(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 751 481 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
23.07.2003 Bulletin 2003/30

(21) Application number: **95940440.1**

(22) Date of filing: **14.12.1995**

(51) Int Cl.[7]: **G06T 1/00**, G06T 15/70

(86) International application number:
PCT/JP95/02570

(87) International publication number:
WO 96/022580 (25.07.1996 Gazette 1996/34)

(54) IMAGE PROCESSOR AND ELECTRONIC APPARATUS

BILDVERARBEITUNGSPROZESSOR UND ELEKTRONISCHER APPARAT

PROCESSEUR D'IMAGES ET DISPOSITIF ELECTRONIQUE

(84) Designated Contracting States:
DE ES FR GB IT

(30) Priority: **17.01.1995 JP 531795**

(43) Date of publication of application:
02.01.1997 Bulletin 1997/01

(60) Divisional application:
99203165.8 / 0 989 515

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EP 0 751 481 B1

Printed by Jouve, 75001 PARIS (FR)

Description

Technical Field

[0001] The present invention relates to an image processing method and an electronic device for displaying an image on a monitor screen and conducting image processing, using the displayed image.

Background Art

[0002] Home video game devices are very popular as an amusement because of a wide variety of recently developed amusing games. Among such video game devices, infant video game devices mainly for infants have been developed.

[0003] As a conventional infant video game device is known a video game device using cartridges of picture book type software so as to interest infants to play the games. By commanding a picture book by a touch pen, a game display can be changed, and by commanding specific positions on game displays on the monitor screen by a touch pen, various games can be played. By tracing a tablet with a touch pen: in such a manner as to draw pictures, pictures can be arbitrarily drawn on the monitor screen. A plurality of colors can be used, and various touch lines can be selectively used.

[0004] Thus the conventional infant video game device has the drawing function of a game player arbitrarily drawing pictures on the monitor screen, but the drawing function simply enables a game player to draw pictures on the monitor screen and erase them. The games can be played at first with interest but soon bore players because of the lack of game properties other than a simple drawing function.

[0005] The document US-A-5159140 discloses an apparatus for control of musical tone in response to an image wherein a musical tone is performed in response to the periodicity in variation of the color of the image.

[0006] An object of the present invention is to provide an image processing method and an electronic device for conducting image processing using pictures drawn on the monitor screen by a game player.

Disclosure of the Invention

[0007] An image processing method according to the present invention comprises drawing pictures with a plurality of colors on a monitor screen, displaying a display body at a screen position determined by position command means; reading color information displayed at the screen position determined by the position command means when the display body indicates a sounding state; and making sounds corresponding to the read color information.

[0008] The image processing method according to the present invention may further comprise setting a timbre using the position command means, wherein the display body indicates that the sounds are to be made in the previously set timbre. The sounds are then made in that timbre.

[0009] An electronic device according to the present invention comprises position command mans for determining an arbitrary position on the screen; display means for displaying a display body at the screen position determined by the position command means; and sound making means for making sounds of a frequency corresponding to the color displayed on the screen at the position determined by the position command means when the display body indicates a sounding state.

[0010] The electronic device according to the present invention may also have a timbre set in advance using the position command means wherein the display body indicates that the sounds are to be made in the previously set timbre. The sounds are than made in that timbre.

[0011] An information storage medium to be mounted on electronic devices according to the present invention comprises a picture book unit in which pictures to be commanded by the position command means are drawn.

[0012] According to the present invention, pictures are drawn with a plurality of colors on a monitor screen, color information at a position commanded by position command means is read, and sounds corresponding to read color information are made, whereby music can be played in various timbres by using the pictures drawn on the monitor screen. Thereby the image processing can be unique.

Brief Description of the Drawings

[0013]

FIG. 1 is a perspective view of a video game device according to one embodiment of the present invention, which shows the appearance thereof.

FIG. 2 is a view of a software cartridge of the video game device according to said one embodiment of the present invention.

FIG. 3 is a block diagram of a structure of the hardware of the video game device according to said one embodiment of the present invention.

FIG. 4 is a block diagram of a function of the video game device according to said one embodiment of the present invention.

PIG. 5 is a view of one example of a picture book of the software cartridge according to a first example of the video game.

FIG. 6 is a flow chart of drawing processing of the first example of the video game,

PIG. 7 is one example of sample pictures of the first example of the video game.

FIG. 8 is a view of one example of pictures on a canvas of the first example of the video game.

FIG. 9 is a flow chart of sound making processing of the first example of the video game.
FIG. 10 is a flow chart of sound making processing of a second example of the video game.
FIG. 11 is a view of an example of pictures of the second example of the video game.

Best Modes for Carrying out the Invention

[0014] A video game device according to one embodiment of the present invention will be explained with reference to FIGs. 1 to 4. FIG. 1 is a perspective view of the video game device according to the present embodiment, which shows its appearance. FIG. 2 is a view of a software cartridge for use in the video game device according to the present embodiment. FIG. 3 is a block diagram of the hardware video game device according to the present embodiment. FIG. 4 is a block diagram of a function of the video game device according to the present embodiment.

Game Device Body

[0015] In the video game device according to the present embodiment, a software cartridge 12 of picture book type is inserted into a foldable game device body 10. As shown in FIG. 1, a top cover of the game device body 10 is unlocked from a bottom cover thereof to be opened, and a software cartridge 12 is inserted into a cartridge slot in the inside thereof.

[0016] On the inside of the bottom cover 14 of the game device body, a direction button 20 and an execution button is disposed on the left part thereof, a drawing tablet 24 is disposed on the central part thereof, and a touch pen holder 26 is disposed on the right part thereof.

[0017] The direction button 20 and the execution button 22 are operated by a game player. Four directions are commanded by the direction button 20, and an execution command is given by the execution button 22. The touch pen holder 26 holds a touch pen 28. The touch pen 28 makes contact with the tablet to operate the picture book software. A pen button 28a is disposed on the tip of the touch pen 28. The game player presses the pen button 28a to give commands.

[0018] The drawing tablet 24 detects, by an electromagnetic induction method, a position to which the touch pen 28 is moved. The game player gives commands based on the position by pressing the pen button 28a.

[0019] On a central part of the inside of the top cover 16 of the game device body 10 is disposed a picture book tablet 32 where a picture book-type software cartridge is mounted. The picture book tablet 32 detects, by an electromagnetic induction method, a position to which the touch pen 28 is moved.

[0020] A power switch 34 for turning on/off an electric power source is disposed below a lower left part of the picture book tablet 32. The cartridge slot 18 for a software cartridge to be inserted into is disposed below a lower right part of the picture book tablet 32. The loaded software cartridge 12 can be taken out through the cartridge slot 18 by pushing an ejection button 36.

[0021] Page sensors 38 are disposed on an upper right part of the picture book tablet 32. The page sensors 38 detect what page 42 of the picture book of the software cartridge 12 is opened. Cuts are formed in an upper right part of respective pages of the picture book, and the cuts have increased widths in accordance with increases of page number. Accordingly different numbers of the sensors are covered by opened pages, whereby a currently opened page can be detected.

[0022] As shown in FIG. 1, the software cartridge 12 has the basic form of a picture book of a plurality of pages 42 bonded by bonding rings 40 on the left edge. Pictures corresponding to a game program are drawn on the respective pages 42.

Software Cartridge

[0023] The software cartridge 12 will be explained with reference to FIG. 2. FIG. 2 is a plan view of the software cartridge 12 with respective pages 42 of a picture book closed.

[0024] The software cartridge 12 has the upper part in the form of a picture book mount 46 on which a picture book is mounted, and the lower part in the form of a circuit substrate housing unit 50 for housing a circuit substrate 48.

[0025] The bonding rings 40 are disposed on the left edge of the picture book mount 46 and bond the respective pages 42 of the picture book. In the present embodiment five pages 42 are bonded, and index tabs are formed on the right edge of the respective pages, displaced from each other. Six sensor holes 52 are opened in the picture book tablet 32 at positions corresponding to the page sensors 38.

[0026] The circuit substrate housing unit 50 houses the circuit substrate 48. The circuit substrate 48 has a connector 49 formed on for connection to the game device body 10 and has a program ROM 54 mounted on which stores a game program.

Hardware

[0027] A structure of the hardware of the video game device according to the present embodiment will be explained with reference to FIG. 3.

[0028] The game device body 10 will be explained. An MPU 60 generally controls the video game device. A RAM 62 is a work memory for the MPU 60. A video display processor (VDP) 64 controls drawing processing of drawing backgrounds, characters, etc. Image information is written in the video RAM 66. Image signals from the video display processor 64 are output to a monitor 90 from an image terminal 70.

[0029] An audio synthesizing LSI (ADPCM) 72 syn-

thesizes all sounds and voices, such as words spoken by characters. Sounds and voices corresponding to a game are synthesized and spoken. Audio signals from the video display processor 64, and audio signals from the audio synthesizing LSI 172 are mixed and outputted to the monitor 90 through the audio terminal 76.

[0030] The controller 78 monitors states of the direction button 20, the execution button 22, the touch pen 28, the pen button 28a and the page sensor 38 and outputs to the MPU 60 input information inputted by the game player.

[0031] The controller 78 monitors states of the picture book tablet 32 and the drawing tablet 24 through an analog switch 80.

[0032] The MPU 60, the RAM 62, the video display processor 64, the audio synthesizing LSI 72 and the controller 78 are interconnected with each other by an address bus 84, a data bus 86 and a control bus 88.

[0033] In the software cartridge 12, the program ROM 54 storing a game program is mounted on the circuit substrate 48. The software cartridge 12 is connected to the game device body 10 by connectors 49, 82, and the address bus 84, the data bus 86 and the control bus 88 are respectively connected to the software cartridge 12. An electric power source line (not shown) is also connected to the software cartridge 12 by the connectors 49, 82.

Operational Block Diagram

[0034] Next, the operation of the video game device according to the present embodiment will be explained with reference to the block diagram of FIG. 4. FIG. 4 is a block diagram of the video game device which is in operation with the software cartridge loaded in the game device body 10.

[0035] A control unit 100 controls drawing processing and sound making processing. A drawing control unit 102 controls a drawing processing unit 104 to draw a required picture, based on a position of the touch pen 28 relative to the picture book tablet 32. The drawing processing unit 104 writes line drawings in a buffer memory 120 through a buffer memory input/output unit 110. The drawing processing unit 104 controls writing required pictures in the buffer memory 120 and writing line drawings in the buffer memory 120, based on the position of the touch pen 28 relative to drawing tablet 24; and a movable body drawing unit 106 controls writing pictures of insects, animals, etc. in the buffer memory 120. The movable body drawing unit 106 draws pictures of movable bodies, such as insects, animals, etc., in a direction determined by a proceeding direction deciding unit 107. A sound making processing unit 108 conducts sound making processing, based on the position of the touch pen 28 relative to the drawing tablet 24 and color information from the buffer memory 120.

[0036] A buffer memory input/output unit 110 writes color information in the buffer memory 120 in response to drawing control by the control unit 100 and reads color information from the buffer memory 120 and outputs the same to the control unit 100.

[0037] In writing color information, a writing position: supplied by the control unit 100 is converted to an address of the buffer memory 120 by a coordinate conversion unit 112, and the color information commanded by the control unit 100 is written in the address by a color information writing unit 114.

[0038] In reading color information, a reading position supplied by the control unit 100 is converted to an address of the buffer memory 120 by a coordinate conversion unit 116, and color information at the address of the buffer memory 120 is read by a color information reading unit 118 and outputs the same to the sound making processing unit 108 of the control unit 100.

[0039] Image information is written in the video RAM 66 in images for each frame based on color information stored in the buffer memory 120 and is output to the monitor 90 through the image terminal 70.

[0040] Audio information is output to the monitor 90 through the audio terminal 76 in audio signals outputted by the sound making processing unit 108.

A First Example of the Video Game

[0041] A first example of the video game of the video game device according to the present embodiment will be explained with reference to FIGS. 5 to 9.

Basic Drawing Processing

[0042] The drawing processing according to the first example will be explained with reference to FIGs. 5 to 8.

[0043] FIG. 5 shows an example of pictures of the software cartridge 12 used in the drawing processing of the drawing processing according to the present example. When the touch pen 28 approaches a part of a picture in FIG. 5, the picture book tablet 32 detects the position of the picture book tablet 32 relative to the touch pen 28, and then the pen button 28a is pressed to input a drawing command corresponding to the position.

[0044] On the left page 200 of the picture book tablet 32 of FIG. 5 there are arranged a canvas region 201, and sample picture regions 202, 203, 204. When the canvas region 201 is touched by the touch pen 28, a canvas on which pictures can be freely drawn is displayed on the monitor 90. When the touch pen 28 touches the sample picture regions 202, 203, 204, prescribed sample pictures are displayed on the monitor 90.

[0045] On the right page 210 of the picture book tablet 32 of FIG. 5 there are arranged a pencil region 211, an eraser region 212, a net region 213, a conductor baton region 214 and a color command region 215. When the touch pen 28 touches the pencil region 211, the touch pen 28 functions as a pencil. Further a color of the pencil can be commanded by touching the touch pen 28 to the required color region in the color command region 215.

When the touch pen 28 touches the eraser region 212, the touch pen 28 functions as a eraser. When the touch pen 28 touches the net region 213, the touch pen 28 functions as an insect net. When the touch pen 28 touches the conductor baton region 214, the touch pen 28 functions a conductor baton.

[0046] The drawing processing will be explained with reference to the flow chart of FIG. 6.

[0047] First, it is judged whether or not a sample picture has been selected by the touch pen 28 (step S10). When a game player contacts one of the sample regions 202, 203, 204 with the touch pen 28, the drawing control unit 102 controls the drawing processing unit 104 to draw the selected sample picture on the monitor 90 (step S11). FIG. 7 shows an example of the sample pictures. A grand piano is drawn.

[0048] If none of the sample pictures has been selected, it is judged whether or not the canvas has been selected with the touch pen 28 (step S12). When the game player contacts the touch pen 28 to the canvas region 201, the drawing control unit 102 controls the drawing processing unit 102 to draw the canvas on the monitor 90 (step S13). FIG. 7 shows an example of the canvas picture.

[0049] First the canvas without any picture is drawn. Then line drawings are drawn with the pencil on the monitor 90. First, a case in which line drawings are drawn on the canvas of FIG. 8 will be explained, but it is possible to draw line drawings on the sample picture of FIG. 7.

[0050] First it is judged whether or not the pencil and a color have been selected by the touch pen 28 (step S14). When the touch pen 28 contacts the pencil region 211 and one of the color command region 215, the pencil 500 of a commanded color is displayed on the monitor 90.

[0051] Then, it is judged whether or not the touch pen 28 is on the drawing tablet 24 (step S16). When the game player contacts the touch pen 28 to the drawing tablet 24, the drawing processing unit 104 outputs a position signal to the coordinate conversion unit 112, and a color signal is outputted to the color information writing unit 114. The coordinate conversion unit 112 converts the position signal to an address signal indicative of an address of the buffer memory 120. The color information writing unit 114 writes the color information indicated by the color signal in the converted address (step S17). When the game player moves the touch pen with the touch pen 28 in contact with the drawing tablet 24, as shown in FIG. 8, the pencil 500 moves on the monitor 90 in synchronization with the movement of the touch pen 28, and a line drawing of the selected color is drawn on the canvas.

[0052] When the touch pen 28 contacts the color command region 215, the color of the pencil 500 is changed, thus line drawings of a plurality of colors are drawn on the canvas of the monitor 90. The touch pen 28 contacts the eraser region 212 to display the eraser on the monitor 90, and then the touch pen 28 is moved, tracing the drawn line drawing on the canvas of the monitor 90, whereby the drawn line drawing can be erased. Thus pictures can be freely drawn on the canvas of the monitor 90 as pictures are drawn on an actual canvas.

Sound Making Processing

[0053] The sound making processing according to the first example will be explained with reference to the flow chart of FIG. 9. The sound making processing will be explained by using the grand piano of a sample picture of FIG. 7, but the sound processing can be conducted by using the line drawing on the canvas shown in FIG. 8.

[0054] First, it is judged whether or not the touch pen 2 has selected the conductor baton (step S20). When a game player contacts the touch pen 28 to the conductor baton region 214, the conductor baton 502 is displayed on the monitor 90.

[0055] Then, it is judged whether or not the touch pen 28 is on the drawing tablet (step S21). Further it is judged whether the pen button 28a is being pressed (step S22). When the game player contacts the touch pen 28 to the drawing tablet 24, the sound making processing unit 108 outputs a position signal to the coordinate conversion unit 116, which converts the position signal to an address of the buffer memory 120. Subsequently the color information reading unit 118 reads a color signal at the converted address of the buffer memory 120, and outputs the color signal to the sound making process unit 108 (step S23).

[0056] Then, it is judged whether or not a change of the color information is present (step S24). In the absence of a change of the color information, it is judged whether or not it is immediately after the pen button 28a was pressed (step S25). Unless it is immediately after the pen button 28a was pressed, the process is returned to Step S20.

[0057] When it is immediately after the pen button 28a being pressed or there is a change of colors, the sound making processing unit 108 judges whether the read color information is transparent or black (step S26). This is because no sounds are generated if the color information is transparent or black (step S26). When the selected color information is black, glowing powder is displayed (step S27), and the step is returned to Step S20.

[0058] Unless the read color information is transparent or black, the sound making processing unit 108 decides in accordance with the color information a sound to be made (step S28). A sound making frequency table which decides amplitudes of frequencies of sounds corresponding to the respective color information is prepared, and based on the sound making frequency table a frequency amplitude is decided. Subsequently the sound making processing unit 108 outputs a decided sound signal and outputs the same to the monitor 90 through the audio terminal 76 to make a sound (step S29).

[0059] In FIG. 7, the conductor baton 502 is positioned on a yellow note 504, and a sound preset for yellow, for example, B of the piano, is made.

[0060] By thus moving the touch pen 28 on the drawing tablet 24, and pressing the pen button 28a, sounds corresponding to commanded colors can be made.

[0061] Furthermore, as shown in FIG. 7, a picture is drawn in colors which correspond to the notes of the key board of the piano, and it is possible that simple music can be freely played by commanding keys of the piano with the conductor baton.

[0062] By the above-described sound making processing, it is possible not only for pictures to be drawn on the monitor, but also for various games, such as making sounds, playing music,etc., to be played using the pictures.

A Second Example of the Video Game

[0063] Next, a second example of the video game of the video game device according to the present embodiment will be explained with reference to FIGs. 11 and 12. The second example is different from the first example in the sound making processing.

Sound Making Processing

[0064] The sound making processing according to the present example will be explained with reference to the flow chart of FIG. 10. The sound making processing will be explained for a sample picture of the grand piano shown in FIG. 11.

[0065] First, it is judged which kind of conductor baton has been selected by the touch pen 28 (step S120). In the present example, in addition to a conductor baton, for selecting the usual organ sounds, conductor batons which can make timbres of animals can be selected. As shown in FIG. 11, the different kinds of conductor batons can be displayed in a tool box 520 on the screen, and a game player operates the touch pen 28 to position the cursor on a picture of an animal in the tool box 52 and presses the pen button 28a to select the required animal. For example, when the cat picture 522 in the tool box 520 is selected, as shown in FIG. 11 a conductor baton 524 having the cat picture on the tip portion is displayed.

[0066] Then, it is judged whether or not the touch pen 28 is on the drawing tablet 24 (step S121), and further it is judged whether or not the pen button 28a is being pressed (step S122). When the game player contacts the touch pen 28 to the drawing tablet 24, the sound making processing unit 108 outputs a position signal to the coordinate conversion unit 116, and there the position signal is converted to an address of the buffer memory 120. Then, the color information reading unit 118 reads a color signal at the converted address of the buffer memory 120 and outputs the signal to the sound making processing unit 108 (step S123).

[0067] Then, it is judged whether or not a change has been made to the color information (step S124). When no change has been made to the color information, it is judged whether it is immediately after the pen button 28a being pressed (step S125). Unless it is immediately after the pen button 28a being pressed, the processing is returned to step S120.

[0068] When it is immediately after the pen button 28a being pressed or if there is a change of color, the sound making processing unit 108 judges whether the read color information is transparent, light blue or black (step S120). When the read color information is transparent, light blue or black, no sound is made, and the processing is returned to step S120.

[0069] Unless the read color information is transparent, light blue, or black, the sound making processing unit 108 decides a sound to be made corresponding to the read color information and the kind of the conductor batons (step S127). Timbres (organ sound, dogs' sound, cats' sound, monkeys' sound, pigs' sound, and elephants' sound) are set corresponding to the kinds of the conductor batons, and a sound making frequency table which sets amplitudes of sound frequencies corresponding to respective color information is prepared, and based on a timbre and the sound making frequency table, a sound to be made is set. For example, when a cat is selected, a scale can be played using cats' sounds.

[0070] Subsequently, the sound making processing unit 108 outputs a decided sound signal to the monitor 90 through the audio terminal 76, and a sound is generated (step S128).

[0071] In FIG. 11, in which the cat conductor baton 524 is positioned on the yellow note 504, a sound which is preset for the cat conductor baton and the color yellow, e.g., the cats' sound in B tone, is selected.

[0072] Thus by moving the touch pen 28 on the drawing tablet 24 and pressing the pen button 28a, various sounds can be made corresponding to commanded colors.

[0073] Alternatively, an image of an animal from the picture book may be clicked to conduct processing of making sounds of its voice. The touch pen 28 is operated to position the cursor on the animal on the screen and is clicked. An image of the animal changes and makes sounds.

[0074] The present invention is not limited to the above-described embodiment and covers other various modifications.

[0075] For example, in the above-described embodiment, an infant video game device is described, but the present invention is applicable to game devices of other constitutions.

[0076] Further, the present invention is applicable to an electronic tablet for electrically drawing pictures other than the game devices.

[0077] Furthermore, the present invention is universally applicable to game programs for universal comput-

ers, such as personal computers, etc., and image processing, such as image programs, etc.

[0078] The present invention is suitable for a video game device for playing games using monitor screens, especially for infant video game devices for playing games using pictures drawn on monitor screens by game players.

Claims

1. An image processing method for drawing pictures on a screen (90) in a plurality of colors, including the steps of:

   displaying a display body (524) at a screen position determined by position command means (28);
   reading color information displayed at the screen position determined by the position command means (28) when the display body (524) indicates a sounding state; and
   making sounds corresponding to the read color information.

2. An image processing method according to claim 1, further including a preliminary step of setting a timbre using the position command means (28), wherein the display body (524) indicates that the sounds are to be made in the previously set timbre.

3. An image processing method according to claim 2, wherein the sounds are made in the previously set timbre.

4. An electronic device for drawing pictures on a screen (90) in a plurality of colors, comprising:

   position command means (28) for determining an arbitrary position on the screen (90);
   display means for displaying a display body (524) at the screen position determined by the position command means (28); and
   sound making means (108) for making sounds of a frequency corresponding to the color displayed on the screen (90) at the position determined by the position commend means (28) when the display body (524) indicates a sounding state.

5. An electronic device according to claim 4, wherein a timbre is set in advance using the position command means (28), and the display body (524) indicates that the sounds are to be made in the previously set timbre.

6. An electronic device according to claim 5, wherein the sounds are made in the previously set timbre.

7. An electronic device according to any of claims 4 to 6, further comprising:

   a mount for a picture book unit (42) to be loaded in;
   the picture book unit (42) loaded in the mount including a region which is to be used to draw pictures on the screen (90) and to specify a function of the position command means (28); and
   a picture displaying the function specified, based on the region of the picture book unit (42) commanded by the position command means (28), being displayed on the screen (90) by the display means.

8. An information storage medium (12) for mounting on an electronic device according to claim 5, comprising a picture book unit (42) that includes pictures to be selected using the position command means (28).

Patentansprüche

1. Ein Bildverarbeitungsverfahren für das Zeichnen von Bildern auf einem Bildschirm (90) in einer Vielzahl von Farben, das die folgenden Stufen umfaßt:

   das Anzeigen eines Anzeigegegenstandes (524) in einer Bildschirmposition, die von einer Positionsbefehlsvorrichtung (28) bestimmt wird;
   das Ablesen von Farbinformation, die in der von der Positionsbefehlsvorrichtung (28) bestimmten Bildschirmposition angezeigt wird, wenn der Anzeigegegenstand (524) einen Tonausgabe-Status andeutet; und
   das Erzeugen von Klängen, die der abgelesenen Farbinformation entsprechen.

2. Ein Bildverarbeitungsverfahren nach Anspruch 1, das auch eine preliminäre Stufe des Einstellens einer Tonqualität mit Hilfe der Positionsbefehlsvorrichtung (28) umfaßt, wobei der Anzeigegegenstand (524) andeutet, dass die Klänge gemäß der vorher eingestellten Tonqualität erzeugt werden sollen.

3. Ein Bildverarbeitungsverfahren nach Anspruch 2, bei dem die Klänge gemäß der vorher eingestellten Tonqualität erzeugt werden.

4. Ein elektronisches Gerät für das Zeichnen von Bildern auf einem Bildschirm (90) in einer Vielzahl von Farben, das auch das Folgende umfaßt:

   eine Positionsbefehlsvorrichtung (28) für das

Bestimmen einer arbiträren Position auf einem Bildschirm (90);
ein Anzeigegerät für das Anzeigen eines Anzeigegegenstandes (524) in der Bildschirmposition, welche von der Positionsbefehlsvorrichtung (28) bestimmt wird; und
ein Klangerzeugungsgerät (108) für das Erzeugen von Klängen auf einer Frequenz, welche mit der Farbe korrespondiert, die auf dem Bildschirm (90) in der von der Positionsbefehlsvorrichtung (28) bestimmten Position angezeigt wird, wenn der Anzeigegegenstand (524) einen Tonausgabe-Status andeutet.

5. Ein elektronisches Gerät nach Anspruch 4, bei dem eine Tonqualität schon vorher mit Hilfe der Positionsbefehlsvorrichtung (28) eingestellt wird, und bei dem der Anzeigegegenstand (524) andeutet, dass die Klänge gemäß derselben vorher eingestellten Klangqualität erzeugt werden sollen.

6. Ein elektronisches Gerät nach Anspruch 5, bei dem die Klänge gemäß der vorher eingestellten Tonqualität erzeugt werden.

7. Ein elektronisches Gerät nach einem der obigen Ansprüche 4 bis 6, das auch das Folgende umfaßt:

eine Unterlage für das Aufladen einer Bildereinheit (42);
die auf die Unterlage aufgeladene Bildereinheit (42) umfaßt eine Region, welche für das Zeichnen von Bildern auf dem Bildschirm (90) und für das Spezifizieren einer Funktion für die Positionsbefehlsvorrichtung (28) angewendet werden kann; und
das jeweilige Bild deutet die spezifizierte Funktion an, welche auf die von der Positionsbefehlsvorrichtung (28) bestimmten Region der Bildereinheit (42) basiert ist und von dem Anzeigegerät auf dem Bildschirm (90) angezeigt wird.

8. Ein Informationsspeichermedium (12) für den Anschluß an ein elektronisches Gerät nach Anspruch 5, das weiter eine Bildereinheit (42) umfaßt, die wiederum Bilder enthält, die mit Hilfe der Positionsbefehlsvorrichtung (28) ausgewählt werden können.

Revendications

1. Une méthode de traitement d'images pour le dessin d'images sur un écran (90) en plusieurs couleurs, comprenant les étapes ci-après :

affichage d'un corps d'affichage (524) à un emplacement sur l'écran déterminé par le moyen de contrôle de position (28) ;
lecture des informations concernant les couleurs affichées à l'emplacement sur l'écran déterminé par le moyen de contrôle de position (28) quand le corps d'affichage (524) indique un état d'émission d'un son ; et
émission de sons correspondant aux informations lues concernant les couleurs.

2. Une méthode de traitement d'images selon la revendication 1, comprenant en outre une étape préliminaire consistant à définir un timbre en utilisant le moyen de contrôle de position (28), **caractérisée en ce que** le corps d'affichage (524) indique que les sons doivent être émis dans le timbre défini auparavant.

3. Une méthode de traitement d'images selon la revendication 2, **caractérisée en ce que** les sons sont émis dans le timbre défini auparavant.

4. Un dispositif électronique pour le dessin d'images sur un écran (90) en plusieurs couleurs, comprenant :

un moyen de contrôle de position (28) pour la détermination d'une position arbitraire sur l'écran (90) ;
un moyen d'affichage pour l'affichage d'un corps d'affichage (524) à l'emplacement sur l'écran déterminé par le moyen de contrôle de position (28) ; et
un moyen d'émission de sons (108) pour l'émission de sons d'une fréquence correspondant à la couleur affichée sur l'écran (90) à l'emplacement déterminé par le moyen de contrôle de position (28) quand le corps d'affichage (524) indique un état d'émission d'un son.

5. Un dispositif électronique selon la revendication 4, **caractérisé en ce qu'**un timbre est défini à l'avance en utilisant le moyen de contrôle de position (28), et **en ce que** le corps d'affichage (524) indique que les sons doivent être émis dans le timbre défini auparavant.

6. Un dispositif électronique selon la revendication 5, **caractérisé en ce que** les sons sont émis dans le timbre défini auparavant.

7. Un dispositif électronique selon toute revendication de 4 à 6, comprenant en outre:

une monture dans laquelle charger un livre d'images (42) ;
le livre d'images (42) chargé dans la monture comprenant une zone à utiliser pour dessiner des images sur l'écran (90) et pour spécifier

une fonction du moyen de contrôle de position (28) ; et

une image présentant la fonction spécifiée, basée sur la zone du livre d'images (42) contrôlée par le moyen de contrôle de position (28), affichée sur l'écran (90) par le moyen d'affichage.

8. Un support de stockage d'informations (12) pour le montage sur un dispositif électronique selon la revendication 5, comprenant un livre d'images (42) qui contient les images à sélectionner en utilisant le moyen de contrôle de position (28).

FIG.1

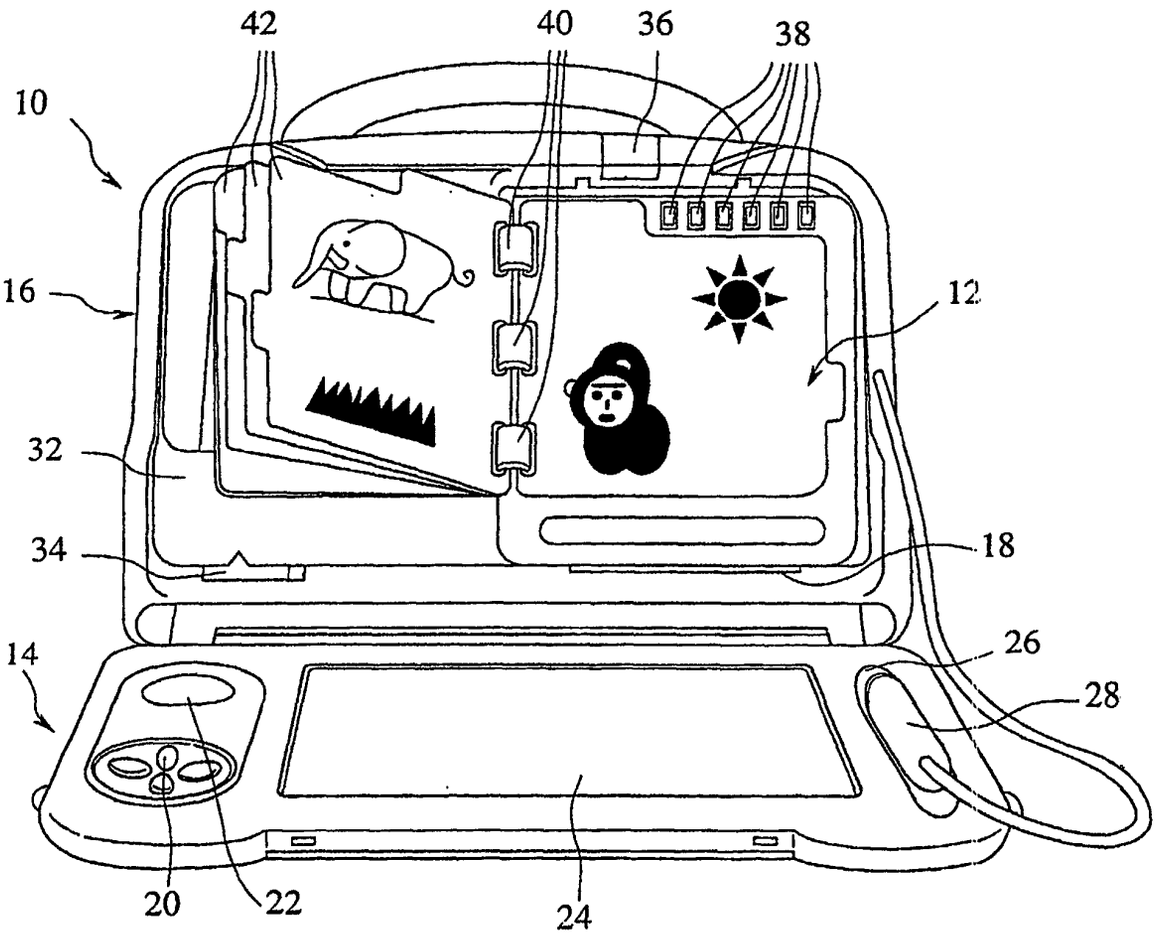


FIG.2

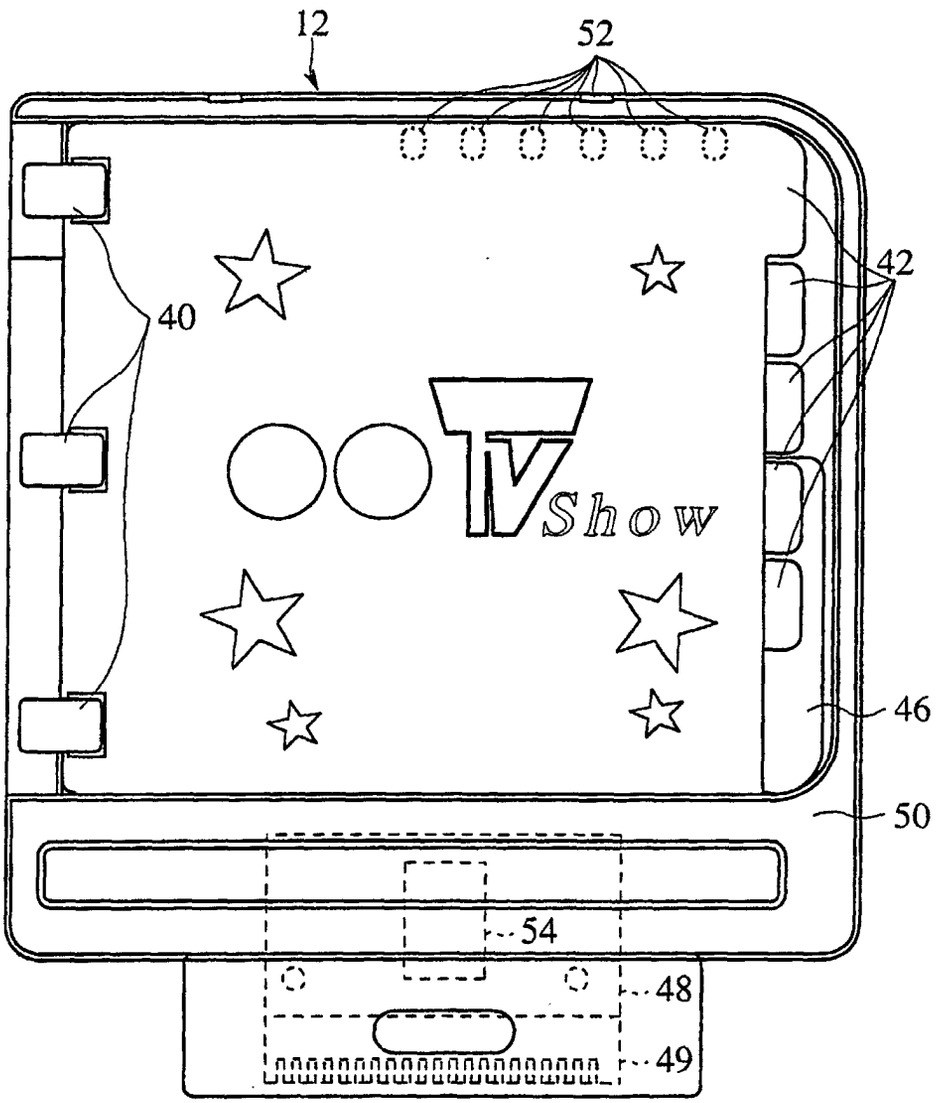


FIG.3

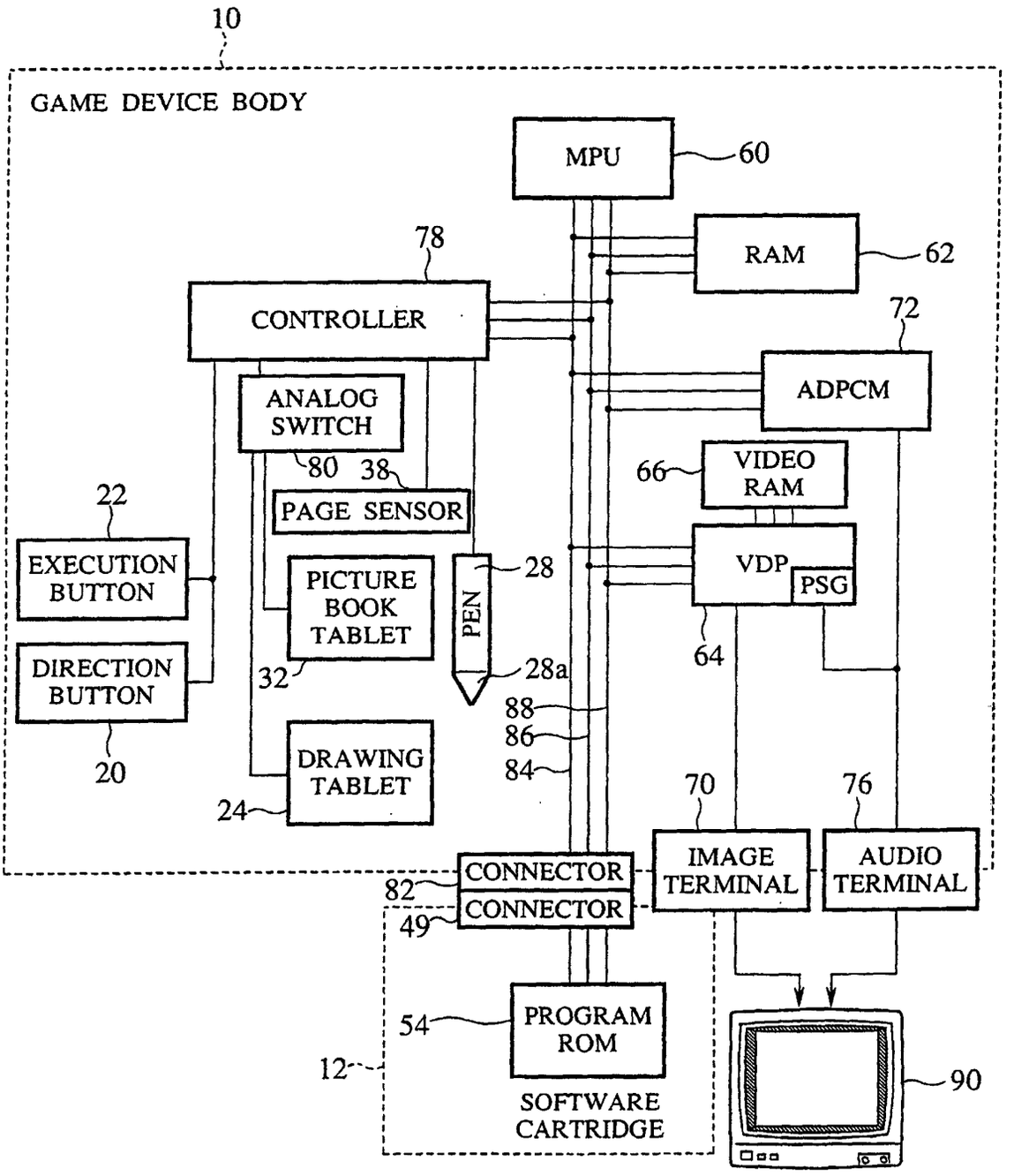

10
GAME DEVICE BODY
MPU
60
RAM
62
78
CONTROLLER
72
ADPCM
ANALOG SWITCH
80
38
PAGE SENSOR
66
VIDEO RAM
22
EXECUTION BUTTON
PICTURE BOOK TABLET
PEN
28
VDP
PSG
64
DIRECTION BUTTON
32
28a
88
86
84
20
DRAWING TABLET
24
70
76
IMAGE TERMINAL
AUDIO TERMINAL
CONNECTOR
82
CONNECTOR
49
54
PROGRAM ROM
12
SOFTWARE CARTRIDGE
90

FIG.4

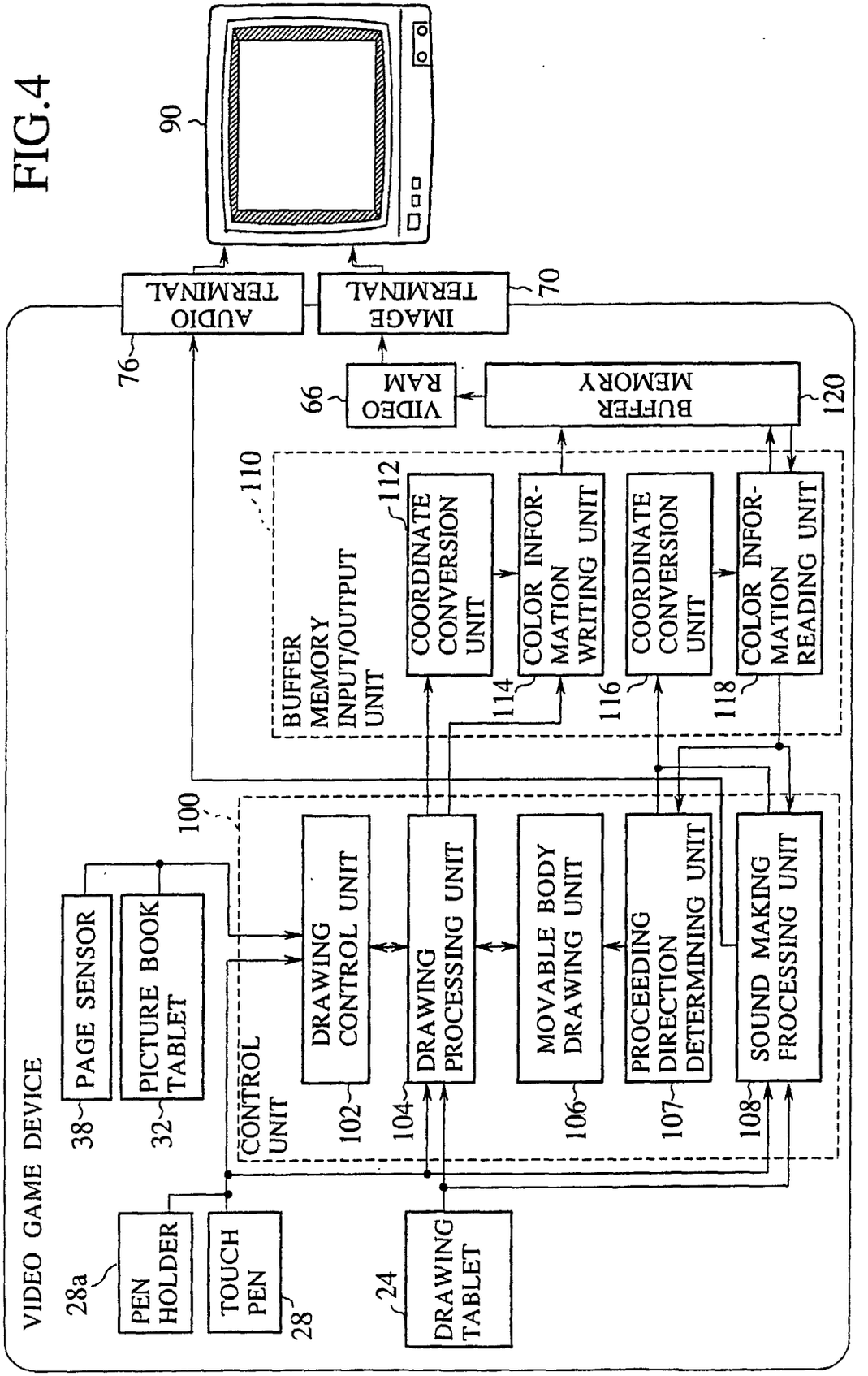

VIDEO GAME DEVICE
90
IMAGE TERMINAL
70
AUDIO TERMINAL
76
VIDEO RAM
66
BUFFER MEMORY
120
BUFFER MEMORY INPUT/OUTPUT UNIT
110
COORDINATE CONVERSION UNIT
112
COLOR INFORMATION WRITING UNIT
114
COORDINATE CONVERSION UNIT
116
COLOR INFORMATION READING UNIT
118
CONTROL UNIT
100
DRAWING CONTROL UNIT
102
DRAWING PROCESSING UNIT
104
MOVABLE BODY DRAWING UNIT
106
PROCEEDING DIRECTION DETERMINING UNIT
107
SOUND MAKING PROCESSING UNIT
108
PAGE SENSOR
38
PICTURE BOOK TABLET
32
PEN HOLDER
28a
TOUCH PEN
28
DRAWING TABLET
24

FIG.5

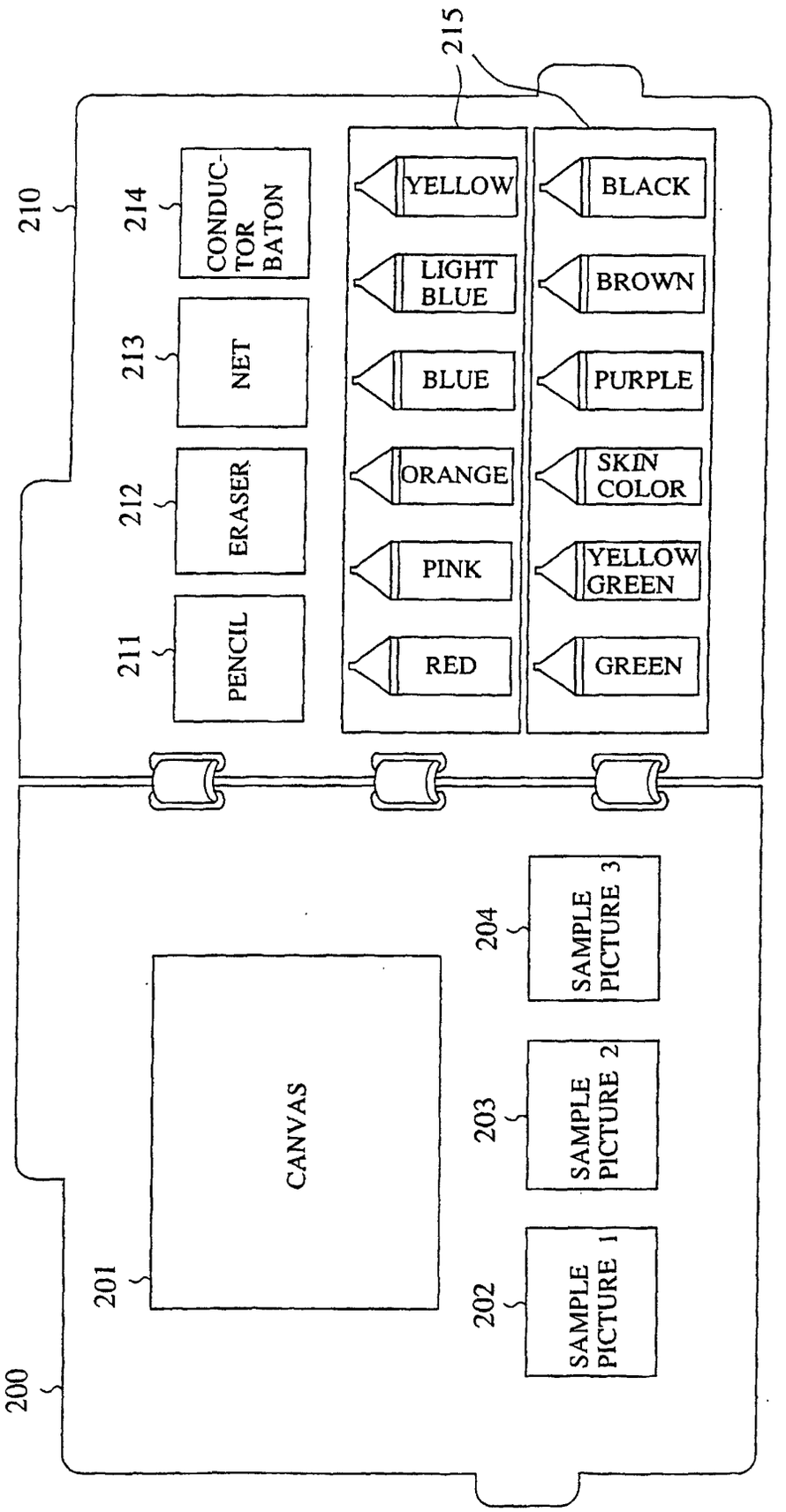

200
201
CANVAS
202
SAMPLE PICTURE 1
203
SAMPLE PICTURE 2
204
SAMPLE PICTURE 3
210
211
PENCIL
212
ERASER
213
NET
214
CONDUC-TOR BATON
215
YELLOW
LIGHT BLUE
BLUE
ORANGE
PINK
RED
BLACK
BROWN
PURPLE
SKIN COLOR
YELLOW GREEN
GREEN

FIG.6

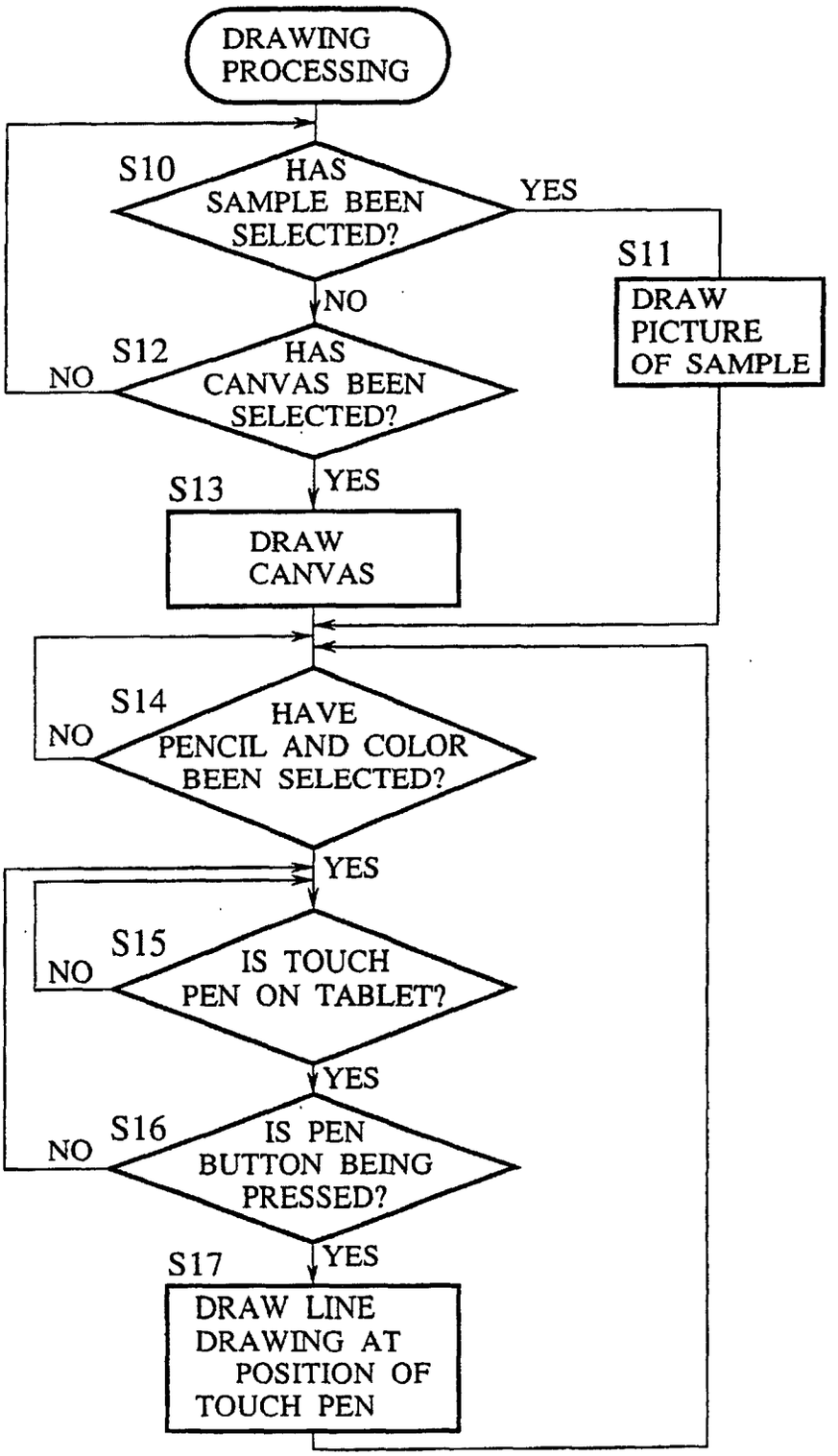

DRAWING PROCESSING
S10
HAS SAMPLE BEEN SELECTED?
YES
NO
S11
DRAW PICTURE OF SAMPLE
S12
HAS CANVAS BEEN SELECTED?
NO
YES
S13
DRAW CANVAS
S14
HAVE PENCIL AND COLOR BEEN SELECTED?
NO
YES
S15
IS TOUCH PEN ON TABLET?
NO
YES
S16
IS PEN BUTTON BEING PRESSED?
NO
YES
S17
DRAW LINE DRAWING AT POSITION OF TOUCH PEN

FIG.7

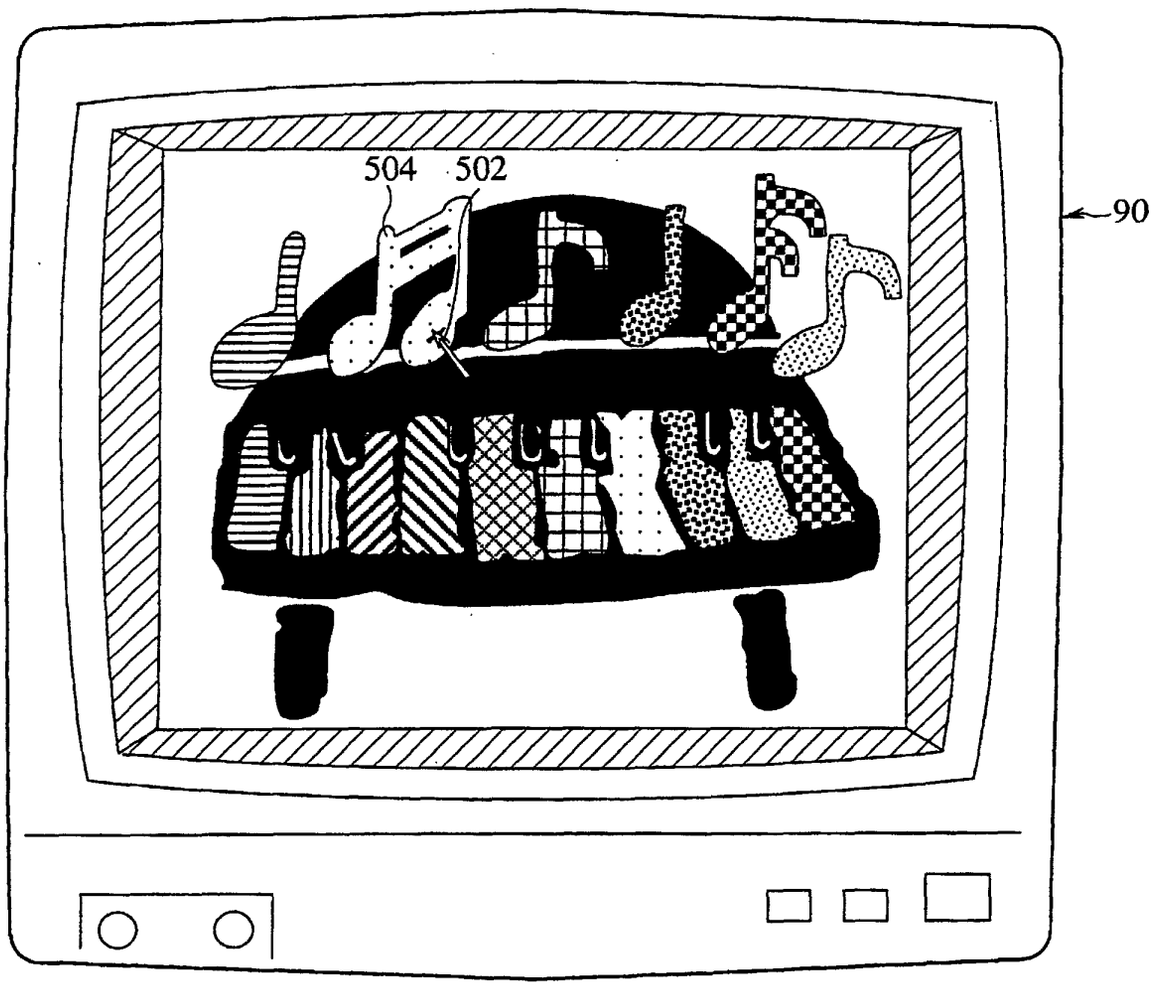


FIG.8

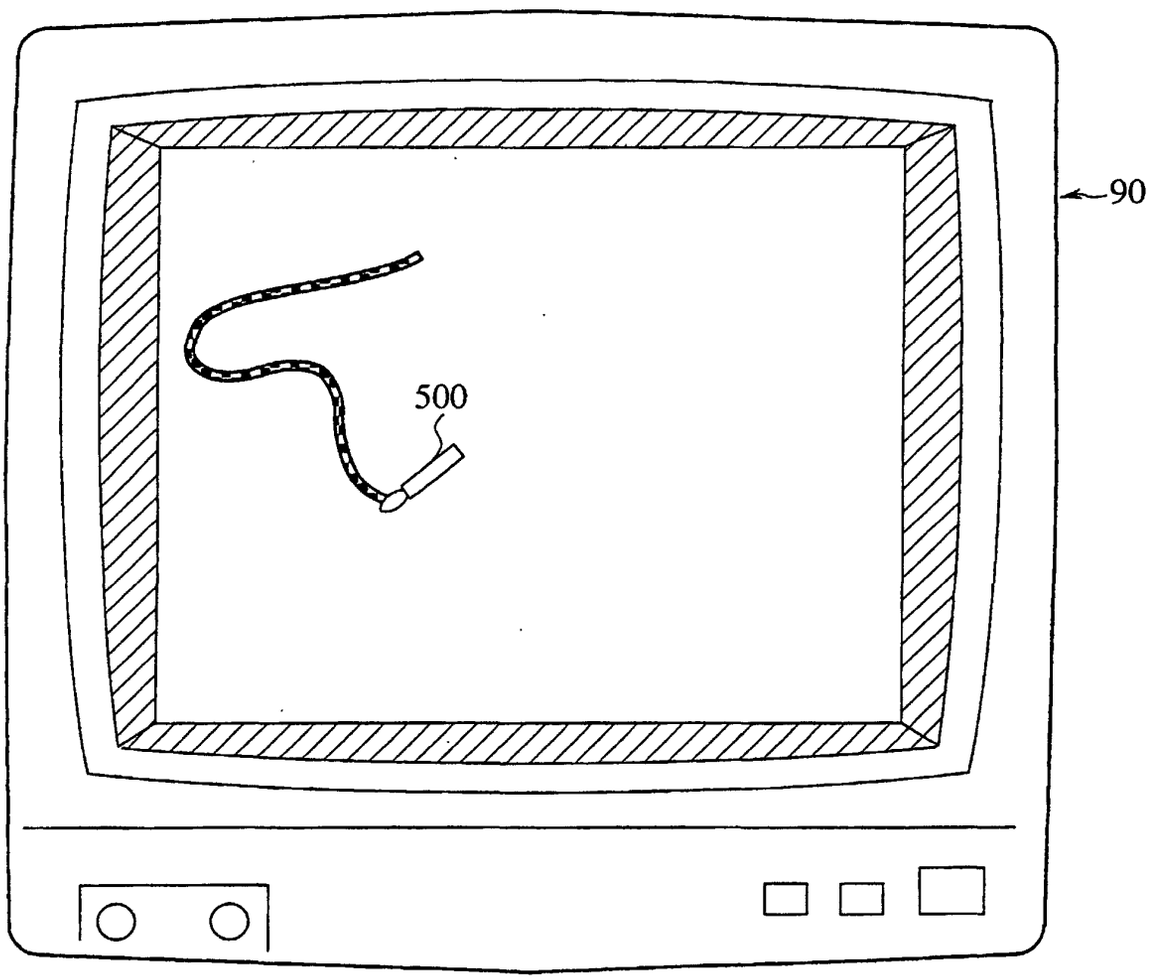


FIG.9

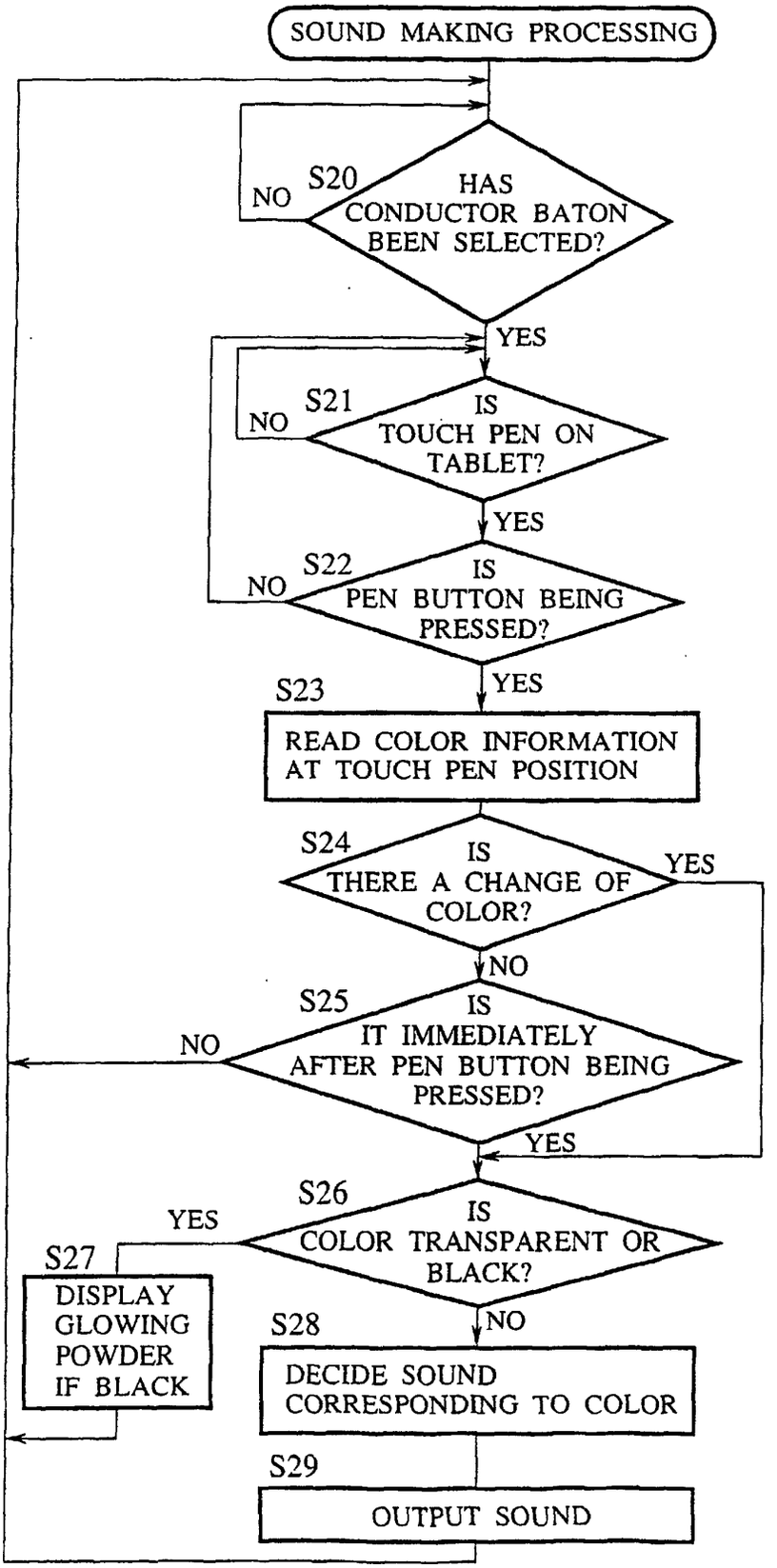
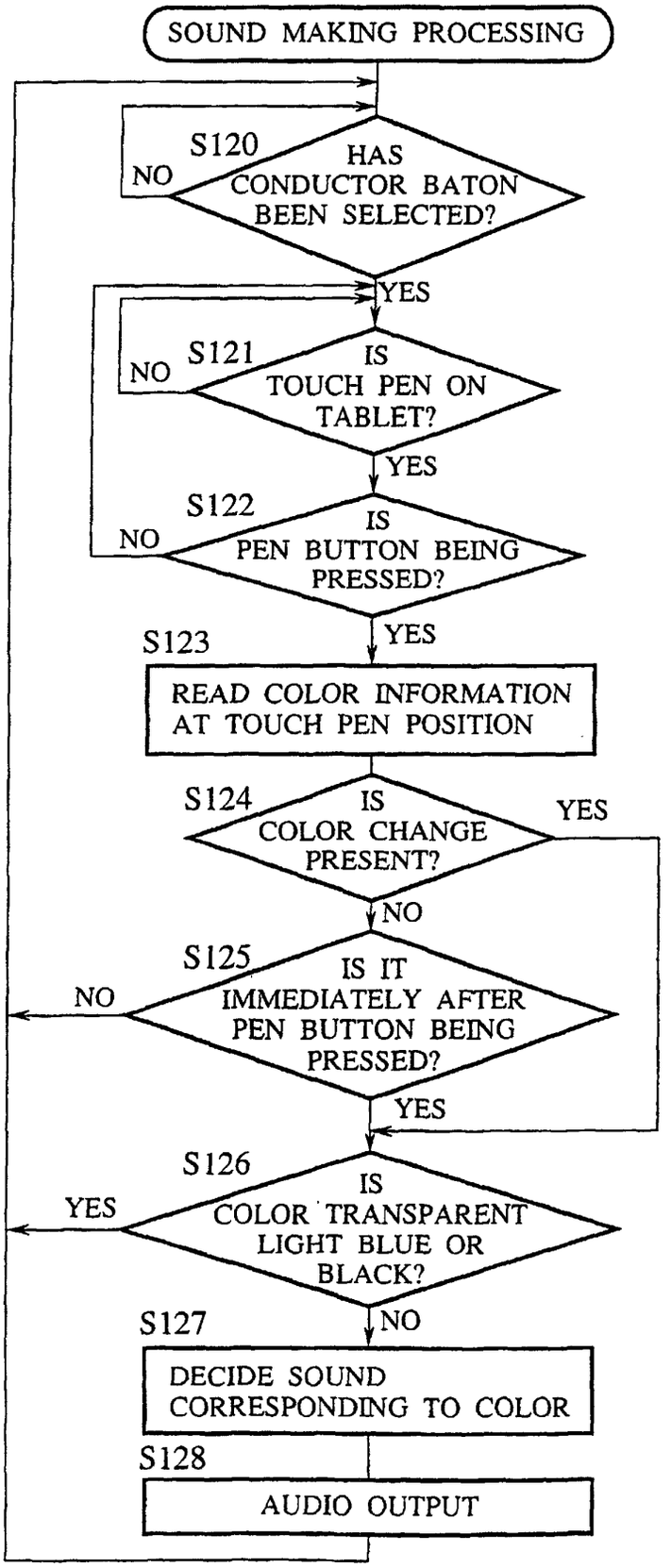

SOUND MAKING PROCESSING
S20
HAS CONDUCTOR BATON BEEN SELECTED?
NO
YES
S21
IS TOUCH PEN ON TABLET?
NO
YES
S22
IS PEN BUTTON BEING PRESSED?
NO
YES
S23
READ COLOR INFORMATION AT TOUCH PEN POSITION
S24
IS THERE A CHANGE OF COLOR?
YES
NO
S25
IS IT IMMEDIATELY AFTER PEN BUTTON BEING PRESSED?
NO
YES
S26
IS COLOR TRANSPARENT OR BLACK?
YES
NO
S27
DISPLAY GLOWING POWDER IF BLACK
S28
DECIDE SOUND CORRESPONDING TO COLOR
S29
OUTPUT SOUND

FIG.10


SOUND MAKING PROCESSING
S120
HAS CONDUCTOR BATON BEEN SELECTED?
NO
YES
S121
IS TOUCH PEN ON TABLET?
NO
YES
S122
IS PEN BUTTON BEING PRESSED?
NO
YES
S123
READ COLOR INFORMATION AT TOUCH PEN POSITION
S124
IS COLOR CHANGE PRESENT?
YES
NO
S125
IS IT IMMEDIATELY AFTER PEN BUTTON BEING PRESSED?
NO
YES
S126
IS COLOR TRANSPARENT LIGHT BLUE OR BLACK?
YES
NO
S127
DECIDE SOUND CORRESPONDING TO COLOR
S128
AUDIO OUTPUT

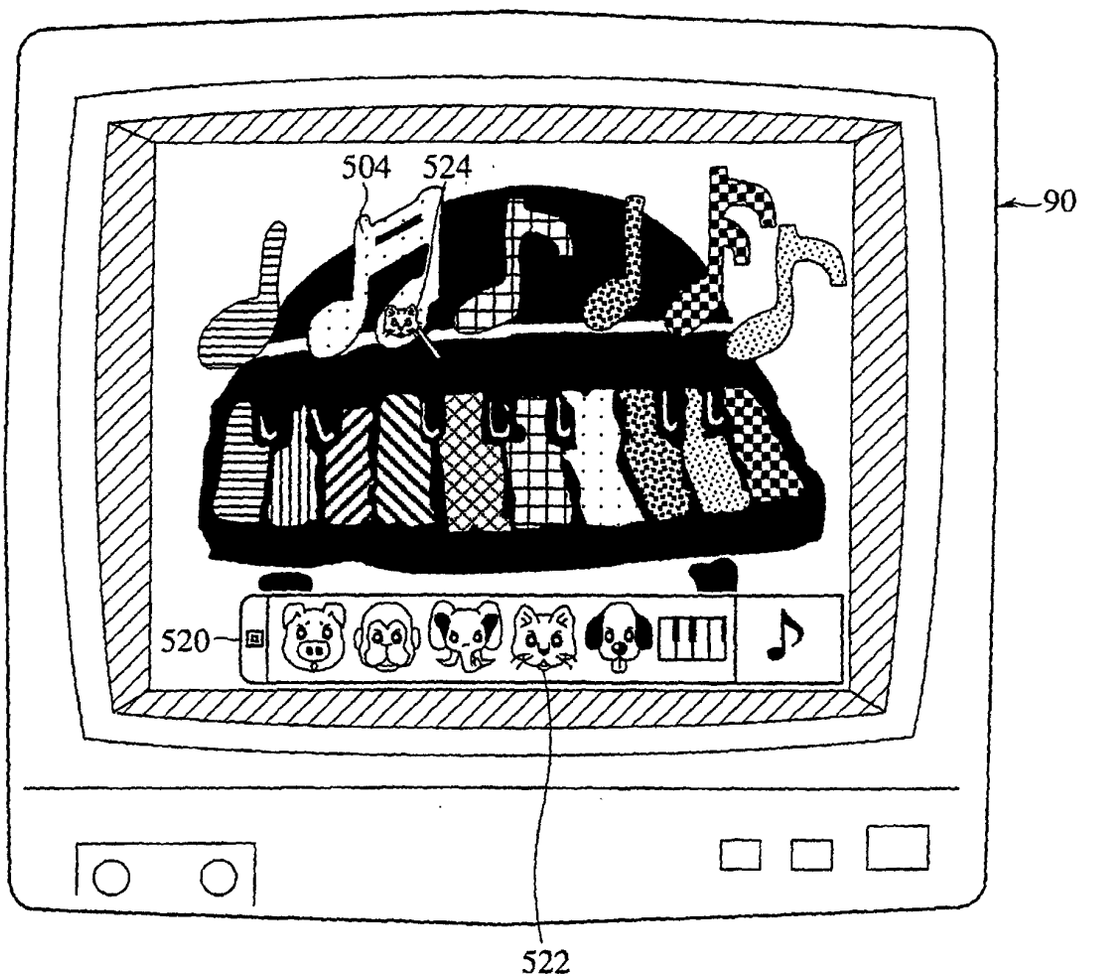



FIG.11