 20, then operation advances to step S2105, in which it is determined whether the X coordinate is within range b in FIG. 20. Then, if it is determined that the X coordinate is not within range b in FIG. 20, then operation advances to step S2108, in which the

state in which only the first-stage list is displayed (the image state of 1902 in the screen display examples in FIG. 19) is maintained, after which the present processing operation is ended.

[0121] In addition, if it is determined that the X coordinate is within range b in FIG. 20, then operation advances to step S2106, in which it is determined whether the X coordinate is within range c in FIG. 20. Then, if it is determined that the X coordinate is not within range c in FIG. 20, then operation advances to step S2109, in which the state in which the second-stage list is displayed (the image state of 1903 in the screen display examples in FIG. 19) is maintained, after which the present processing operation is ended. In addition, if it is determined that the X coordinate is within range b in FIG. 20, then the present processing operation is ended.

[0122] Note that it can also be contemplated to concurrently cause a buzzer sound to be emitted when coordinates are detected for a location at which b is entered and a location at which c is entered, respectively, so that a user can easily ascertain where b and c were entered. In addition, although FIG. 20 shows an example of specifications in which the menu is laid out in two vertical columns, the basic mechanism is the same even with three or more columns: range b is simply increasingly subdivided as the number of columns increases. In addition, when closing a drawer menu, the drawer menu can similarly be closed in stages. Furthermore, similar rules also apply to the other tools.

[0123] (Third Embodiment) Next, a third embodiment of the present invention will be described using FIG. 22 and FIG. 23.

[0124] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0125] FIG. 22 is a diagram showing image display examples pertaining to the expansion of the maximum slide-in amount in the information-processing apparatus according to the present embodiment, and FIG. 23 is a flow chart showing an operational flow pertaining to the expansion of the maximum slide-in amount in the information-processing apparatus according to the present embodiment.

[0126] In FIG. 22, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0127] In FIG. 5 in the first embodiment described above, an example is described in which the maximum slide-in amount is limited to up to a halfway position in the slide-in direction in contemplation of a situation in which, when a menu is slid in, the menu and a target image on which a process is to be performed using the menu are simultaneously displayed on the display 803; however, depending on the properties of the functions, elements for a greater number of functions can be displayed by using the display region of the display to the utmost to secure the maximum slide-in amount.

[0128] In the first embodiment described above, the maximum display amount is defined as being up to a central position; the reason for this is out of consideration for not hiding the entire image before the menu is slid in. However, depending on the properties of the function, it is not necessarily required that the image from before the display of

the menu be displayed; rather, there are some situations in which it is desired to improve the listability of the interior of the menu.

[0129] For example, the entire display region of the display is used if an association between the menu and the image prior to the menu being displayed is not required, as in the case of a search function; or the maximum slide-in amount is up to 1/2 if an association between the menu and the image prior to the menu being displayed is required, as in the case of an image-editing function such as a category-B tool or a category-C tool.

[0130] In the present embodiment, it is contemplated that the upper and lower tools are functions that are frequently selected while looking at an image, and the menus for these tools will thus be slid halfway in; thus, it is also conceivable for the left and right menus to be slid all the way in.

[0131] A mixed display style combining a display style in which the slide-in amount is continuous and all items can be listed up, as shown in FIG. 22, and a display style in which the slide-in amount is changed in stages (2205-2208 in the screen display examples in FIG. 22) can also be contemplated; it is contemplated that either one of these will be selected and equipped depending on the properties of the functions or that the user can freely modify both styles.

[0132] The differences between FIG. 23 and FIGS. 11, 12 in the first embodiment described above, which is a method in which the maximum slide-in amount is limited to halfway, are that: definitions for the maximum slide-in amounts for X and Y, which are the processes performed in step S111 in FIG. 11 and step S1119 in FIG. 12, are not provided; the display region of the display is expanded to the maximum extent; and the slide-in region, which is updated according to changes in coordinate information, is extended.

[0133] That is, in FIG. 23, after going through the same processes as in step S1101 and step S1102 in FIG. 11, in step S2301, it is determined whether a drawer menu display-triggering area has been detected. Then, if the determination result is negative (NO), then the same process as in step S1104 in FIG. 11 is performed; in addition, if the determination result is affirmative (YES), then operation advances to a next step S2302, in which it is determined whether the area that was detected in step S2301 is A, B, C, or D.

[0134] Then, if the determination result is A or D, then operation advances to step S2303 after going through the same process as in step S1106 in FIG. 11; if the determination result is B or C, then the same process as in step S1114 in FIG. 12 is performed.

[0135] In step S2303, operation stands by to receive X-coordinate information and ignores the Y coordinate. Next, in step S2304, it is determined whether to continuously update the bar display position in accordance with the X coordinate. Next, if it is not updated, then operation advances to step S2307, in which the display state is maintained, after which the present processing operation is ended; in addition, if it is updated, then operation advances to step S2305, in which it is determined whether to update the position if detected coordinates are further indicated in the opposite direction. Next, if it is not updated, then operation advances to step S2307; in addition, if it is updated, then operation advances to step S2306, in which the drawer menu display is

turned OFF (OFF) in the state in which the slide-in amount x is less than a defined amount, after which the present processing operation is ended.

[0136] (Fourth Embodiment) Next, a fourth embodiment of the present invention will be described using FIG. 24 and FIG. 25.

[0137] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0138] Although methods for displaying menus sorted into four categories in which the four edges are triggers have primarily been described in the embodiments described above, the maximum number of categories in these methods is limited to four, given that a typical quadrangular display is installed. Accordingly, the present embodiment gives consideration to trigger positions and display methods in situations in which the number of items is further increased.

[0139] FIG. 24 is a diagram showing screen display examples of an infrequently used advanced menu in the information-processing apparatus according to the present embodiment, and FIG. 25 is a flow chart showing the flow of an operation for displaying an infrequently used advanced menu in the information-processing apparatus according to the present embodiment.

[0140] In FIG. 24, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0141] In FIG. 24 and FIG. 25, an example that contemplates displaying a category-a advanced menu is shown.

[0142] Positions that avoid the coordinate definition region of the "drawer menu display-triggering-region area" described using FIG. 5 in the first embodiment described above are set as trigger-region areas and assigned to the activation of particularly infrequently used functions, such as special settings (e.g., advanced settings, user settings, etc.). In 2400 in the screen display examples in FIG. 24, a, b, c, and d are the triggering region areas. Whereas consideration was given to casually and easily displaying ordinarily used menus by using the four edges surrounding the display 803 as triggers, the present embodiment conversely gives consideration to keeping functions from being easily displayed even if an erroneous manipulation is performed; thus, consideration is given to forms in which coordinates within the defined regions can easily be indicated, despite the surface area of the activation triggering regions being small, by pressing the tip portion of the input device 107 against the step part 109 surrounding the display 803 so that menus can be smoothly displayed when consciously activated.

[0143] Although the slide-in directions for the drawer tools described in the embodiments described above have hitherto been strictly defined as the horizontal direction or the vertical direction, functions in the present embodiment are characterized by a coordinate calculation method for displaying a menu without an unnatural feel in response to an indication of an oblique direction as a slide-in direction.

[0144] That is, information for whichever of the detected coordinates for the X axis and Y axis has the larger absolute

value, assuming an origin of 0 (i.e., the point farthest from the specified corner), is received with priority. In 2402 in the screen display examples in FIG. 24, a 45° bar 2406 passing through said point is displayed, and is displayed using a sliding manipulation in a diagonal direction.

[0145] The details of the process during sliding in are the same as in the menu display methods in the embodiments described above.

[0146] In FIG. 25, the state in which a photographic image or the like is displayed using the entire display screen of the image-displaying display 803 (a full-screen image view state) is entered in step S2501. Next, in step S2502, arbitrary coordinates are detected. Next, in step S2503, it is determined whether a menu-triggering area for a category-a advanced menu is a defined area. Then, if it is determined that the menu-triggering area is not a defined area, then operation advances to step S2509, in which it is determined whether a GUI function button has been turned ON. Then, if it is determined that a GUI function button has not been turned ON, then operation returns to step S2503; if it is determined that a GUI function button has been turned ON, then operation advances to step S2510, in which the function process is executed, after which the present processing operation is ended.

[0147] Meanwhile, if it is determined in step S2503 that the menu-triggering area is a defined area, then operation advances to a next step S2504, in which it is determined whether the area detected in step S2503 is a, b, c, or d. Then, if it is determined that it is a or d, then operation advances to step S2505; if it is determined that it is b or c, then operation advances to the corresponding process step.

[0148] In step S2505, it is determined whether the trigger area is highlighted and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S2503; if the determination result is affirmative (YES), then operation advances to a next step S2506, in which whichever of the X and Y coordinates is farther from the initially received coordinate is prioritized, and the slide-in amount from the corner is updated in accordance with a bar passing through that point.

[0149] Next, operation advances to step S2507, in which the sliding-in is stopped at the maximum slide-in-amount position; in a next step S2508, if the cursor has moved from the maximum slide-in-amount position in a direction not toward the activation point, then that movement is ignored and coordinate information is enabled until it is turned OFF (OFF), after which the present processing operation is ended.

[0150] (Fifth Embodiment) Next, a fifth embodiment of the present invention will be described using FIG. 26 and FIG. 27.

[0151] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0152] FIG. 26 is a diagram showing screen display

examples of an infrequently used menu in the information-processing apparatus according to the present embodiment, and FIG. 27 is a flow chart showing the flow of an operation for displaying an infrequently used menu in the information-processing apparatus according to the present embodiment.

[0153] In FIG. 26, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0154] In step S2701 in FIG. 27, the state in which a photographic image or the like is displayed using the entire display screen of the image-displaying display 803 (a full-screen image view state) is entered. Next, in step S2702, arbitrary coordinates are detected. Next, in step S2703, it is determined whether a menu-triggering area for a category-a advanced menu is a defined area. Then, if it is determined that the menu-triggering area is not a defined area, then operation advances to step S2708, in which it is determined whether a GUI function button has been turned ON. Then, if it is determined that a GUI function button has not been turned ON, then operation returns to step S2703; if it is determined that a GUI function button has been turned ON, then operation advances to step S2709, in which the function process is executed, after which the present processing operation is ended.

[0155] Meanwhile, if it is determined in step S2703 that the menu-triggering area is a defined area, then operation advances to step S2704, in which it is determined whether the area detected in step S2703 is a, b, c, or d. Then, if it is determined that it is a or d, then operation advances to step S2705; if it is determined that it is b or c, then operation advances to the corresponding process step.

[0156] In step S2705, it is determined whether an activation button that activates a settings menu has popped up, the trigger area has been highlighted, and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S2703; if the determination result is affirmative (YES), then the activation button is selected (shifted in a diagonally rightward direction) in a next step S2706. Next, in step S2707, an advanced menu is displayed on the display 803, after which the present processing operation is ended.

[0157] That is, when coordinates are detected within the defined area of the category-a advanced menu, an activation button that activates a settings menu pops up, as shown in 2602 in the screen display examples in FIG. 26. By sliding the input device 107 in a direction somewhat diagonally upward toward the right from that state, the interior of the activation button region is detected, after which, when the detected coordinate information becomes 0 (OFF), the activation button selected in 2603 in the screen display examples in FIG. 26 is executed and processed, and an advanced settings menu is displayed on the display 803, as shown in 2604 in the screen display examples in FIG. 26.

[0158] When closing this advanced settings menu,

coordinates within the range of the "SETTINGS" text shown in 2604 in the screen display examples in FIG. 26 are similarly indicated, after which a means for detecting the interior of the region of trigger area a or a means such as providing a CLOSE button somewhere in the layout of the window shown in 2604 in the screen display examples in FIG. 26 can be contemplated.

[0159] Note that the provision of such means makes it possible to sort the basic menus into up to four categories and to sort other advanced settings menus into four categories; however, because this method for displaying advanced menus assumes infrequent use and a low probability of erroneous manipulations, it is preferable to limit the options to approximately two if installation in a commercial product is taken into consideration.

[0160] In addition, in view of practical use conditions, it is preferable to have the ability to change positions, in terms of which two of the four corners of the display 803 are used for activation, according to the dominant hand of the user. It is necessary to be able to change settings so as to conform to the principle that the natural stroke direction for a right-handed person is from the lower left to the upper right (2607 in the screen display examples in FIG. 26) and the natural stroke direction for a left-handed person is from the upper left to the lower right (2608 in the screen display examples in FIG. 26); the layout shown in 2605 in the screen display examples in FIG. 26 is optimal for right-handed users, and the layout shown in 2606 in the screen display examples in FIG. 26 is optimal for left-handed users.

[0161] This means for setting optimization for the dominant hand is effective through the diversification of the gesture, scrolling, or movement method by which, after a selection has been made using an operation method based on the use of the input device to select a soft-touch button on the screen of the display, as in existing devices, the input device is slid on the screen to process a command.

[0162] (Sixth Embodiment) Next, a sixth embodiment of the present invention will be described using FIG. 28 and FIG. 35.

[0163] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0164] FIG. 28 is a diagram showing screen display examples of a situation in which the slide-in relationship between two drawer menus in the information-processing apparatus according to the present embodiment is a perpendicular relationship, FIG. 29 is a diagram showing screen display examples of a situation in which the slide-in relationship between two drawer menus in the information-processing apparatus according to the present embodiment is a parallel relationship, FIGS. 30–32 are diagrams showing screen display examples of situations in which two or more drawer menus are slid in in the information-processing apparatus according to the present embodiment, FIG. 33 is a flow chart showing the flow of operation and basic principles according to the positional relationship between menus when two or more and up to four drawer menus are slid in in the information-processing apparatus according to the present embodiment, and FIG. 34 and FIG. 35 are flow charts showing an operation flow for sliding in and displaying a maximum of four drawer menus in the information-

processing apparatus according to the present embodiment.

[0165] In FIG. 28 to FIG. 32, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0166] The present embodiment has a configuration such that drawer menus are displayed from multiple directions at the same time and is applicable in situations in which the display surface area of the display 803 is large.

[0167] In situations in which two drawer menus are displayed at the same time, a distinction is made between perpendicular relationships and parallel relationships according to the positional relationship between the two drawer menus; there are four display patterns for perpendicular positional relationships and two display patterns for parallel positional relationships. Furthermore, the display method differs depending on the order in which the menus are slid in, the menu displayed first is affected by subsequently selected tools, and screen transitions are as shown in FIG. 28 and FIG. 29.

[0168] In FIG. 28 and FIG. 29, the numbers over the slid-in menus indicate the order in which the menus were slid in.

[0169] FIG. 28 shows screen display examples in which the relationship between the two drawers is a perpendicular relationship; in the same drawing, the examples shown in 2800–2803 and the examples shown in 2804–2807 are a comparison showing how the display method differs according to the order in which the two drawers are slid in, even if the relationship between the two drawers is the same. The drawing also shows relationships in which the handling of the menu slid in later is prioritized and the interiors of the menus are displayed as usual; as a result, the display of the menu slid in first is consequently affected.

[0170] In 2800 in the screen display examples in FIG. 28, in the state in which the category-A menu is already slid in, if the category-B menu, which is in a perpendicular positional relationship therewith, is slid in, then the Y-axis direction of the category-A menu is displayed rescaled/downscaled according to the amount by which the category-B tools are slid in, as shown in 2802 in the screen display examples in FIG. 28; the progression up to being fixed at the position of the maximum slide-in amount of the category-B menu in 2803 in the screen display examples in FIG. 28 is shown.

[0171] There are situations wherein display processes in which the contents displayed within the category-A tools are simply scaled down as image information, and, depending on the specifications, there can also be situations in which display information is altered if scaled down. For example, it is also possible to alter the type of information in accordance with the display area of the display 803, such as by displaying the options within the category-A menu using a combination of icons and text in 2801 in the screen display examples in FIG. 28, but using only icons in 2803 in the screen display examples in FIG. 28.

[0172] Next, in 2804 in the screen display examples in FIG. 28, in the state in which the category-B menu is already slid in, if the category-A menu, which is in a perpendicular positional relationship therewith, is slid in, then the X-axis direction of the category-B menu is displayed scaled down

according to the amount by which the category-A menu and the contents thereof have been slid in, as shown in 2806 in the screen display examples in FIG. 28; the progression up to being fixed at the position of the maximum slide-in amount of the category-A menu in 2807 in the screen display examples in FIG. 28 is shown.

[0173] FIG. 29 shows screen display examples in which two or more drawers in a parallel relationship are slid in; in 2901 in the screen display examples in the same drawing, in the state in which the category-A menu is being displayed, when the category-D menu, which is in a parallel positional relationship therewith, is about to be slid in, the category-A menu is rescaled/downscaled in the reverse direction while keeping the slide-in distance constant according to the slide-in direction and the slide-in amount of the category-D menu (2902–2903 in the screen display examples in FIG. 29). This is because, by continuously displaying a certain amount of the display area other than menus as a feature of adopting this slide-in method, the main idea is to ensure listability of images other than drawers.

[0174] FIG. 30 shows screen display examples in which two or more menus are slid in; the display method differs between the situation wherein, in the state in which a third "drawer menu" is to be slid in, tools from two edges aligned in perpendicular directions are displayed and the situation wherein tools from two edges aligned in parallel directions are displayed.

[0175] The former will be described in FIG. 30. Screen changes are shown for the situation in which the tools are at positions such that the third tool is in a parallel relationship with the second drawer as a continuation of 2803 in the screen display examples in FIG. 28 (3001–3003 in the screen display examples in FIG. 30), and the situation in which the third tool is perpendicular to the second drawer (3004–3006 in the screen display examples in FIG. 30).

[0176] In 3001–3003 in the screen display examples in FIG. 30, the drawer of the category-A menu, which is in a perpendicular relationship, is already in the state in which the contents are displayed scaled down from the maximum display in the vertical direction; thus, the display state changes according to the principle of the relationship between facing tools in a manner ensuring that the scaled-down amount is minimized. Because the positional relationship between the category-B menu and the category-C menu is a parallel relationship, in 3002–3003 in the screen display examples in FIG. 30, steps S3303–S3304 in FIG. 33 (described below) are applied; this is shown in step S3416 in FIG. 34 (described below).

[0177] In addition, in 3004–3006 in the screen display examples in FIG. 30, the category-A tools are tools in a facing positional relationship, the category-B tools are tools in a perpendicular relationship, and change occurs according to the sequence of events in the screen display examples shown in FIG. 30 according to the respective principles. In addition, because the positional relationship between the category-B menu and the category-D menu is a perpendicular relationship, in 3005–3006 in the screen display examples in FIG. 30, steps S3304–3305 in FIG. 33 (described below) are applied; this is shown in step S3417 in FIG. 34 (described below).

[0178] FIG. 31 shows screen display examples of the situation in which two or more drawers are slid in, and shows

an example of the latter described above in 3100–3103 in the screen display examples of the same drawing; the display progression in the situation in which the third tools are slid in from two edges aligned in a parallel direction as a continuation of 2903 in the screen display examples in FIG. 29 is shown.

[0179] Because the relationship with the two already slid-in drawers is perpendicular, the principles in step S3304 to step S3305 in FIG. 33 (described below) are applied, and, as the third drawer is slid in, the already displayed category-A tools and category-D tools are both simultaneously scaled down and deformed in the Y-axis direction. This is shown in step S3407 in FIG. 34 (described below).

[0180] Screen display examples of a progression according to similar rules is shown in 3104–3107 in the screen display examples in FIG. 31 as a continuation of 2907 in the screen display examples in FIG. 29.

[0181] FIG. 32 shows screen display examples of the situation in which two or more drawers are slid in, and shows screen display examples of intermediate progress in the situation in which four edges are slid in to the maximum amount according to the above-described principles.

[0182] 3201–3203 in the screen display examples in FIG. 32 show intermediate progress in a process of sliding in the remaining category-D tools as a continuation of 3003 in the screen display examples in FIG. 30. 3204–3206 in the screen display examples in FIG. 32 show intermediate progress in a process of sliding in the remaining category-C tools as a continuation of 3006 in the screen display examples in FIG. 30. 3207–3209 in the screen display examples in FIG. 32 show intermediate progress in a process of sliding in the remaining category-C tools as a continuation of 3003 in the screen display examples in FIG. 30. 3210–3212 in the screen display examples in FIG. 32 show intermediate progress in a process of sliding in the remaining category-D tools as a continuation of 3007 in the screen display examples in FIG. 30.

[0183] Note that if one wishes to close one of the drawers in any process, then that drawer can be closed, regardless of the order in which the drawers were slid in, by indicating coordinates within the defined area of the menu bar and sliding from there in the direction from which the tools were initially slid in.

[0184] In addition, for ease of explaining the situation in which a plurality of drawer menus is slid in, an example was described in which the maximum slide-in amount is set to up to a position at half of the display surface area of the display 803, but the present invention is not limited thereto, and the means in each of the embodiments described above are applicable to processes such as holding at an arbitrary position during the course of sliding in or, depending on the specifications, expanding the maximum slide-in amount.

[0185] First, basic principles and operations based on the positional relationship between menus when two to four menus are slid in in the information-processing apparatus according to the present embodiment will be described on the basis of the flow chart in FIG. 33.

[0186] In step S3301, a menu on any one of the four edges surrounding the display 803 is in a slid-in state, and, in a next step S3302, it is determined whether the positional relationship thereof with the first drawer menu is a facing

positional relationship or a perpendicular positional relationship. Then, if it is determined to be a facing positional relationship, then operation advances to step S3303, in which the slide-in direction of the first drawer menu is subjected to a rescaling/downscaling display process while a constant distance is maintained between the drawer menus. Next, operation advances to step S3304, in which the drawer is fixed at a position for a slide-in amount equal to 1/2 of the slide-in amount in the situation where the drawer is displayed alone, after which the present processing operation is ended.

[0187] Meanwhile, if it is determined in step S3302 to be a perpendicular positional relationship, then operation advances to step S3305, in which the first drawer menu is subjected to a rescaling/downscaling display process in the same direction as the direction in which the second drawer menu was slid in. Next, operation advances to step S3306, in which it is fixed at the position of the maximum slide-in amount of the second drawer menu, after which the present processing operation is ended.

[0188] The foregoing are the basic principles when displaying a plurality of menus, and are applicable even if the number of menus to be slid-in increases.

[0189] Next, the overall operation up to a maximum of four menus being displayed in the information-processing apparatus according to the present embodiment will be described on the basis of the flow chart in FIG. 34 and FIG. 35.

[0190] First, in FIG. 34, the state in which the category-A drawer menu is slid in is entered in step S3401, and the second tools are slid in in step S3402. Next, in step S3403, it is determined whether the positional relationship between the second tools that were slid in in step S3402 and the tools that were slid in first is a facing positional relationship (2901–2903 in the screen display examples in FIG. 29) or a perpendicular positional relationship (2801–2803 in the screen display examples in FIG. 28). Then, if it is determined to be a perpendicular positional relationship, then operation advances to the process described below in FIG. 35; if it is determined to be a facing positional relationship, then operation advances to a next step S3404.

[0191] In step S3404, the category-D tools are displayed, and, while maintaining the distance to the category-A tools according to the slide-in amount, the category-A tools are displayed in the state in which they are scaled down in the reverse direction of the slide-in direction of the category-D tools. Next, in step S3405, third tools are slid in, and, in a next step S3406, it is determined whether the positional relationship between the third tools slid in in step S3405 and the displayed tools is a facing positional relationship (3101–3103 in the screen display examples in FIG. 31) or a perpendicular positional relationship. Then, if it is determined to be a facing positional relationship, then operation advances to step S3407; if it is determined to be a perpendicular positional relationship, then operation advances to step S3408.

[0192] In step S3407, the category-B tools are displayed and the Y-axis directions of the already displayed category-A tools and category-D tools are subjected to a rescaling/downscaling display process relative to the Y-axis-direction slide-in amount, after which operation advances to step S3409.

[0193] Meanwhile, if it is determined to be a perpendicular positional relationship in step S3406, then operation advances to step S3408, in which the category-C tools are displayed and the Y-axis directions of the already displayed category-A tools and category-D tools are subjected to a rescaling/downscaling display process relative to the Y-axis-direction slide-in amount, after which operation advances to step S3409.

[0194] Fourth tools are slid in in step S3409, the category-C tools are slid in in step S3410, and the category-B tools are slid in in step S3411.

[0195] In step S3412 in FIG. 35, the category-B tools are displayed and the Y-axis direction of the already displayed category-A tools is subjected to a rescaling/downscaling display process relative to the Y-axis-direction slide-in amount, after which operation advances to step S3414. In addition, in step S3413, the category-C tools are displayed and the Y-axis direction of the already displayed category-A tools is subjected to a rescaling/downscaling display process relative to the Y-axis-direction slide-in amount, after which operation advances to step S3414.

[0196] In step S3414, third tools are slid in, and in a next step S3415, it is determined whether the positional relationship between the third tools slid in in step S3414 and the second tools slid in before the third tools is a facing positional relationship or a perpendicular positional relationship. Then, if it is determined to be a facing positional relationship, then operation advances to step S3416; if it is determined to be a perpendicular positional relationship, then operation advances to step S3417.

[0197] In step S3416, the category-C tools are displayed, the Y-axis direction of the already displayed category-B tools is subjected to a rescaling/downscaling display process relative to the Y-axis-direction slide-in amount, and, in that state, the positions of the category-A tools are shifted, after which operation advances to step S3418.

[0198] Meanwhile, if it is determined in step S3415 to be a perpendicular positional relationship, then operation advances to step S3417, in which the category-D tools are displayed, the Y-axis directions of the already displayed category-A tools and category-B tools are subjected to a rescaling/downscaling display process relative to the X-axis-direction slide-in amount, and the category-A tools are also subjected to a rescaling/downscaling display process according to the slide-in amount of the category-D tools while maintaining the distance, after which operation advances to step S3418.

[0199] Fourth tools are slid in in step S3418, the category-D tools are slid in in step S3419, and the category-B tools are slid in in step S3420.

[0200] (Seventh Embodiment) Next, a seventh embodiment of the present invention will be described using FIG. 36 to FIG. 42.

[0201] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0202] FIG. 36 is a diagram showing screen display

examples of the progression of changes in a main image when a drawer menu is activated in the information-processing apparatus according to the present embodiment, FIG. 37 and FIG. 38 are flow charts showing the operational flow of the progression of changes in a main image when a drawer menu is activated in the information-processing apparatus according to the present embodiment, FIG. 39 is a diagram showing screen display examples of a relationship with a main image when a drawer menu is closed in the information-processing apparatus according to the present embodiment, FIG. 40 and FIG. 41 are flow charts showing the operational flow of the relationship with a main image when a drawer menu is closed in the information-processing apparatus according to the present embodiment, and FIG. 42 is a diagram showing screen display examples of a relationship between a storage position of a drawer menu and a main image in the information-processing apparatus according to the present embodiment.

[0203] In FIG. 36, FIG. 39, and FIG. 42, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0204] In the present embodiment, changes in a main image attendant on the slide-in amount of a menu will be described using the category-B menu as an example, and the principles of FIG. 5 and FIG. 6 are assumed for the rest.

[0205] FIG. 36 shows a screen display example illustrating how a main image A displayed in advance before a menu is displayed is progressively deformed by a drawer menu being slid in.

[0206] The main image A is, for example, a photographic image, text, or a mix of a photo and text. In addition, situations in which the main image A is a reproduced image already stored in internal memory or a viewfinder image captured by the CCD of the camera part 102 in the image-capture standby state are also contemplated.

[0207] Although an example of the function of a reproduced image in internal memory was described using FIG. 2, when in the image-capture standby state, categories can be sorted the same as when reproducing an image, and functions of a similar nature can be assigned. For example, it can be contemplated that functions for searching for a past image to be composited with an image about to be captured are assigned to the category-A menu, functions for inputting text or the like for writing in information to be written to an image to be captured are assigned to the category-B menu, functions for setting functions such as special effects on an image about to be captured are assigned to the category-C menu, and functions for, e.g., presetting where captured images are to be saved are assigned to the category-D menu.

[0208] In FIG. 37, the main image A is reproduced in full screen (full screen) in step S3701 (3600 in the screen display examples in FIG. 36). Next, in step S3702, arbitrary coordinates are detected, and, in a next step S3703, it is determined whether a "drawer menu display-triggering area" has been detected. Next, in step S1103, it is determined whether coordinates have been detected within the "drawer menu display-triggering area." Next, if it is determined that no coordinates have been detected within the "drawer menu display-triggering area," then operation advances to step

S3704, in which it is determined whether to remain on coordinate input standby until a defined area is entered. Then, if it is determined to remain on coordinate input standby until a defined area is entered, then operation returns to step S3703; if it is determined not to remain on coordinate input standby until a defined area is entered, then operation returns to step S3701.

[0209] Meanwhile, if it is determined in step S3703 that coordinates have been detected in a "drawer menu display-triggering area," then operation advances to step S3705, in which it is determined whether the area that was detected in step S3703 is A, B, C, or D. Then, if it is determined that it is A or D, then operation advances to step S3706; if it is determined that it is B or C, then operation advances to step S3710 in FIG. 38 (described below).

[0210] In step S3706, it is determined whether the trigger area is highlighted and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S3701; if the determination result is affirmative (YES), then, in a next step S3707, operation stands by to receive X-coordinate information and ignores the Y coordinate; in a next step S3708, it is determined whether to deform the image in 3600 in the screen display examples in FIG. 36 at a ratio of $X - x$ to X according to the X-coordinate information and to continuously update the display ratio. Then, if the determination result is negative (NO), then operation advances to step S3710, in which the display state is maintained; if the determination result is affirmative (YES), then operation advances to a next step S3709, in which it is determined whether to deform and fix the image in 3600 in the screen display examples in FIG. 36 at a ratio of $X/2$ to X . Then, if the determination result is negative (NO), then operation advances to step S3710; if the determination result is affirmative (YES), then the present processing operation is ended.

[0211] In step S3710 in FIG. 38, it is determined whether the trigger area is highlighted and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S3701; if the determination result is affirmative (YES), then operation advances to step S3711, in which operation stands by to receive Y-coordinate information and ignores the X coordinate. Next, in step S3712, the image in 3600 in the screen display examples in FIG. 36 is deformed at a ratio of $Y - y$ to Y in accordance with the Y-coordinate information, and it is determined whether to continuously update the display ratio. Then, if the determination result is negative (NO), then operation returns to step S3710 in FIG. 37; if the determination result is affirmative (YES), then operation advances to step S3713, in which it is determined whether to deform and fix the image in 3600 in the screen display examples in FIG. 36 at a ratio of $Y/2$ to Y . Then, if the determination result is negative (NO), then operation returns to step S3710; if the determination result is affirmative (YES), then the present processing operation is ended.

[0212] That is, main image A is reproduced in full screen;

next, a drawer menu display-triggering area is detected, after which the slide-in amount of the menu is continuously updated in tandem with changes in the detection information concerning the Y-axis coordinate. Meanwhile, the main image A is concurrently subjected to a rescaling/downscaling display process in the Y-axis direction at a ratio of $Y - y$ to Y , and the main image A is maintained in the state in which it is displayed rescaled/downscaled to 1/2 in the Y-axis direction from the maximum slide-in-amount position of the category-B menu. Alternatively, when coordinate detection is turned OFF at an arbitrary location while sliding in, that state is maintained as is and image processing or the like is executed by detection of an input of an arbitrary function button in the menu.

[0213] Next, operation when closing a drawer menu in the information-processing apparatus according to the present embodiment will be described using FIG. 39 and FIG. 40.

[0214] Here, changes in the main image A that accompany the slide-in amount of a menu will be described using the category-B menu as an example, and the principles of FIG. 7 and FIG. 8 described above are assumed for the rest.

[0215] In step S4001 in FIG. 40, the image in 3900 in the screen display examples in FIG. 39 is deformed and fixed at a ratio of $X/2$ to X . Next, in step S4002, arbitrary coordinates are detected, and, in a next step S4003, it is determined whether the display menu movement-triggering area is a defined area. Then, if the determination result is negative (NO), then operation advances to step S4009, in which it is determined whether a GUI function button has turned ON. Then, if the result is negative (NO), then operation returns to step S4003; if the determination result is affirmative (YES), then operation advances to step S4010, in which a function process is executed, after which the present processing operation is ended.

[0216] Meanwhile, if it is determined in step S4003 that the display menu movement-triggering area is a defined area, then operation advances to step S4004, in which it is determined whether the area that was detected in step S4002 is A, B, C, or D. Then, if it is determined that it is A or D, then operation advances to step S4005; if it is determined that it is B or C, then operation advances to step S4012 in FIG. 41 (described below).

[0217] In step S4005, the trigger area is highlighted and the buzzer is turned ON, and, in a next step S4006, operation stands by to receive X-coordinate information and ignores the Y coordinate. Next, in step S4007, it is determined whether to deform the image in 3900 in the screen display examples in FIG. 39 at a ratio of $X - x$ to X in accordance with the X-coordinate information and to continuously update the display ratio. Then, if the determination result is negative (NO), then operation advances to step S4011, in which the display state is maintained, after which the present processing operation is ended.

[0218] Meanwhile, if the determination result in step S4007 is affirmative (YES), then operation advances to step S4008, in which it is determined whether to maintain full-screen display at the original aspect ratio. Then, if the determination result is negative (NO), then operation advances to step S4011; if the determination result is affirmative (YES), then the present processing operation is ended.

[0219] In step S4012 in FIG. 41, it is determined whether the trigger area is highlighted and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S4003 in FIG. 40; if the

determination result is affirmative (YES), then operation advances to step S4013, in which it is determined whether to stand by to receive Y-coordinate information and ignore the X coordinate. Then, if the determination result is negative (NO), then operation returns to step S4003 in FIG. 40; if the determination result is affirmative (YES), then operation advances to step S4014, in which it is determined whether to deform the image in 3900 in the screen display examples in FIG. 39 at a ratio of $Y - y$ to Y in accordance with the Y-coordinate information and to continuously update the display ratio. Then, if the determination result is negative (NO), then operation returns to step S4011 in FIG. 40; if the determination result is affirmative (YES), then operation advances to step S4015, in which it is determined whether to maintain a full-screen display at a proper aspect ratio. Then, if the determination result is negative (NO), then operation returns to step S4011 in FIG. 40; if the determination result is affirmative (YES), then the present processing operation is ended.

[0220] That is, in the state in which the drawer menu is displayed in full screen (full screen) (3900 in the screen display examples in FIG. 39), if coordinates within the respective defined areas of the function buttons within the menu shown in 3902 in the screen display examples in FIG. 39 are detected, then the respective functions are processed, and the processing results are reflected in the main image A according to the process details. Alternatively, if the input device 107 is slid in in the direction indicated by the arrow in 3904 in the screen display examples in FIG. 39, then it is ignored.

[0221] The interior of the category-B "menu-display-triggering area" (3903 in the screen display examples in FIG. 39) is directly indicated from the state in 3900 in the screen display examples in FIG. 39; alternatively, without moving the input device 107 away from the touch panel sensor 106 of the display 803 from 3901 in the screen display examples in FIG. 39, the input device 107 is slid as-is to indicate the interior of the "menu-display-triggering area" shown in 3903 in the screen display examples in FIG. 39; next, a standby state for the next detected change in coordinate information is entered.

[0222] Because the category-B menu is used as an example here, the selected bar is highlighted and, simultaneously, the buzzer emits a sound and a coordinate-information-reception standby state is entered. Next, the image in 3900 in the screen display examples in FIG. 39 is displayed downscaled at a ratio of $Y - y$ to Y in accordance with the Y-coordinate information, and the display ratio is continuously updated as the detected coordinates change. In addition, if coordinate detection is turned OFF after the slide-in amount y enters within a defined amount or the detected coordinates are updated to the position shown in 3909 in the screen display examples in FIG. 39, then the display returns to the state of the full-screen display of the main image A

from before the menu was displayed.

[0223] FIG. 42 shows the relationship between the storage positions of the drawer menus and the main image A; the method by which the main image A is displayed deformed and downscaled differs depending on which edge is slid in.

[0224] For example, in 4204 in the image display examples in FIG. 42, it is assumed that a list of colors for text inputted using the input device 107 is laid out like a color palette.

[0225] It is contemplated that a color can be selected, text can be written onto the image in the state shown in 4204 in the image display examples in FIG. 42 without closing the drawer, and the user can continue to write as is while changing the color along the way. In this situation, the following possibilities are conceivable: a method in which, when the drawer is closed, the text is converted to the ratio at which it was written and is displayed over the image; and a method in which, when the drawer is closed, the image returns to its original ratio and, concurrently, the text is rescaled in the vertical direction to the scale at which it was written.

[0226] Furthermore, in 4202, 4204, 4206, and 4208 in the image display examples in FIG. 42, if a display at the same aspect ratio as the original image is desired, then it can be viewed by means such as grabbing and scrolling a corner of the rescaled image with the input device 107. For example, if the above-described operation is performed in the state of the image in 4204 in the image display examples in FIG. 42, the state in 4303 in the image display examples in FIG. 43 (described below) is entered.

[0227] (Eighth Embodiment) Next, an eighth embodiment of the present invention will be described using FIG. 43 to FIG. 45.

[0228] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0229] FIG. 43 is a diagram showing screen display examples of the progression of changes in a main image accompanying changes in slide-in amount in the information-processing apparatus according to the present embodiment, and FIG. 44 and FIG. 45 are flow charts showing the operational flow of the progression of changes in a main image accompanying changes in slide-in amount in the information-processing apparatus according to the present embodiment.

[0230] In FIG. 43, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0231] Using the category-B tools as an example, 4300–4303 in the screen display examples in FIG. 43 show the intermediate progression of a display method in the situation in which the aspect ratio is kept constant as downscaling in the vertical direction is performed, i.e., the horizontal direction is similarly downscaled as well. Although this method can also be contemplated as a different embodiment having a completely different function or purpose, it is also possible to provide a means for the user to arbitrarily select either method via operation settings within the same equipment model or via a manipulation means performed while pressing any one of the buttons.

[0232] In addition, 4304–4307 in the screen display

examples in FIG. 43 show the situation in which a drawer menu is displayed in a manner overlapping the main image A without any change in the main image A whatsoever.

Although this method is not sufficient for the intended object of the present invention, the present invention assumes, from the start, being equipped with a CPU capable of extremely high-speed computational processing, and thus contemplates an image being displayed downscaled in real time; however, the present embodiment has also been presented as a transitional stage until this becomes technically feasible.

[0233] In the present embodiment, a drawer overlaps the image while it is slid in, and, when the detected coordinate information is turned OFF, image processing is performed for the required length of time to rewrite the main image A. For example, if the detected coordinate information is turned OFF when the slide-in amount is as in 4305 in the screen display examples in FIG. 43, then the menu slide-in amount and the rescaled/downscaled display of the main image A are rewritten into a display such as in 4308 in the screen display examples in FIG. 43 after the required processing time has elapsed. In addition, if the detected coordinate information is turned OFF when the slide-in amount is as in 4306 in the screen display examples in FIG. 43, then the menu slide-in amount and the rescaled/downscaled display of the main image A are rewritten into a display such as in 4309 in the screen display examples in FIG. 43 after the required processing time has elapsed. Furthermore, if the detected coordinate information is turned OFF when the slide-in amount is as in 4307 in the screen display examples in FIG. 43, then the menu slide-in amount and the rescaled/downscaled display of the main image A are rewritten into a display such as in 4310 in the screen display examples in FIG. 43 after the required processing time has elapsed.

[0234] In step S4401 in FIG. 44, the state in which a photographic image or the like is displayed using the entire display screen of the image-displaying display 803 (a full-screen image view state) is entered. Next, in step S4402, arbitrary coordinates are detected. Next, in step S4403, it is determined whether coordinates within the "drawer menu display-triggering area" have been detected. Next, if it is determined that no coordinates have been detected within the "drawer menu display-triggering area," then operation advances to step S4404, in which it is determined whether to remain on coordinate input standby until a defined area is entered. Then, if it is determined not to remain on coordinate input standby until a defined area is entered, then operation returns to step S4401; in addition, if it is determined to remain on coordinate input standby until the defined area is entered, then operation returns to step S4403.

[0235] Meanwhile, if it is determined in step S4403 that coordinates have been detected in a "drawer menu display-triggering area," then operation advances to step S4405, in which it is determined whether the area that was detected in step S4403 is A, B, C, or D. Then, if it is determined that it is A or D, then operation advances to step S4406; if it is determined that it is B or C, then operation advances to step S4411 in FIG. 45 (described below).

[0236] In step S4406, it is determined whether the trigger area is highlighted and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation

returns to step S4401; if the determination result is affirmative (YES), then, in a next step S4407, operation stands by to receive X-coordinate information and ignores the Y coordinate; in a next step S4408, it is determined whether to downscale according to the X-coordinate information while maintaining, as is, the aspect ratio of the image in 4300 in the screen display examples in FIG. 43 and to continuously update the display ratio. Then, if the determination result is negative (NO), then operation advances to step S4410, in which the display state is maintained, after which the present processing operation is ended; if the determination result is affirmative (YES), then operation advances to step S4409, in which it is determined whether to deform and fix the image in 4300 in the screen display examples in FIG. 43 at a ratio of X/2 (vertical):Y/2 (horizontal). Then, if the determination result is negative (NO), then operation advances to step S4410; if the determination result is affirmative (YES), then the present processing operation is ended.

[0237] Next, in FIG. 45, first, in step S4411, it is determined whether the trigger area is highlighted and the buzzer has been turned ON. Then, if the determination result is negative (NO), then operation returns to step S4401 in FIG. 44; if the determination result is affirmative (YES), then, in a next step S4412, operation stands by to receive Y-coordinate information and ignores the X coordinate; in a next step S4413, it is determined whether to downscale according to the Y-coordinate information while maintaining, as is, the aspect ratio of the image in 4300 in the screen display examples in FIG. 43 and to continuously update the display ratio. Then, if the determination result is negative (NO), then operation advances to step S4410 in FIG. 44; in addition, if the determination result is affirmative (YES), then operation advances to a next step S4414, in which it is determined whether to deform and fix the image in 4300 in the screen display examples in FIG. 43 at a ratio of X/2 (vertical):Y/2 (horizontal). Then, if the determination result is negative (NO), then operation advances to step S4410 in FIG. 44; in addition, if the determination result is affirmative (YES), then the present processing operation is ended.

[0238] (Ninth Embodiment) Next, a ninth embodiment of the present invention will be described using FIG. 46 and FIG. 47.

[0239] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0240] FIG. 46 is a diagram showing screen display examples of a "drawer menu partial preview help" function in the information-processing apparatus according to the present embodiment, and FIG. 47 is a flow chart showing an operational flow of the "drawer menu partial preview help" function in the information-processing apparatus according to the present embodiment.

[0241] In FIG. 46, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0242] In the present invention, as described hitherto, the functions sorted into a drawer cannot be ascertained until a "drawer menu" is displayed by the user; therefore, it is assumed that the properties of the respective functions sorted

into the various drawers must be memorized in advance.

[0243] Accordingly, the present embodiment considers functions for assisting in using the apparatus expertly and without hesitation, even in the transitional period before a user has become accustomed to and memorized the functions.

[0244] Generally, in PCs and the like, a function whereby a balloon explaining in simple terms using text what function a button performs is displayed simply by placing a pointing device, such as a mouse, over a button, such as an icon, before executing the function of the button is called balloon help.

[0245] However, in the present invention, a presenting means is proposed whereby a partial preview of the contents of a drawer, presented in the same manner as when the drawer is displayed rather than as a list of function names, is provided, thereby enabling confirmation of the contents.

[0246] 4605 in the screen display examples in FIG. 46 is a screen display example of partial preview help of the contents of the category-A tools being displayed, and 4606 in the screen display examples in FIG. 46 is a screen display example showing, for contrast, a diagram of the category-A tools when slid in and displayed. In addition, another characteristic is that the positions of the visible icons appear the same.

[0247] In addition, if this function has been set in advance, then this function process is executed when the "drawer menu display-triggering areas" on the various edges are touched. Although the main image A is downscaled horizontally when the prerequisite drawer menu is being displayed, as shown in 4606 in the screen display examples in FIG. 46, a preview of only a specific area is displayed in 4605 in the screen display examples in FIG. 46; therefore, this has the advantage that, although the main image A is partially hidden, the image is not scaled down.

[0248] First, starting from the state in which only the main image A is displayed, when the interior of a respective "drawer menu display-triggering area" is selected, the portion of the drawer at the location nearest the indicated coordinates thereof is displayed. From there, when the tip of the input device 107 is pressed against the exterior frame and slid up and down within the category-A menu display-triggering area, the contents are scrolled. 4604 in the screen display examples in FIG. 46 is a screen display example when having scrolled to the bottom of the screen.

[0249] Through the means above, the contents of a drawer menu can be confirmed even if the drawer menu is not completely displayed, and, if the target function button is not found, then the interior of another drawer menu can be searched using the same method. In addition, if the icon of the target function button is found, then it is displayed as is for a prescribed length of time (2–3 seconds) when the input device 107 is moved away from the touch panel sensor 106, and, if the function icon is directly selected using the input

device 107 during this period, then the function is selected or executed, thus also enabling use as a shortcut function that affords simpler manipulation compared to methods in which the drawer menu is slid in and the target function button is selected.

[0250] 4607-4609 in the screen display examples in FIG. 46 are screen display examples for each of the tools other than the category-A tools described at the beginning, and show how this preview help is displayed (omitting icons, etc., in the content of the help) in response to indications of the respective drawer menu display-triggering areas and the directions in which the contents are scrolled through; the arrows show the direction when scrolling.

[0251] In step S4701 in FIG. 47, after going through the same processes as in step S4401 and step S4402 in FIG. 44, it is determined whether a "drawer menu-triggering area" has been detected. Then, if the determination result is negative (NO), then operation advances to step S4710, in which a screen reproducing only the main image A is shown, after which the present processing operation is ended; if the determination result is affirmative (YES), then operation advances to step S4702, in which it is determined whether help is ON (ON) or OFF (OFF). Then, if it is determined that it is OFF, then operation advances to the processes in step S505 onward in FIG. 5; in addition, if it is determined that it is ON, then operation advances to step S4703, in which it is determined whether the area that was detected in step S4701 is A, B, C, or D. Then, if it is A or D, then operation advances to step S4704; if it is B or C, then operation advances to step S4712.

[0252] In step S4704, operation stands by to receive X-coordinate information and ignores the Y coordinate, and, in a next step S4705, the display position of the preview help scrolls in the perpendicular direction in accordance with the Y-coordinate information and with the X coordinate being within the menu triggering-area definition. Next, in step S4706, it is determined whether it is a process performed while the display is being maintained for a prescribed length of time (2-3 seconds). Then, if the determination result is affirmative (YES), then operation advances to step S4707; if the determination result is negative (NO), then operation advances to step S4709.

[0253] In step S4707, an arbitrary icon within the preview help display is selected, and operation advances to a next step S4708. In step S4708, the preview help is turned OFF, after which the command of the selected icon is executed, after which the present processing operation is ended. In addition, in step S4709, the display of the preview help is turned OFF, after which the present processing operation is ended.

[0254] Meanwhile, in step S4712, operation stands by to receive Y-coordinate information and ignores the X coordinate, and, in a next step S4713, the display position of the preview help scrolls in the horizontal direction in accordance with the X-coordinate information and with the Y coordinate being within the menu triggering-area definition. Next, in step S4714, it is determined whether it is a process performed while the display is being maintained for a prescribed length

of time (2-3 seconds). Then, if the determination result is affirmative (YES), then operation advances to step S4715; if the determination result is negative (NO), then operation advances to step S4709. In step S4715, an arbitrary icon within the preview help display is selected, and, in a next step S4716, the preview help display is turned OFF, after which the command of the selected icon is executed, after which the present processing operation is ended.

[0255] (Tenth Embodiment) Next, a tenth embodiment of the present invention will be described using FIG. 48.

[0256] Note that the basic configuration of the information-processing apparatus according to the present embodiment is the same as that of the first embodiment described above in FIG. 1 to FIG. 8 and therefore will be described while reusing these drawings.

[0257] FIG. 48 is a diagram showing screen display examples of a "drawer menu partial preview help" function in the information-processing apparatus according to the present embodiment.

[0258] In FIG. 48, bar regions are shown over the four edges surrounding the display 803 in order to make the relationship between these four edges and other edges easier to understand; however, these are not necessarily all visible to the user.

[0259] The present embodiment is configured for application to situations in which the means described in the ninth embodiment described above cannot be realized owing to some sort of constraint.

[0260] 4801-4805 in the screen display examples in FIG. 48 are all screen display examples of situations in which coordinates are indicated for the drawer menu display-triggering area for the category-A menu.

[0261] The object of providing a partial preview in order to aid in quickly finding a function button without completely hiding the main image A is the same as that of the means described in the ninth embodiment described above and is given as an example of another conceivable presenting means.

[0262] 4801 in the screen display examples in FIG. 48 is a displaying means for obtaining the effect of making the contents easier to view by securing slightly more display region for this function. In addition, 4802 in the screen display examples in FIG. 48 is a displaying means for the situation in which this "drawer menu partial preview help" function has been executed, assuming expansion to the maximum slide-in amount shown in FIG. 22. In addition, 4803 in the screen display examples in FIG. 48 is a displaying means for displaying a full list all at once without scrolling through the "help" function. In addition, 4804 in the screen display examples in FIG. 48 is a displaying means for listing only the names of the function items in the "help" as text only, thereby minimizing the surface area of the preview region relative to the main image A. Furthermore, 4805 in the screen display examples in FIG. 48 is a displaying means for providing a soft scroll button in the layout in the situation in which a manipulation means for sliding and scrolling the edges surrounding the display 803 cannot be realized.

[0263] (Other Embodiments) The techniques described in the embodiments described above can also be adapted to operation of devices with display screens, such as still cameras, video cameras, electronic mobile terminals, notebook computers, head-mounted displays, car navigation systems, and the like.

[0264] In addition, they can also be adapted to display screens for desktop PCs, workstations, and the like. For example, with a PC, the mouse is slid in any direction—up, down, left, or right—and, when the cursor reaches an edge of the screen, it maintains its display position and a bar for sliding in the menu is displayed. By incorporating the manipulation means of clicking and holding and then sliding the mouse, starting from this state, toward the center, the manipulation of the present invention can be performed. This situation is characterized in that it is possible to rapidly display a list within a menu, and the user can arbitrarily adjust the amount of the display area.

[0265] In addition, in models equipped with so-called arrow keys, wherein mechanical switches are laid out in a plus formation—up, bottom, left, and right—a manipulation method is concurrently used wherein one of the edges is selected by depressing one of the up, bottom, left, and right mechanical switches and then removing one's finger to release the switch to cause the menu to be fixed and displayed in a slid-in state, thereby enabling the user to arbitrarily switch between manipulation using the input device 107 and using only the keys, as the manipulation circumstances demand.

[0266] In addition, although examples in which sliding in is continuous and a user can stop sliding in at any location have been described in the embodiments of the present invention, a method in which sliding in is limited to stopping in steps at a discrete number of fixed locations can also be contemplated as another method. This method has the advantage of enabling even faster processing speed and is a processing means to be considered, depending on the processing speed of the apparatus.

[0267] Note that it goes without saying that the object of the present invention can also be achieved by providing, to a system or an apparatus, a storage medium on which is recorded program code of software for realizing the functions of the embodiments described above, and causing a computer (or a CPU, an MPU, or the like) of the system or apparatus to read out and execute the program code stored in the storage medium.

[0268] In this situation, the program code read out from the storage medium will itself realize the functions of the embodiments described above, and the storage medium in which the program code is stored will constitute the present invention.

[0269] In addition, for example, a Floppy® disk, a hard disk, a magneto-optical disk, a CD-ROM, a CD-R, a CD-RW, a DVD-ROM, a DVD-RAM, a DVD-RW, a DVD+RW, magnetic tape, a nonvolatile memory card, ROM, or the like can be used as the storage medium for providing the program code.

[0270] In addition, it goes without saying that not only can

the functions of the embodiments described above be realized by executing program code read out by a computer, but the situation in which, on the basis of the instructions in the program code, an OS (operating system) or the like running on the computer performs some or all of the actual processing, thereby realizing the functions of the embodiments described above, is also encompassed.

[0271] In addition, it goes without saying that the situation in which, after the program code read out from the storage medium has been written to memory furnished in a function expansion board inserted into the computer or furnished in a function expansion unit connected to the computer, a CPU or the like furnished in the function expansion board or the function expansion unit then performs some or all of the actual processing on the basis of the instructions in the program code, thereby realizing the functions of the embodiments described above, is also encompassed.

[0272] EFFECTS OF THE INVENTION

According to the present invention, as described above, in a menu display method in which there are no keys whatsoever around the perimeter of the displaying means for performing specific functions and in which the four edges of the displaying means are display triggers, it is possible to specifically ascertain the types of function tools contained in the menus, which are categorized as top-level items, without scaling down the entire main image; furthermore, commands can be issued more quickly by directly selecting a target button, thereby making it possible to improve the visibility and ease of operation of the display screen.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view showing the configuration of an information-processing apparatus according to a first embodiment of the present invention.

FIG. 2 is a plan view showing the configuration of the information-processing apparatus according to the first embodiment of the present invention.

FIG. 3 is a rear view showing the configuration of the information-processing apparatus according to the first embodiment of the present invention.

FIG. 4 is a cross-sectional view taken along line IV-IV in FIG. 3.

FIG. 5 is a diagram showing an example of a coordinate definition for a "drawer menu display-triggering area" on a display in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 6 is a diagram showing an example of a coordinate definition for a "drawer menu display-triggering area" on the display in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 7 is a diagram showing an example of a coordinate definition for a "drawer menu display-triggering area" on the display in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 8 is a block diagram showing the configuration of the information-processing apparatus according to the first embodiment of the present invention.

FIG. 9 is a flow chart showing the flow of the functional operation of the information-processing apparatus according to the first embodiment of the present invention.

FIG. 10 is a diagram showing a screen display example of a drawer-menu-activating manipulation in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 11 is a flow chart showing the flow of a display operation when a drawer-menu-activating manipulation is performed in the information-processing apparatus according to

the first embodiment of the present invention.

FIG. 12 is a flow chart showing the flow of a display operation when a drawer-menu-activating manipulation is performed in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 13 is a diagram showing screen display examples of closing a drawer menu in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 14 is a flow chart showing the flow of a display operation when closing a drawer menu in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 15 is a flow chart showing the flow of a display operation when closing a drawer menu in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 16 includes screen display examples that show a method of laying out the interior of a drawer menu according to slide-in amount in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 17 is a flow chart showing the operational flow of displaying the interior of a drawer menu according to slide-in amount in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 18 includes screen display examples showing images of collapsed positions of drawer menus in the information-processing apparatus according to the first embodiment of the present invention.

FIG. 19 includes screen display examples of the situation in which a display is performed in stages according to function priority in an information-processing apparatus according to a second embodiment of the present invention.

FIG. 20 is a diagram showing range in the situation in which detected coordinates are turned OFF when a display is performed in stages according to function priority in the information-processing apparatus according to the second embodiment of the present invention.

FIG. 21 is a flow chart that shows a flow of a display operation in a situation in which a display is performed in stages according to function priority in the information-processing apparatus according to the second embodiment of the present invention.

FIG. 22 includes screen display examples pertaining to expanding the maximum slide-in amount in an information-processing apparatus according to a third embodiment of the present invention.

FIG. 23 is a flow chart showing a flow of a display operation pertaining to expanding the maximum slide-in amount in the information-processing apparatus according to the third embodiment of the present invention.

FIG. 24 includes screen display examples of an infrequently used advanced menu in an information-processing apparatus according to a fourth embodiment of the present invention.

FIG. 25 is a flow chart showing the flow of a display operation for an infrequently used advanced menu in the information-processing apparatus according to the fourth embodiment of the present invention.

FIG. 26 includes screen display examples of an infrequently used advanced menu in an information-processing apparatus according to a fifth embodiment of the present invention.

FIG. 27 is a flow chart showing the flow of a display operation for an infrequently used advanced menu in the information-processing apparatus according to the fifth embodiment of the present invention.

FIG. 28 includes screen display examples of the situation in which two or more drawer menus (two in perpendicular directions) are slid in in an information-processing apparatus according to a sixth embodiment of the present invention.

FIG. 29 includes screen display examples of the situation in

which two or more drawer menus (two in parallel directions) are slid in in an information-processing apparatus according to the sixth embodiment of the present invention.

FIG. 30 includes screen display examples of the situation in which two or more (three) drawer menus are slid in in an information-processing apparatus according to the sixth embodiment of the present invention.

FIG. 31 includes screen display examples of the situation in which two or more (three) drawer menus are slid in in an information-processing apparatus according to the sixth embodiment of the present invention.

FIG. 32 includes screen display examples of the situation in which two or more (four) drawer menus are slid in in an information-processing apparatus according to the sixth embodiment of the present invention.

FIG. 33 is a flow chart showing the flow of a display operation performed when sliding in two or more drawer menus in the information-processing apparatus according to the sixth embodiment of the present invention.

FIG. 34 is a flow chart showing the flow of a display operation performed when sliding in two or more drawer menus in the information-processing apparatus according to the sixth embodiment of the present invention.

FIG. 35 is a flow chart showing the flow of a display operation performed when sliding in two or more drawer menus in the information-processing apparatus according to the sixth embodiment of the present invention.

FIG. 36 includes screen display examples of the progression of changes in a main image when a drawer-menu-activating manipulation is performed in an information-processing apparatus according to a seventh embodiment of the present invention.

FIG. 37 is a flow chart showing the flow of a display operation for the progression of changes in a main image when a drawer-menu-activating manipulation is performed in the information-processing apparatus according to the seventh embodiment of the present invention.

FIG. 38 is a flow chart showing the flow of a display operation for the progression of changes in a main image when a drawer-menu-activating manipulation is performed in the information-processing apparatus according to the seventh embodiment of the present invention.

FIG. 39 includes screen display examples showing the relationship with a main image when a drawer menu is closed in the information-processing apparatus according to the seventh embodiment of the present invention.

FIG. 40 is a flow chart showing the flow of a display operation for the relationship with a main image when a drawer menu is closed in the information-processing apparatus according to the seventh embodiment of the present invention.

FIG. 41 is a flow chart showing the flow of a display operation for the relationship with a main image when a drawer menu is closed in the information-processing apparatus according to the seventh embodiment of the present invention.

FIG. 42 includes screen display examples showing the relationship between a storage position of a drawer menu and changes in a main image in the information-processing apparatus according to the seventh embodiment of the present invention.

FIG. 43 includes screen display examples showing the relationship with changes in a main image accompanying changes in the slide-in amount of a drawer menu in an information-processing apparatus according to an eighth embodiment of the present invention.

FIG. 44 is a flow chart showing the flow of a display operation for the relationship with changes in a main image accompanying changes in the slide-in amount of a drawer menu in an information-processing apparatus according to an eighth embodiment of the present invention.

FIG. 45 is a flow chart showing the flow of a display operation for the relationship with changes in a main image accompanying changes in the slide-in amount of a drawer menu

in an information-processing apparatus according to an eighth embodiment of the present invention.

FIG. 46 includes screen display examples of a "drawer menu partial preview help" function in an information-processing apparatus according to a ninth embodiment of the present invention.

FIG. 47 is a flow chart showing the flow of a display operation for a "drawer menu partial preview help" function in the information-processing apparatus according to the ninth embodiment of the present invention.

FIG. 48 includes screen display examples of a "drawer menu partial preview help" function in an information-processing apparatus according to a tenth embodiment of the present invention.

EXPLANATION OF THE REFERENCE NUMBERS

100 Information processing device
101 Exterior cover
102 Camera part
103 Mic (microphone)
104 Shutter button

105 Display (displaying means)
106 Touch panel sensor
107 Input device (pen-type pointing device)
108 Speaker
109 Step part
701 Function button
801 CPU (central processing unit)
802 CCD (image-capturing device)
803 Image-displaying display
804 RAM (random-access memory)
805 Flash memory
806 Mic (microphone)
807 Shutter switch
808 Touch panel sensor
809 ROM (read-only memory)
810 Battery
811 Speaker

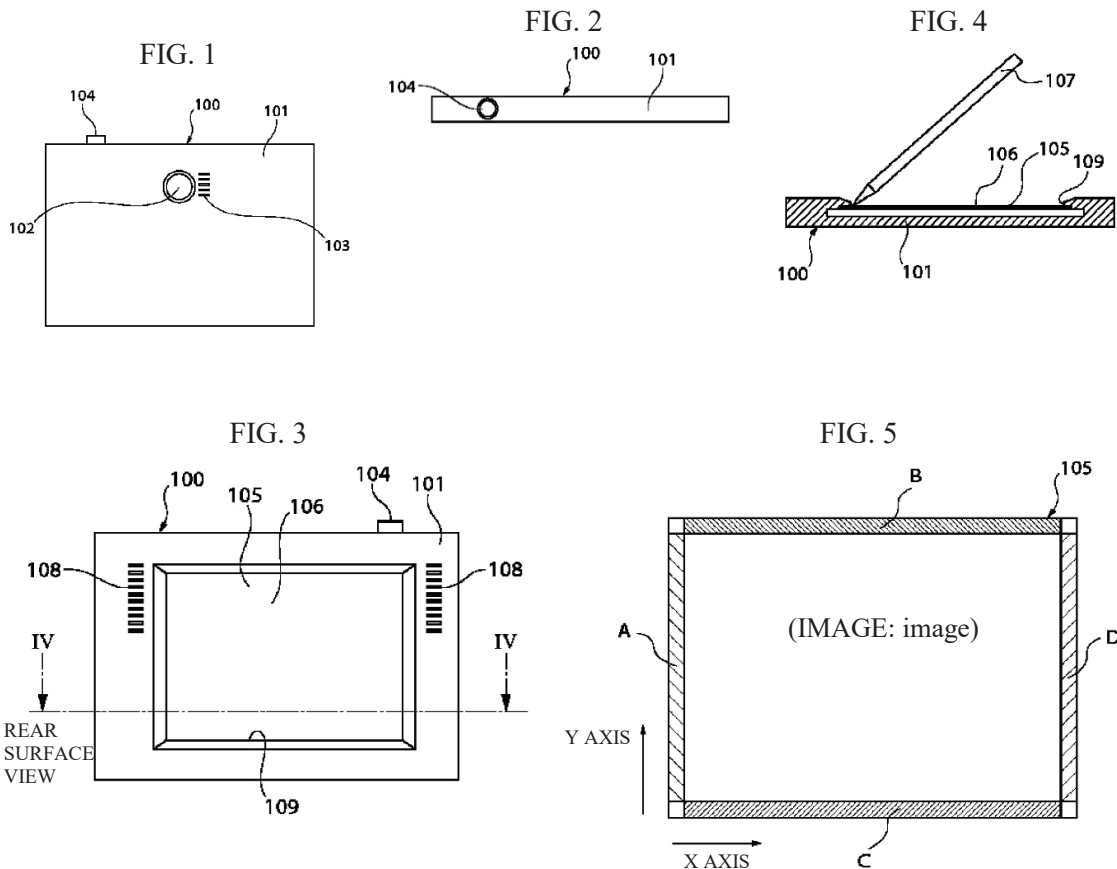


FIG. 6

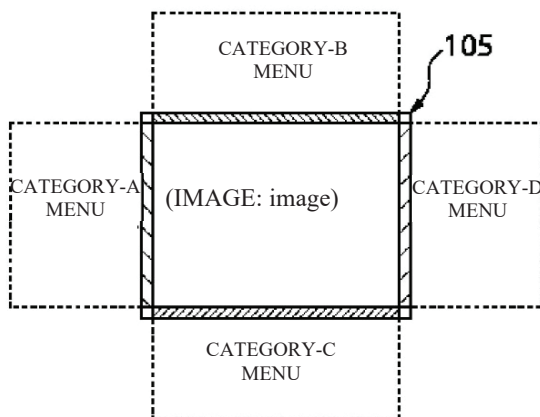


FIG. 7

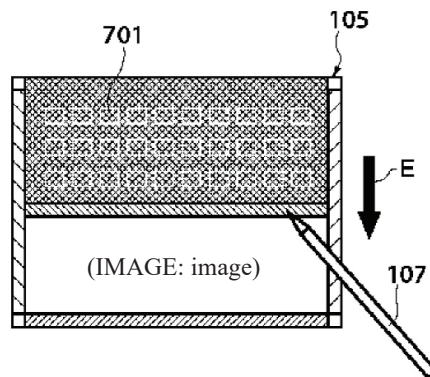


FIG. 8

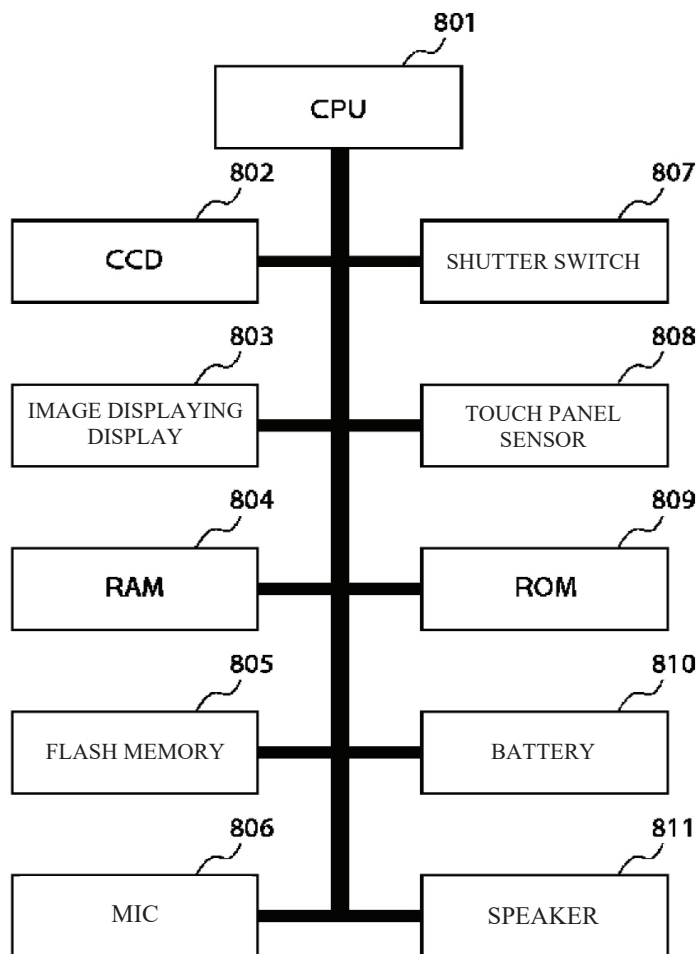


FIG. 10

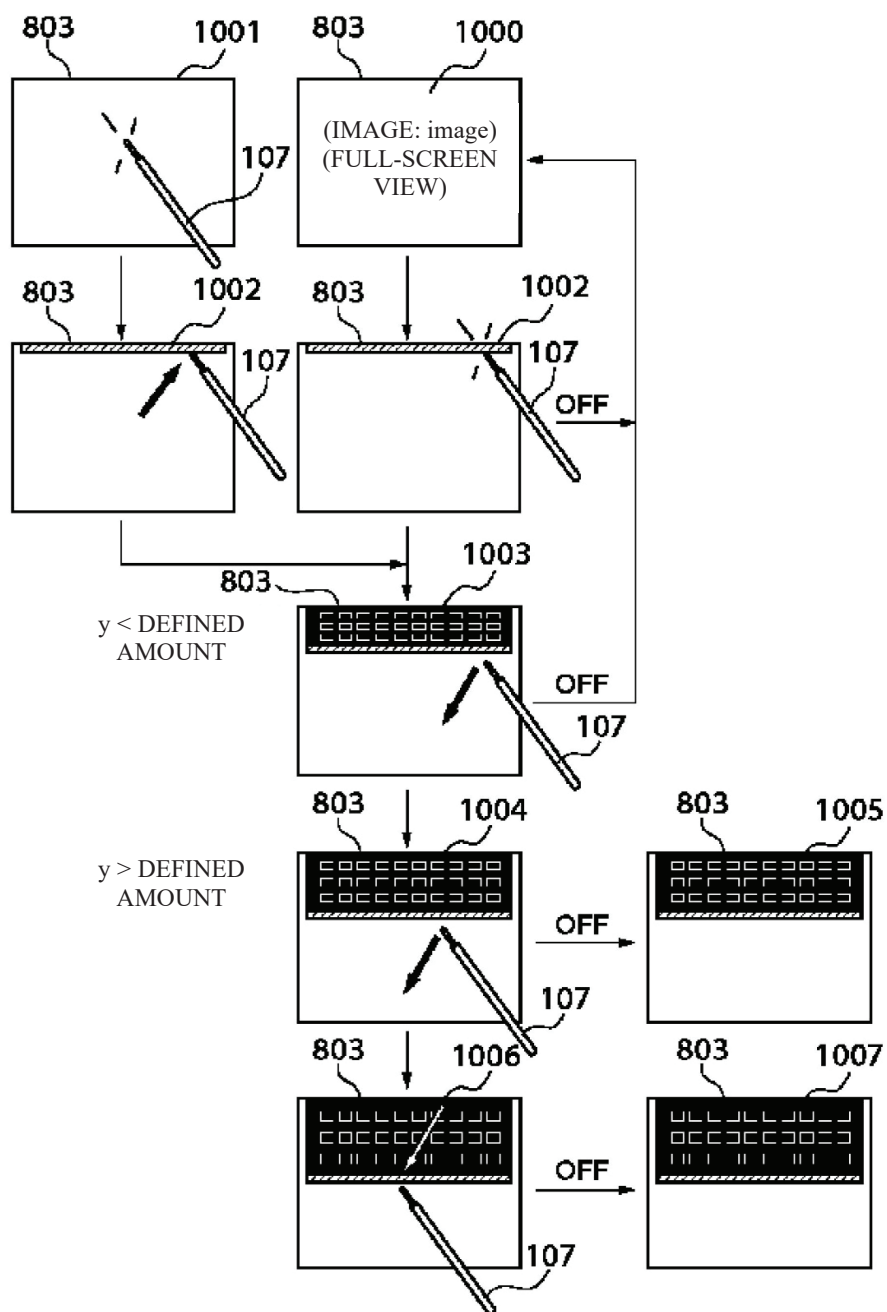


FIG. 11

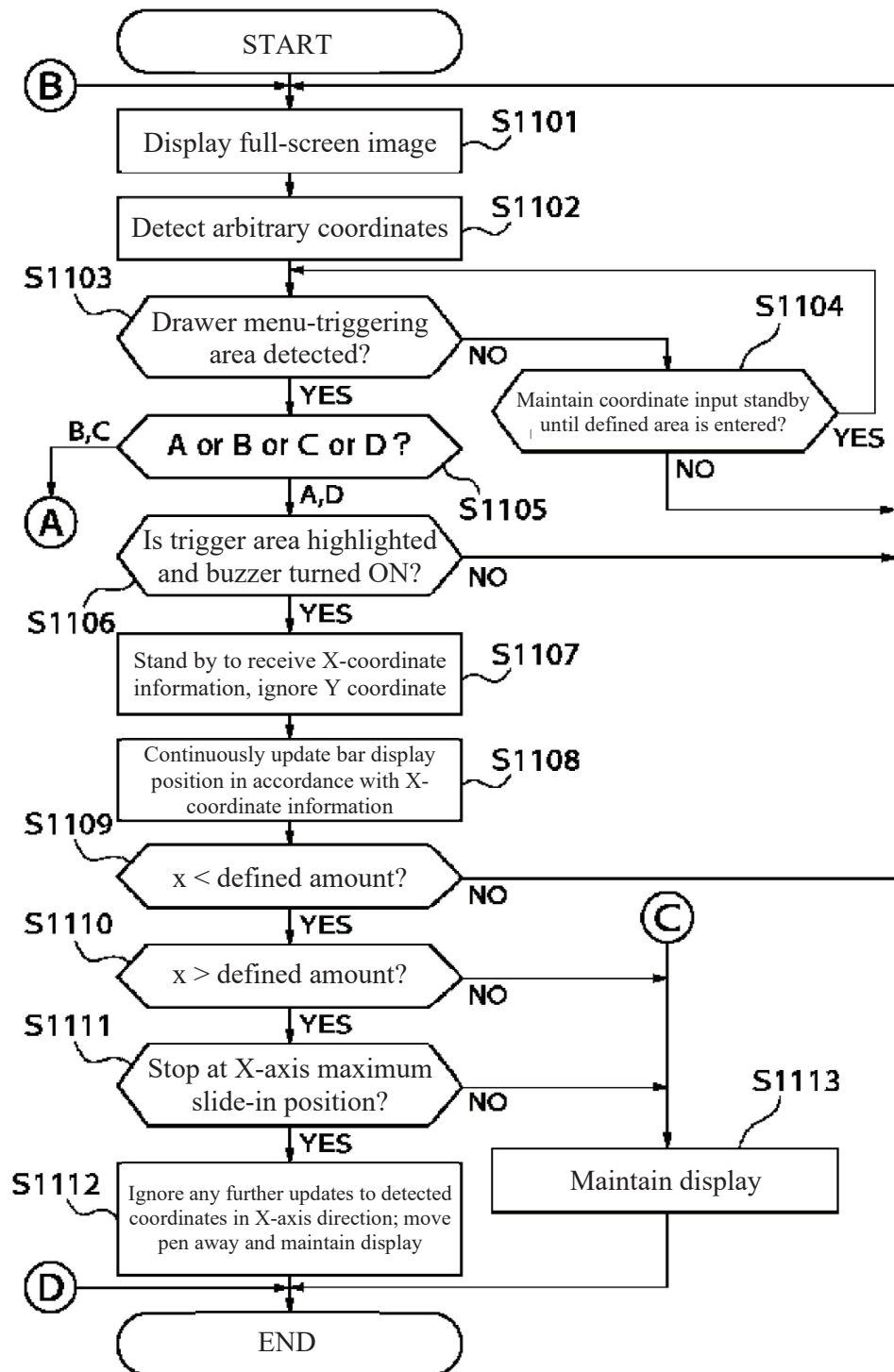


FIG. 12

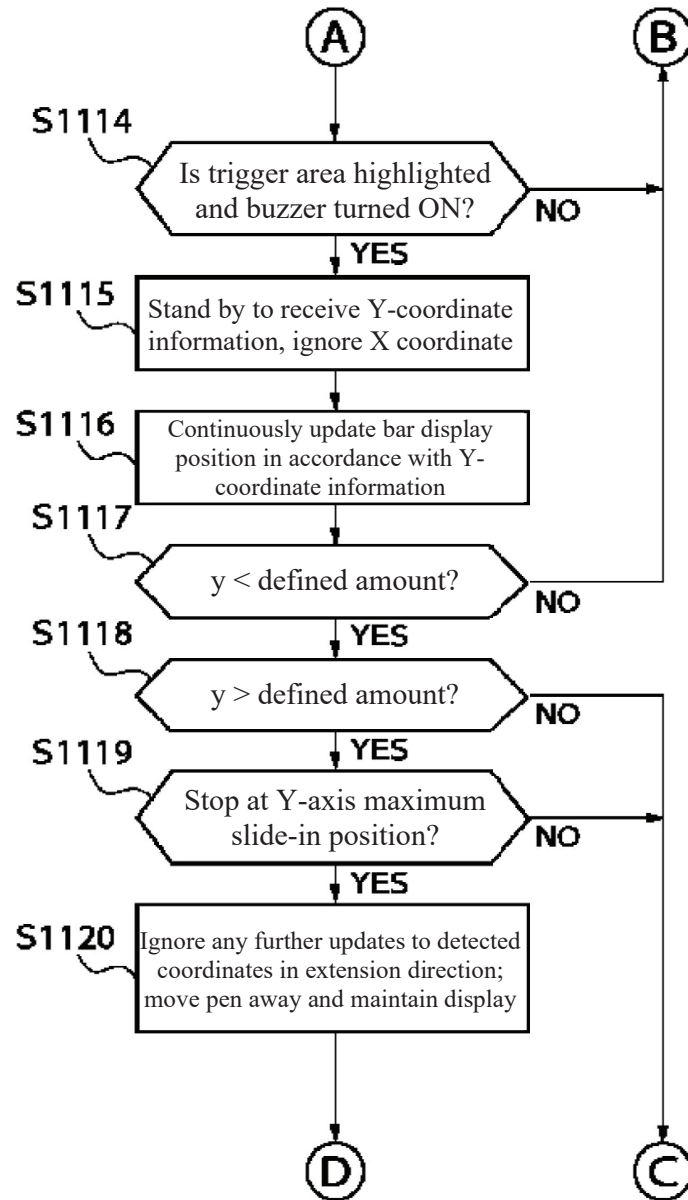


FIG. 15

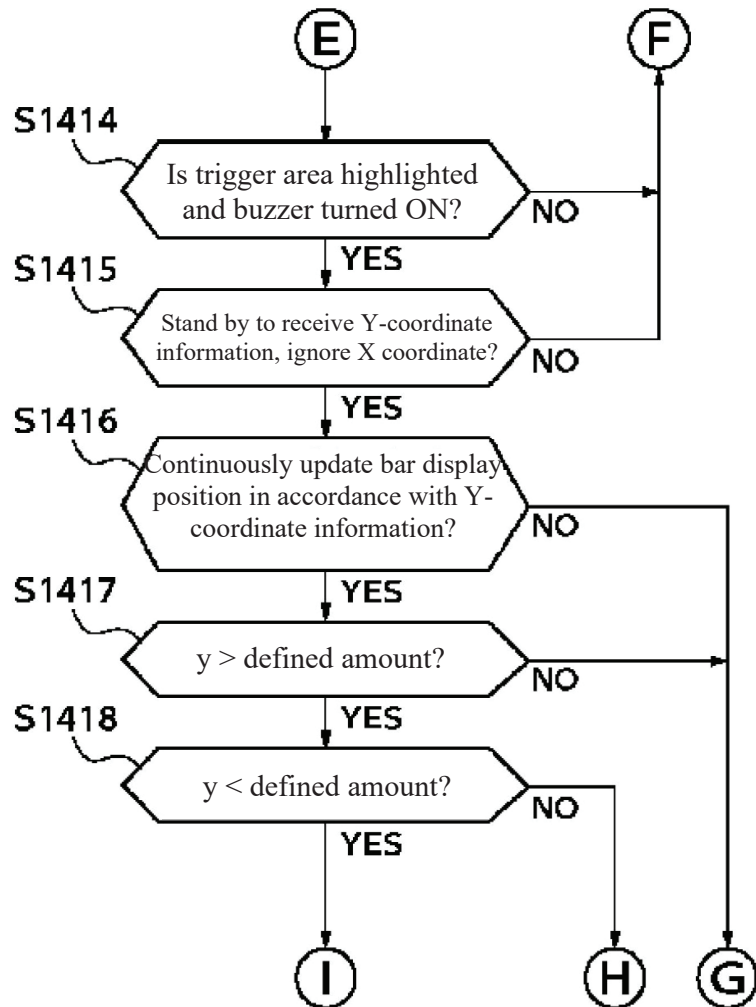


FIG. 14

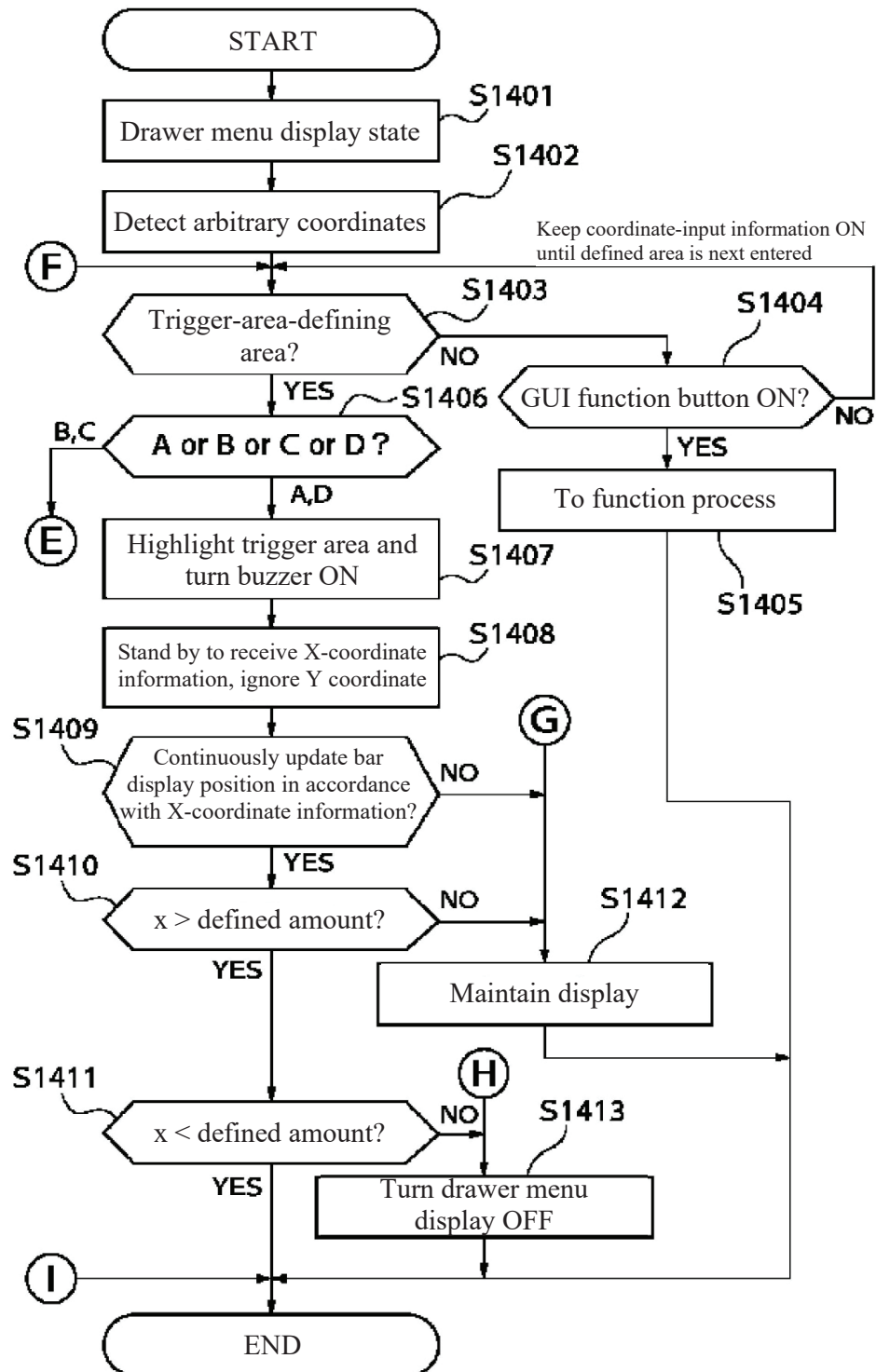


FIG. 16

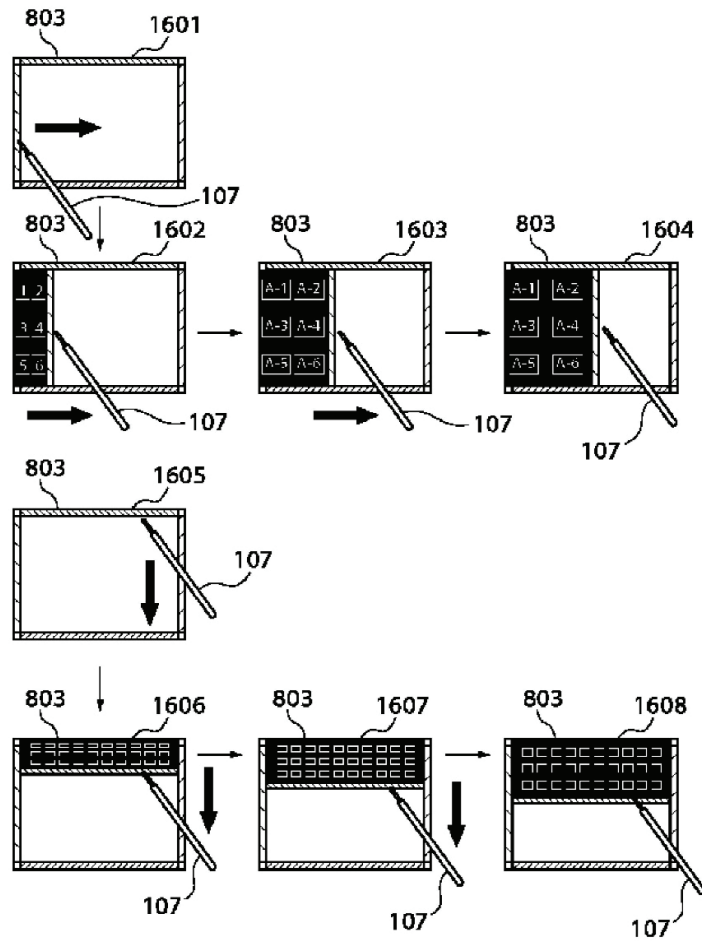


FIG. 20

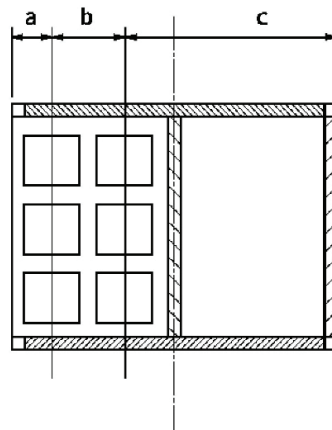


FIG. 17

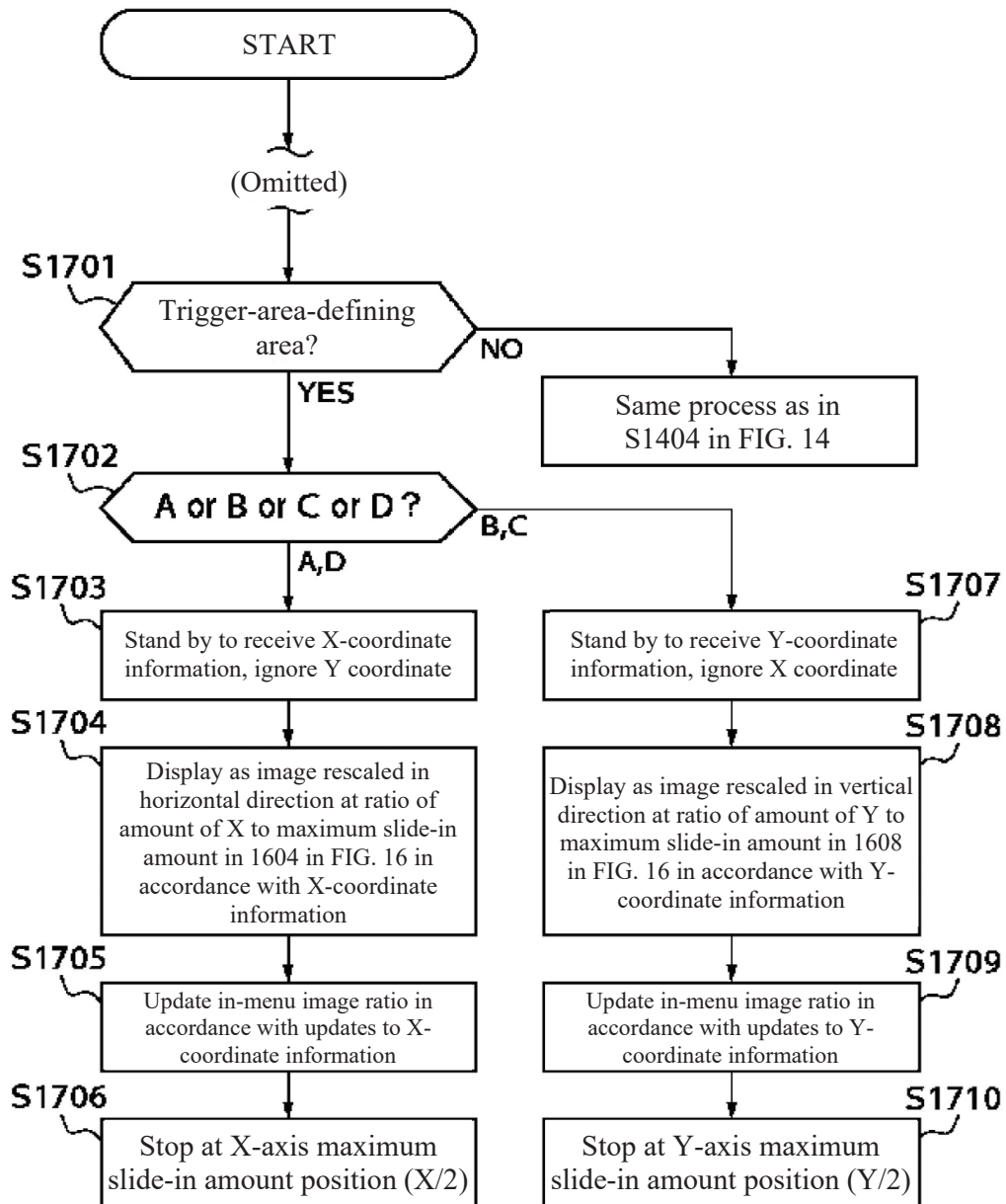


FIG. 18

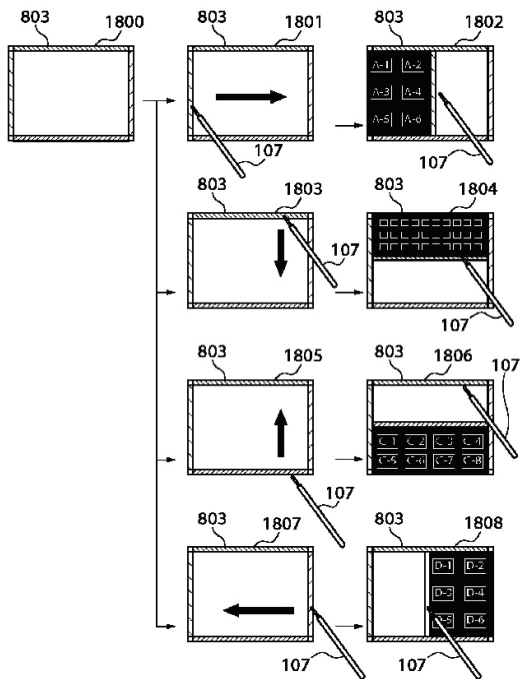


FIG. 19

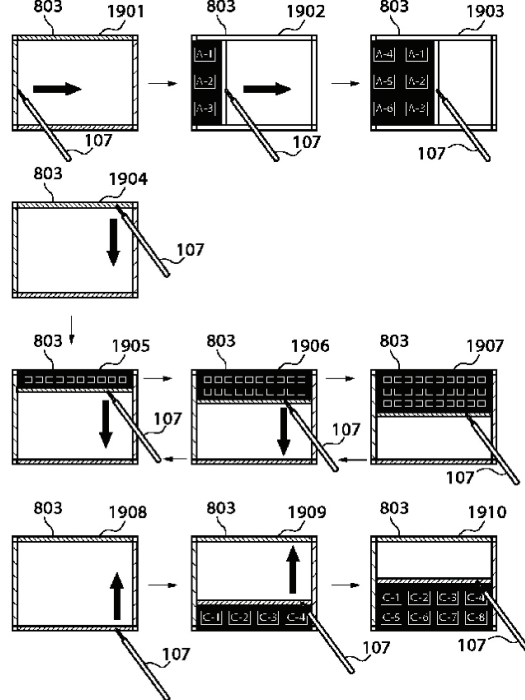


FIG. 22

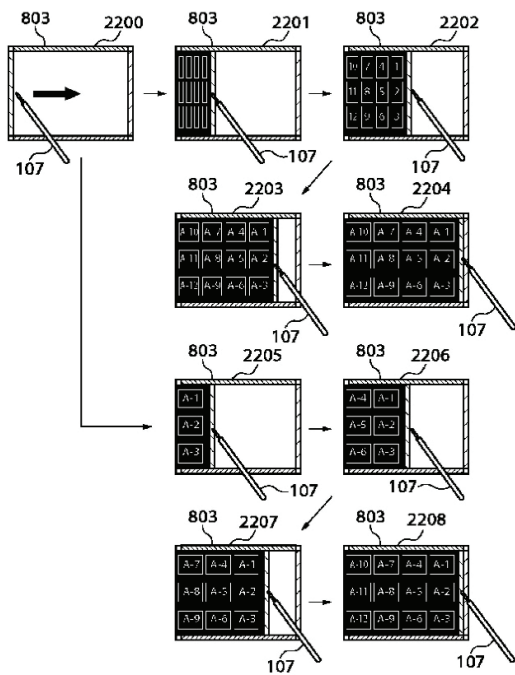


FIG. 21

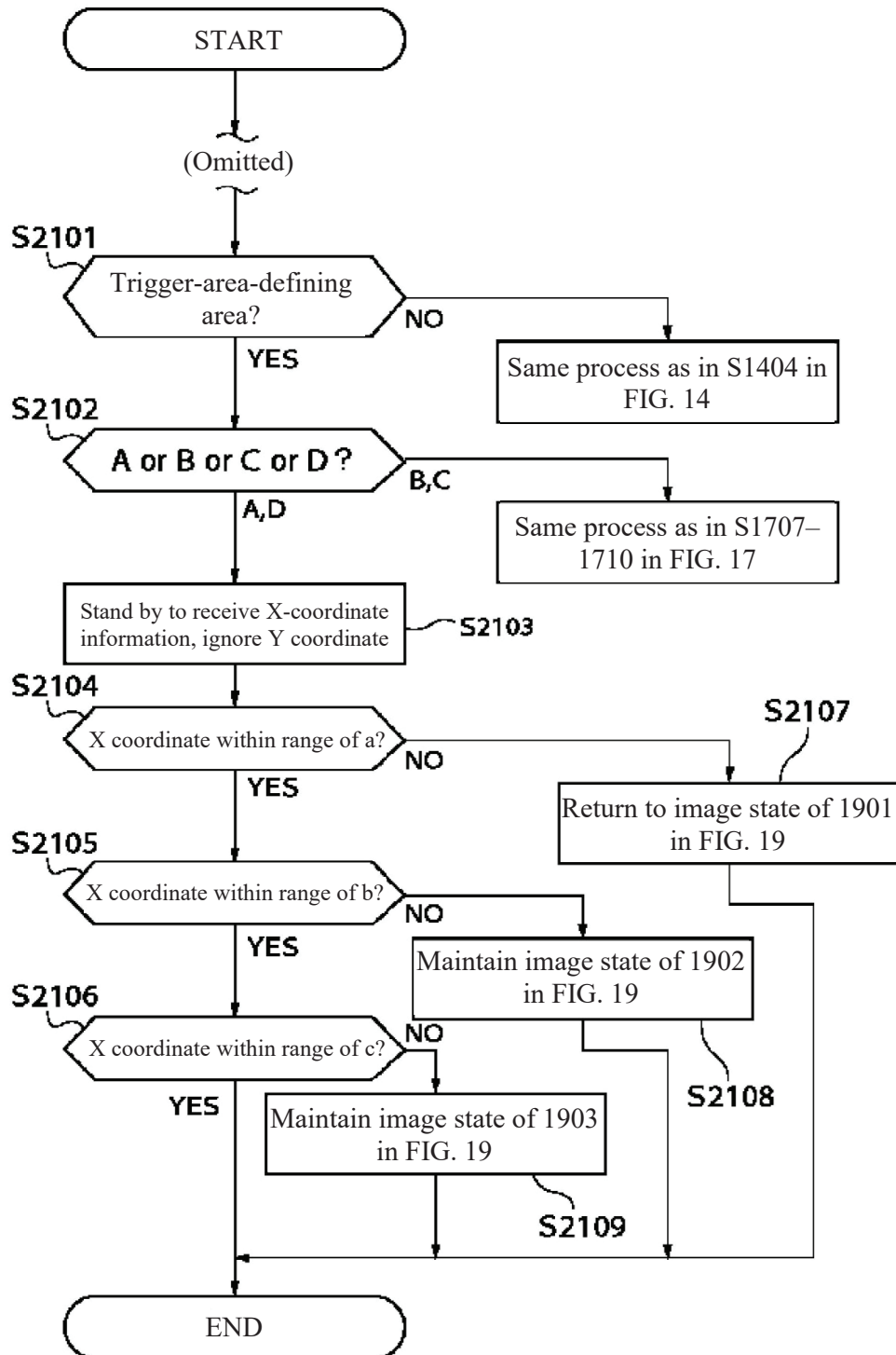


FIG. 23

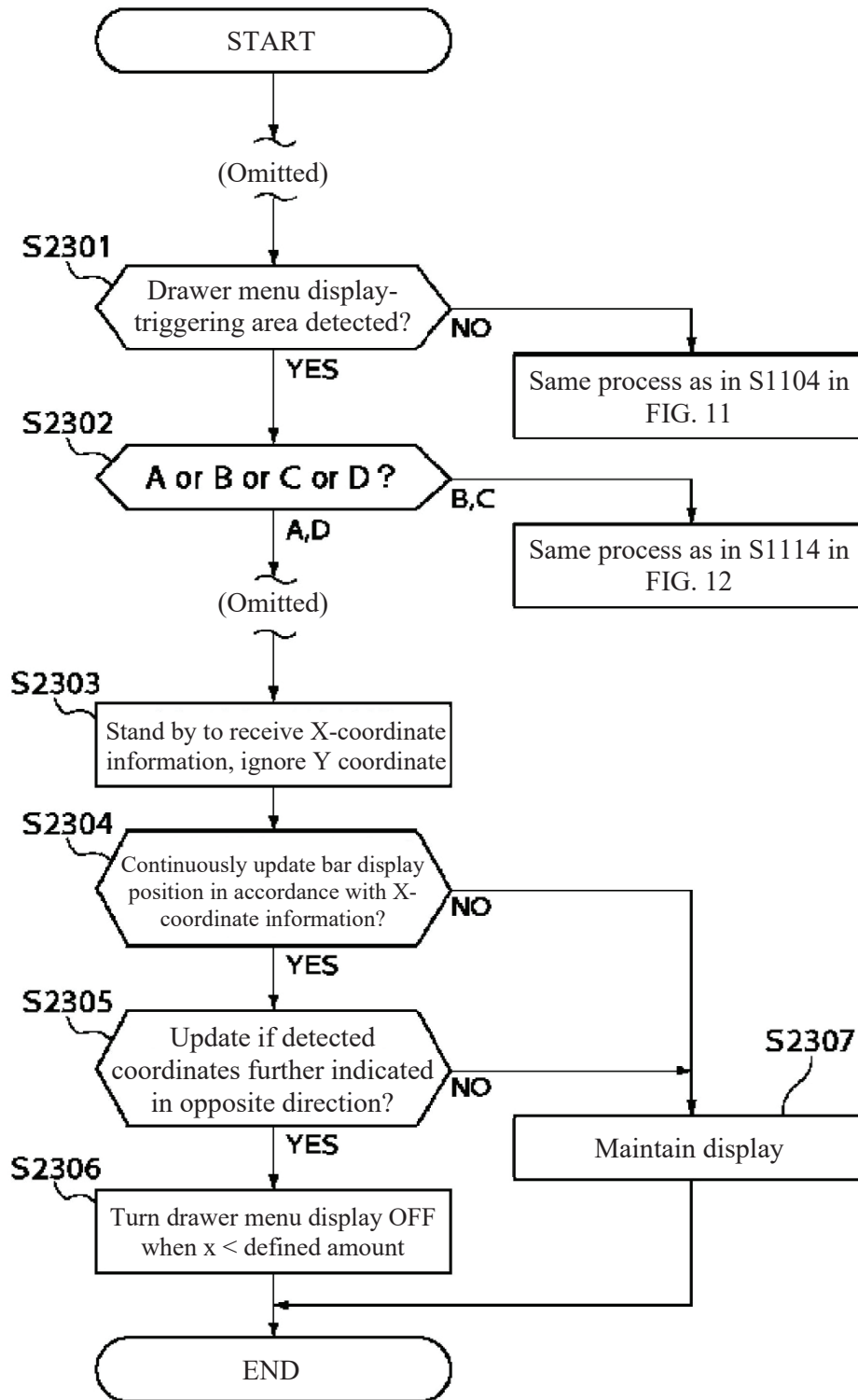


FIG. 33

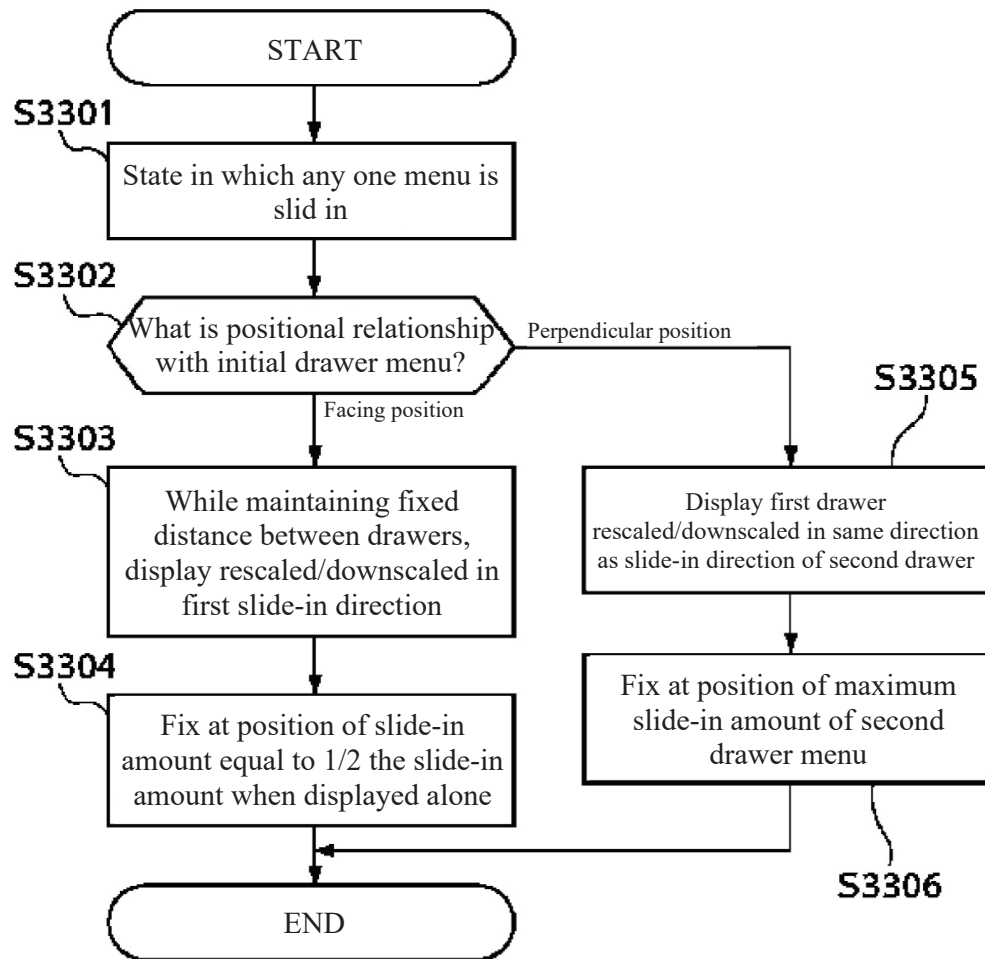


FIG. 38

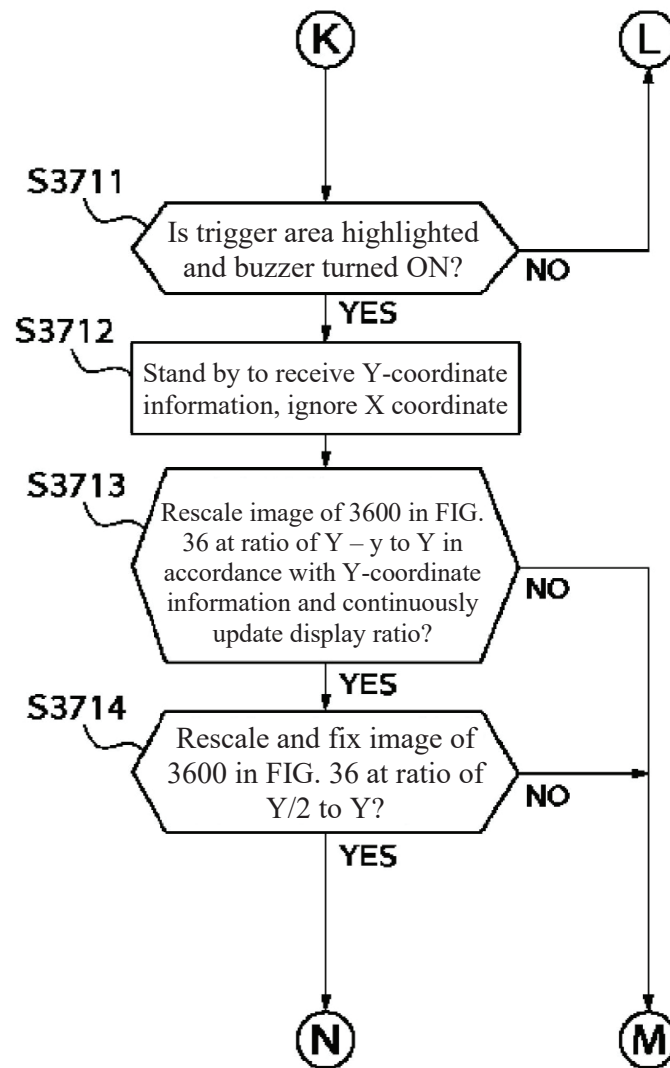


FIG. 25

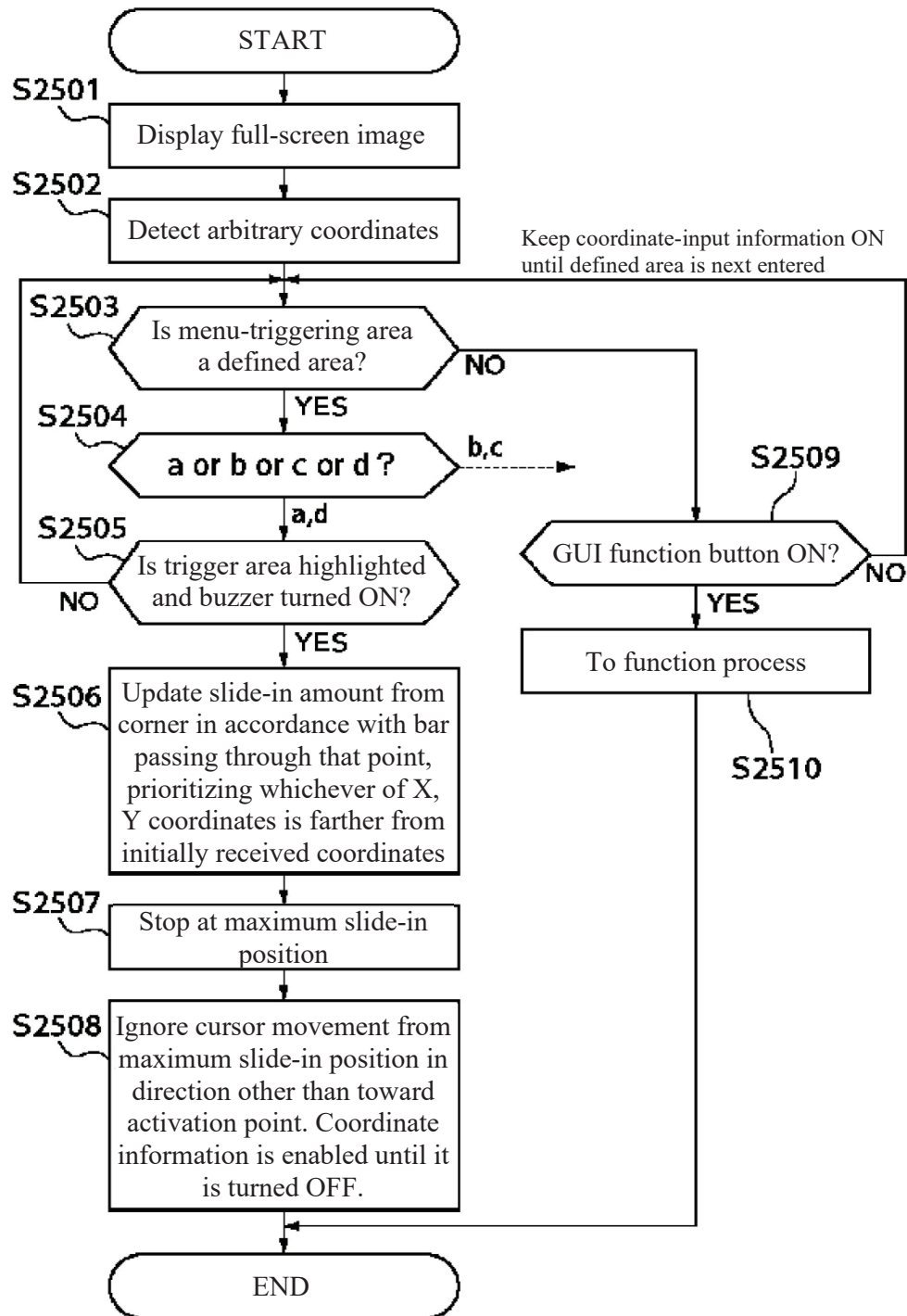


FIG. 26

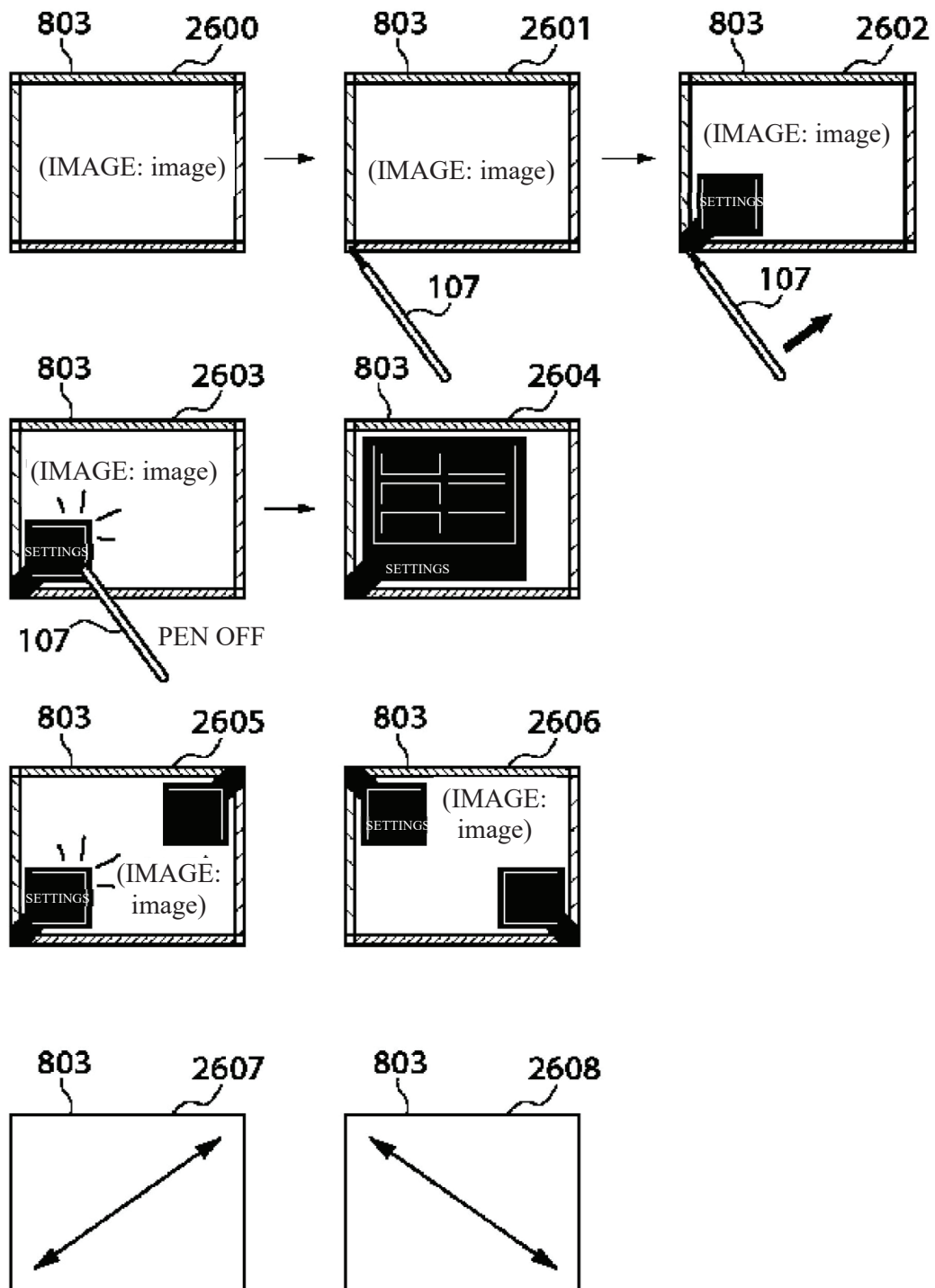


FIG. 27

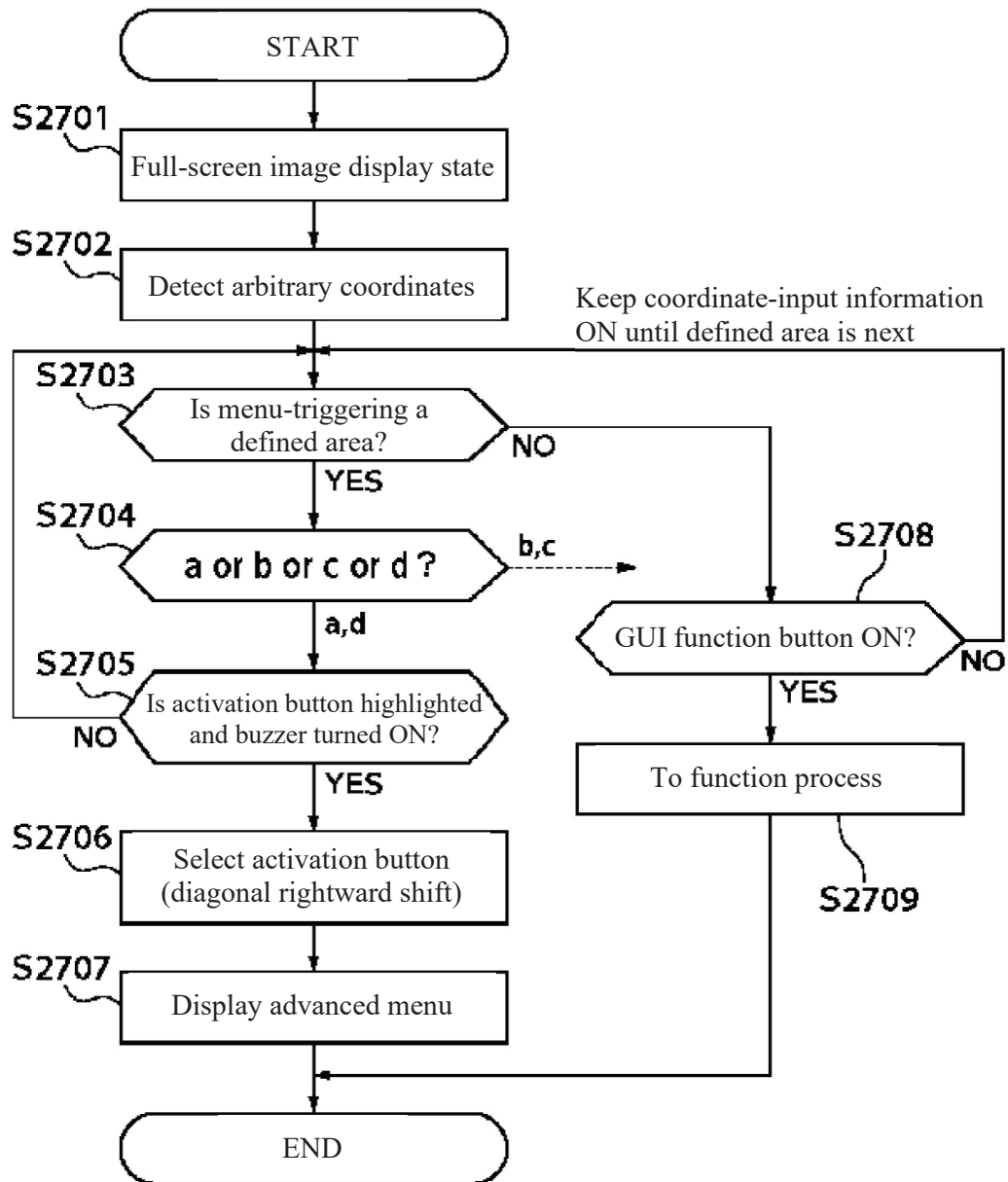


FIG. 28

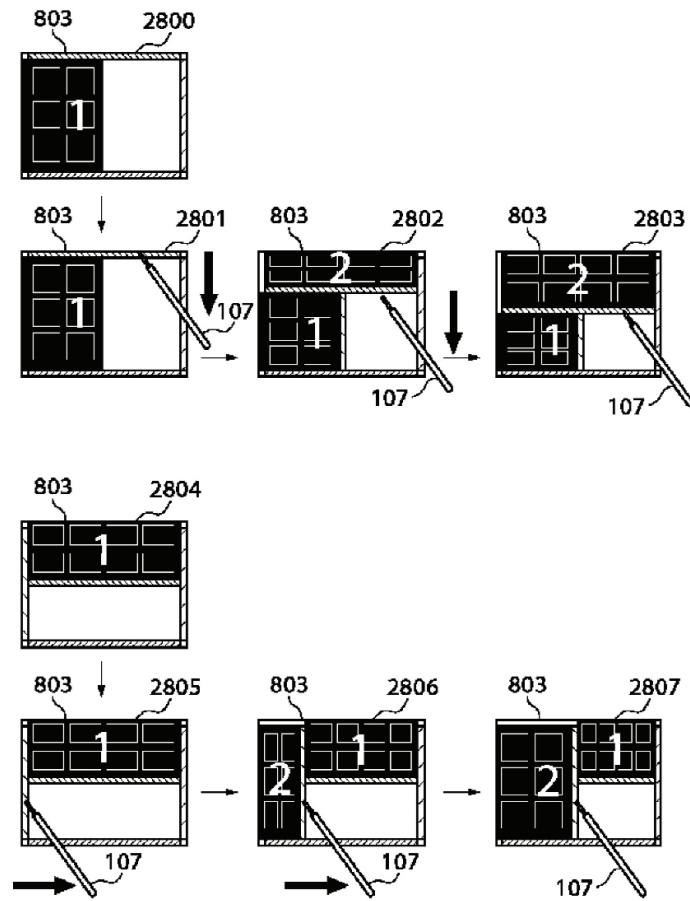


FIG. 29

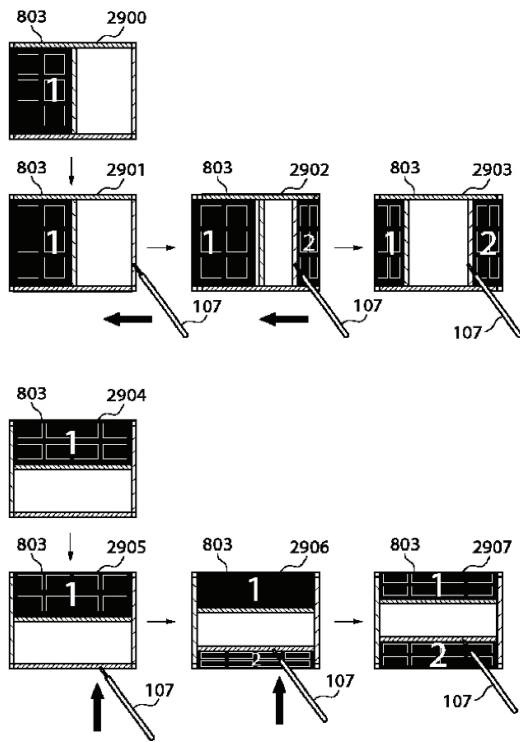


FIG. 30

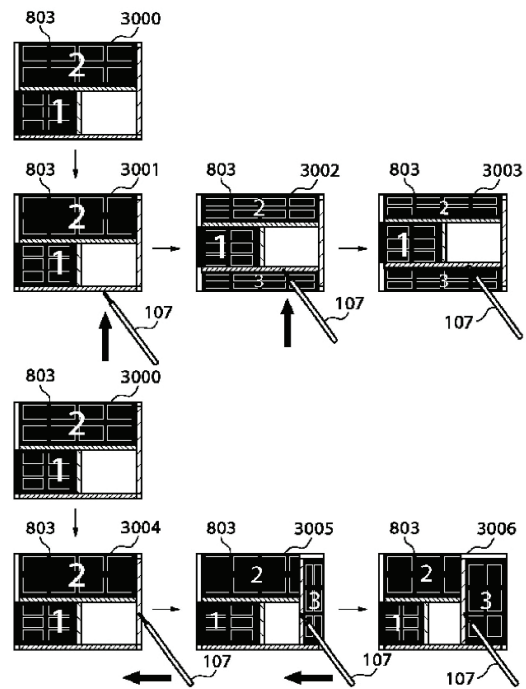


FIG. 31

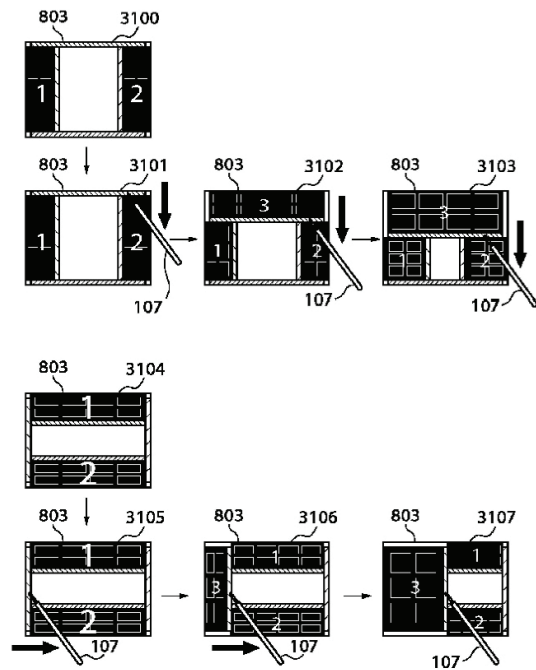


FIG. 41

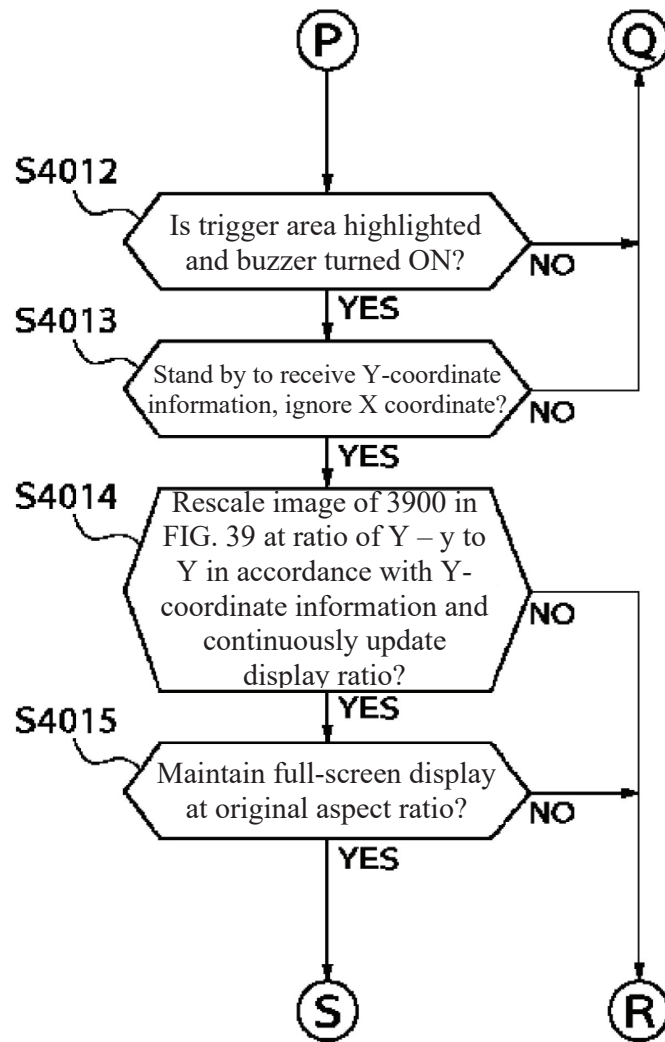


FIG. 32

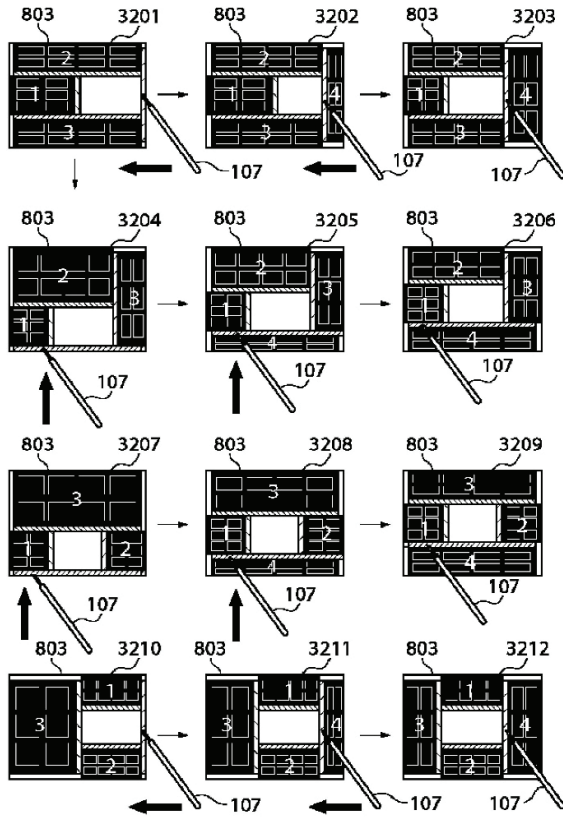


FIG. 48

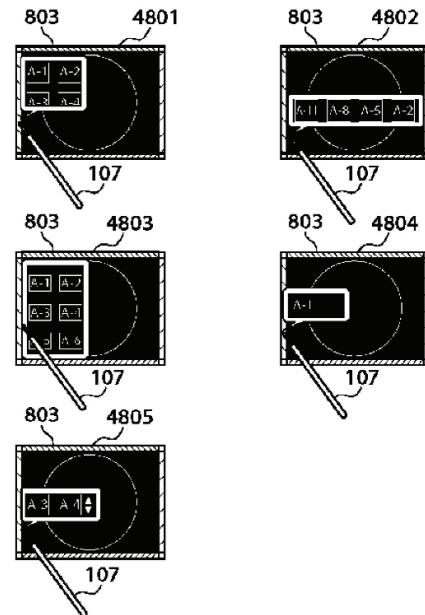


FIG. 34

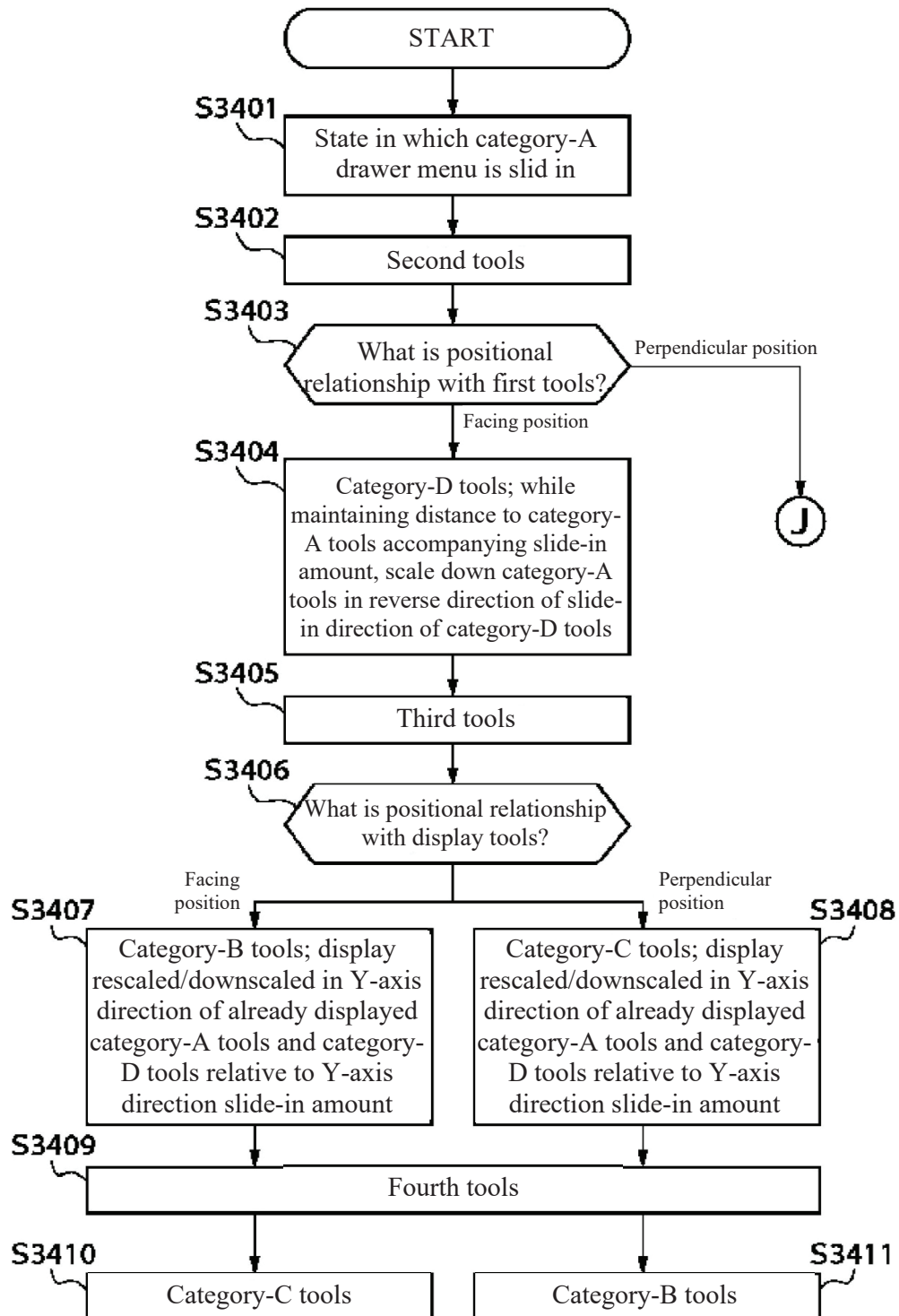


FIG. 45

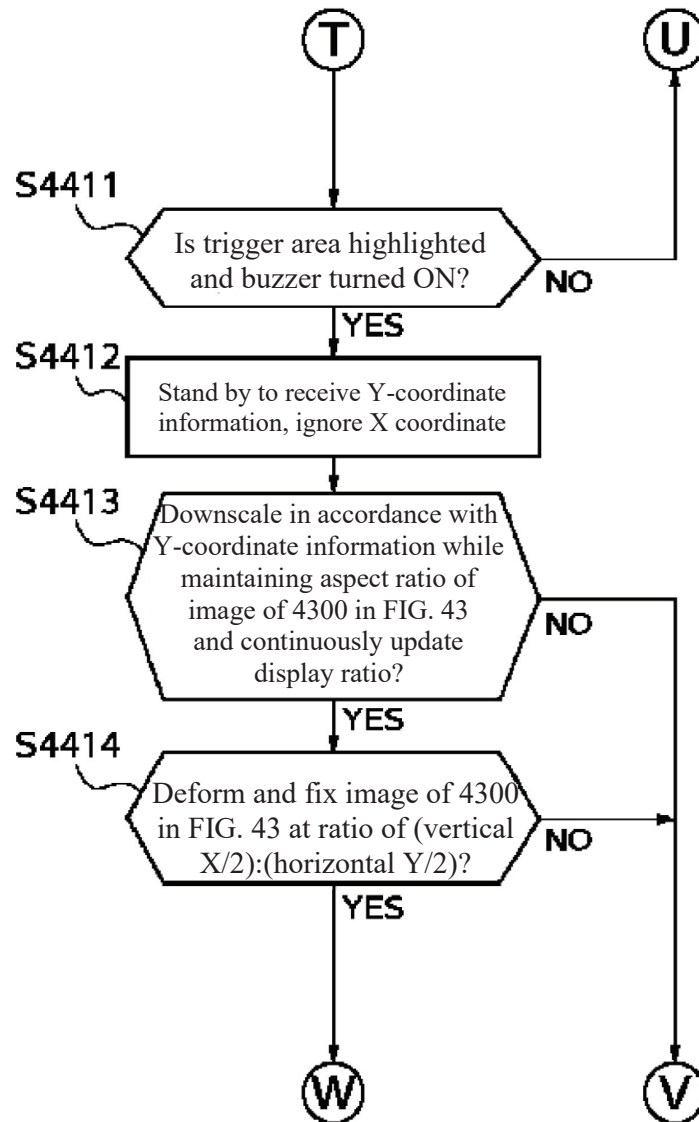


FIG. 35

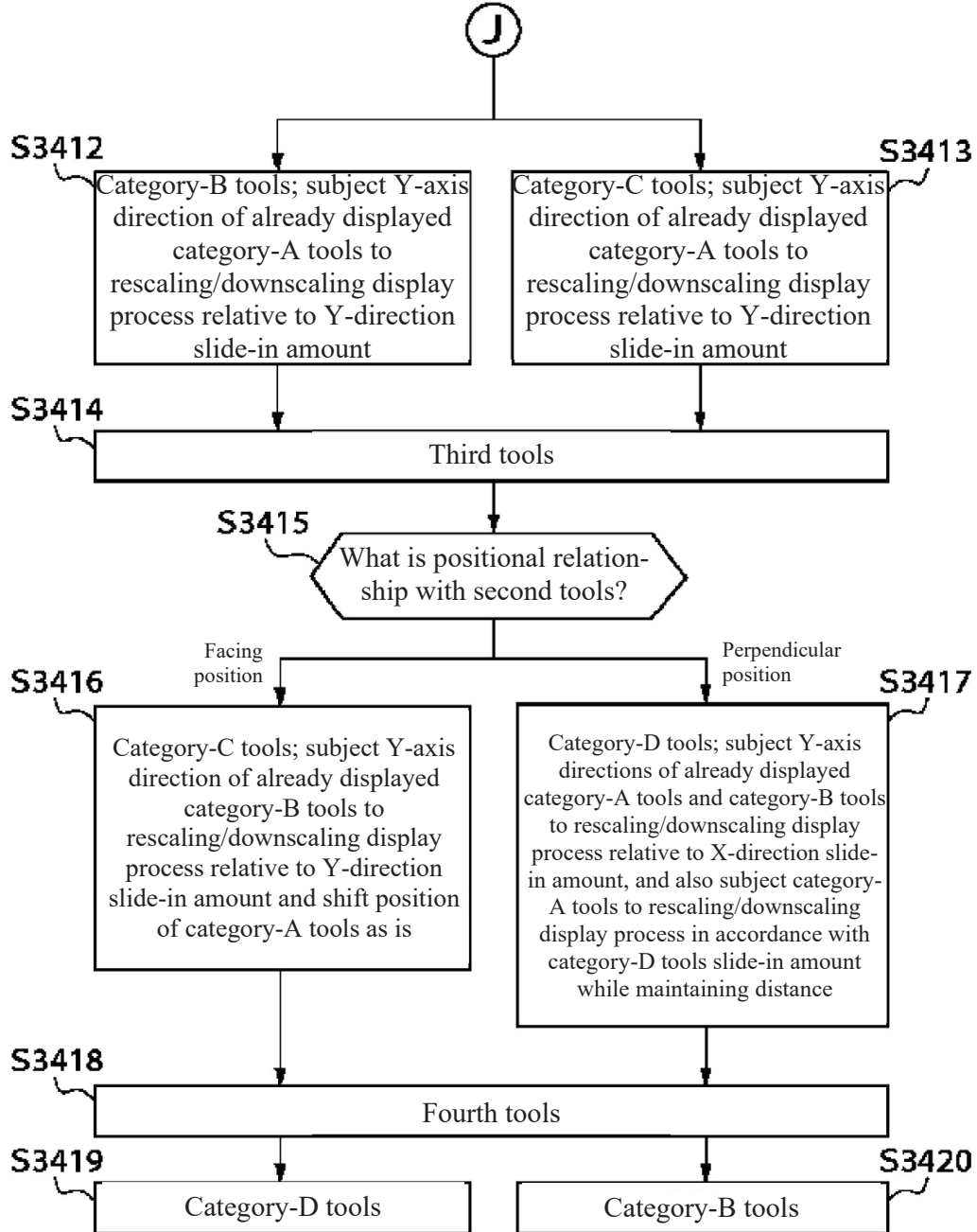


FIG. 36

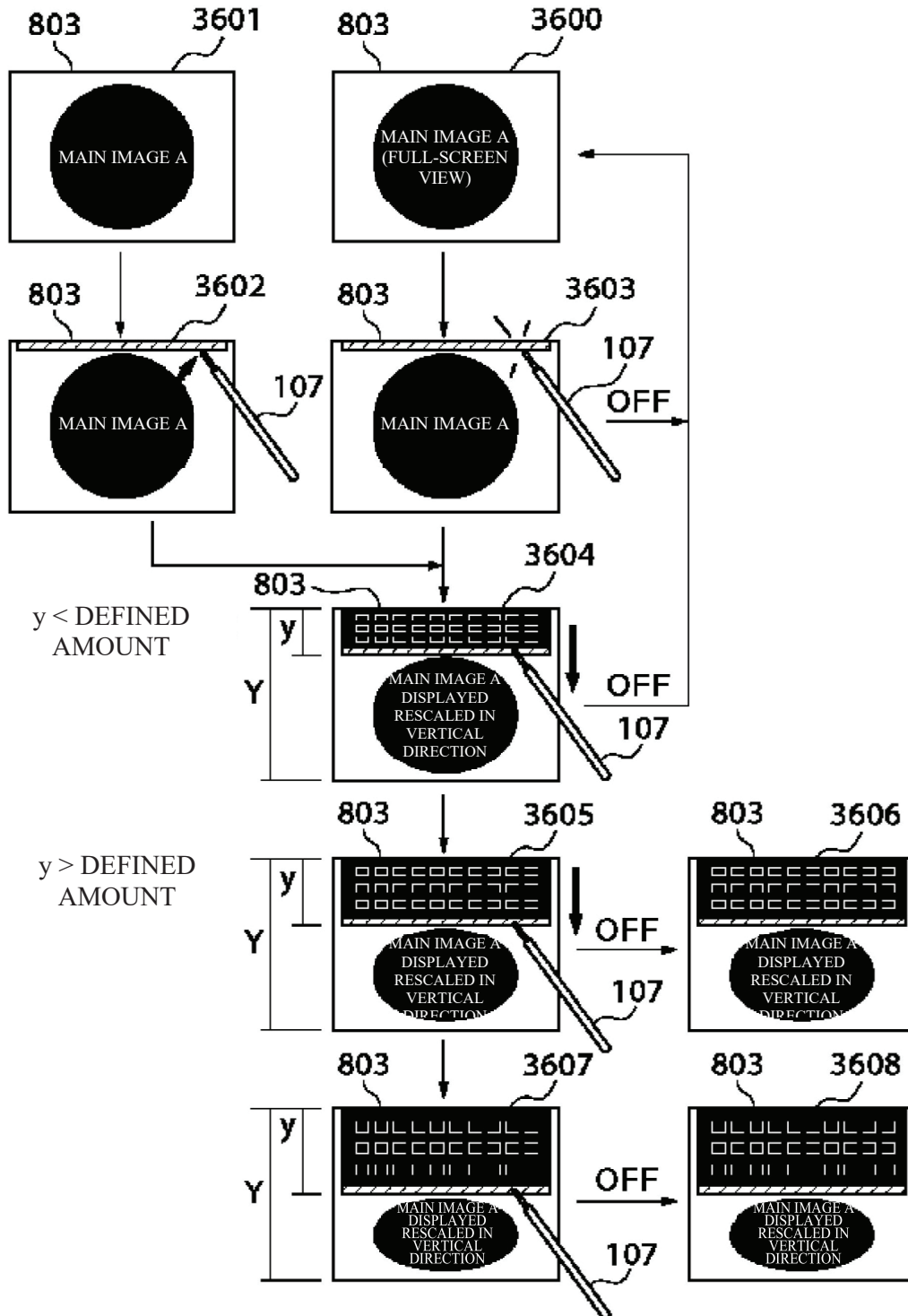


FIG. 42

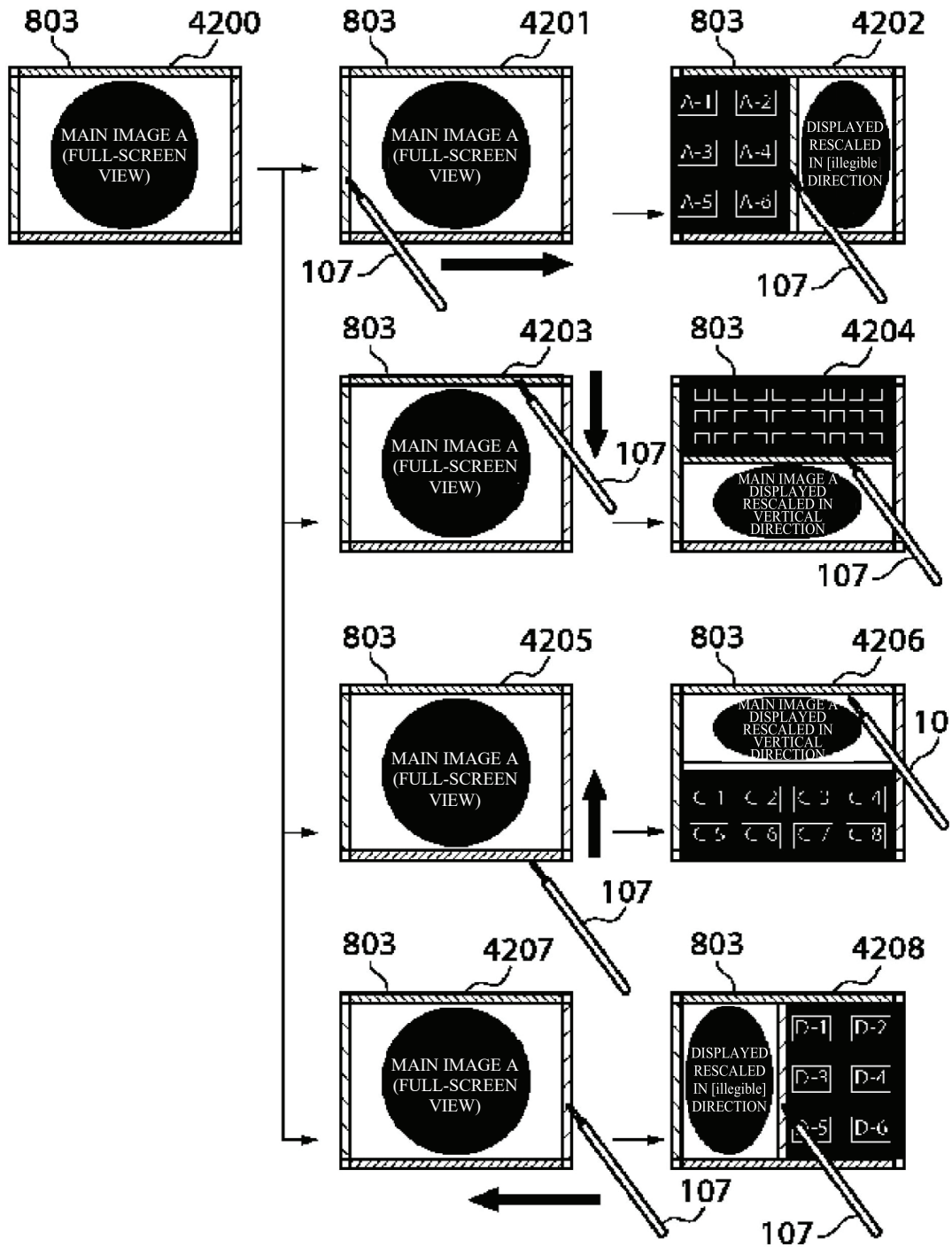


FIG. 37

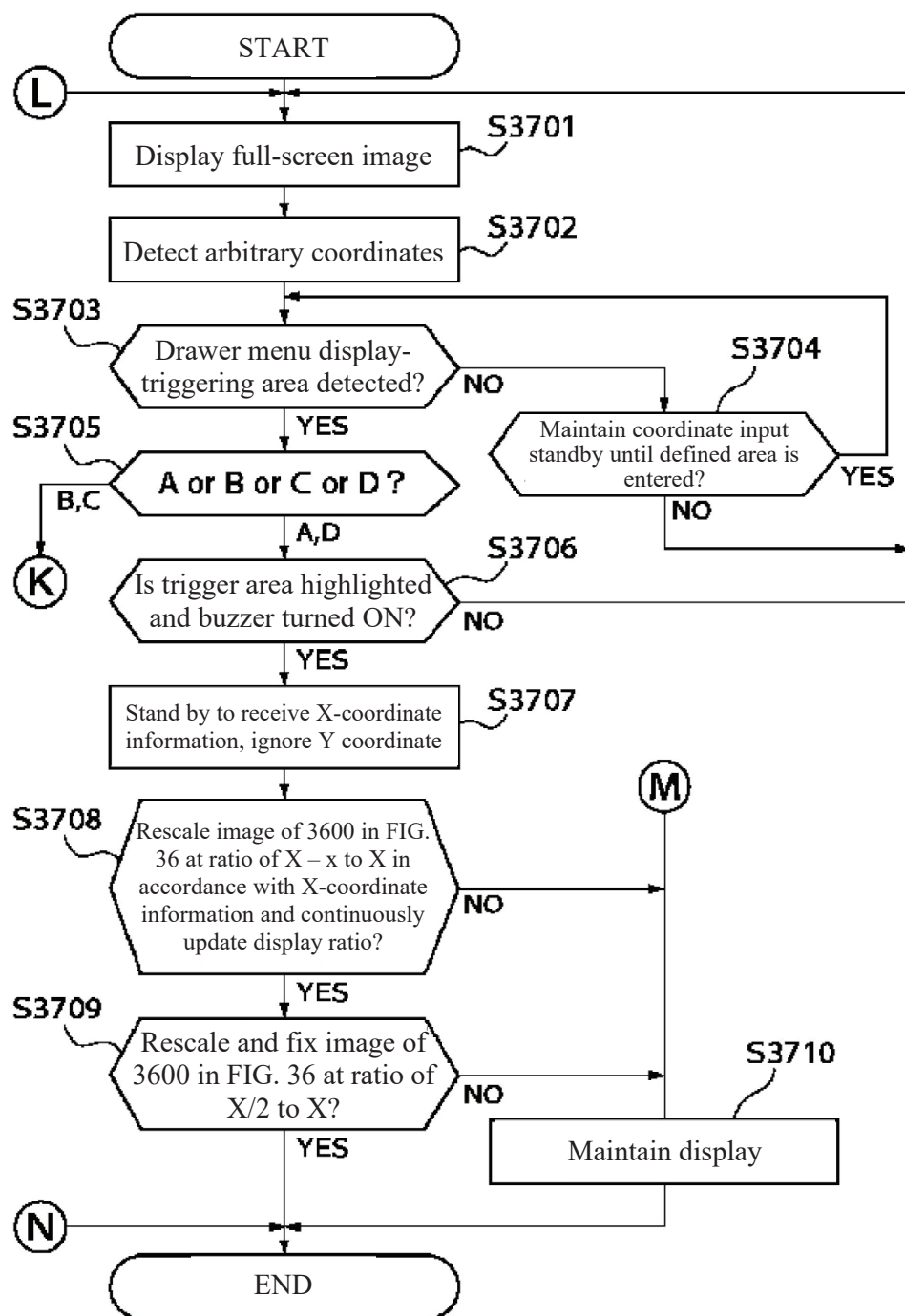


FIG. 39

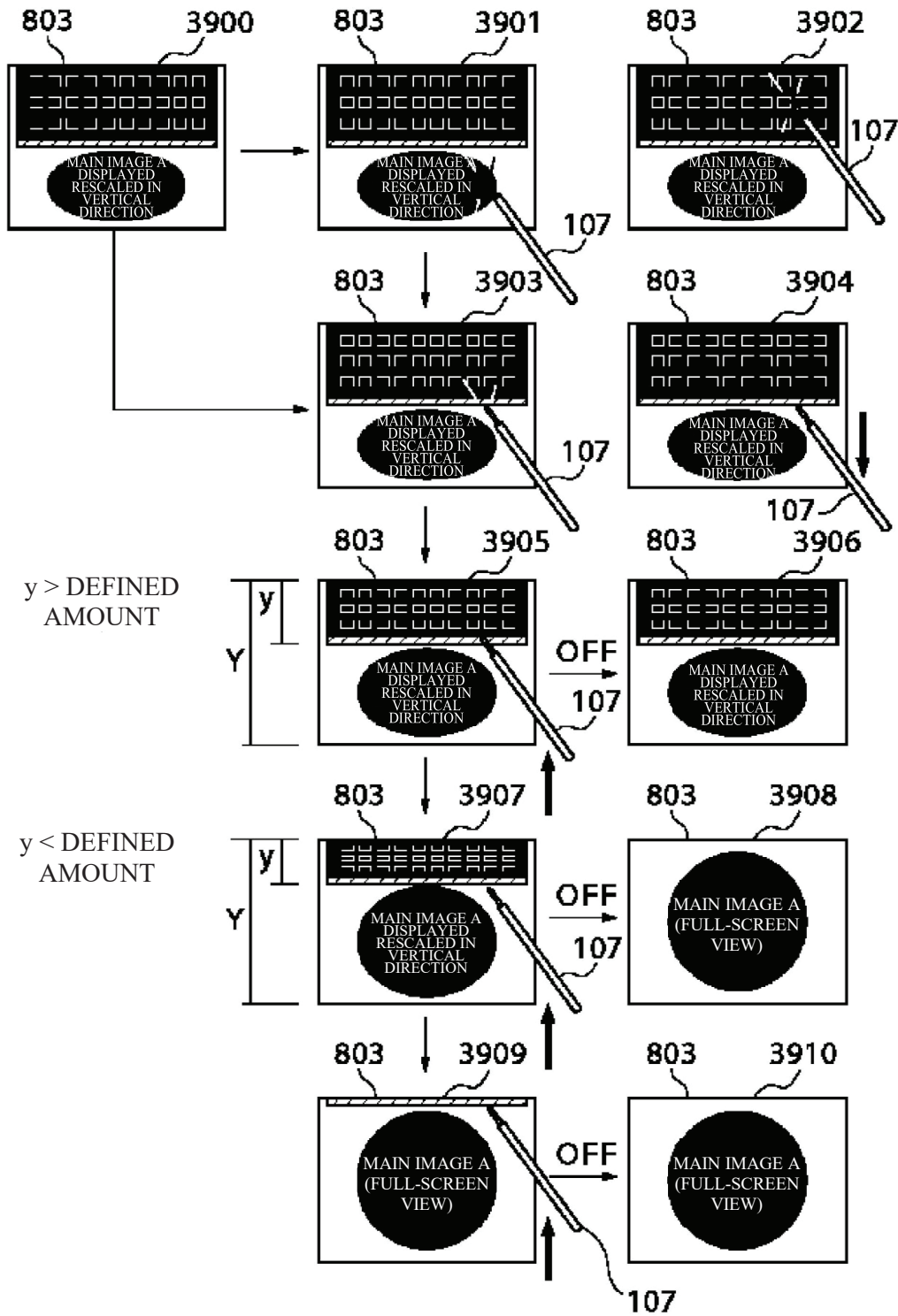


FIG. 40

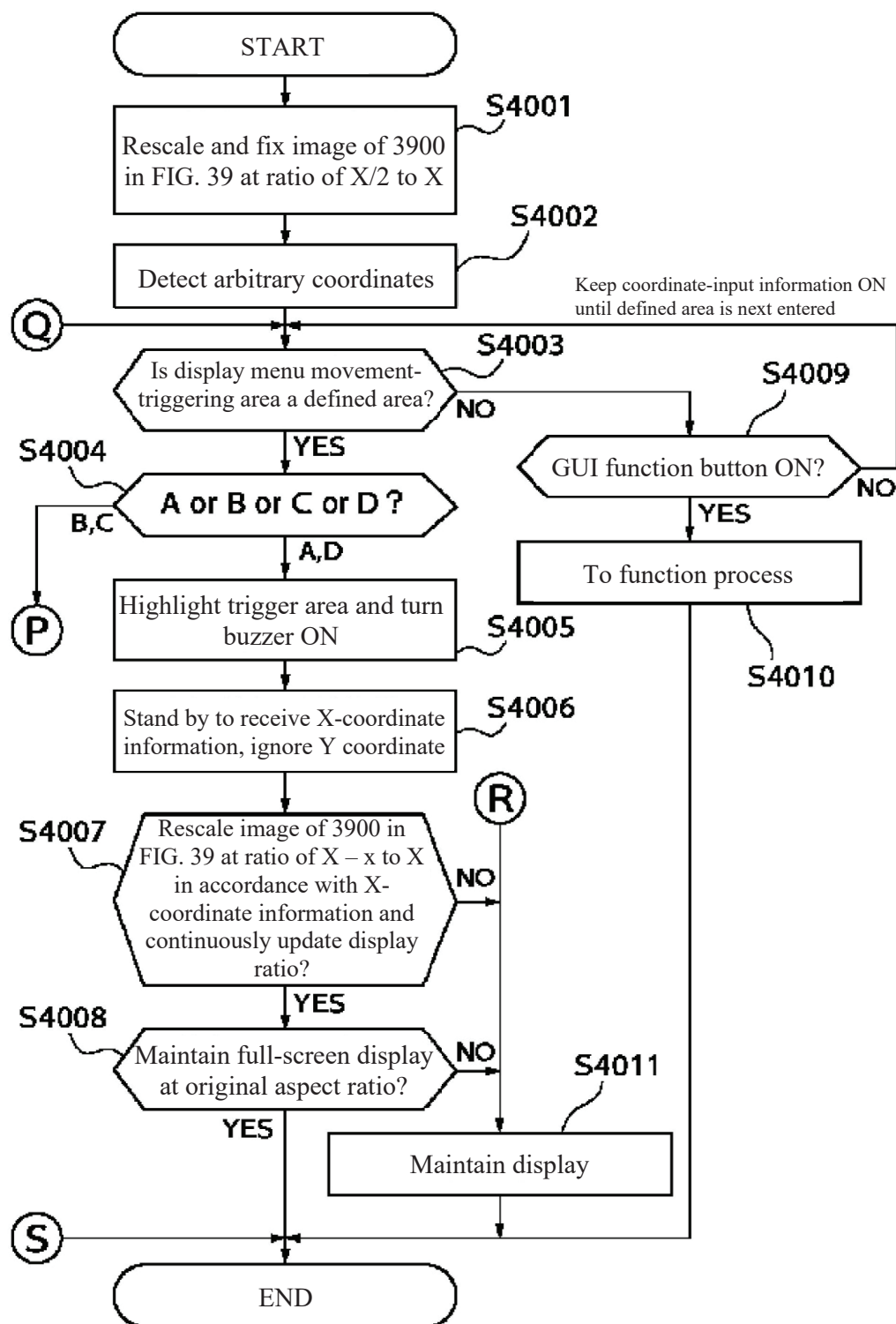


FIG. 43

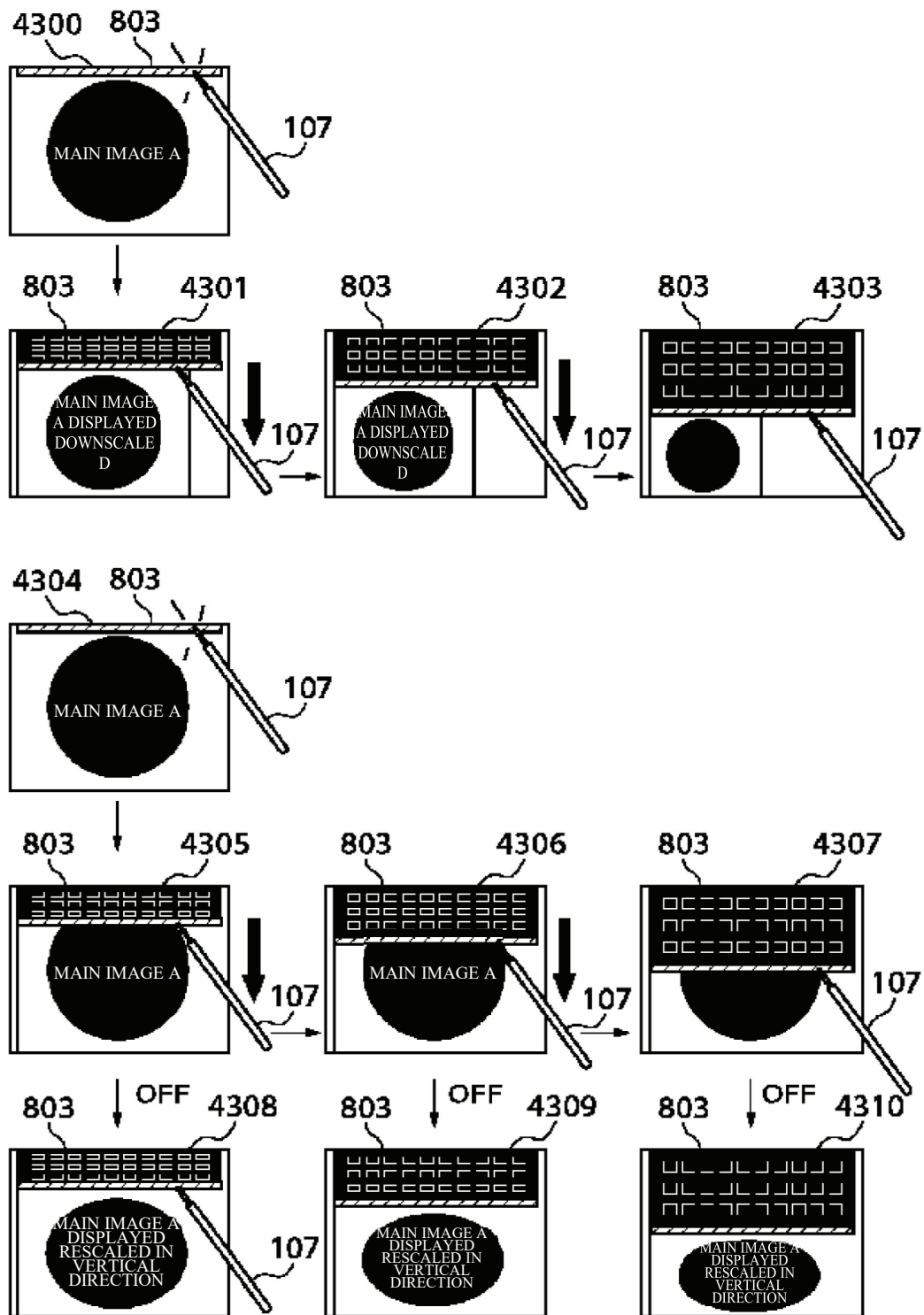


FIG. 44

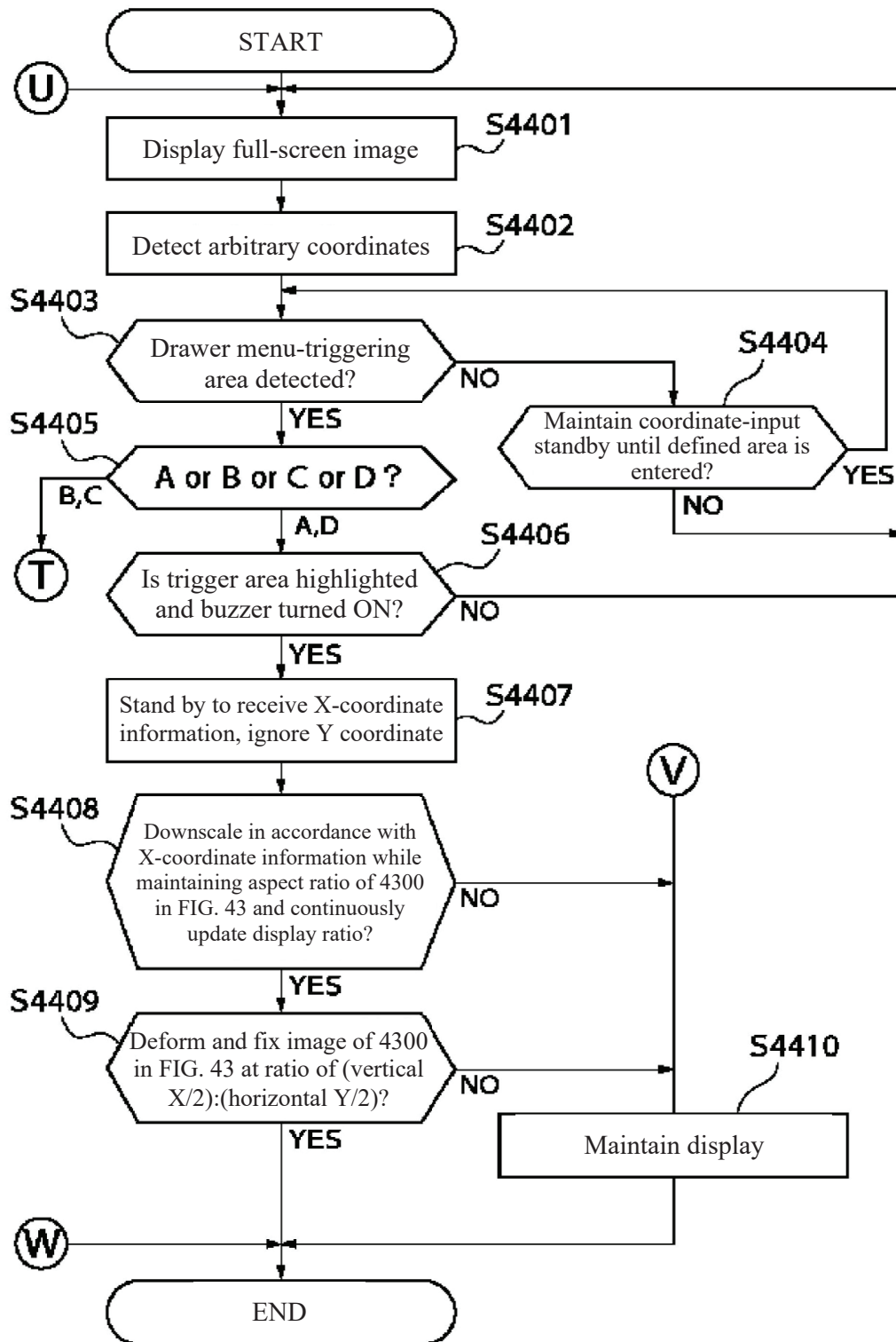


FIG. 46

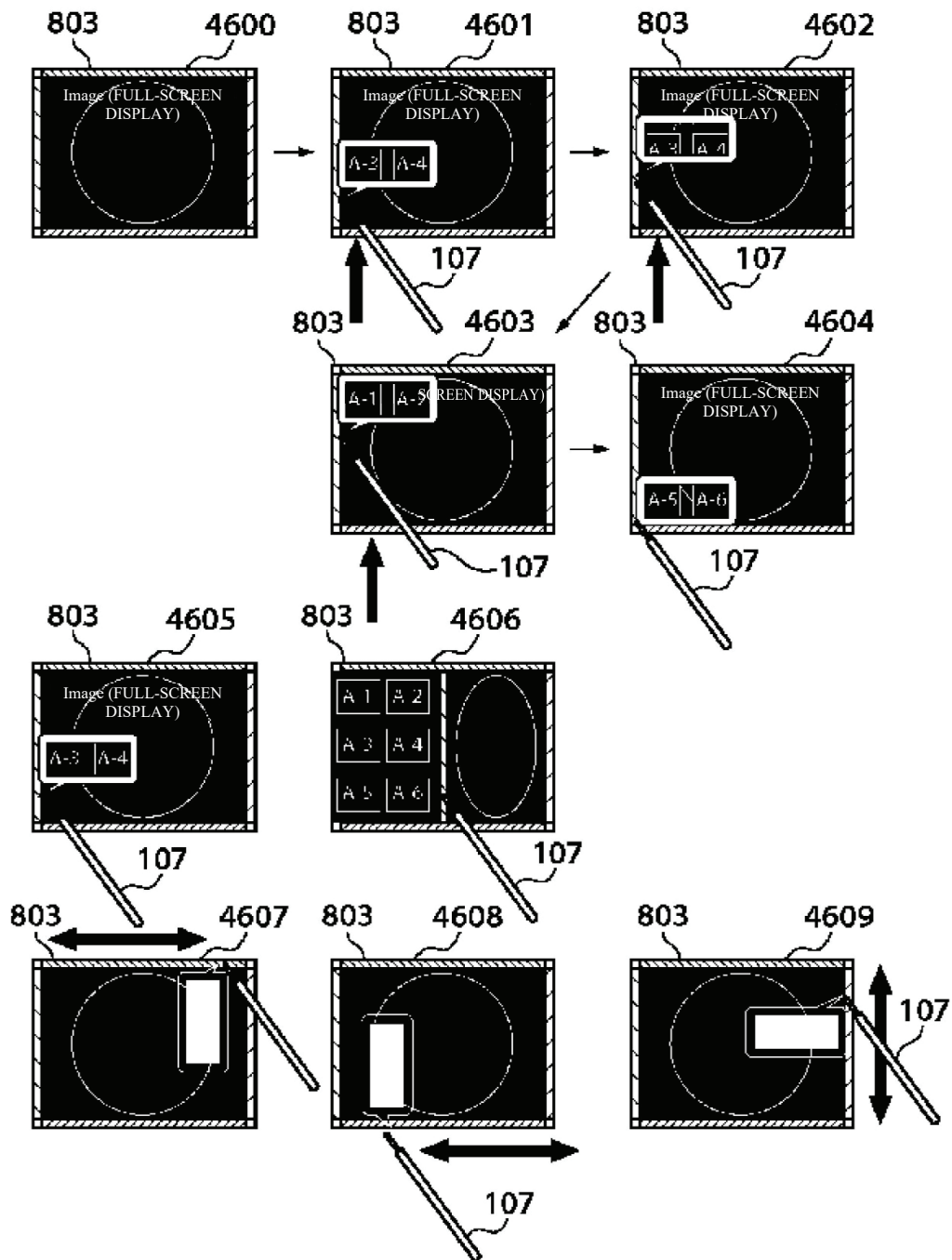
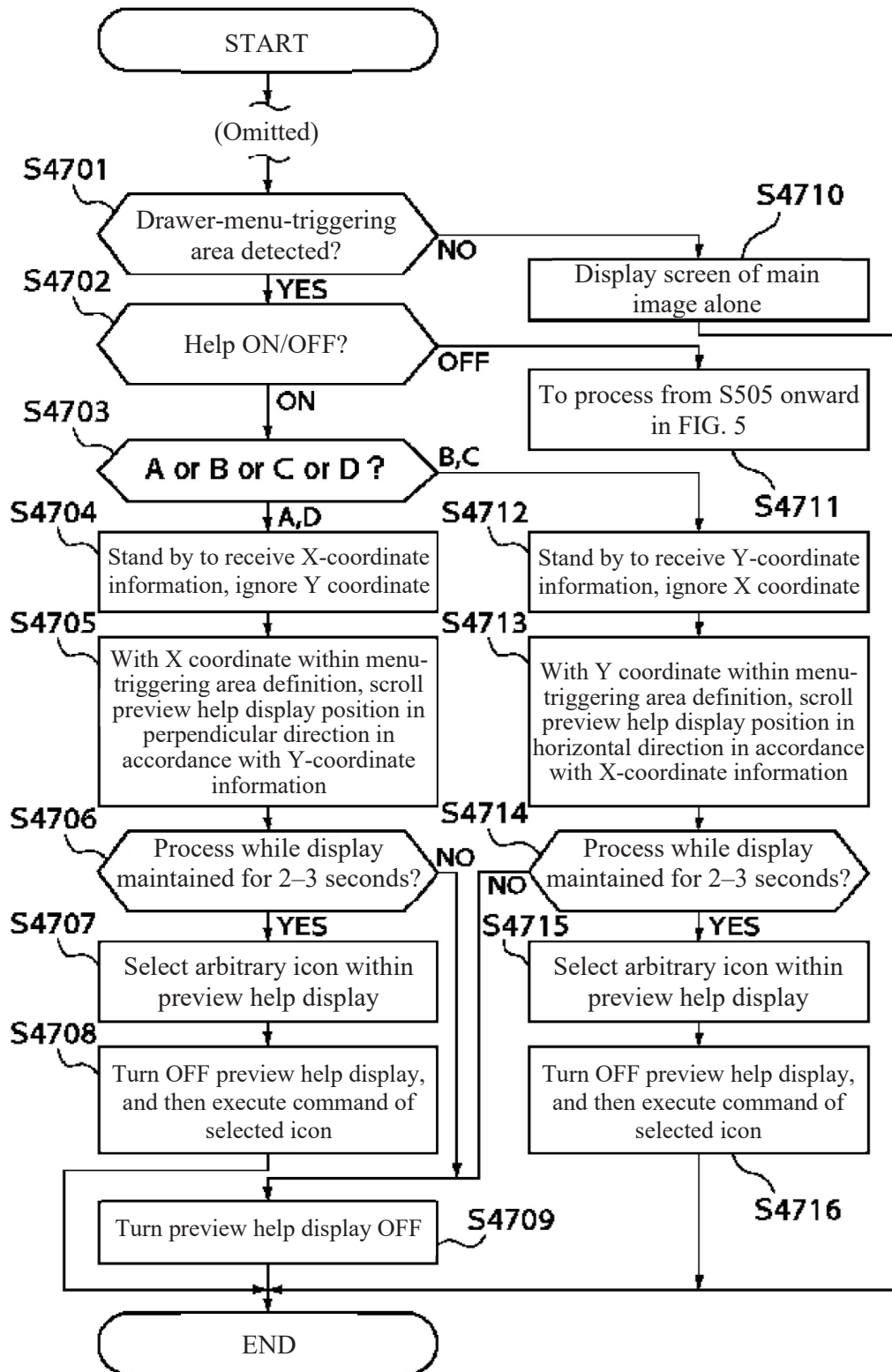


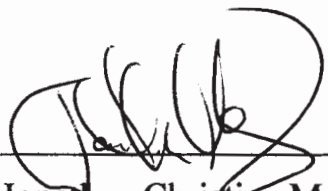
FIG. 47



I, Jonathan Christian Merz, declare as follows:

1. I am over 21 years of age and am competent to make this declaration.
2. I am a native speaker of English.
3. I am fluent in Japanese.
4. I have 15 years of experience translating Japanese to English.
5. I translated the attached patent document "JP2003195998A" from Japanese to English.
6. I certify that the translation of the document "JP2003195998A" is, to the best of my knowledge, a true and accurate translation from Japanese to English.
7. In signing this declaration, I understand that the translation and this declaration may be filed as evidence in a contested case. I acknowledge that I may be subject to cross-examination within the United States.
8. I declare under penalty of perjury that all statements made herein are true and accurate to the best of my knowledge and belief, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed: January 7, 2025

By: 
Jonathan Christian Merz