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(54) **DISPLAY APPARATUS, DISPLAY METHOD, PROGRAM AND STORAGE MEDIUM**

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(57) **ABSTRACT**

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For two screen configurations with different icons are arranged in the same region, when screens are immediately switched from one to the other, the switching is not easy to be recognized, being mistaken that both icons have strong relationship with each other. After deleting a group of icons, the other group of icons is animated and arranged. Alternatively, a group of icons are deleted when the screen is switched, and after a window is animated in a region where the group of icons is displayed, the other group of icons is displayed.

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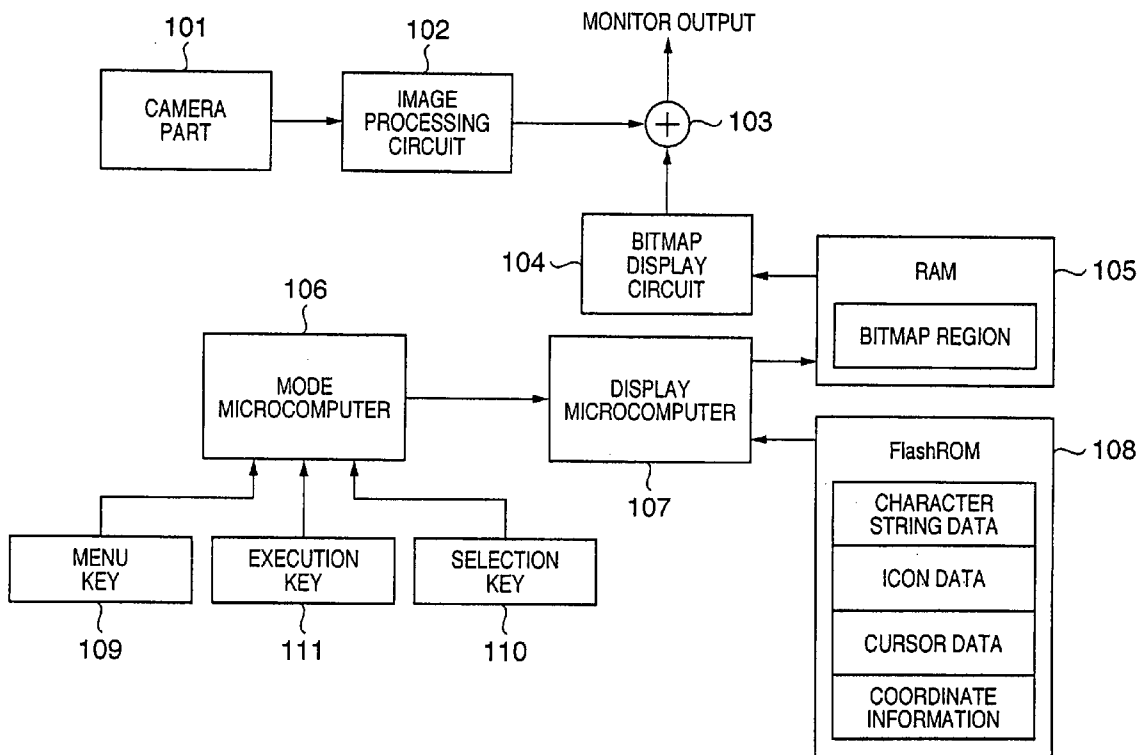


FIG. 1

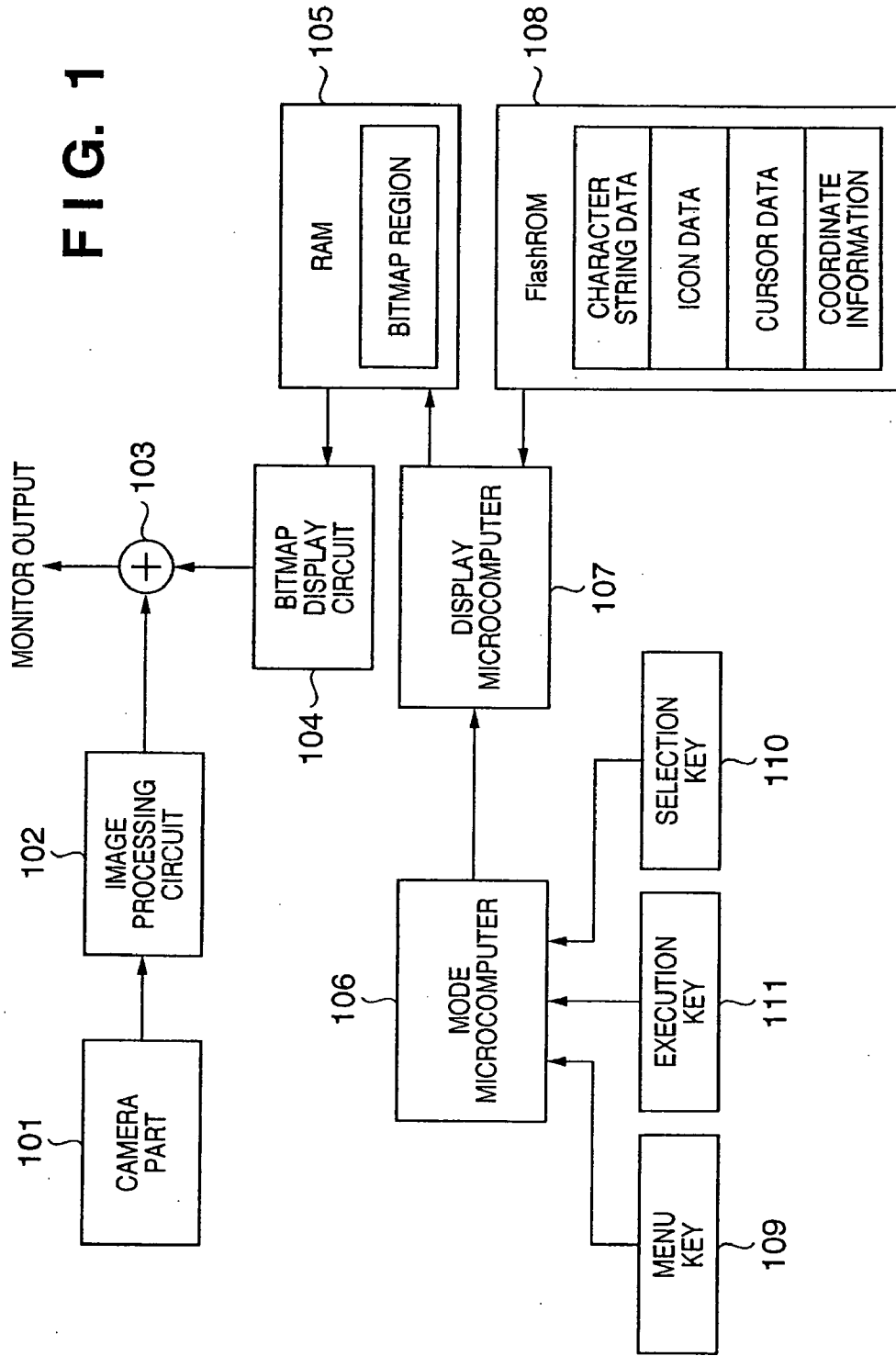


FIG. 2

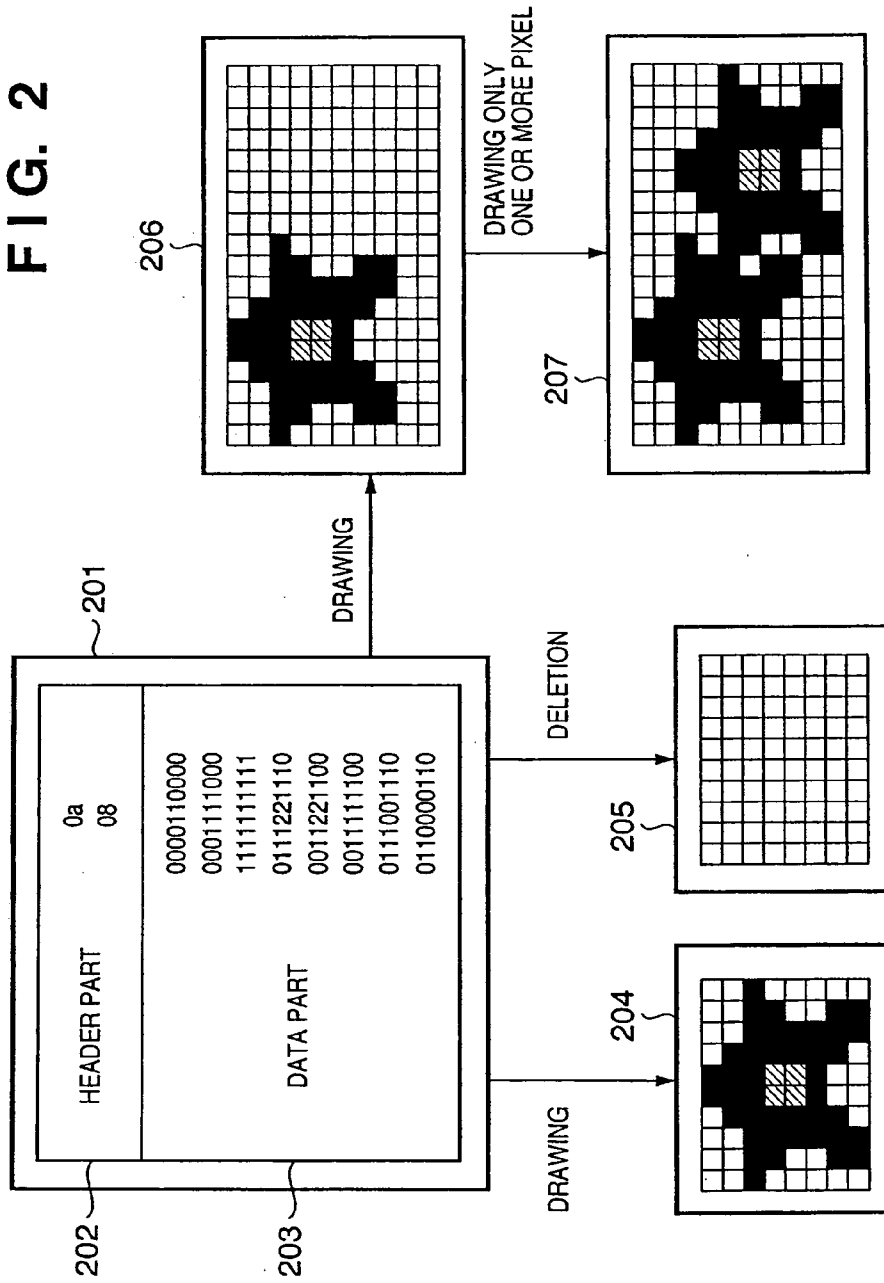


FIG. 3

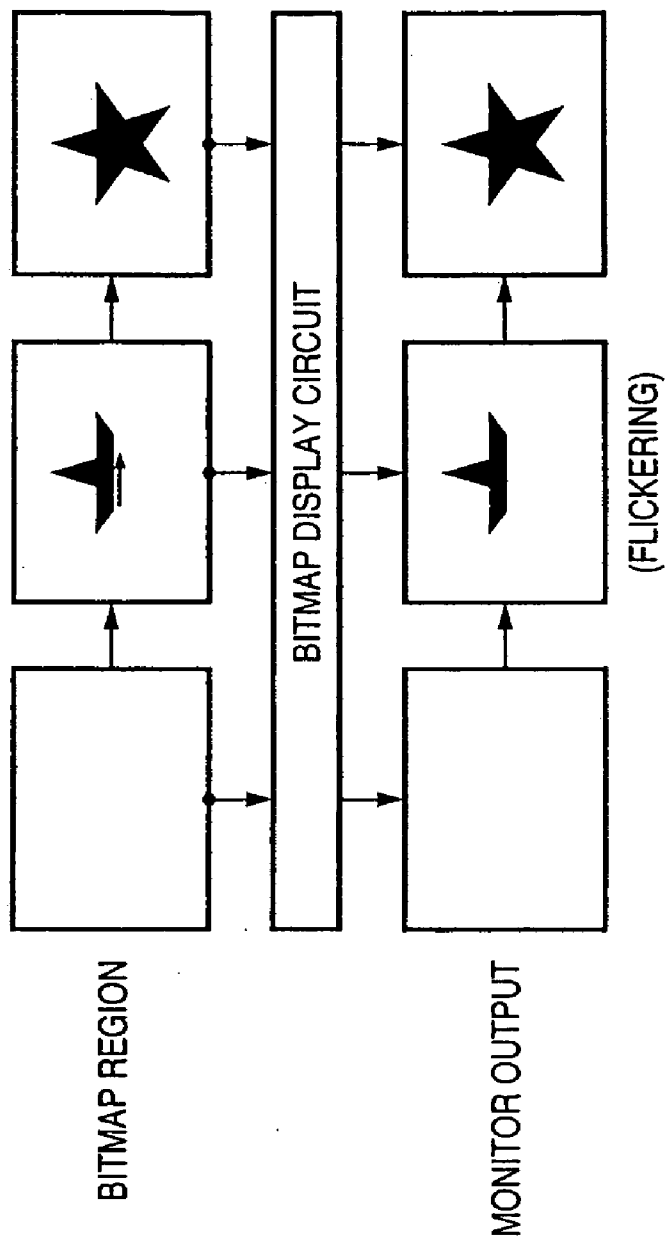


FIG. 4

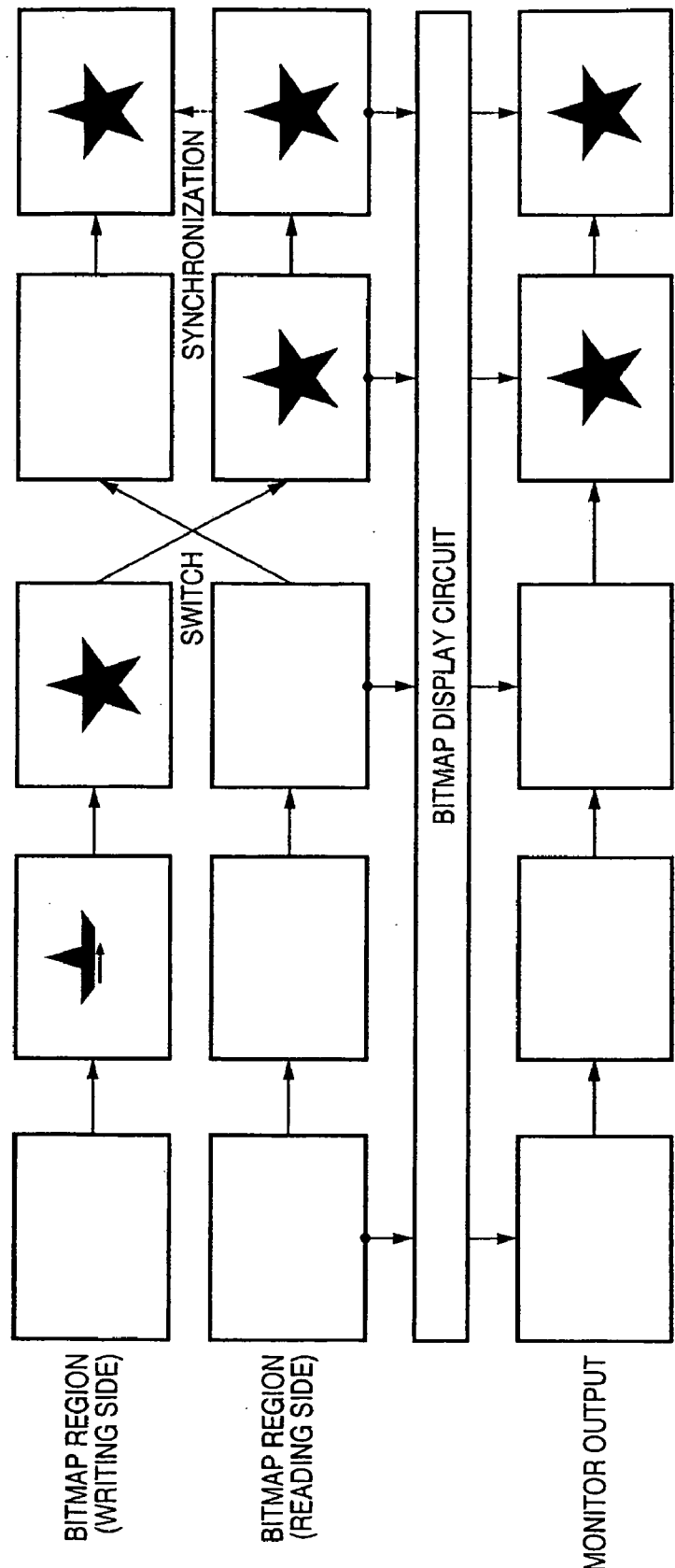


FIG. 5

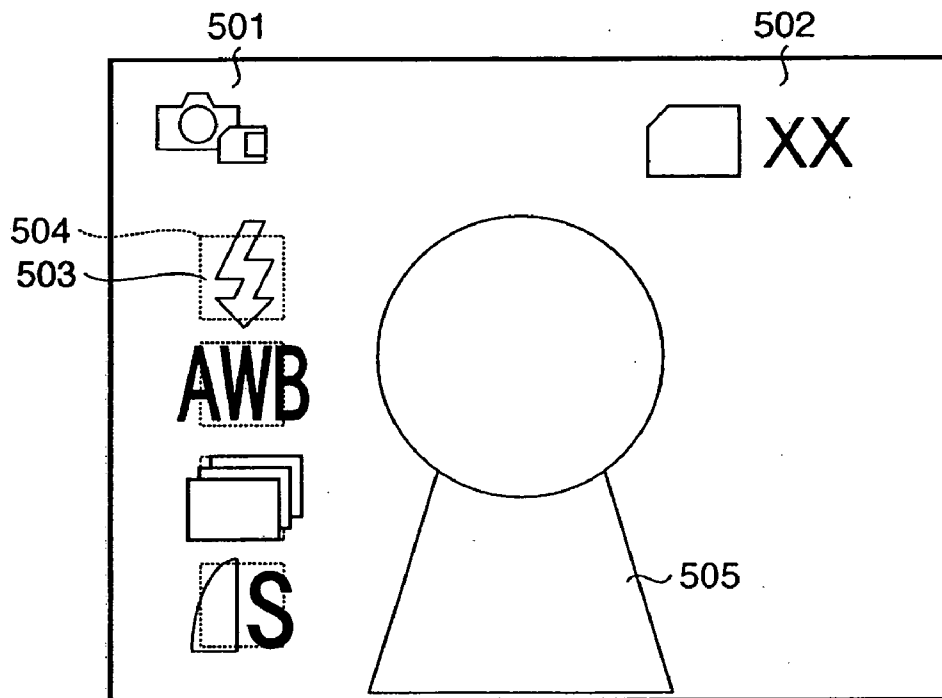


FIG. 6

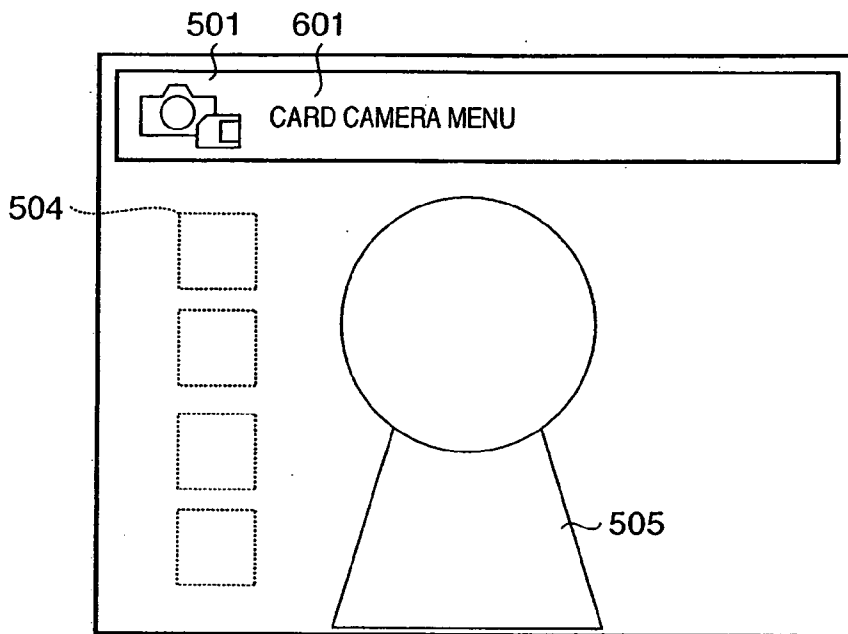


FIG. 7

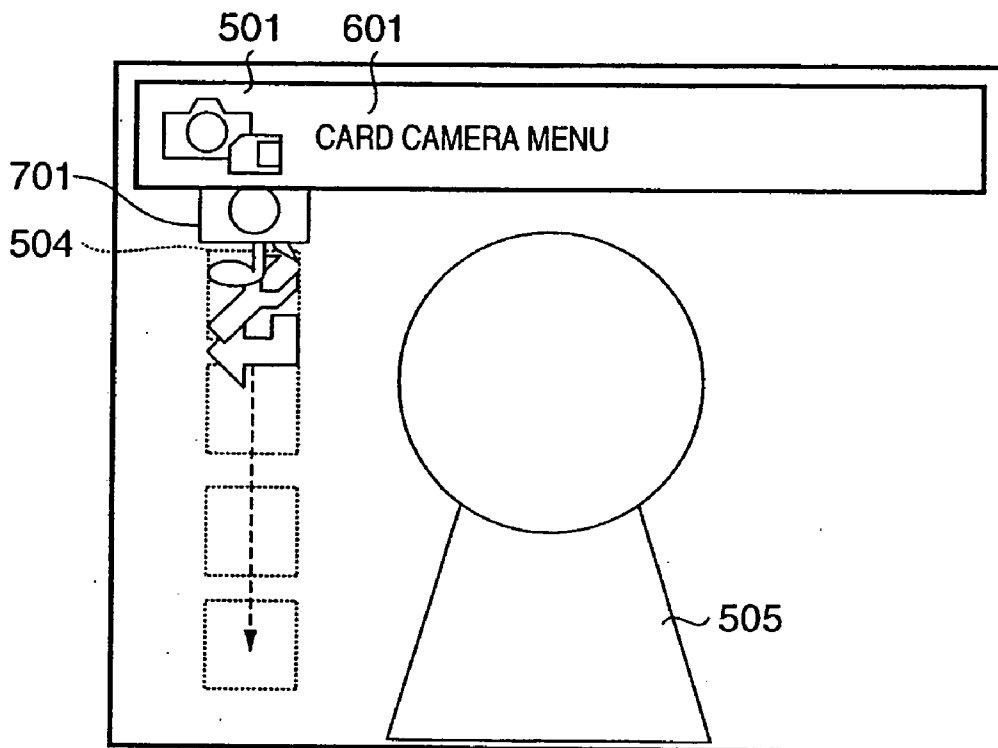


FIG. 8

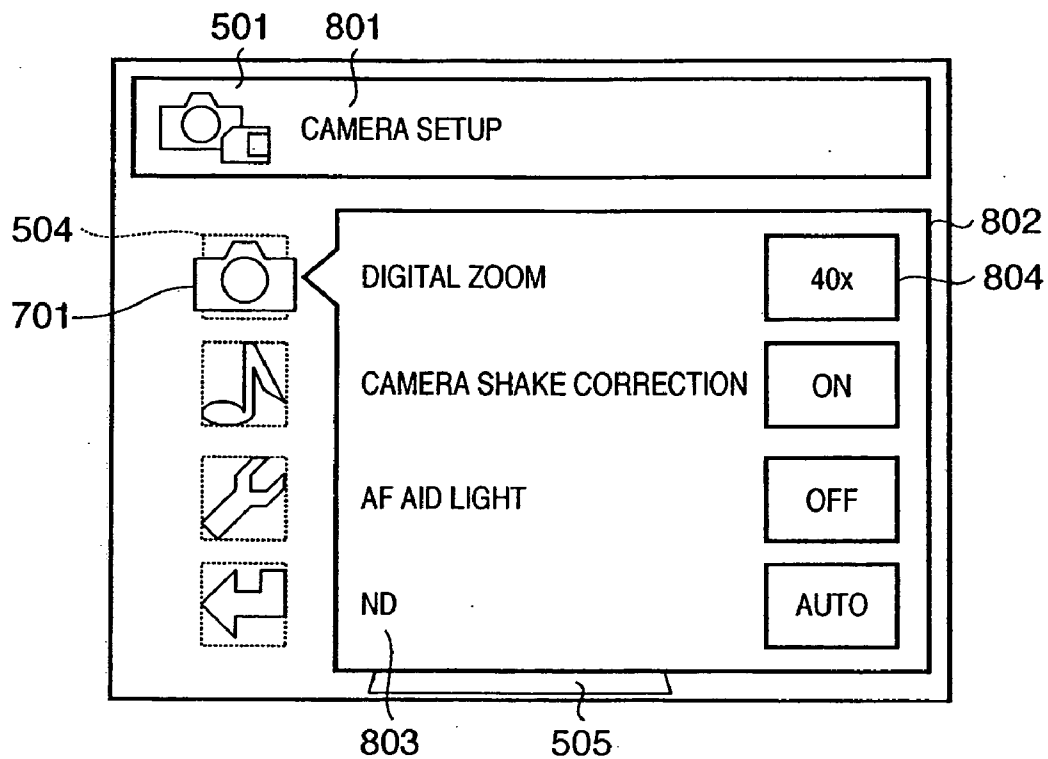


FIG. 9

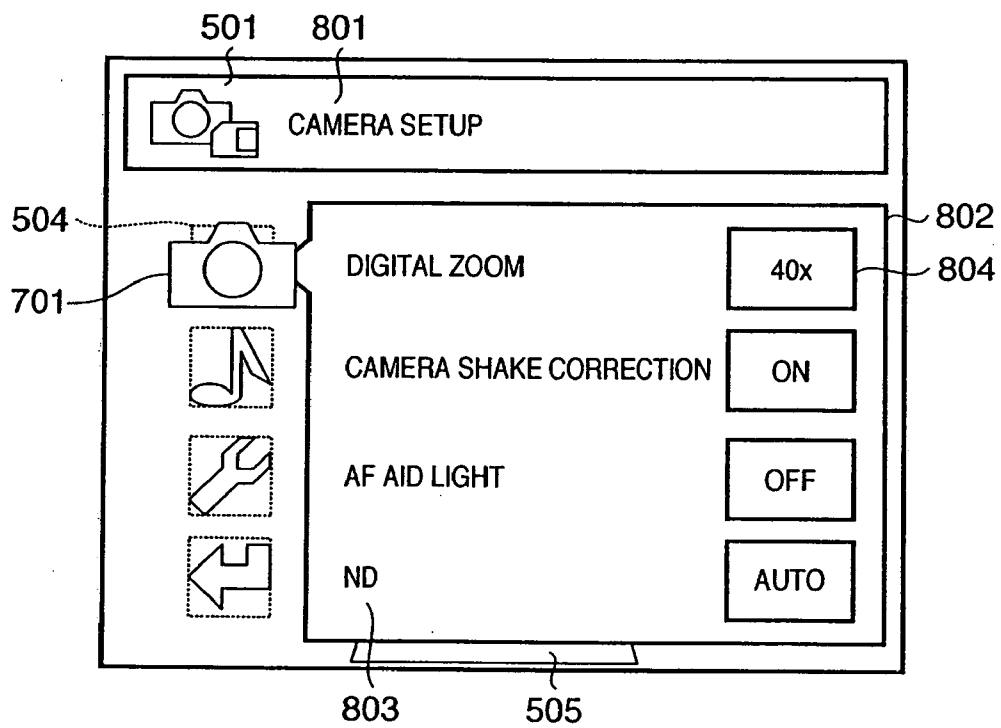


FIG. 10

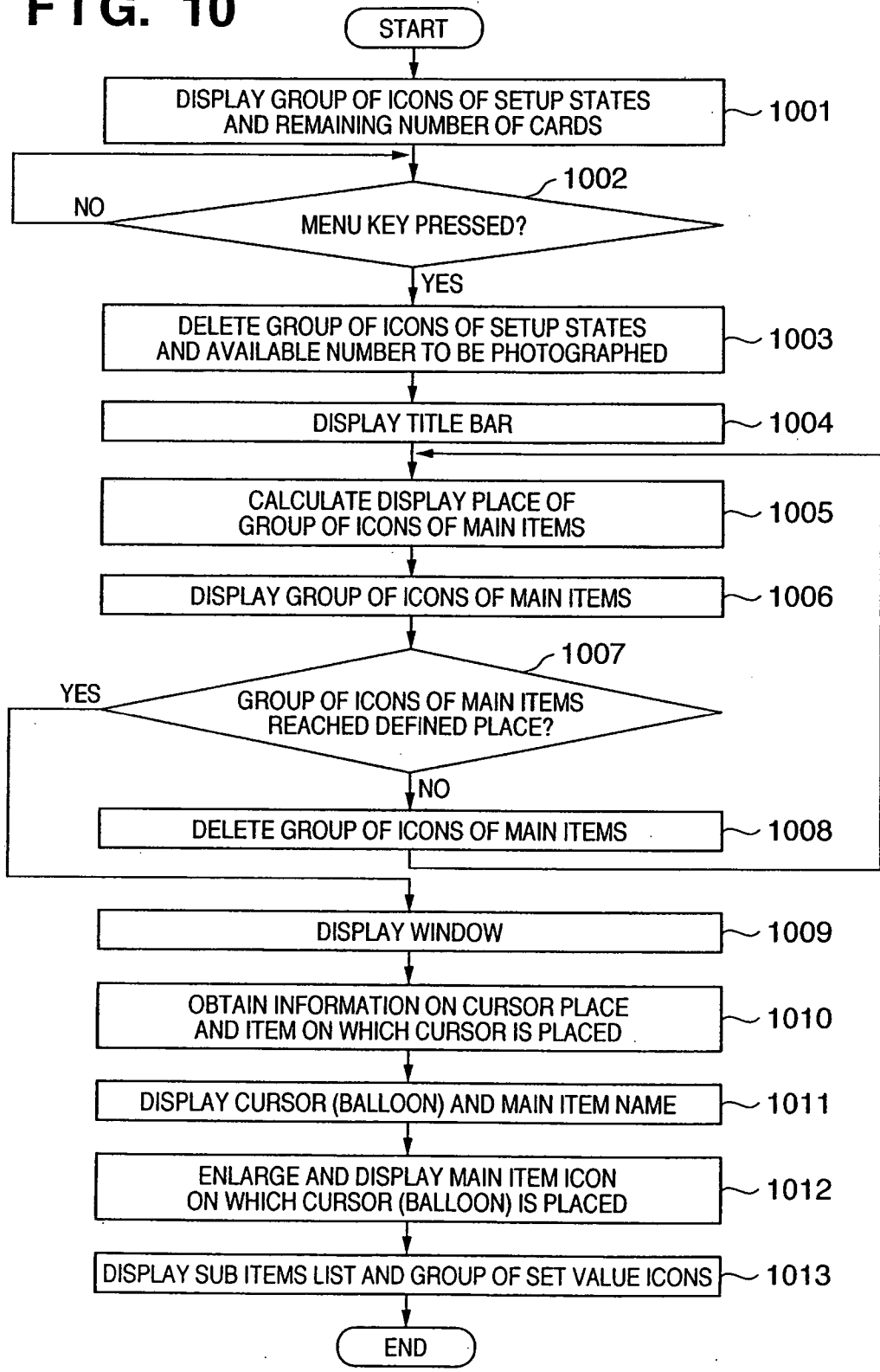


FIG. 11

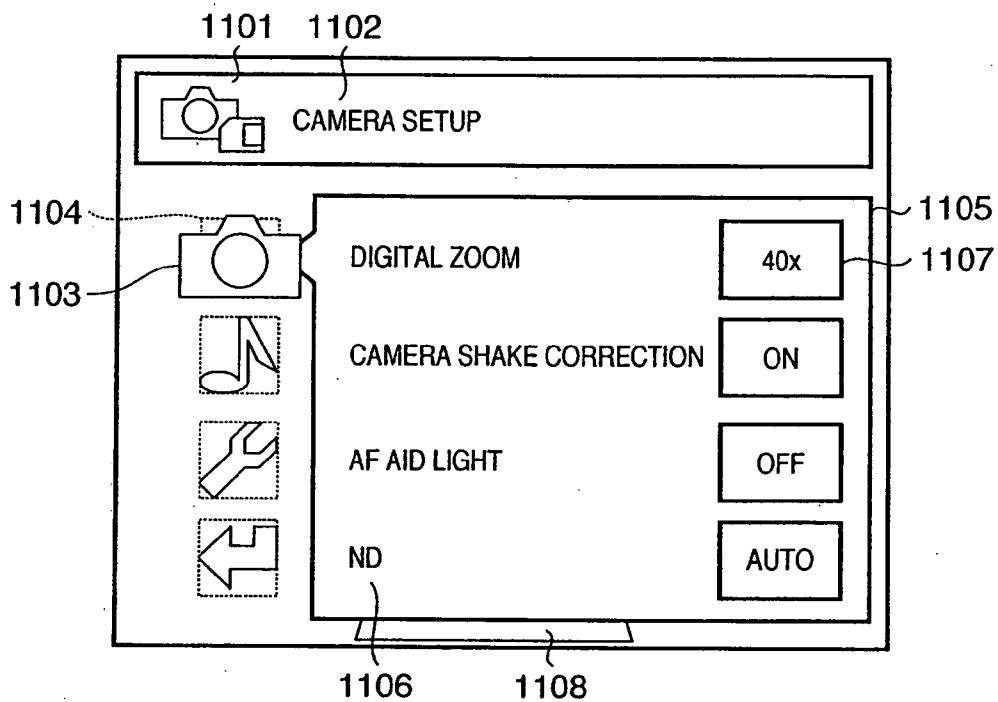


FIG. 12

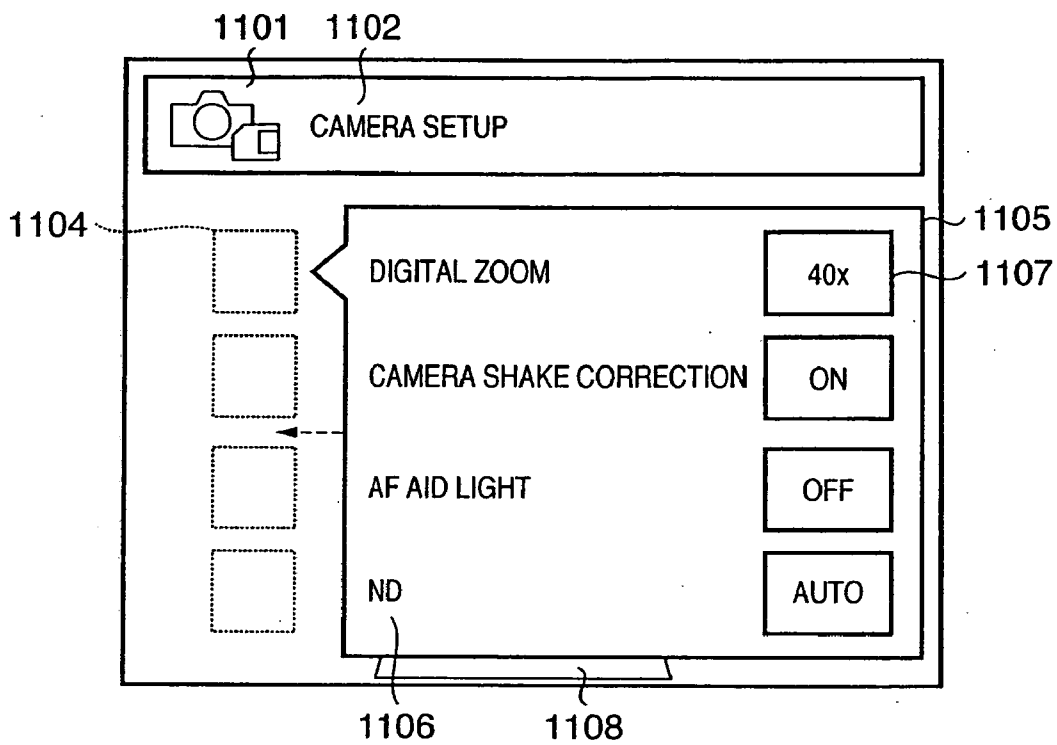


FIG. 13

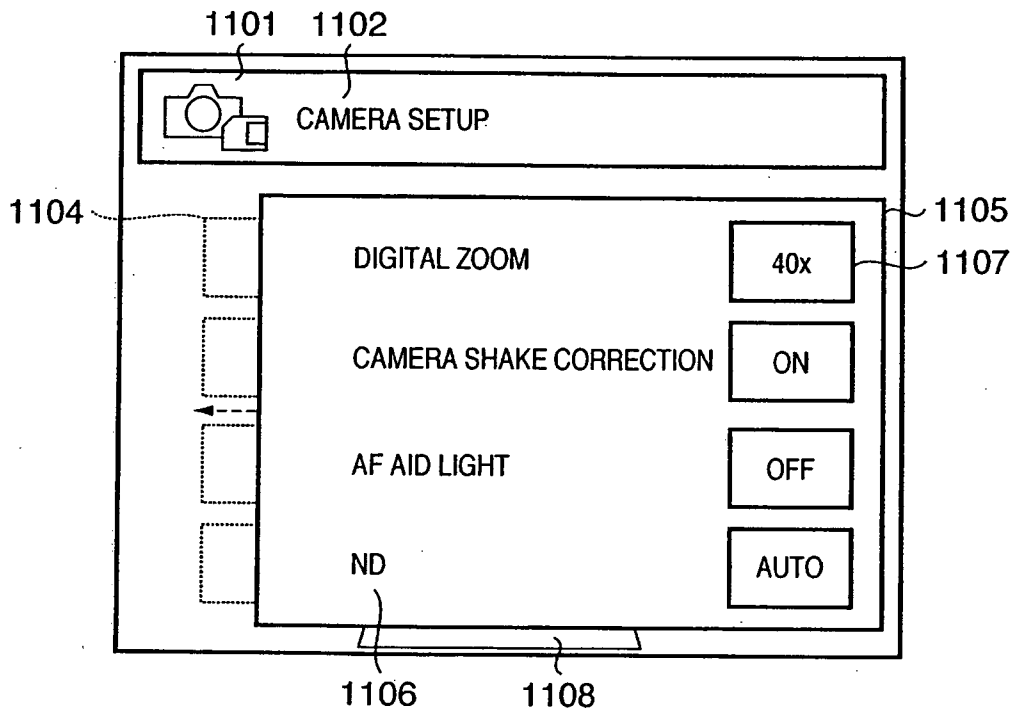


FIG. 14

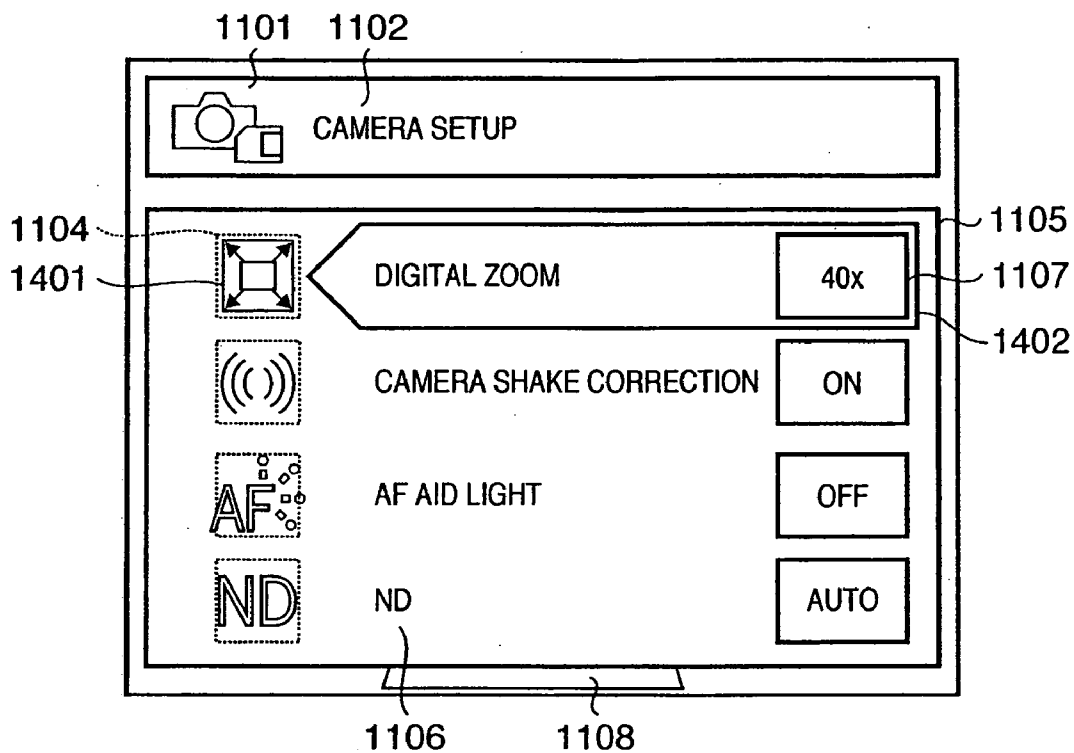


FIG. 15

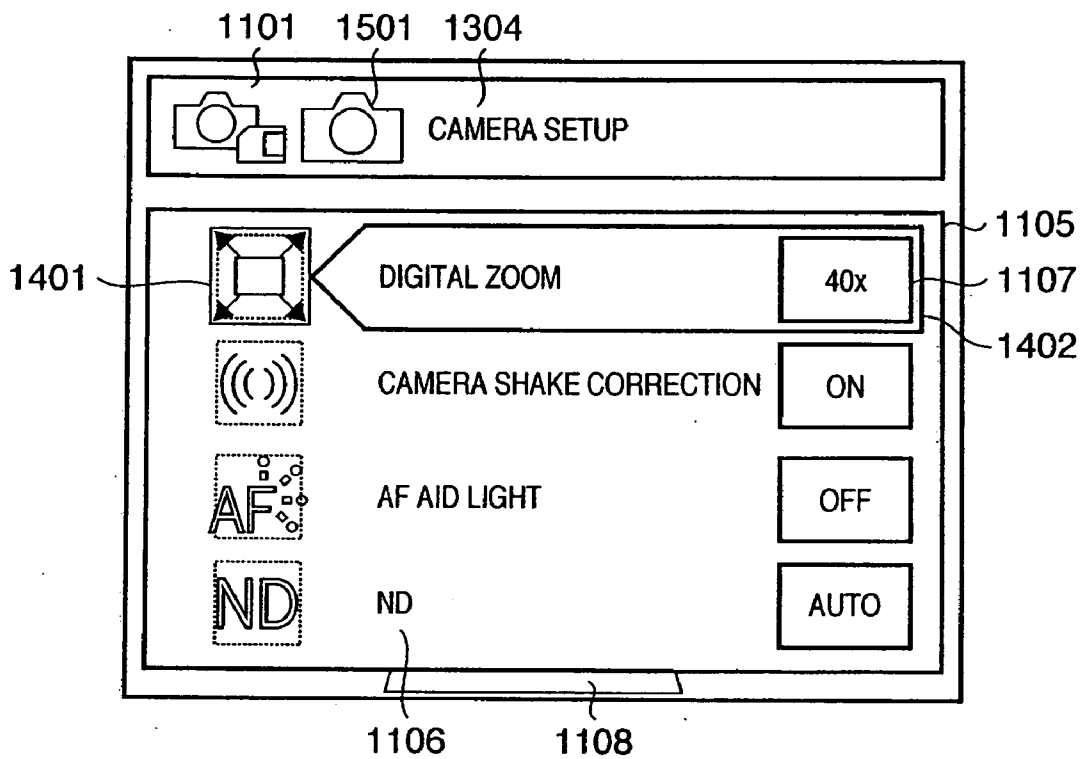


FIG. 16

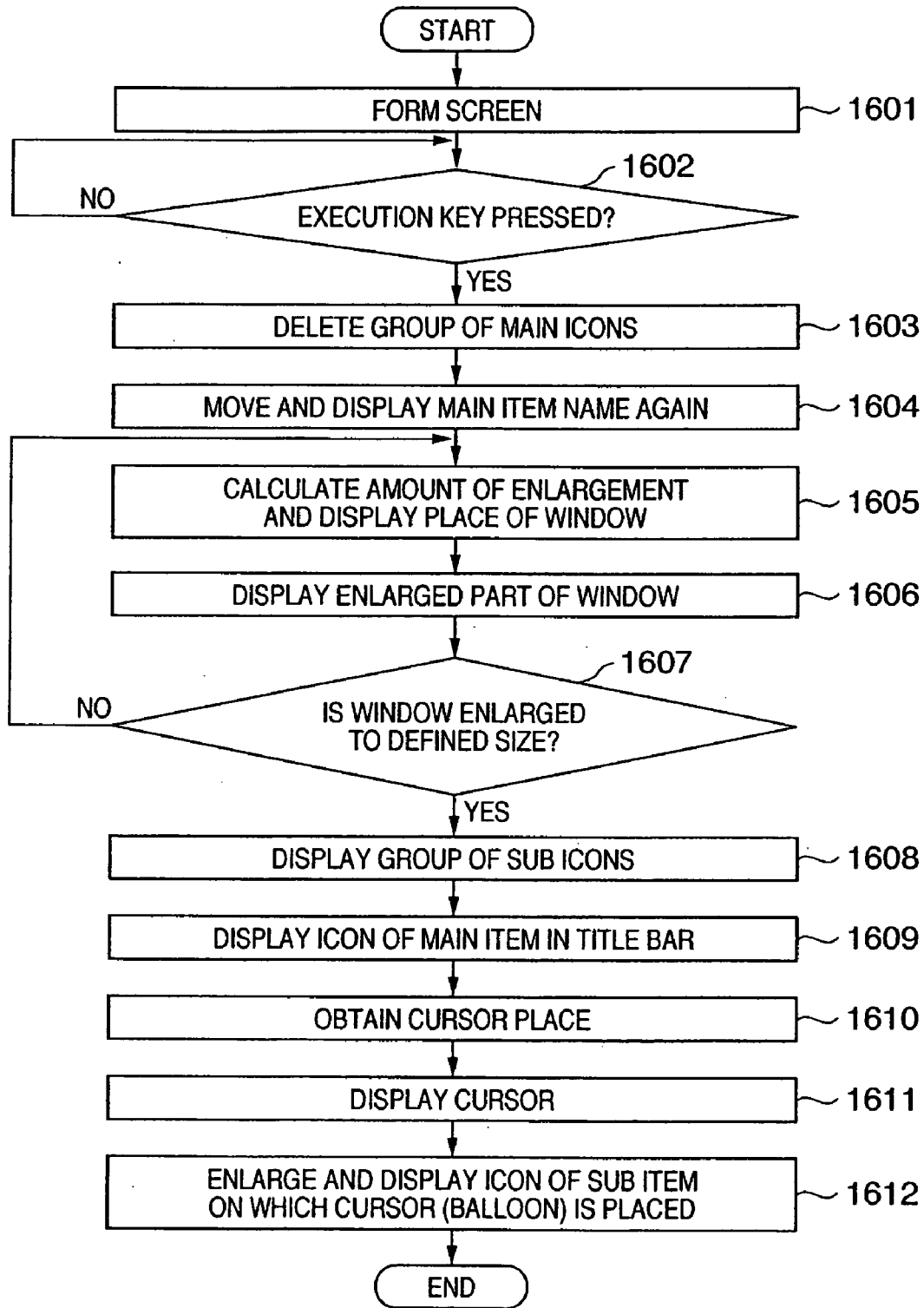


FIG. 17

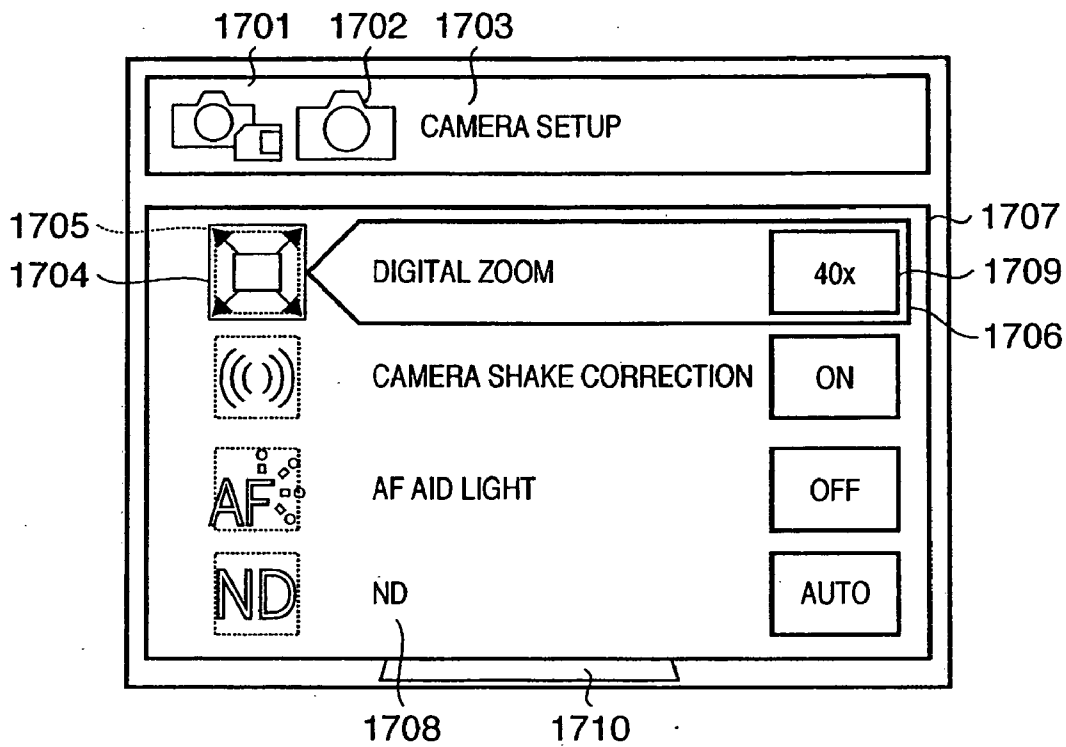


FIG. 18

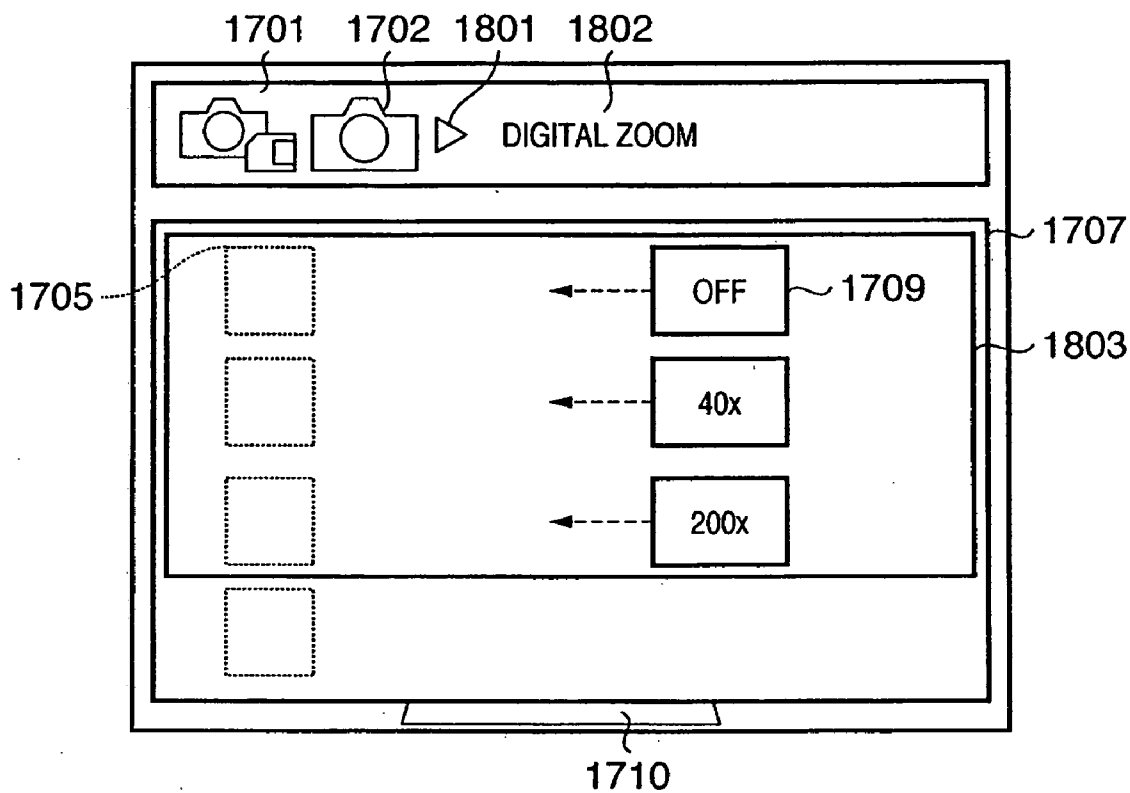


FIG. 19

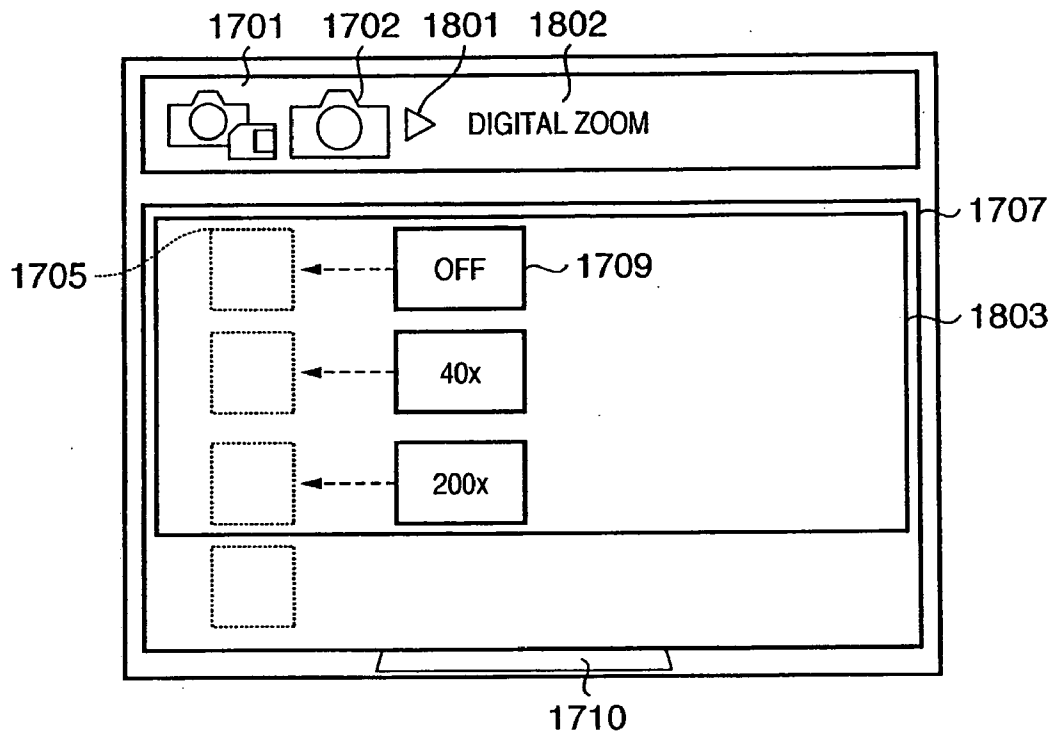


FIG. 20

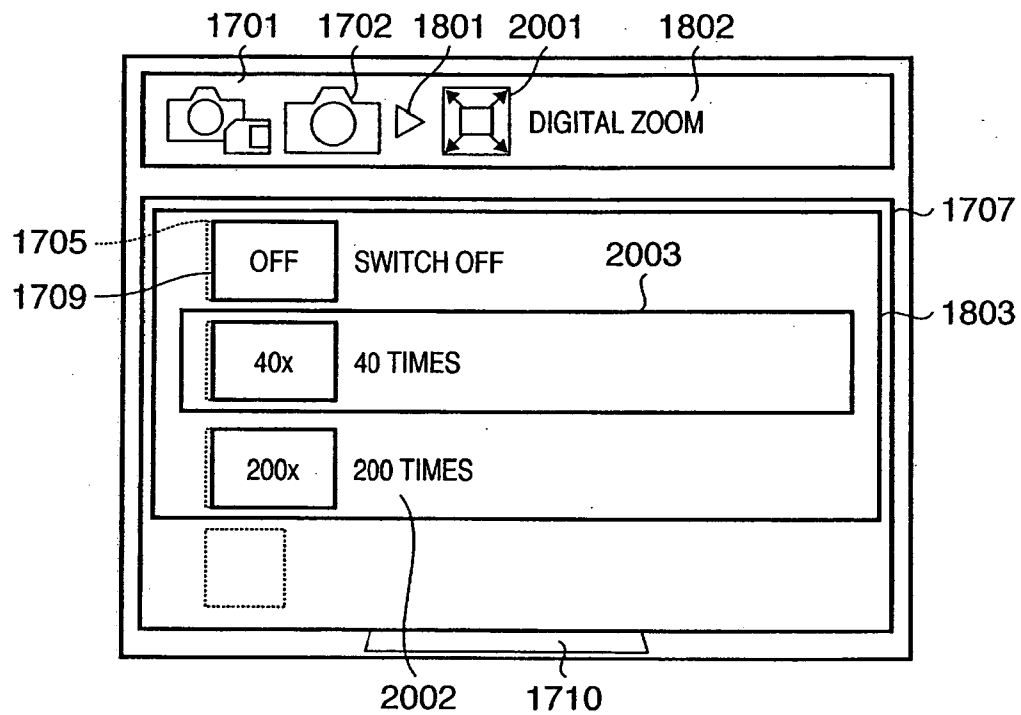
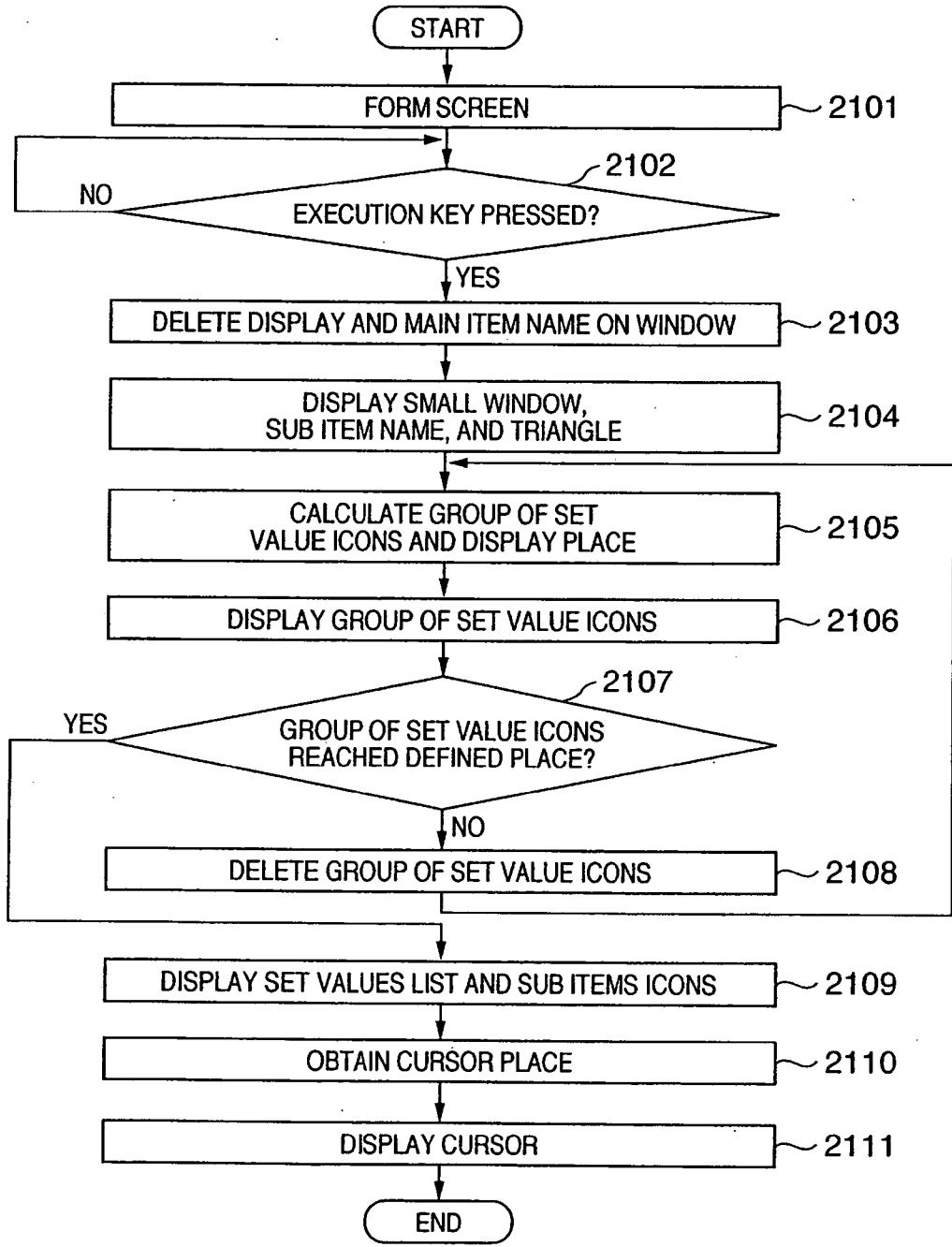


FIG. 21



**DISPLAY APPARATUS, DISPLAY METHOD,
PROGRAM AND STORAGE MEDIUM**

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a technique for switching and displaying different screens on which a plurality of icons are arranged and displayed on display apparatus.

[0003] 2. Description of the Related Art

[0004] In many of information processing apparatus with a display screen, display of icons is used for indicating setup items or a setup state of various functions mounted or an operational state of the apparatus. In order to display information as much as possible on a limited display area of a cellular phone, for example, or in order to effectively display both of the picked-up image or the playback image from a camera and a state of the apparatus in a digital camera, icons often replace character strings and used. In a DVD recorder, a known example is that an icon is attached to a character string of an item name for the purpose of facilitating recognition of each item of selection items on a menu screen. According to a hierarchical structure of a user interface, or in order to restrict a screen area, all of a plurality of icons indicating the state or items is seldom displayed on a display screen at a time. In many cases, some icons are switched and displayed in order according to operation of the apparatus or operation of a user.

[0005] Assume that an apparatus displays a screen by switching at least two screens of a screen A which arranges and displays a plurality of icons at a particular place in a screen area and a screen B which arranges and displays a plurality of icons different from those in the screen A at the same place or a near place in the screen area on which icons are arranged in the screen A. In this case, when the two screens are switched in a moment of time, a user may have problems in two points below.

[0006] First, it is not easy for a user to recognize that screens are switched. This is because that the screen A and the screen B have similar configurations and that a difference between icons is as not easy to be recognized as a difference between character strings is.

[0007] Second, it is misunderstood that a group of icons on the screen A and a group of icons on the screen B are strongly related with each other more than they actually are. This is because that the icons displayed in the same place on the screen A and the screen B are felt as corresponding to each other one for one. Actually, a switched icon does not necessarily correspond to an icon before the switching in such a case of switching screens, or the icons may have completely different meaning.

SUMMARY OF THE INVENTION

[0008] Therefore, the present invention is adapted in view of the abovementioned problems, and intends to facilitate a user to recognize that screens are switched when screens, on which icons are placed in similar arrangements, are switched.

[0009] In order to solve the abovementioned problems, the present invention provides display apparatus including a

display unit adapted to display predetermined information, and a control unit adapted to control the display unit so that displayed contents are switched with a different effect depending on an instruction to switch, when the instruction to switch the displayed contents on a display screen of the display unit is issued.

[0010] Further features of the present invention will be become apparent from the following description of exemplary embodiments with reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a block diagram showing a configuration of a digital video camera according to a first embodiment of the present invention;

[0012] FIG. 2 is a diagram showing drawing and deletion of bit map data;

[0013] FIG. 3 is a diagram showing a display processing example where double buffering is not performed;

[0014] FIG. 4 is a diagram showing a display processing example where double buffering is performed;

[0015] FIG. 5 is a diagram showing a usual photographing screen displayed on a monitor;

[0016] FIG. 6 is a diagram showing a screen before animation operates where a usual photographing screen is switched to a main menu screen;

[0017] FIG. 7 is a diagram showing a screen on which an animation is operating where the usual photographing screen is switched to the main menu screen;

[0018] FIG. 8 is a diagram showing the main menu screen displayed on a monitor;

[0019] FIG. 9 is a diagram showing the main menu screen displayed on the monitor;

[0020] FIG. 10 is a flowchart showing operation of the embodiment of the present invention;

[0021] FIG. 11 is a diagram showing a screen before animation operates where the main menu screen is switched to a sub menu screen;

[0022] FIG. 12 is a diagram showing a screen before animation operates where the main menu screen is switched to the sub menu screen;

[0023] FIG. 13 is a diagram showing a screen on which an animation is operating where the main menu screen is switched to the sub menu screen;

[0024] FIG. 14 is a diagram showing the sub menu screen displayed on a monitor;

[0025] FIG. 15 is a diagram showing the sub menu screen displayed on the monitor;

[0026] FIG. 16 is a flowchart showing operation of an embodiment of the present invention;

[0027] FIG. 17 is a diagram showing a sub menu screen displayed on the monitor;

[0028] FIG. 18 is a diagram showing a screen on which an animation is operating where the sub menu screen is switched to a setup screen;

[0029] FIG. 19 is a diagram showing a screen on which an animation is operating where the sub menu screen is switched to the setup screen;

[0030] FIG. 20 is showing the setup screen displayed on the monitor; and

[0031] FIG. 21 is a flowchart showing operation of an embodiment of the present invention.

DESCRIPTION OF THE EMBODIMENTS

[0032] Preferred embodiments of the present invention will be described in detail below with reference to attached drawings.

[0033] <On Transition from a Photographing Screen to a Main Menu Screen>

[0034] In the embodiment, an example of applying the present invention to transition from a photographing screen to a main menu screen in a digital video camera will be shown.

[0035] Embodiments of the present invention will be described below based on the drawings.

[0036] FIG. 1 is a block diagram showing a configuration of a digital video camera according to a first embodiment of the present invention.

[0037] A digital video camera has a camera part 101 which includes an image sensor and converts an optical object image into electrical image signals.

[0038] In such a digital video camera, a mode microcomputer 106 sends an instruction and a set value to a display microcomputer 107 for displaying a setup state of apparatus on a usual photographing screen of a monitor. The display microcomputer 107 receives them and arranges character string data and icon data recorded in FlashROM 108 in a bit map region in RAM 105 according to coordinate information which is also in the FlashROM 108. Data in a bitmap region is read out by a bitmap display circuit 104 and converted into video signals, and combined with video image signals sent from the camera part 101 via an image processing circuit 102 by a combination circuit 103 and outputted to the monitor. A new instruction is sent from the mode microcomputer 106 to the display microcomputer 107 and the display is updated each time the setup state of the apparatus changes.

[0039] When a user presses a menu key 109, the mode microcomputer 106 responds to that by issuing an instruction to display a menu to the display microcomputer 107. The menu screen is formed by the display microcomputer 107 arranging character string data, icon data, and cursor data on the bitmap region. When a user operates a selection key 110 or an execution key 111, the display microcomputer responds to that by rewriting contents of the bitmap region to reflect it on the outputted image, while the mode microcomputer 106 changes various kinds of setup data of the video camera.

[0040] FIG. 2 is a diagram showing an example of object data such as an icon or a character and an example of drawing and deletion.

[0041] An object data 201 largely divided into a header part 202 and a data part 203. The header part 202 records the

number of pixels in breadth and the number of pixels in height when object data is placed on the bitmap region. On the other hand, the data part 203 records a pixel map of the object data.

[0042] In order to draw the object data 201 in a desired place in the bitmap region, data is copied from the top data of the data part 203 by the pixels in breadth recorded in the header part 202 to a place in the bitmap region where the data is to be drawn. Data is also copied from the next pixel data in the data part 203 by the pixels in breads to a place a line under said place in the bitmap region. When that is repeated for the number of pixels in height, the object data 201 can be drawn in a designated place in the bitmap region as shown by the reference numeral 204.

[0043] In order to delete the drawn object data 201 from the bitmap region, data corresponding to a background color only needs to overwrite said data as shown by the reference numeral 205, instead of copying values in the data part 203 to the same place where said data is drawn. The breadth and the height in deleting are also obtained from the header part 202 of the object data 201 as in the same way as they are drawn.

[0044] When each bit in the data part is referenced and only pixels whose values are one or more is copied to a bitmap region for drawing an image, data can be additionally written in the bitmap region 206 where graphics are already drawn, as shown by the reference numeral 207.

[0045] When object data is drawn or deleted in such a way, a certain processing time period is required in writing data into the bitmap region. The bitmap region is scanned by the bitmap display circuit 104 at 60 times/second in NTSC and 50 times/second in PAL, and outputted to a monitor. If the bitmap display circuit 104 scans said region for displaying before drawing or deletion of the object data to or from the bitmap region completes, data which is uncompleted in being written into the bitmap region is outputted on the monitor. That appears to a user as flickering on the screen as shown in FIG. 3. If the display microcomputer 107 particularly has a little throughput or has a slow access rate to the RAM 105, such flickering often occurs.

[0046] In order to solve the problem, double buffering, in which two bitmap regions are included and reading out by a bitmap display circuit is alternatively performed from either region, is effective. In such a case, the bitmap display circuit 104 reads out from one bitmap region, while the display microcomputer 107 is writing in the other bitmap region, as shown in FIG. 4. That causes no flickering. Switching of bitmap regions to be read and written is performed within a blanking period between scans, and is not performed while the other bitmap region is being read.

[0047] That double buffering technique is effective when the embodiment is applied to an environment where the display microcomputer 107 has a little throughput or has a slow access rate to the RAM 105.

[0048] Next, operation of the embodiment will be described according to schematic diagrams of screen configurations shown in FIG. 5 to FIG. 8.

[0049] In the examples, icons on the photographing screen and icons on the menu screen are specifically shown that they are independent elements when operation of the

embodiment is applied in transferring a photographing screen to a menu screen in a digital video camera. FIG. 5 is a diagram showing a photographing screen in a card camera mode (mode for photographing a still image and recording it into a memory card).

[0050] On a screen of a monitor, icons indicating setup states of a flash, white balance, continuous shooting mode and recording size/image quality are displayed. The reference numeral 502 denotes the remaining amount of the memory card (the remaining number to be photographed). The reference numeral 505 denotes an object to be photographed by the camera, on which icons drawn in the bitmap are displayed.

[0051] An icon 501 indicates that it is currently operating in the card camera mode. For icons 503, a group of icons indicating setup states of a flash, white balance, a continuous shooting mode and recording size/image quality is displayed from the top in order. Said icons are switched to other icons depending on the setup state of the apparatus. Frames of the icons 504 schematically show places where icons of the group of icons 503 are displayed and they are not actually displayed on the screen.

[0052] On the other hand, FIG. 9 shows a main menu screen. A group of icons 701 indicates main items. The icon is enlarged and displayed for clearly showing a selected item, with its name of the item being displayed by a character string as shown by the reference numeral 801. A window 802 shows the enlarged icon by a balloon-like cursor. Sub items 803 and their current set values 804 in the selected item are previewed in the window 802.

[0053] Here, in FIG. 5 and FIG. 9, the group of icons 503 indicating setup states and the group of icons 701 indicating main items in the menu are arranged in the same places 504 and in the same direction. Accordingly, when the menu key 109 is pressed and the screen is immediately transitioned from FIG. 5 to FIG. 9, it is not easy for a user to recognize that the screens are switched. Or, the user may mistake that the group of icons 503 indicating setup states and the group of icons 701 indicating main items in the main menu are corresponding with each other one to one and there is some relationship with each other.

[0054] Then, with animation of FIG. 6 to FIG. 8 being inserted between FIG. 5 and FIG. 9, appearance of the group of icons 701 after disappearance of the group of icons 503 is visually shown so that such mistaking may be prevented.

[0055] FIG. 10 is a flowchart showing operation of the display microcomputer 107.

[0056] First at the step 1001, data of a mode icon 501, the available number to be photographed 502 and the group of icons 503 of setup states is read out from FlashROM 108 based on the set value obtained from the mode microcomputer 106 and drawn to the bitmap region of the RAM 105 to form the screen of FIG. 5. The data drawn in the bitmap region is read out to the bitmap display circuit 104 and outputted to the monitor through the combining circuit 103. When it is determined that the menu key 109 is pressed at the step S1002, operation proceeds to the step S1003. At the step S1003, the available number to be photographed 502 and the group of icons 503 are deleted, then, a title bar 601 is displayed at the step S1004. FIG. 6 shows that state.

[0057] Next at the step S1005, for the group of icons 701 of the main items to be displayed, respective display places are calculated, and at the step S1006, they are displayed as shown in FIG. 7. If it is determined that the group of icons of main items 701 is not displayed at the defined place on the menu screen at the step S1007, the group of icons 701 is deleted at the step S1008 and the next display places are calculated again at the step S1005, and the group of main icons is displayed at the step S1006. As processing from the step S1005 to the step S1008 is repeated, animation is performed showing the group of icons 701 inching downward from the top of the screen.

[0058] If it is determined that the icons reach the defined places at the step S1007, the window 802 is displayed at the step S1009. At the step 1010, position information on a cursor is obtained from the mode microcomputer 106 and the cursor (balloon) is drawn in the place. As the cursor is placed on "camera setup" in FIG. 8, that is displayed in the title bar 801 at the step S1011. The selected icon is enlarged and displayed at the step S1012, and a sub item character string 801 of the item and each set value 803 are displayed at the step S1013.

[0059] <On Transition from a Main Menu Screen to a Sub Menu Screen>

[0060] Next, transition from the abovementioned main menu screen to the sub menu screen will be described.

[0061] Even if icons with different meaning are arranged in the same places in the main menu screen and the sub menu screen, transition of the screens can be clearly shown.

[0062] FIG. 11 shows the main menu screen for selecting a main item of a digital video camera.

[0063] An icon 1101 represents that it is currently operating in the card camera mode. A group of icons 1103 indicates main items, with the item name of the currently selected icon "camera setup" 1102 is displayed by a character string on the title bar.

[0064] The selected icon is enlarged and displayed among the group of icons 1103, with the names of a group of sub items 1106 in the item and the current set values 1107 of respective sub items are previewed in a window 1105. Frames of dotted lines 1104 overlapping on respective icons of the group of icons 1103 schematically shows places where icons of the group of icons 1103 are placed, and they are not actually displayed on the screen.

[0065] The reference numeral 1108 denotes an image of an object being photographed, which is hidden behind the window 1105 on the screen. The window 1105 may not be filled with color and may be displayed only with a frame, or may be filled with translucent color. In such a case, the object 1108 can be seen transparent under the window 1105. On the other hand, FIG. 14 shows the sub menu screen which appears after "camera setup" is selected in FIG. 11.

[0066] Each sub item is displayed by an icon 1401 and the character string 1106 in the window 1105, with a set value for each item being indicated by an icon 1107. When an item is selected by a cursor 1402, the screen is transferred to the screen for setting the individual sub item. The icon of "camera setup" 1101 selected in FIG. 11 is added to the left of the title display 1102.

[0067] Icons of the group of icons 1401 are placed at the frames 1104 in FIG. 11, i.e., in the same places and in the same direction as those of the group of icons 1103 indicating main items. Accordingly, when the execution key 111 is pressed in the main menu and FIG. 11 is immediately transited to FIG. 14, it is not easy for the user to recognize that the screens are switched. Or, the user may mistake that icons of the group of icons 1103 and the group of icons 1401 corresponding to each other has relationship with each other. Then, with animation of FIG. 12 and FIG. 13 being inserted between FIG. 11 and FIG. 14, appearance of the group of icons 1401 after disappearance of the group of icons 1103 is visually shown so that such a mistake may be prevented.

[0068] FIG. 16 is a flowchart showing operation of the display microcomputer 107.

[0069] First at the step S1601, when the photographing screen is transited to the main menu screen (processing of FIG. 10), the main menu screen of FIG. 11 is formed. Next, if it is determined that the execution key 111 is pressed at the step S1602, the group of main icons 1103 is deleted at the step S1603. At the step S1604, the place to display the main item in the tile bar is moved, with the state transited to that of FIG. 12. Next at the step S1605, the amount of enlargement of the window and the display place of the enlarged part are calculated, and at the step S1606, the enlarged part is displayed as shown in FIG. 12. If it is determined that the window is not enlarged to the defined size at the step 1607, the next amount of enlargement and the display place are calculated and displayed. By repeating the processing from the step S1605 to the step S1607, animation is performed showing the window as shown in FIG. 13 being enlarged leftward little by little. At the step S1608, when the window is enlarged to the defined size, the group of icons 1401 of the sub items is displayed in the place 1104 where the main item icons are placed. At the step S1609, the icon of the main item selected for the title bar is displayed. Then at the step S1610, place information on a cursor is obtained from the mode microcomputer 106. At the step S1611, the screen becomes that of FIG. 14 when the cursor is drawn in the place.

[0070] Further at the step S1612, the selected sub item icon is enlarged and displayed again as shown in FIG. 15.

[0071] <On Transition from a Sub Menu Screen to a Setup Screen>

[0072] Next, transition from the sub menu screen to the setup screen on a digital video camera will be described.

[0073] If icons with different meaning are arranged in the same places in the sub menu screen and the setup screen, transition of the screens can be clearly shown.

[0074] FIG. 17 shows a sub menu screen for selecting a sub item after a main item is selected.

[0075] An icon 1701 represents that it is currently operating in the card camera mode. For an icon 1702 and a title 1703, a main item which is at a higher level of each of the displayed sub items, i.e., a main item which the user has already selected is represented. The group of icons 1704 indicates respective sub items, with the icon selected by a cursor 1706 is enlarged and displayed. Frames of dotted lines 1705 overlapping on respective icons of the group of icons 1704 schematically show places where icons of the group of icons 1704 are placed and they are not actually

displayed on the screen. To the right of the group of icons 1705, names of the items 1708 and the current set value of the items 1709 are arranged.

[0076] The reference numeral 1710 denotes an image of an object being photographed, and hidden behind the window 1707 on the screen. The window 1707 may not be filled with color and may be displayed only with a frame, or may be filled with translucent color. In such a case, an object 1710 can be seen transparent under the window 1707. On the other hand, FIG. 20 shows setup screen displayed after "digital zoom" is selected in FIG. 17. A small window 1803 is displayed on the window 1707. In the small window 1803, setup items of "digital zoom" are displayed both by an icon 2001 and a character string 1802. The currently selected item is pointed by a cursor 2003. When the item is pointed by the cursor 2003 and selected, setting of the sub item (digital zoom) is changed, and the screen can be returned to the screen of FIG. 17.

[0077] In the tile bar at the top of the screen, a main item icon 1702 indicating "camera setup" and a sub item icon 2001 indicating "digital zoom" are displayed next to the mode icon 1701 with a triangle 1801 between them. That visualizes process from when the menu is opened to when that screen is opened.

[0078] Here, the group of icons 1709 are placed in the places of the frames 1705 in FIG. 17, i.e., in the same places of the group of icons 1704 indicating sub items and in the same direction. Accordingly, when the execution key 111 is pressed at the sub menu and the screen is immediately transited from FIG. 17 to FIG. 20, it is not easy for the user to recognize that the screens are switched. Or, the user may mistake that the group of icons 1704 and the group of icons 1709 corresponding to each other have relationship with each other.

[0079] Then, with animation of FIG. 18 and FIG. 19 being inserted between FIG. 17 and FIG. 20, appearance of the group of icons 1709 after disappearance of the group of icons 1704 is visually shown so that such a mistake may be prevented.

[0080] FIG. 21 is a flowchart showing operation of the display microcomputer 107.

[0081] First at the step S2101, when the main menu screen is transited to the sub menu screen (processing of FIG. 16), the sub menu screen of FIG. 17 is formed. Next, if it is determined that the execution key 111 is pressed at the step S2102, the group of sub icons 1704 displayed on the window 1707, sub items list 1708, the group of set value icons 1709, the cursor 1706, and the name of the main item in the title bar "camera setup" 1703 are deleted. Then at the step S2104, the small window 1803 for setup screen, the sub item name in the title bar "digital zoom" 1802, and a triangle 1801 are displayed.

[0082] At the step S2105, the display places of the set value icons are calculated, and at the step S2106, they are displayed. At the step S2107, whether the group of set value icons has reached the defined place or not is determined. If it is determined that it has not reached, the group of set value icons is deleted, the next display places are calculated and displayed at the step S2108. By repeating the processing from the step S2105 to the step S2108, animation is per-

formed showing the group of set value icons inching leftward from the right of the screen (FIGS. 18, 19).

[0083] If it is determined that the group of set value icons has reached in a defined place at the step S2107, the set values list 2002 and the sub item icon 2001 on the title bar are displayed at the step S2109. At the step S2110, place information on the cursor is obtained from the mode micro-computer 106. At the step S2111, the screen becomes the screen of FIG. 20 when the cursor is drawn to the place.

[0084] According to the embodiment, that the icons are switched as a screen A is transited to a screen B is visually indicated. As animation is inserted between the screen transitions, it can prevent a user from excessively considering the icons in the screen A and the icons in the same place in the screen B have related with each other.

[0085] As described above, according to the embodiment, by changing animation in transition process from a usual screen to a main menu screen, from a main menu screen to a sub menu screen, from a sub menu screen to a setup screen, an operator can easily check the screen to which the current screen is to be transited.

[0086] Although the embodiment is described by using a digital video camera, the present invention can be applied to the other apparatus which has a display part, such as a digital camera, a cellular phone, a PDA or the like.

<Other Embodiments>

[0087] Needless to say, objects of the present invention can also be achieved when a storage medium (or recording medium) recording program codes of software that realizes functions of the embodiments is supplied to a system or apparatus, and the program codes stored in the storage medium is read out and executed by the system or a computer (or CPU or MPU) of the apparatus. In such a case, the program codes read out from the storage medium realizes the functions of the embodiments and the storage medium storing the program codes forms the present invention. Needless to say, the case where the functions of the embodiments are realized by processing when a computer executes the read out program codes so that not only functions of the embodiments are realized but also an operating system (OS) or the like running on the computer executes a part or all of the actual processing based on an instruction of the program codes is also included.

[0088] Also needless to say, the case where the functions of the embodiments are realized by processing when the program codes read out from the storage medium is written in a function extension card inserted in a computer or memory provided in the function extension unit connected to a computer, and then the function extension card or a CPU or the like provided in the function extension unit executes a part or all of the actual processing based on an instruction of the program code is also included.

[0089] While the present invention has been described with reference to exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

[0090] This application claims the benefit of Japanese Patent Application No. 2005-209158, filed Jul. 19, 2005, and Japanese Patent Application No. 2006-165367, filed Jun. 14, 2006, which are hereby incorporated by reference herein in its entirety.

What is claimed is:

1. A display apparatus comprising:
 - a display unit adapted to display predetermined information; and
 - a control unit adapted to control said display unit so that displayed contents are switched with a different effect depending on an instruction to switch being attached, when the instruction to switch the displayed contents on a display screen of said display unit is issued.
2. The display apparatus according to claim 1, wherein said control unit controls said display unit to delete a first group of icons displayed on the display screen, and after the first group of icons is deleted, display animation of a second group of icons different from said first group of icons on said display screen, while arrange said second group of icons in almost the same place as the place where said first group of icons is displayed.
3. The display apparatus according to claim 1, wherein said control unit controls said display unit to delete the first group of icons displayed on a display screen and said first group of icons in a window that divides a display region, and after the first group of icons is deleted, arrange said window in a defined place on said display screen by displaying animation of said window, and further arrange the second group of icons different from said first group of icons in almost the same place where said first group of icons is displayed on said display screen.
4. The display apparatus according to claim 1, wherein said control unit displays animation of said second group of icons by any of or a combination of operation of movement, scaling, rotation, distortion, reverse, morphing, frame animation, color change and fade.
5. The display apparatus according to claim 1, wherein said control unit can switch and display a hierarchical menu screen and controls to switch displayed contents with a different effect depending on a hierarchy of the menu screen being attached.
6. The display apparatus according to claim 1, wherein said control unit can switch and display a hierarchical menu screen and controls to display information indicating a depth of a hierarchy of the menu screen.
7. A display apparatus comprising:
 - a display unit adapted to display predetermined information; and
 - a control unit adapted to control said display unit to delete a first group of icons displayed on said display screen, and after the first group of icons is deleted, display animation of a second group of icons different from said first group of icons on said display screen, while arrange said second group of icons in almost the same place as the place where said first group of icons is

displayed, when an instruction to switch the displayed contents on a display screen of said display unit is issued.

8. A display apparatus comprising:

a display unit adapted to display predetermined information; and

a control unit adapted to control said display unit to delete the first group of icons displayed on said display screen and said first group of icons in a window that divides a display region, and after the first group of icons is deleted, display animation of said window on said display screen, while arrange the window to a defined place, and further arrange a second group of icons different from said first group of icons in almost the same place as the place where said first group of icons is displayed on said display screen, when the instruction to switch the displayed contents on a display screen of said display unit is issued.

9. A display method comprising:

a display step of displaying predetermined information; and

a control step of controlling to switch displayed contents with a different effect depending on an instruction to switch being attached, when the instruction to switch the displayed contents on a display screen displayed at said display step is issued.

10. The display method according to claim 9, wherein

said control step controls to delete a first group of icons displayed on the display screen, and after the first group of icons is deleted, display animation of a second group of icons different from said first group of icons on said display screen, while arrange said second group of icons in almost the same place as the place where said first group of icons is displayed.

11. The display method according to claim 9, wherein

said control step controls to delete the first group of icons displayed on a display screen and said first group of icons in a window that divides a display region, and after the first group of icons is deleted, arrange said window in a defined place on said display screen by displaying animation of said window, and further arrange the second group of icons different from said first group of icons in almost the same place where said first group of icons is displayed on said display screen.

12. The display method according to claim 9, wherein

said control step displays animation of said second group of icons by any of or a combination of operation of

movement, scaling, rotation, distortion, reverse, morphing, frame animation, color change and fade.

13. The display method according to claim 9, wherein

said control step can switch and display a hierarchical menu screen and controls to switch displayed contents with a different effect depending on a hierarchy of the menu screen being attached.

14. The display method according to claim 9, wherein

said control means can switch and display a hierarchical menu screen and controls to display information indicating a depth of a hierarchy of the menu screen.

15. A display method comprising:

a first display step of displaying a first group of icons on a display screen of a display unit;

a deleting step of deleting the first group of icons displayed on said display screen, when an instruction to switch the displayed contents on a display screen of said display unit is issued; and

a second display step of displaying animation of a second group of icons different from said first group of icons on said display screen, while arrange said second group of icons in almost the same place as the place where said first group of icons is displayed, after said first group of icons is deleted.

16. A display method comprising:

a first display step of displaying a first group of icons and a window that divides a display region on a display screen of a display unit;

a deleting step of deleting the first group of icons displayed on said display screen and said first group of icons in a window, when an instruction to switch displayed contents on a display screen of said display unit is issued;

a window arranging step of arranging said window in a defined place on said display screen by displaying animation of said window, after said first group of icons is deleted; and

a second display step of arranging the second group of icons different from said first group of icons in almost the same place as the place where said first group of icons is displayed on said display screen.

17. A program for causing a computer to execute the display method according to claim 9.

18. A storage medium which computer-readably stores the program according to claim 17.

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