US 20130314578A1

(19) **United States**

(12) **Patent Application Publication**

Imaizumi et al.

(10) **Pub. No.: US 2013/0314578 A1**

(43) **Pub. Date: Nov. 28, 2013**

(54) **DEVICE INCLUDING TOUCHSCREEN**

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(73) Assignee: **Nintendo Co., Ltd.**, Kyoto (JP)

(21) Appl. No.: **13/954,509**

(22) Filed: **Jul. 30, 2013**

Related U.S. Application Data

(62) Division of application No. 12/531,586, filed on Sep. 16, 2009, filed as application No. PCT/JP2008/067864 on Oct. 1, 2008.

Publication Classification

(51) **Int. Cl.**
H04N 5/232 (2006.01)

(52) **U.S. Cl.**
CPC *H04N 5/23216* (2013.01)
USPC **348/333.02**

(57) **ABSTRACT**

An example device includes at least one camera, a touchscreen and a display controller. The display controller is configured to concurrently display on the touchscreen (i) a first button operable for taking a picture using the camera, and (ii) a real time image captured by the camera, wherein the first button overlaps the real time image.

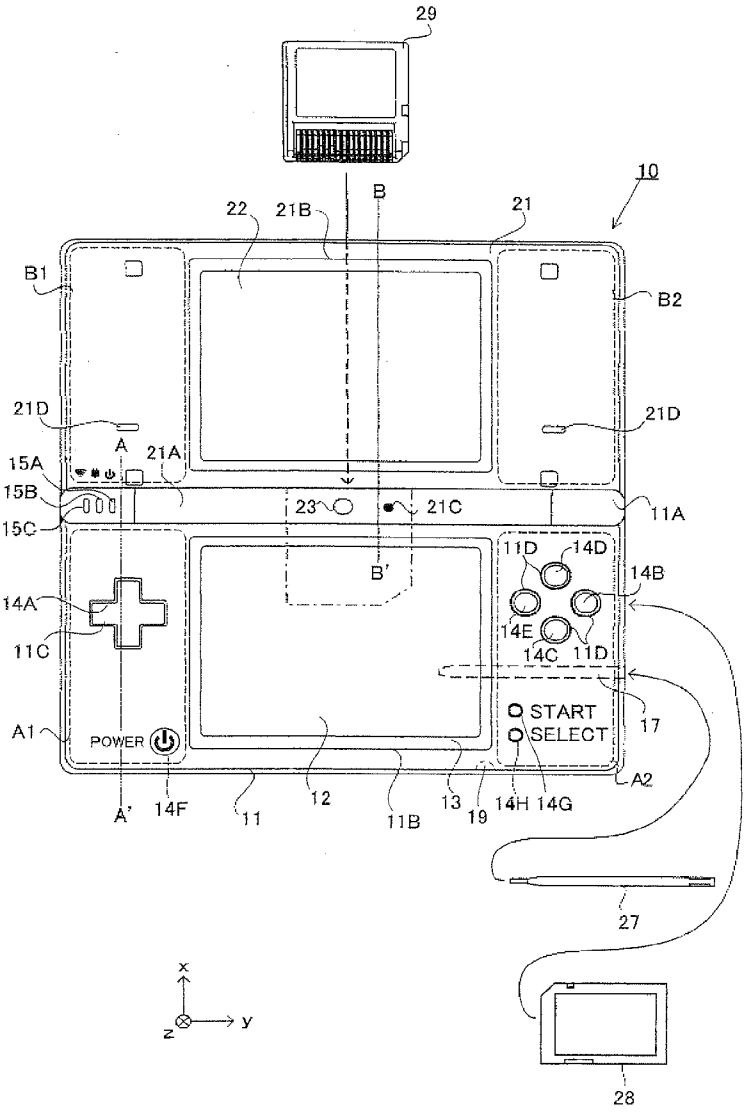


FIG.1

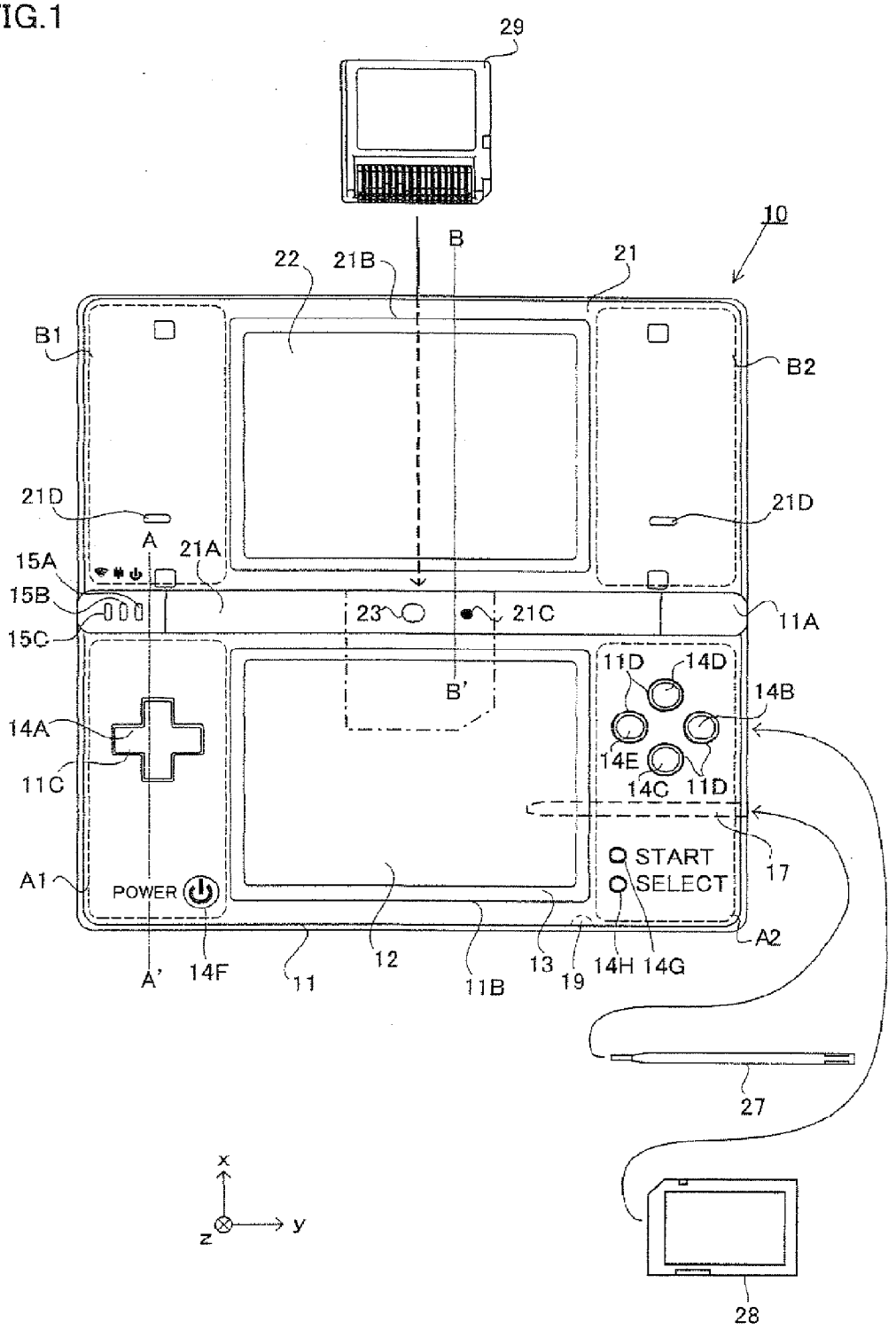

29
10
B
22
21B
21
B1
B2
21D
21D
A
21A
15A
15B
15C
23
21C
11A
B'
11D
14D
14B
14A
14E
11C
14C
11D
START
SELECT
17
A1
POWER
A2
A'
14F
11
12
11B
13
19
14H
14G
27
x
y
z
28

FIG.2

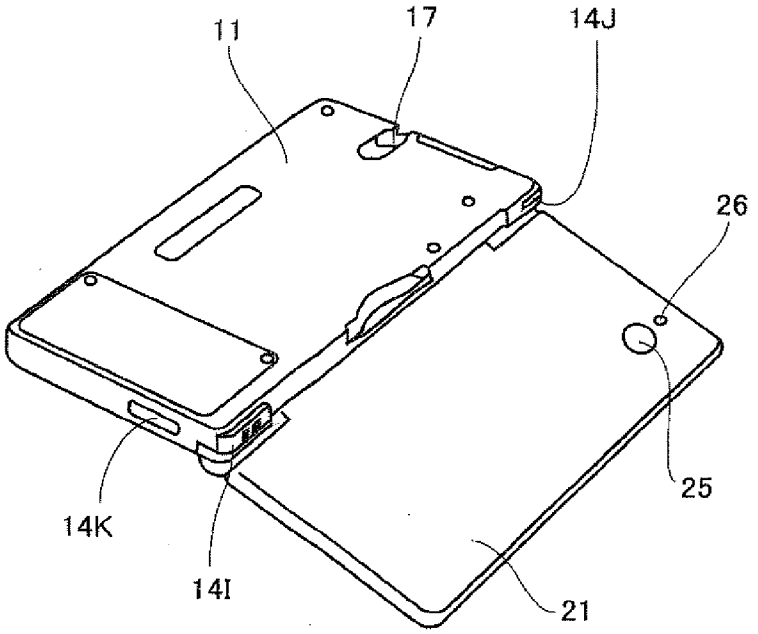


FIG.3

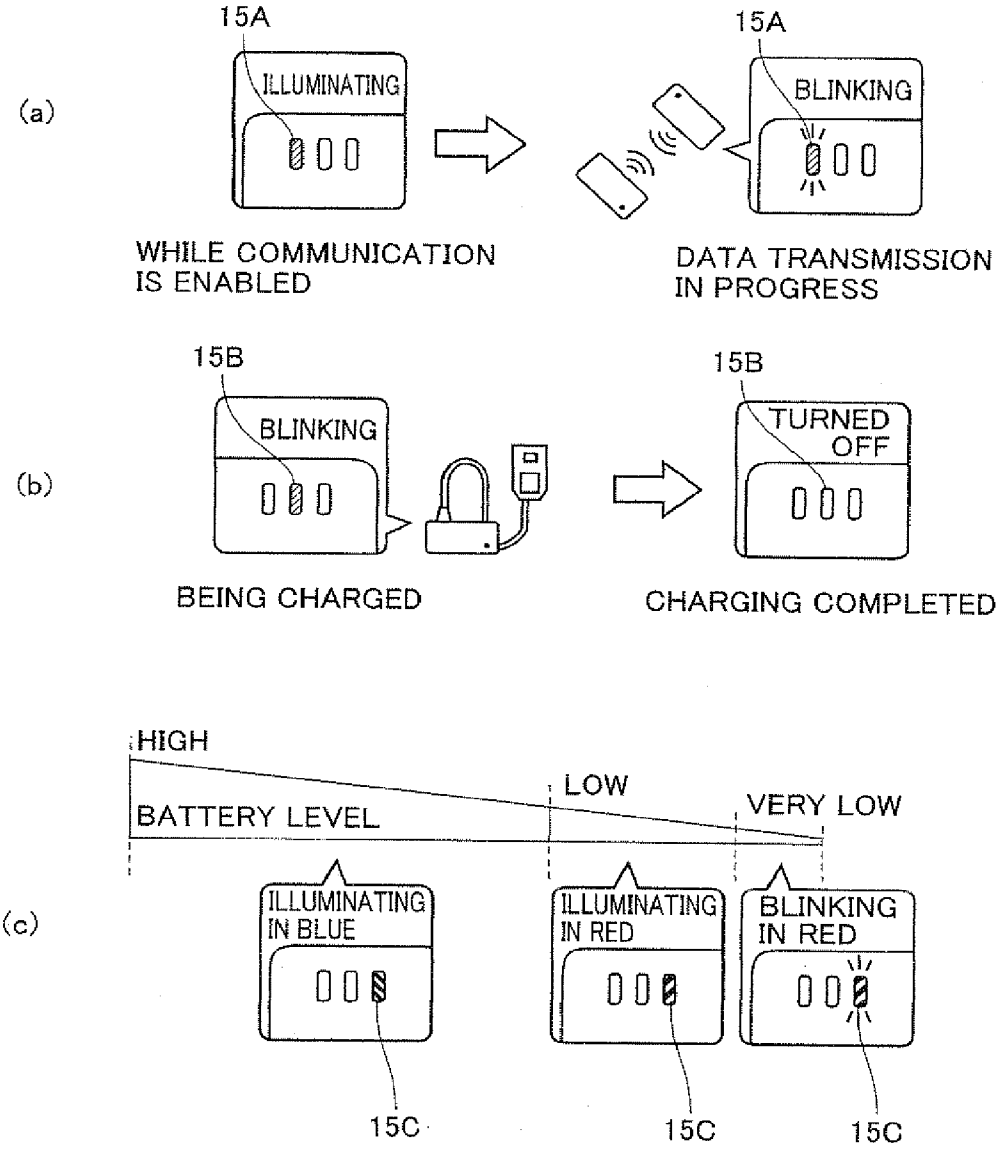

(a)
15A
ILLUMINATING
WHILE COMMUNICATION IS ENABLED
15A
BLINKING
DATA TRANSMISSION IN PROGRESS
(b)
15B
BLINKING
BEING CHARGED
15B
TURNED OFF
CHARGING COMPLETED
(c)
HIGH
BATTERY LEVEL
LOW
VERY LOW
ILLUMINATING IN BLUE
ILLUMINATING IN RED
BLINKING IN RED
15C
15C
15C

FIG.4

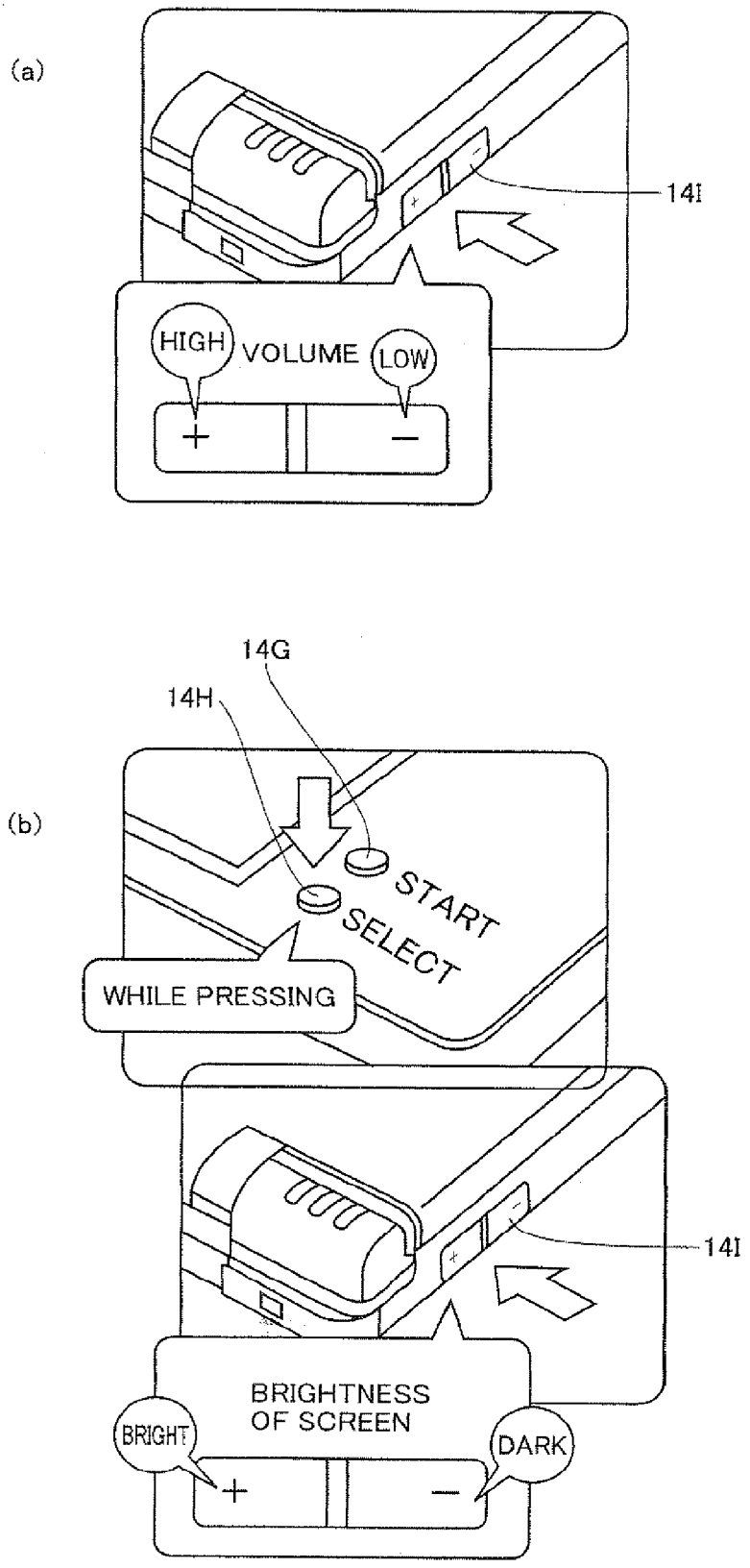

(a)
14I
HIGH
VOLUME
LOW
+
−
14G
14H
(b)
START
SELECT
WHILE PRESSING
14I
BRIGHTNESS
OF SCREEN
BRIGHT
DARK
+
−

FIG.5

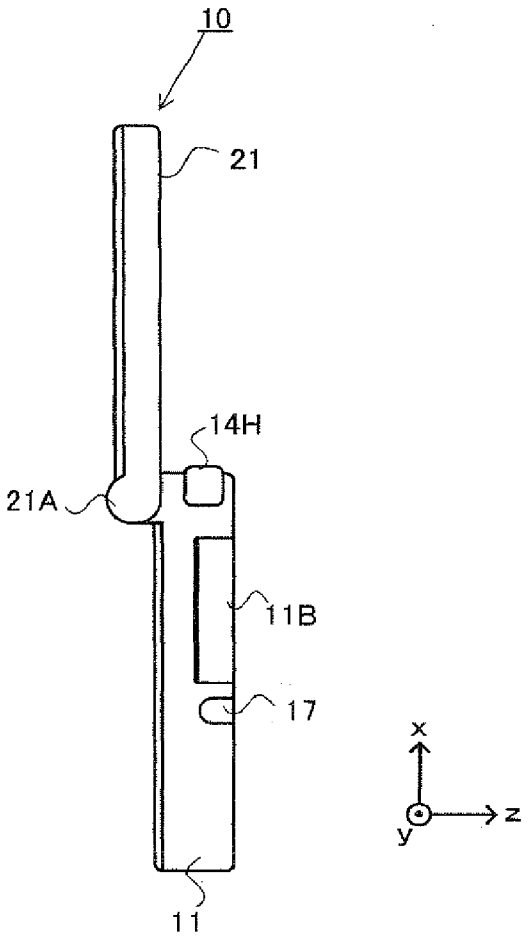


FIG.6

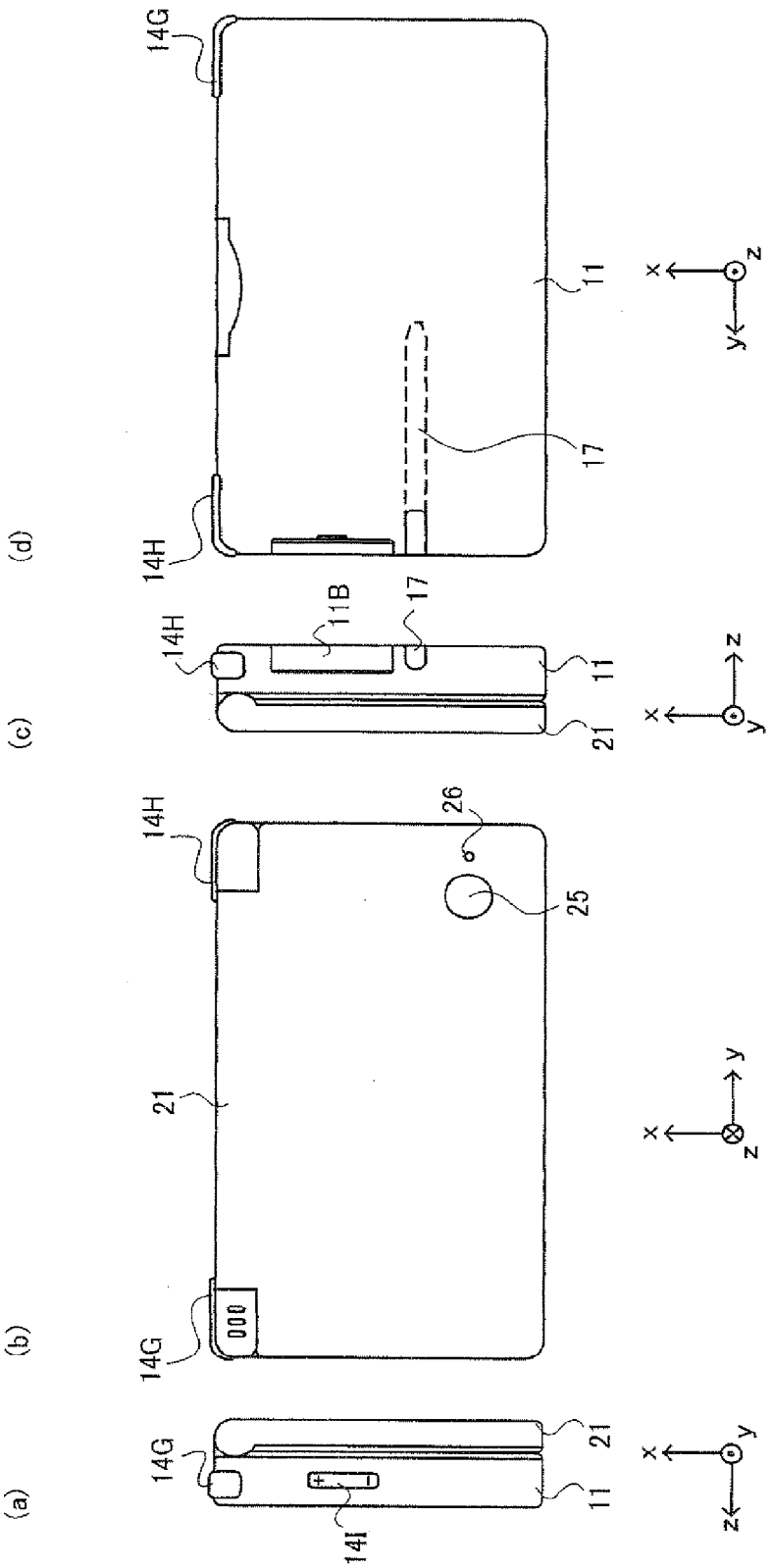

(a)
14G
14I
11
21
x
y
z
(b)
14H
14G
21
25
26
x
y
z
(c)
14H
11B
17
11
21
x
z
y
(d)
14G
14H
17
11
x
z
y

FIG.7

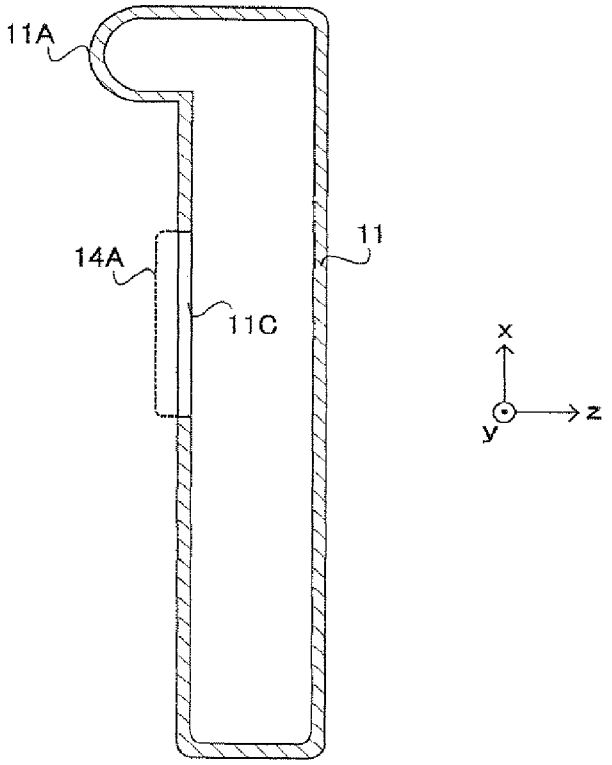


FIG.8

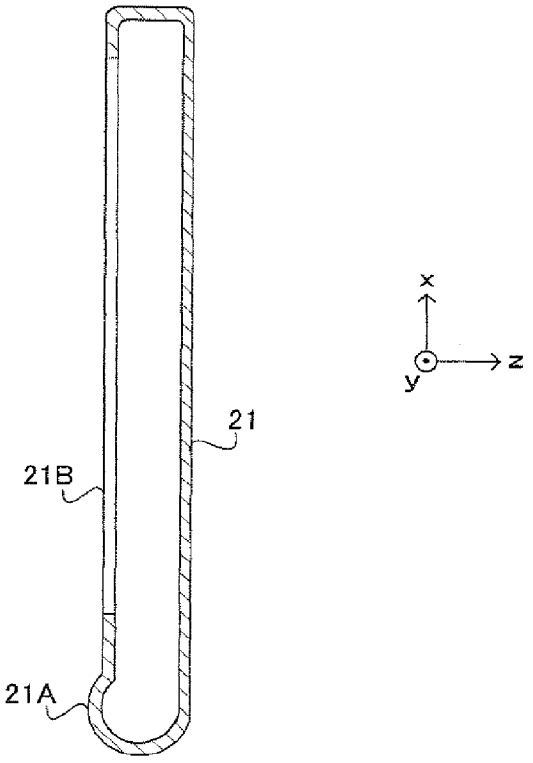


FIG.9

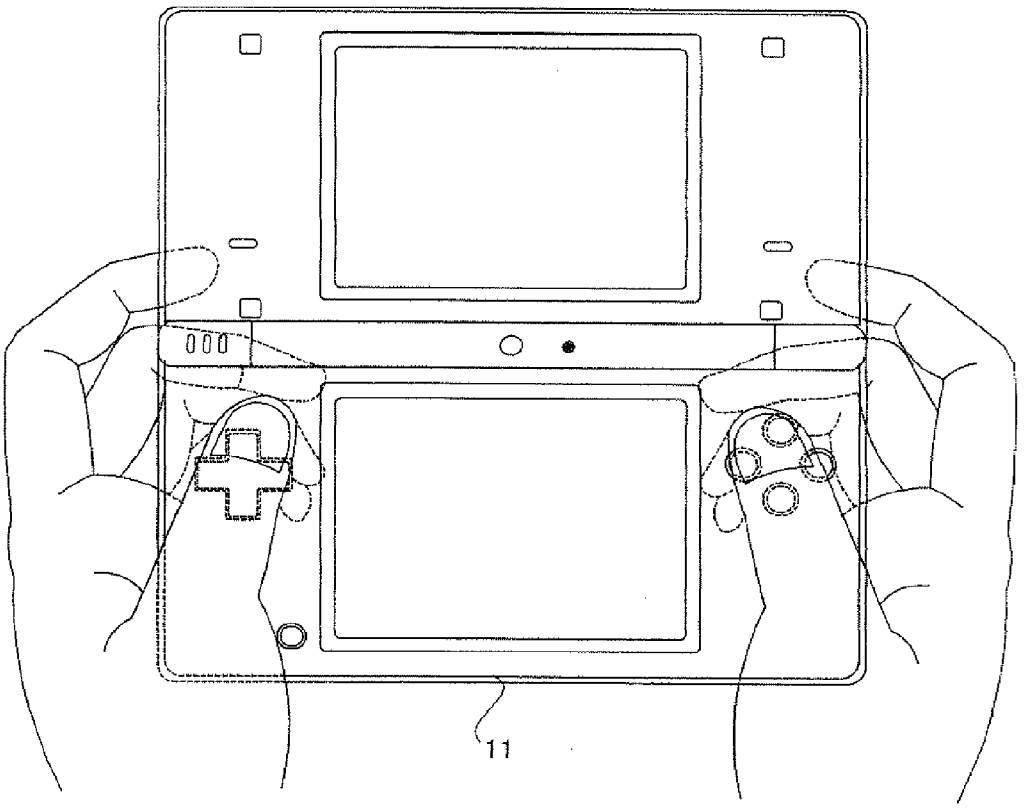


FIG.10

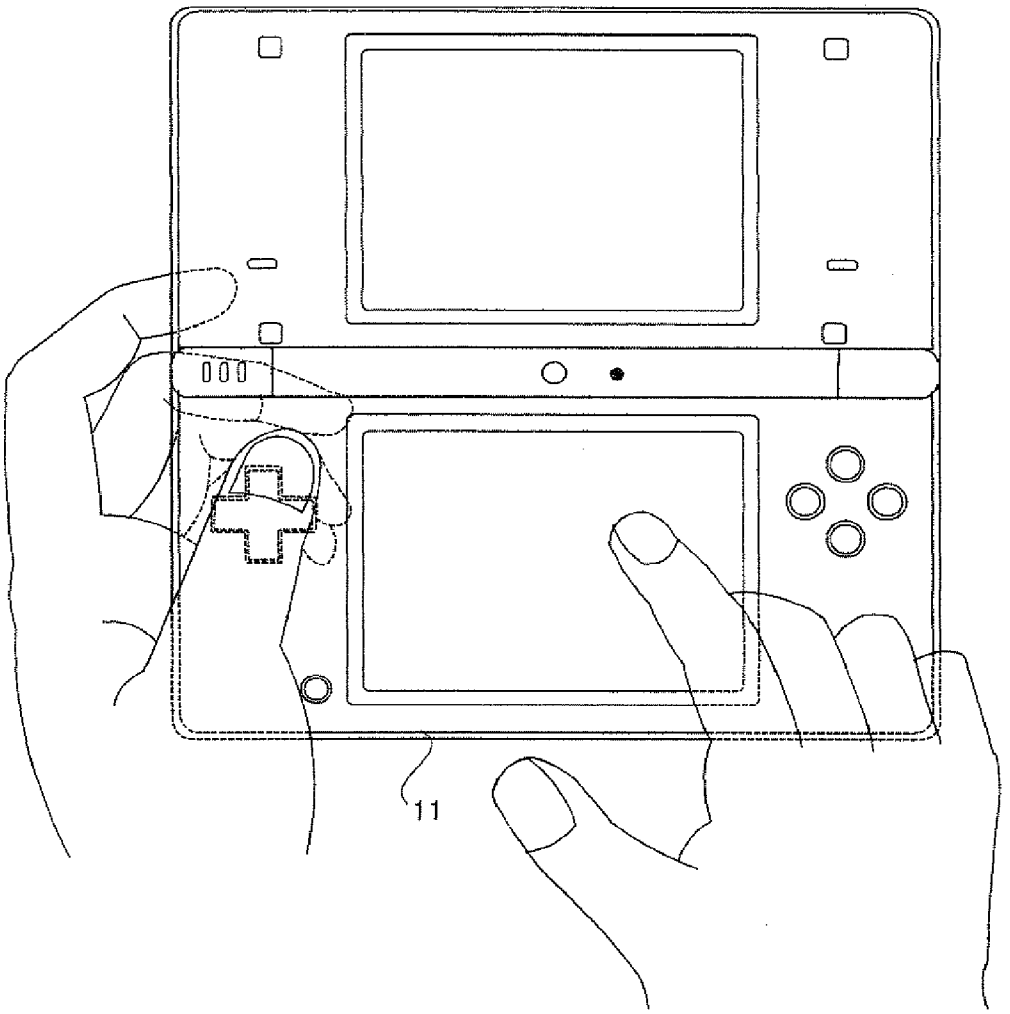


FIG.11

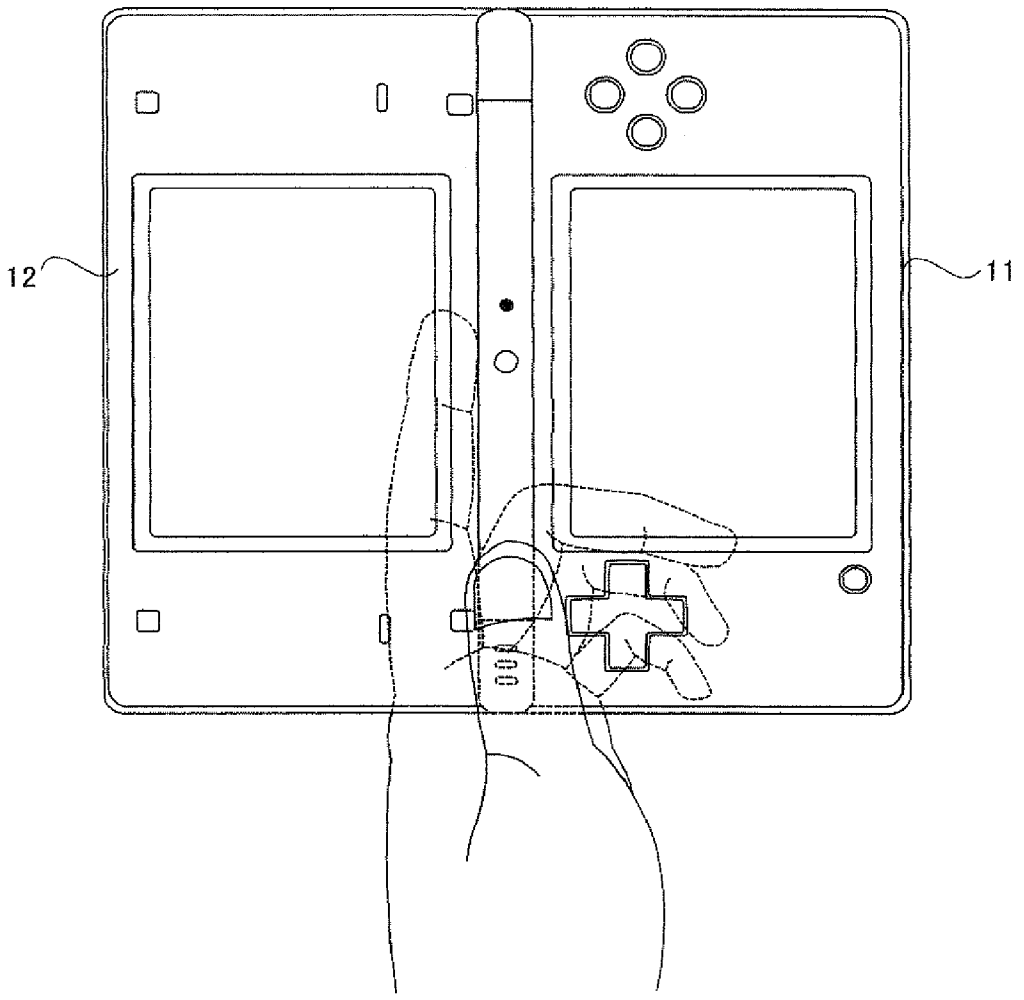


FIG.12

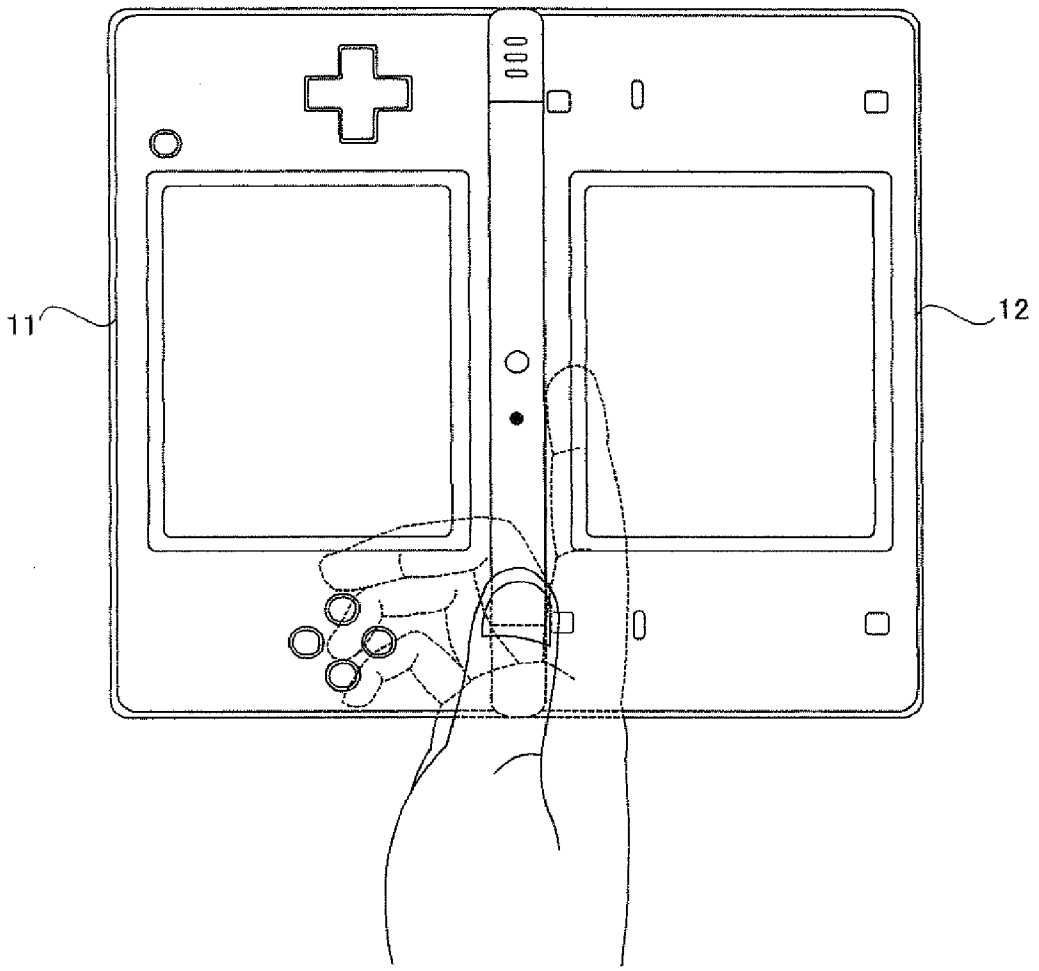


FIG.13

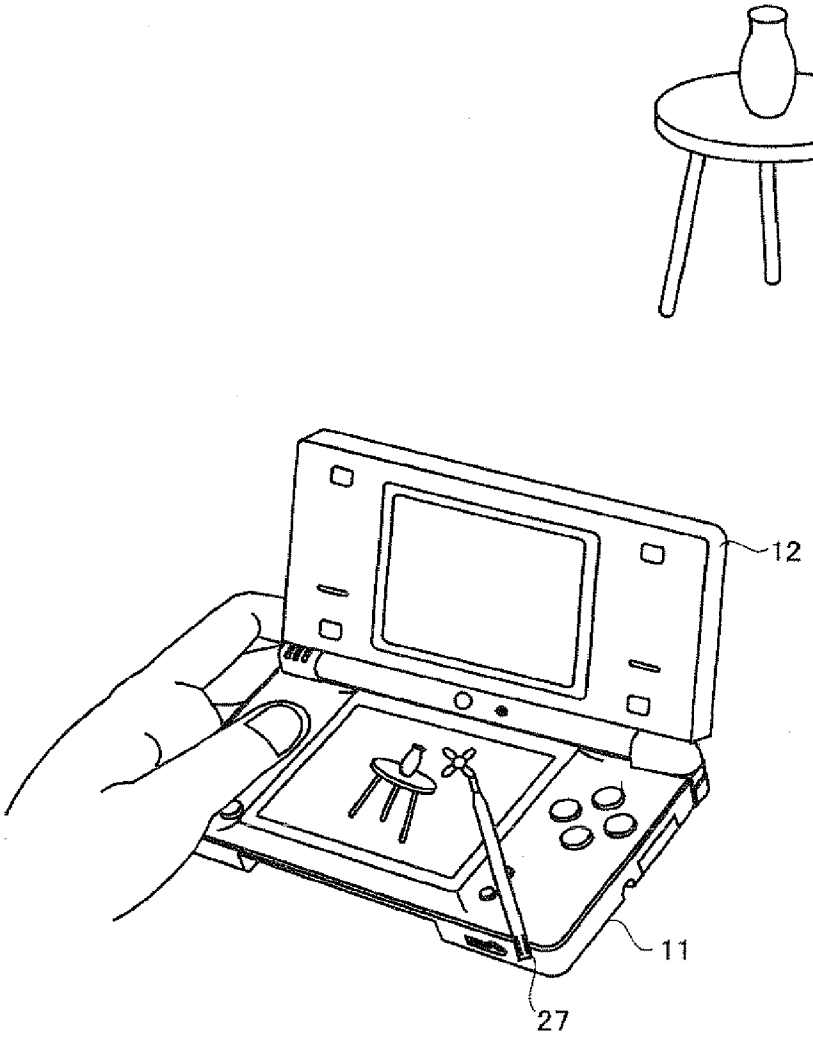


FIG.14

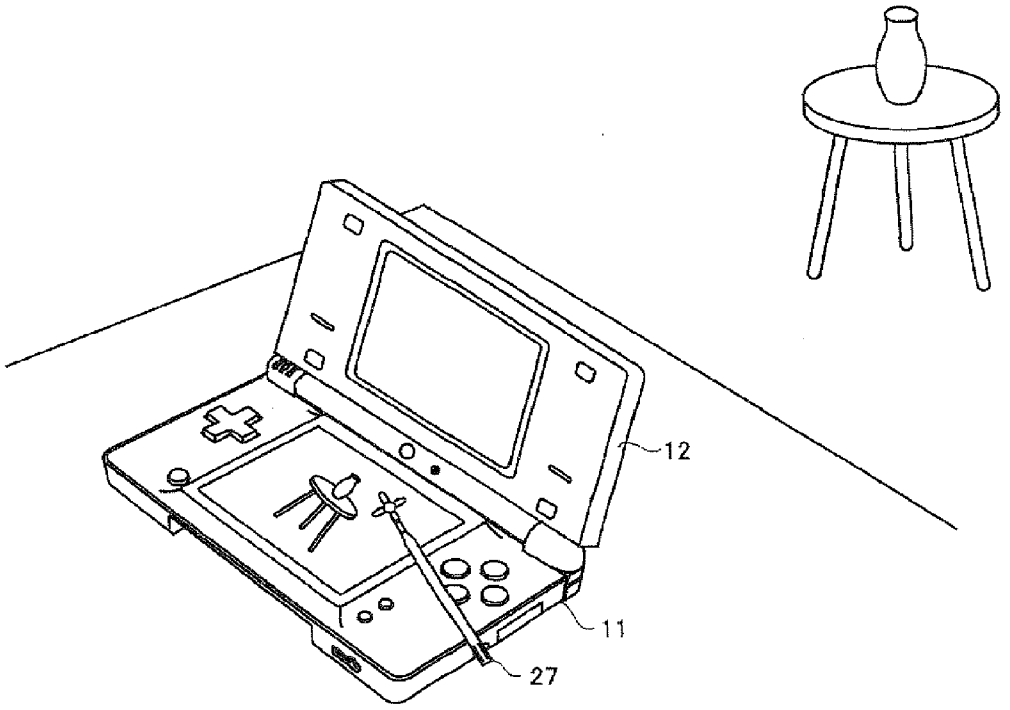


FIG.15

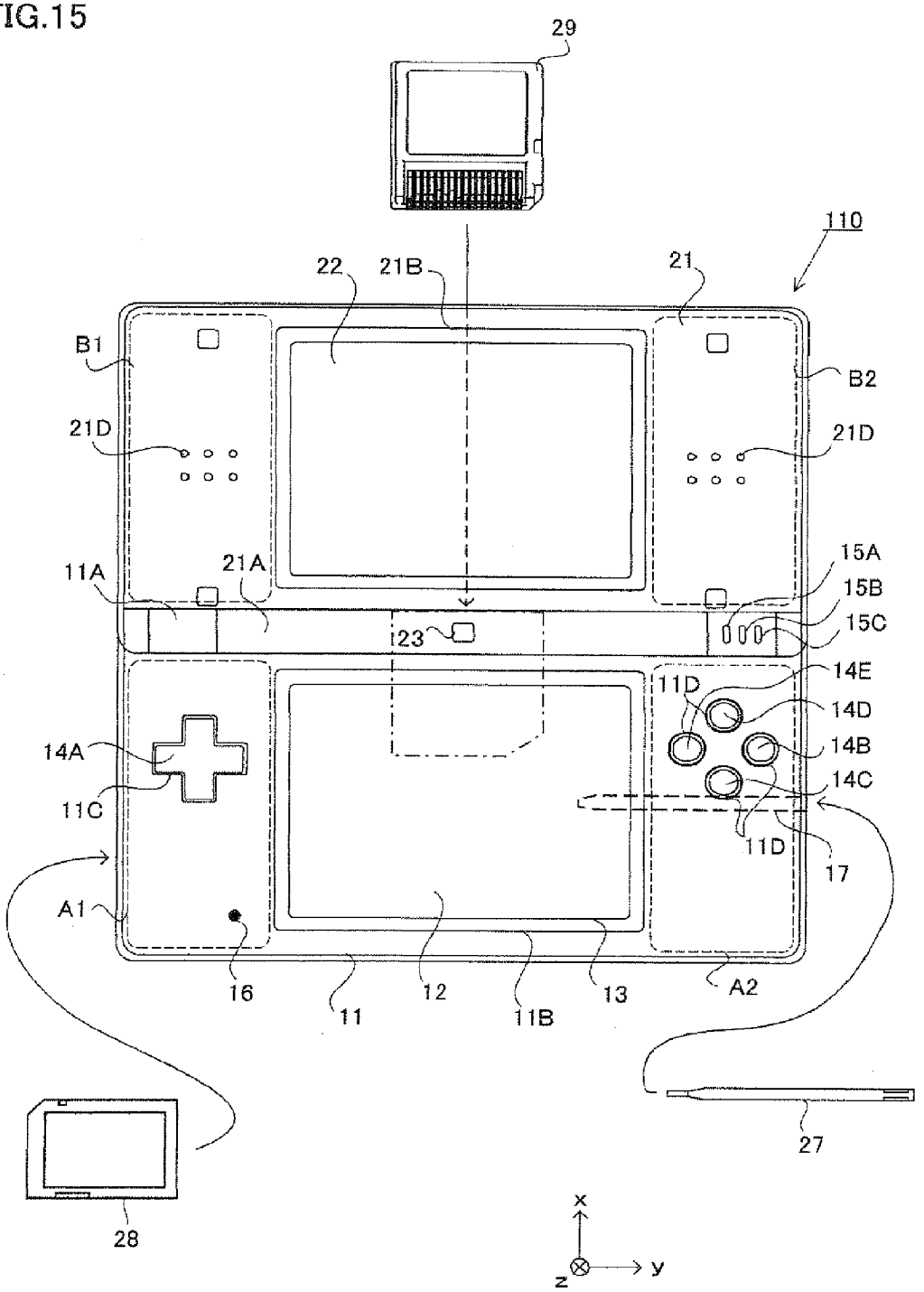

29
110
22
21B
21
B1
B2
21D
21D
11A
21A
15A
15B
15C
23
14E
11D
14D
14A
14B
14C
11C
11D
17
A1
16
11
12
11B
13
A2
27
28
x
z
y

FIG.16

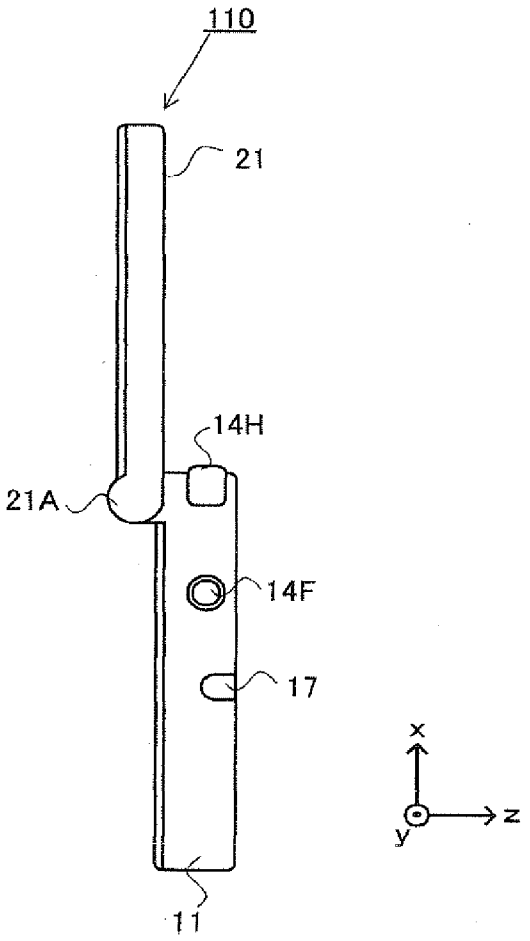


FIG.17

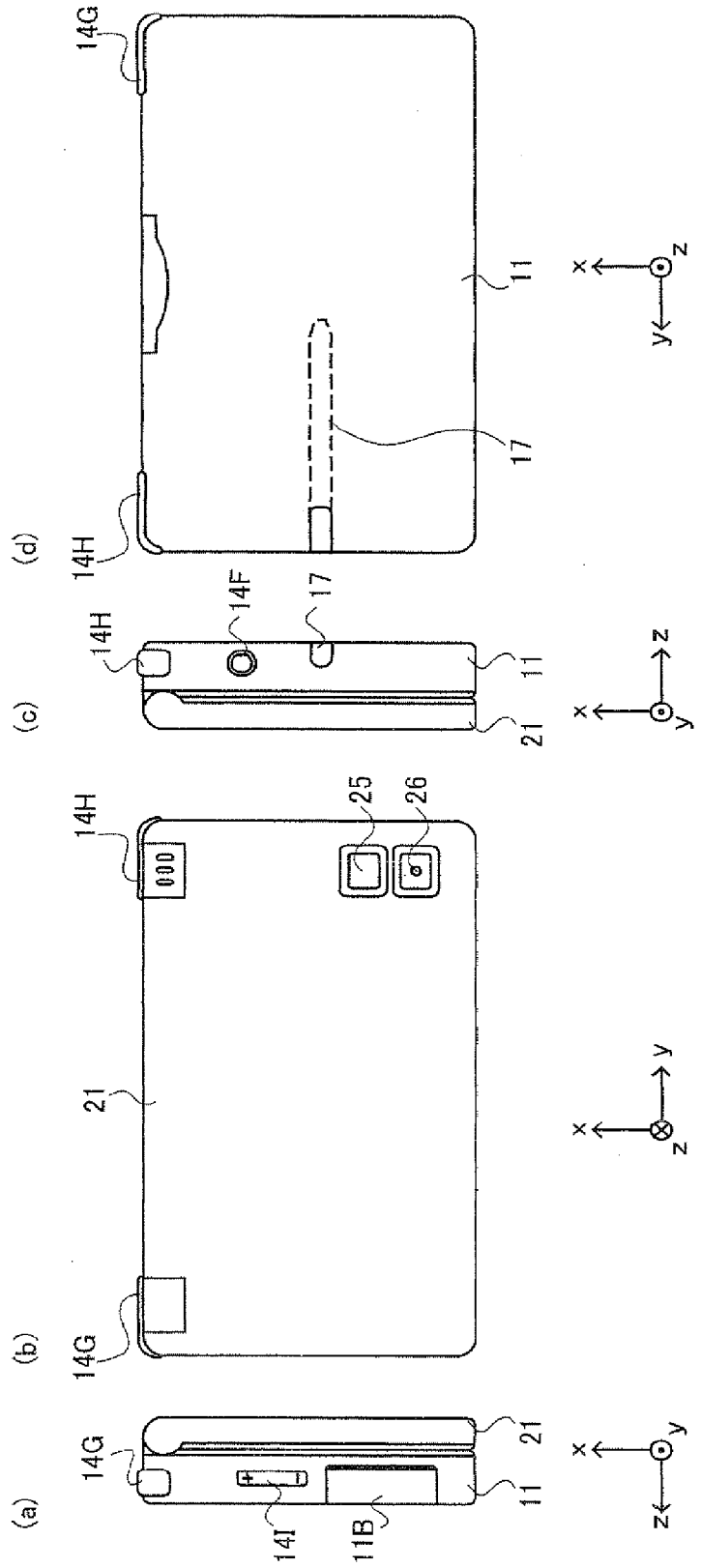

(a)
14G
14I
11B
11
21
(b)
14H
14G
21
25
26
(c)
14H
14F
17
11
21
(d)
14G
14H
17
11
x
y
z

FIG.18

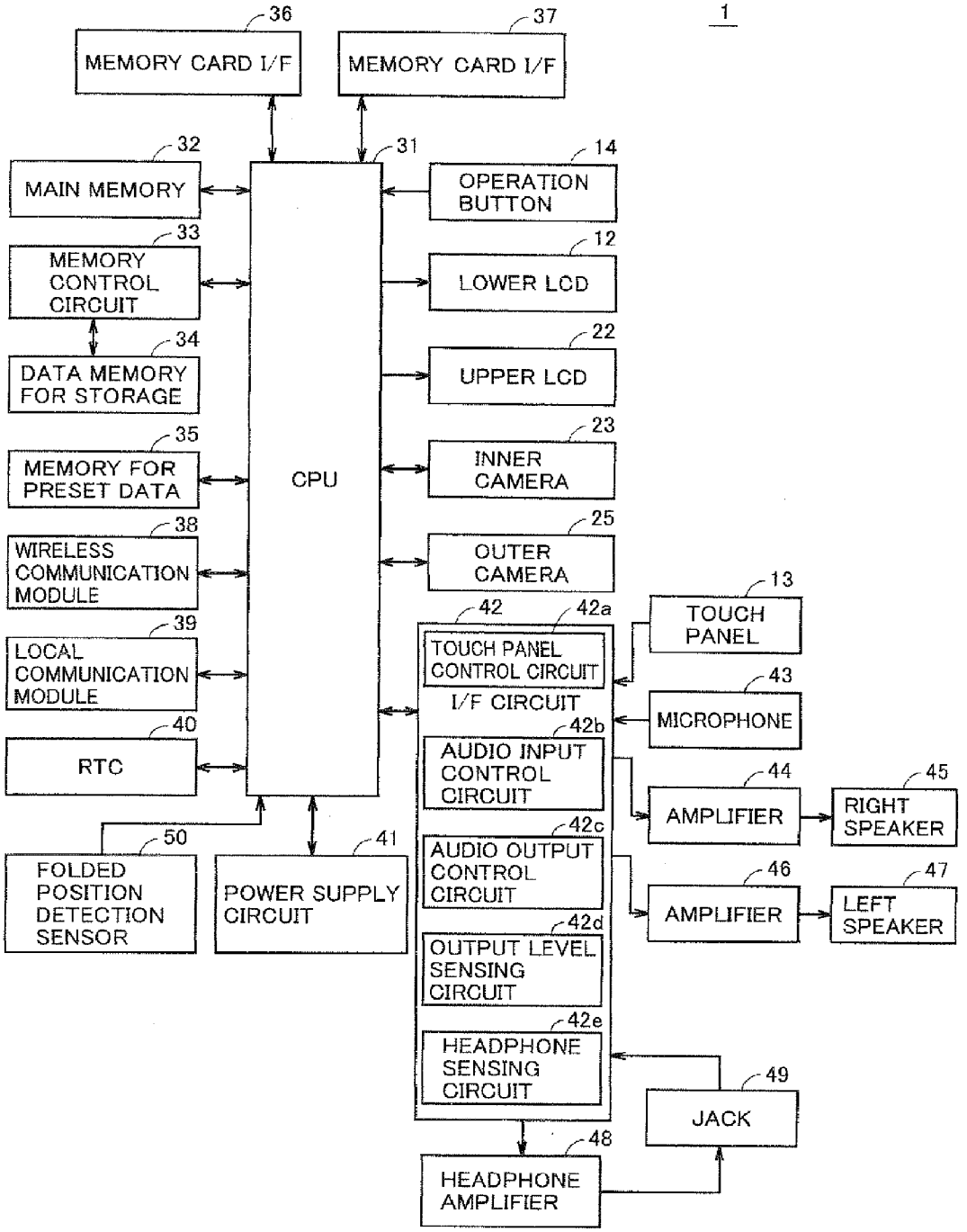

1
36
MEMORY CARD I/F
37
MEMORY CARD I/F
32
MAIN MEMORY
31
CPU
14
OPERATION BUTTON
33
MEMORY CONTROL CIRCUIT
12
LOWER LCD
34
DATA MEMORY FOR STORAGE
22
UPPER LCD
35
MEMORY FOR PRESET DATA
23
INNER CAMERA
38
WIRELESS COMMUNICATION MODULE
25
OUTER CAMERA
39
LOCAL COMMUNICATION MODULE
42
42a
TOUCH PANEL CONTROL CIRCUIT
I/F CIRCUIT
13
TOUCH PANEL
43
MICROPHONE
40
RTC
42b
AUDIO INPUT CONTROL CIRCUIT
44
AMPLIFIER
45
RIGHT SPEAKER
42c
AUDIO OUTPUT CONTROL CIRCUIT
46
AMPLIFIER
47
LEFT SPEAKER
50
FOLDED POSITION DETECTION SENSOR
41
POWER SUPPLY CIRCUIT
42d
OUTPUT LEVEL SENSING CIRCUIT
42e
HEADPHONE SENSING CIRCUIT
49
JACK
48
HEADPHONE AMPLIFIER

FIG.19

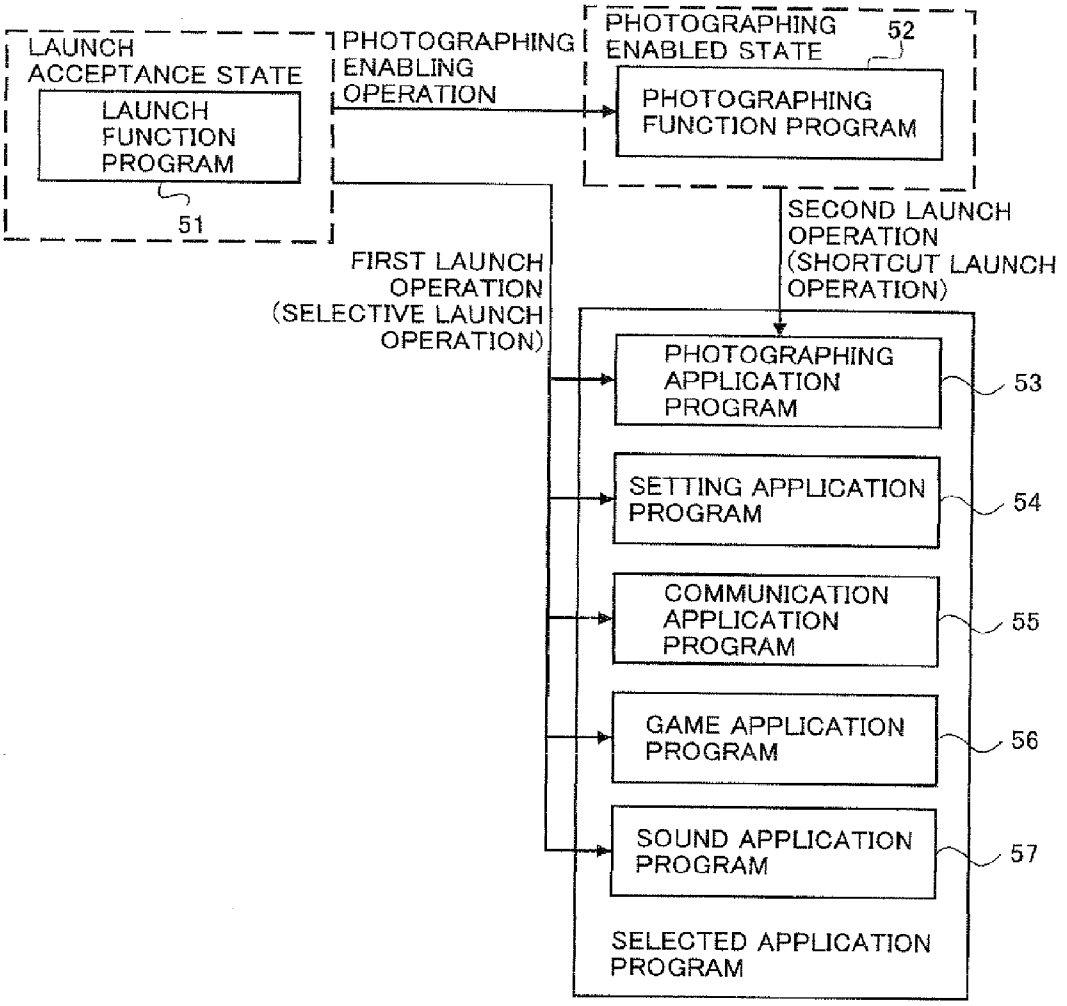

LAUNCH ACCEPTANCE STATE
LAUNCH FUNCTION PROGRAM
51
PHOTOGRAPHING ENABLING OPERATION
PHOTOGRAPHING ENABLED STATE
52
PHOTOGRAPHING FUNCTION PROGRAM
SECOND LAUNCH OPERATION (SHORTCUT LAUNCH OPERATION)
FIRST LAUNCH OPERATION (SELECTIVE LAUNCH OPERATION)
PHOTOGRAPHING APPLICATION PROGRAM
53
SETTING APPLICATION PROGRAM
54
COMMUNICATION APPLICATION PROGRAM
55
GAME APPLICATION PROGRAM
56
SOUND APPLICATION PROGRAM
57
SELECTED APPLICATION PROGRAM

FIG.20

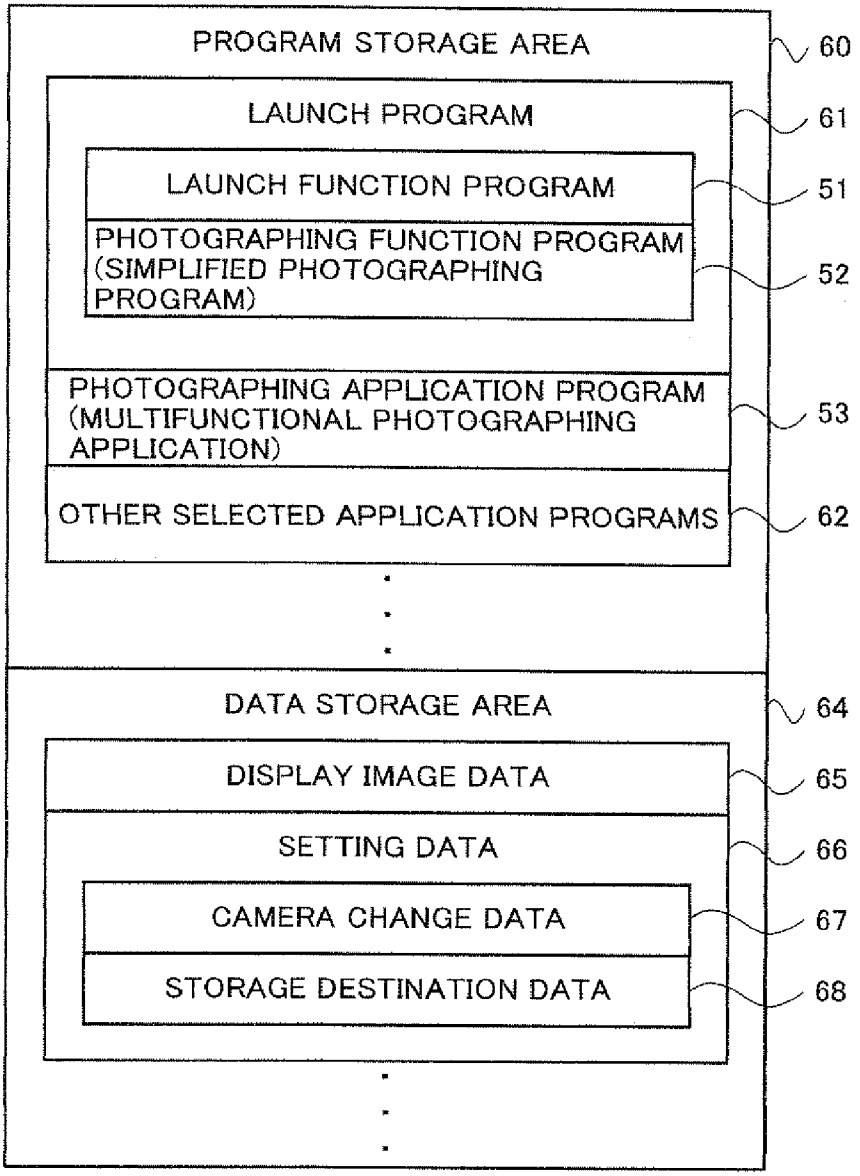

PROGRAM STORAGE AREA
60
LAUNCH PROGRAM
61
LAUNCH FUNCTION PROGRAM
51
PHOTOGRAPHING FUNCTION PROGRAM (SIMPLIFIED PHOTOGRAPHING PROGRAM)
52
PHOTOGRAPHING APPLICATION PROGRAM (MULTIFUNCTIONAL PHOTOGRAPHING APPLICATION)
53
OTHER SELECTED APPLICATION PROGRAMS
62
DATA STORAGE AREA
64
DISPLAY IMAGE DATA
65
SETTING DATA
66
CAMERA CHANGE DATA
67
STORAGE DESTINATION DATA
68

FIG.21

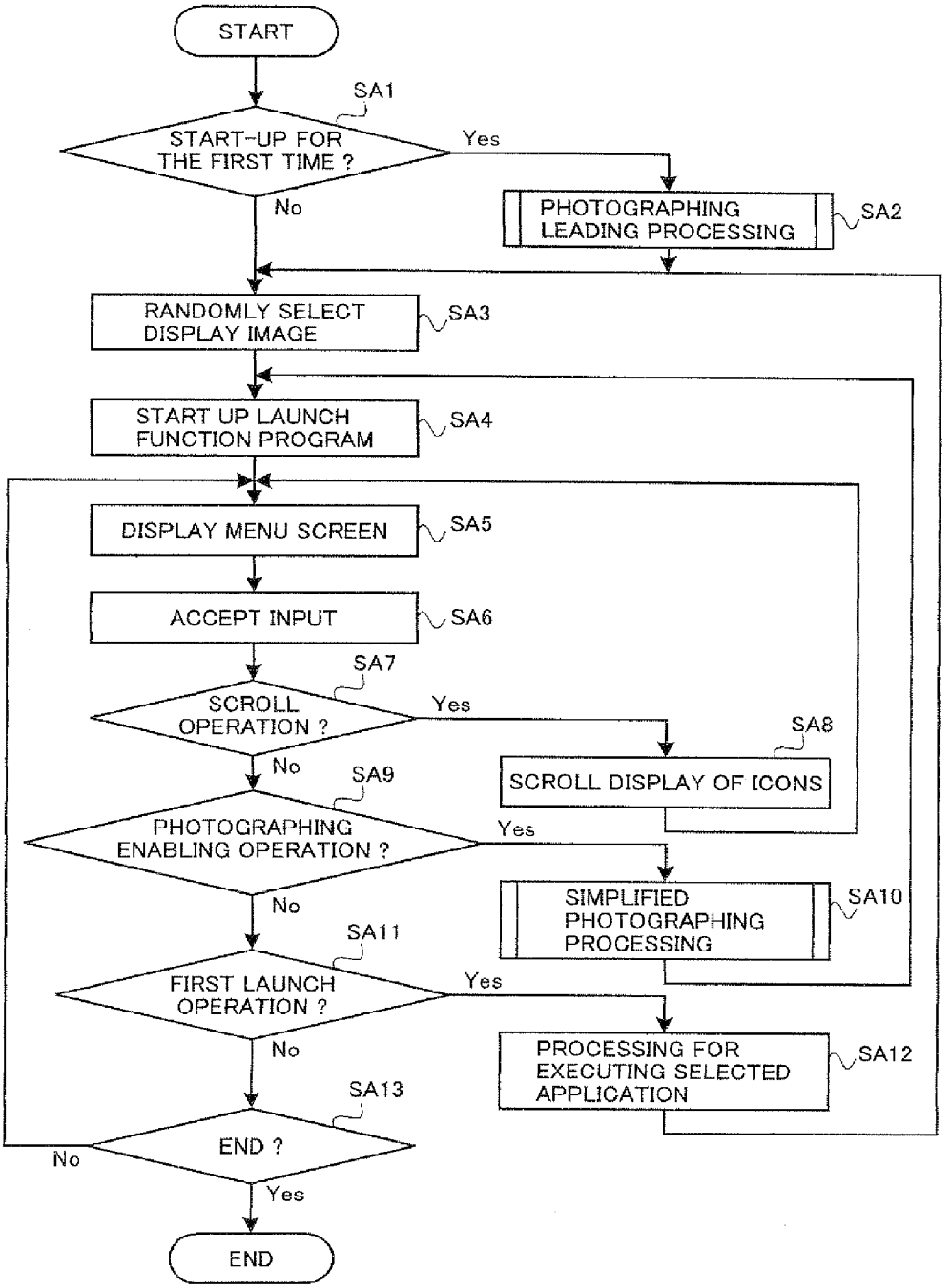

START
SA1
START-UP FOR THE FIRST TIME ?
Yes
No
PHOTOGRAPHING LEADING PROCESSING
SA2
RANDOMLY SELECT DISPLAY IMAGE
SA3
START UP LAUNCH FUNCTION PROGRAM
SA4
DISPLAY MENU SCREEN
SA5
ACCEPT INPUT
SA6
SA7
SCROLL OPERATION ?
Yes
SA8
SCROLL DISPLAY OF ICONS
No
SA9
PHOTOGRAPHING ENABLING OPERATION ?
Yes
SIMPLIFIED PHOTOGRAPHING PROCESSING
SA10
No
SA11
FIRST LAUNCH OPERATION ?
Yes
PROCESSING FOR EXECUTING SELECTED APPLICATION
SA12
No
SA13
END ?
No
Yes
END

FIG.22

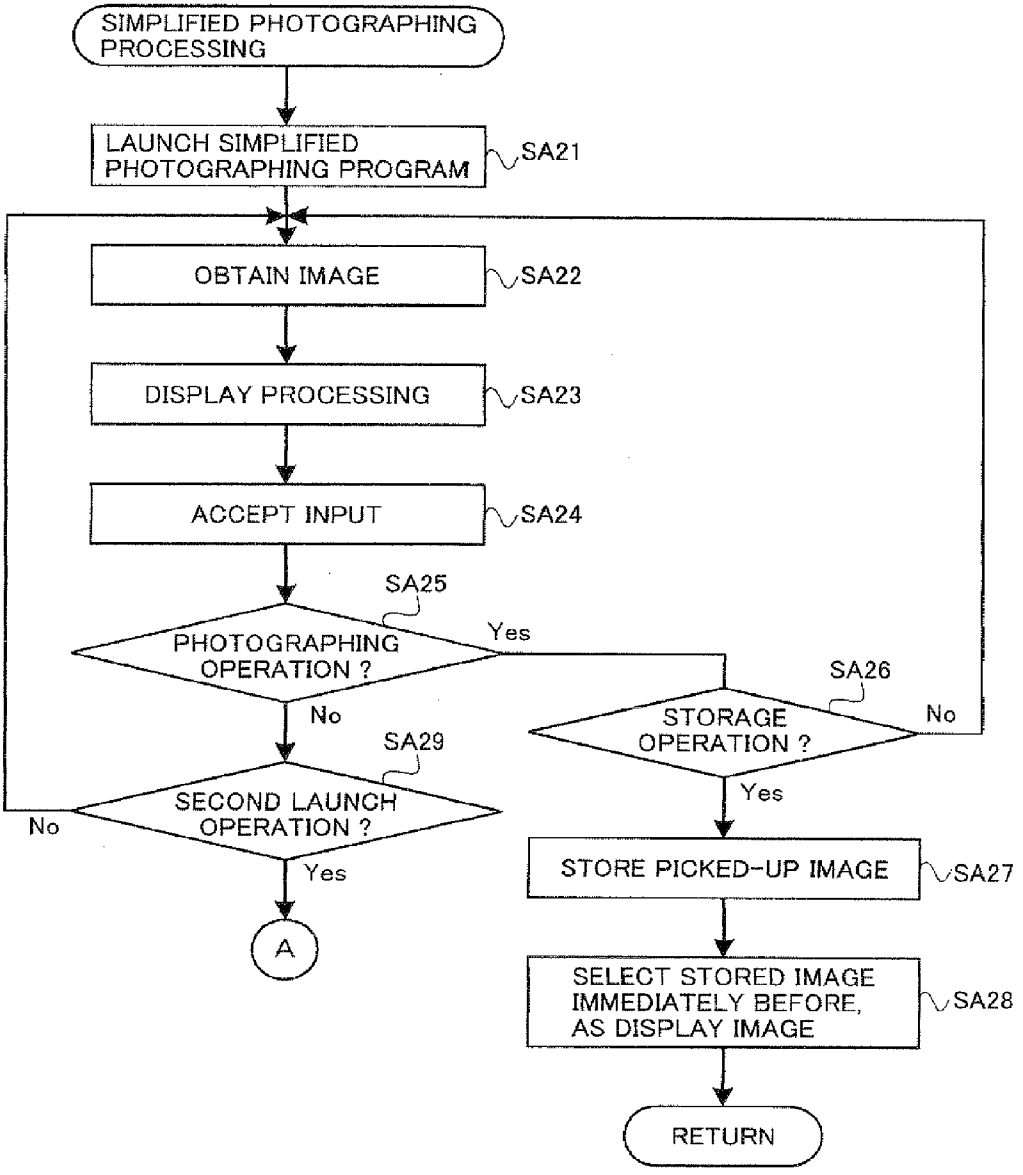

SIMPLIFIED PHOTOGRAPHING PROCESSING
LAUNCH SIMPLIFIED PHOTOGRAPHING PROGRAM
SA21
OBTAIN IMAGE
SA22
DISPLAY PROCESSING
SA23
ACCEPT INPUT
SA24
SA25
PHOTOGRAPHING OPERATION ?
Yes
No
SA26
STORAGE OPERATION ?
No
Yes
SA29
SECOND LAUNCH OPERATION ?
No
Yes
A
STORE PICKED-UP IMAGE
SA27
SELECT STORED IMAGE IMMEDIATELY BEFORE, AS DISPLAY IMAGE
SA28
RETURN

FIG.23

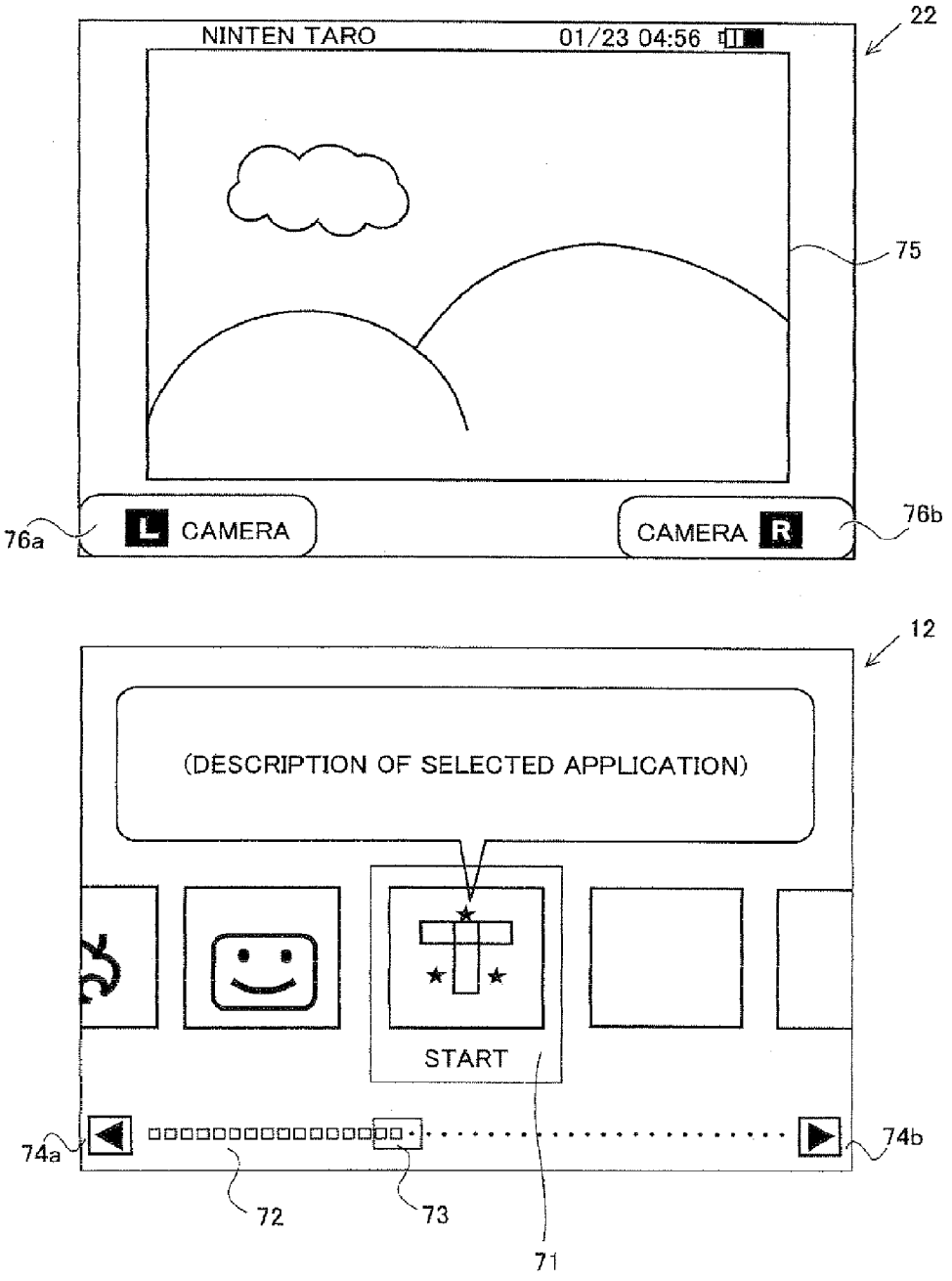

NINTEN TARO
01/23 04:56
22
75
76a
L CAMERA
CAMERA R
76b
12
(DESCRIPTION OF SELECTED APPLICATION)
START
74a
74b
72
73
71

FIG.24

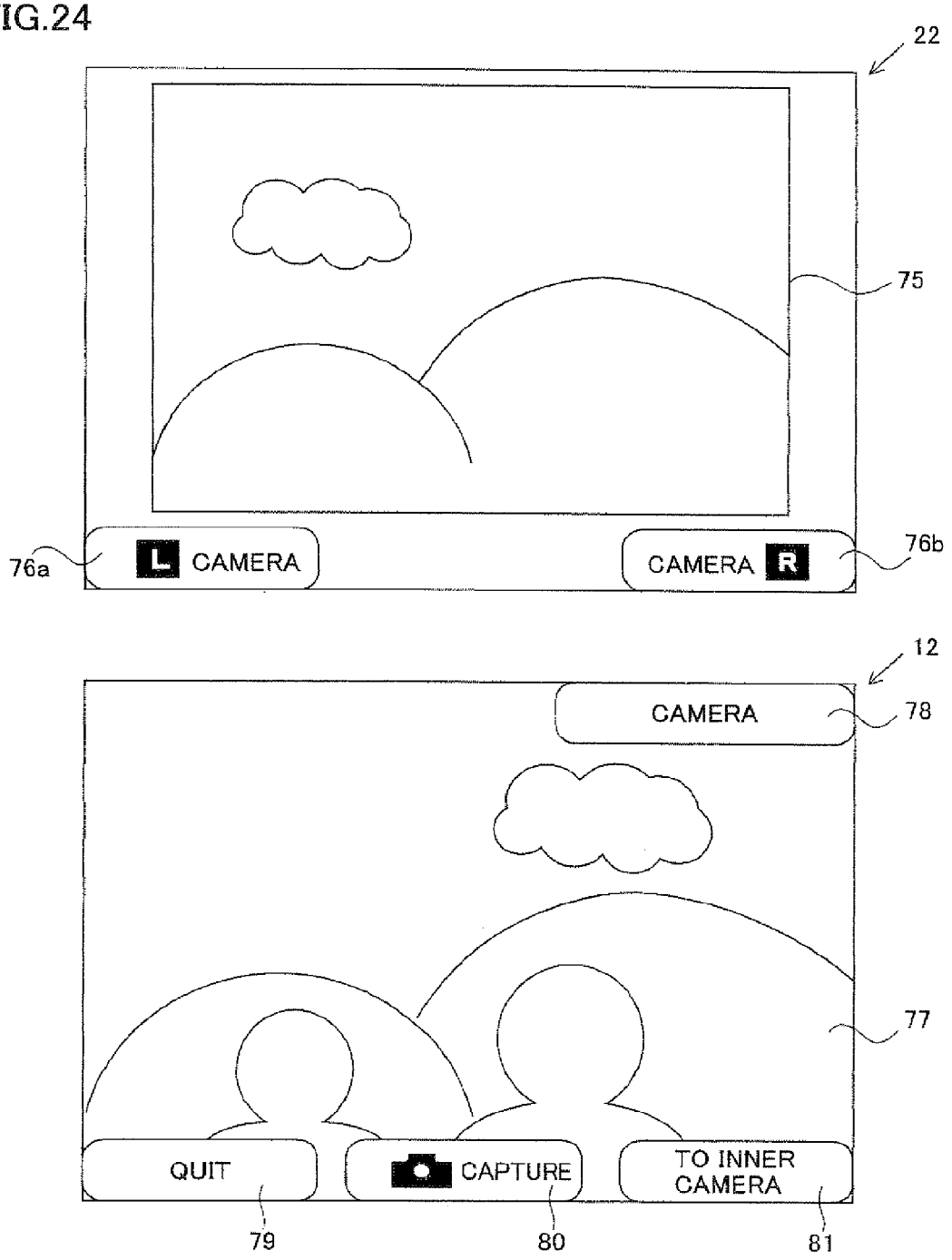

22
75
L CAMERA
CAMERA R
76a
76b
12
CAMERA
78
77
QUIT
CAPTURE
TO INNER CAMERA
79
80
81

FIG.25

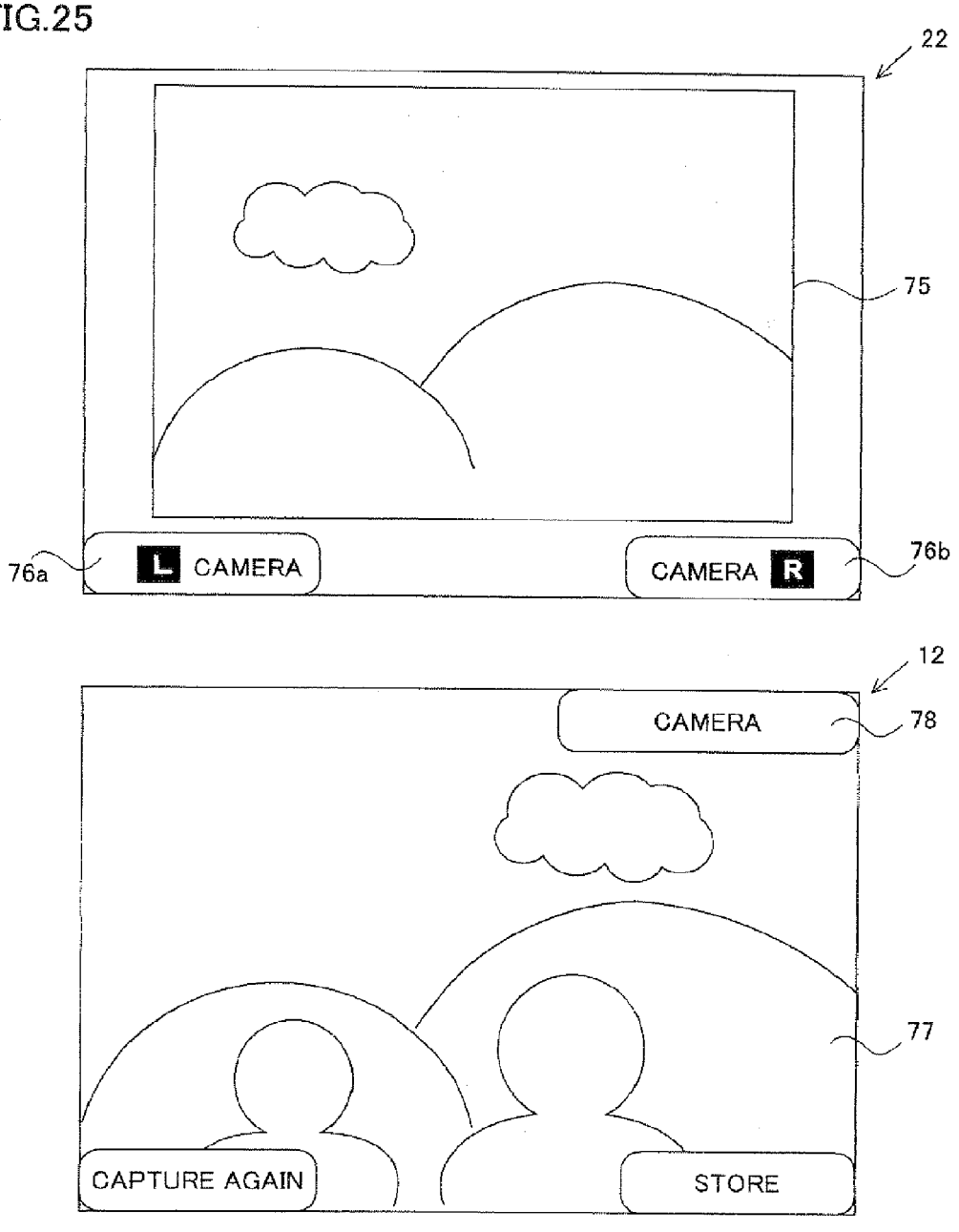

22
75
76a
L CAMERA
CAMERA R
76b
12
CAMERA
78
77
CAPTURE AGAIN
STORE

FIG.26

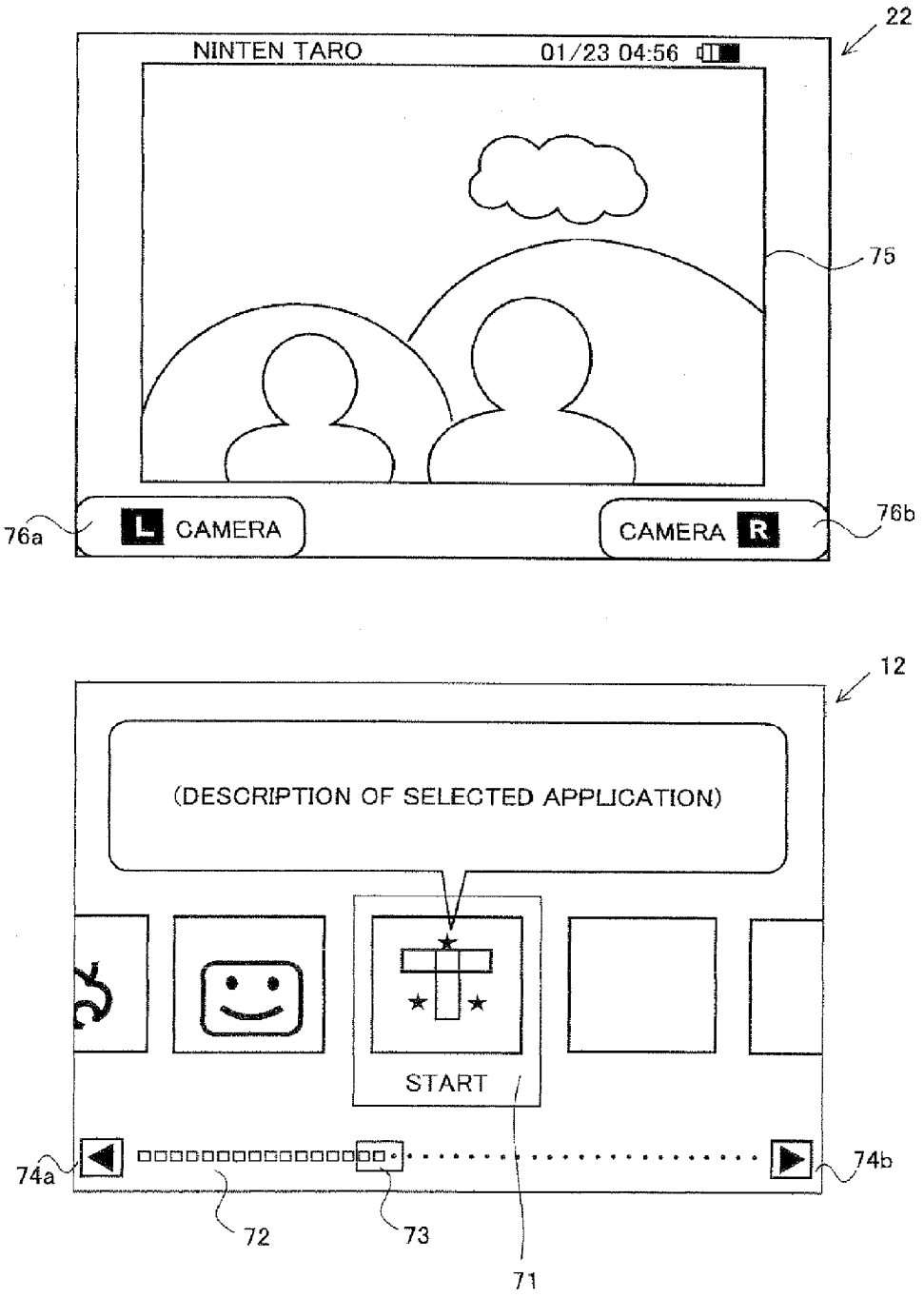

22
NINTEN TARO
01/23 04:56
75
76a
L CAMERA
CAMERA R
76b
12
(DESCRIPTION OF SELECTED APPLICATION)
START
74a
74b
72
73
71

FIG.27

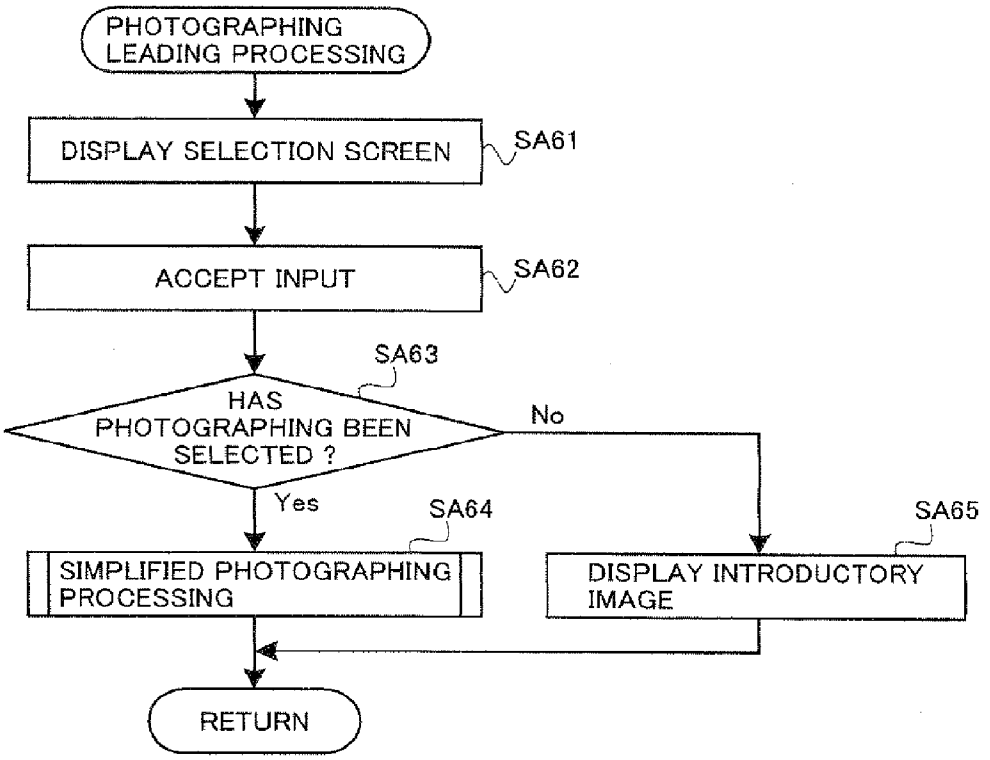

PHOTOGRAPHING LEADING PROCESSING
DISPLAY SELECTION SCREEN
SA61
ACCEPT INPUT
SA62
SA63
HAS PHOTOGRAPHING BEEN SELECTED ?
No
Yes
SA64
SA65
SIMPLIFIED PHOTOGRAPHING PROCESSING
DISPLAY INTRODUCTORY IMAGE
RETURN

FIG.28

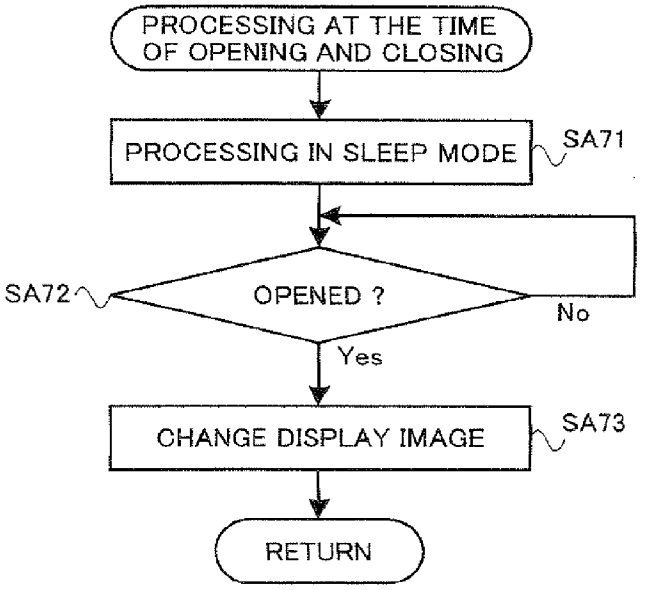

PROCESSING AT THE TIME OF OPENING AND CLOSING
PROCESSING IN SLEEP MODE
SA71
SA72
OPENED ?
No
Yes
CHANGE DISPLAY IMAGE
SA73
RETURN

FIG.29

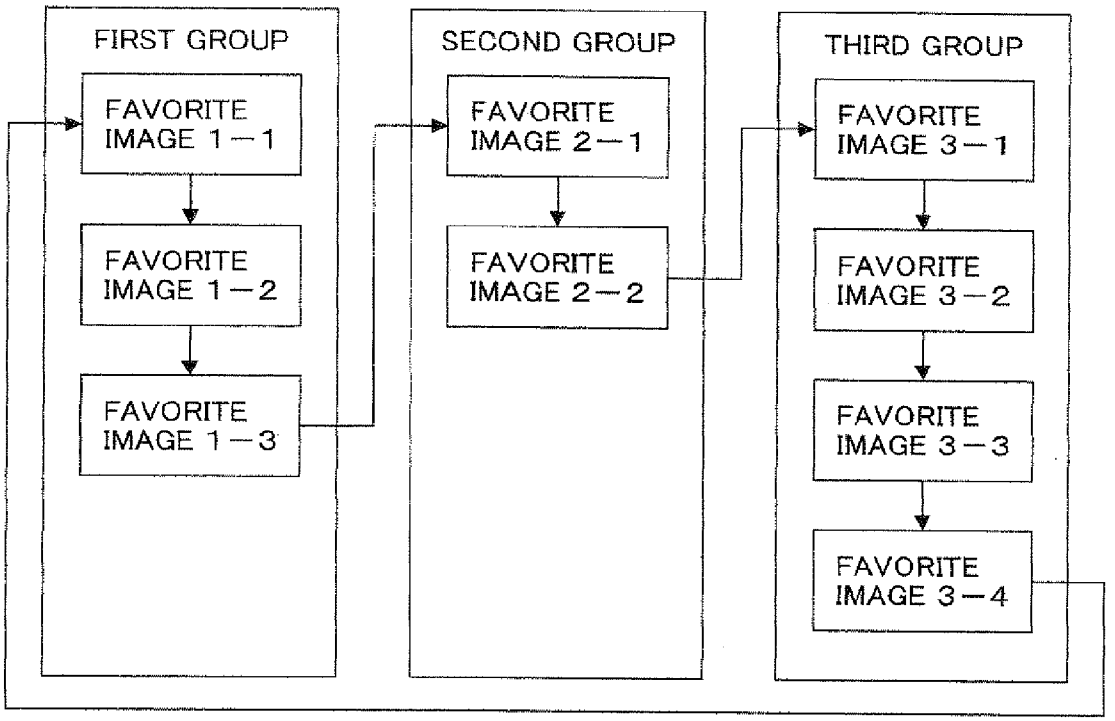

FIRST GROUP
FAVORITE IMAGE 1—1
FAVORITE IMAGE 1—2
FAVORITE IMAGE 1—3
SECOND GROUP
FAVORITE IMAGE 2—1
FAVORITE IMAGE 2—2
THIRD GROUP
FAVORITE IMAGE 3—1
FAVORITE IMAGE 3—2
FAVORITE IMAGE 3—3
FAVORITE IMAGE 3—4

FIG.30

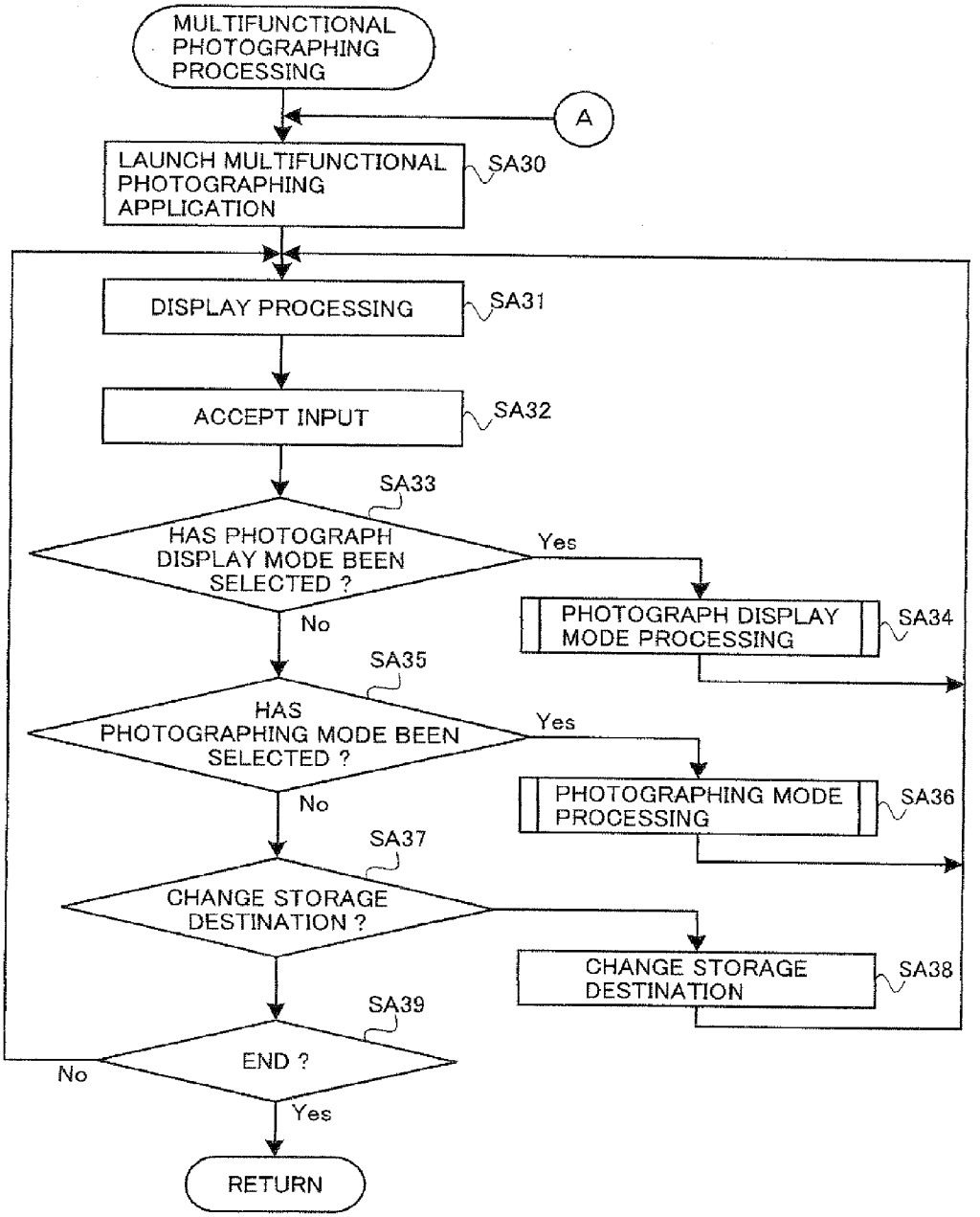

MULTIFUNCTIONAL PHOTOGRAPHING PROCESSING
A
LAUNCH MULTIFUNCTIONAL PHOTOGRAPHING APPLICATION
SA30
DISPLAY PROCESSING
SA31
ACCEPT INPUT
SA32
SA33
HAS PHOTOGRAPH DISPLAY MODE BEEN SELECTED ?
Yes
No
PHOTOGRAPH DISPLAY MODE PROCESSING
SA34
SA35
HAS PHOTOGRAPHING MODE BEEN SELECTED ?
Yes
No
PHOTOGRAPHING MODE PROCESSING
SA36
SA37
CHANGE STORAGE DESTINATION ?
CHANGE STORAGE DESTINATION
SA38
SA39
END ?
No
Yes
RETURN

FIG.31

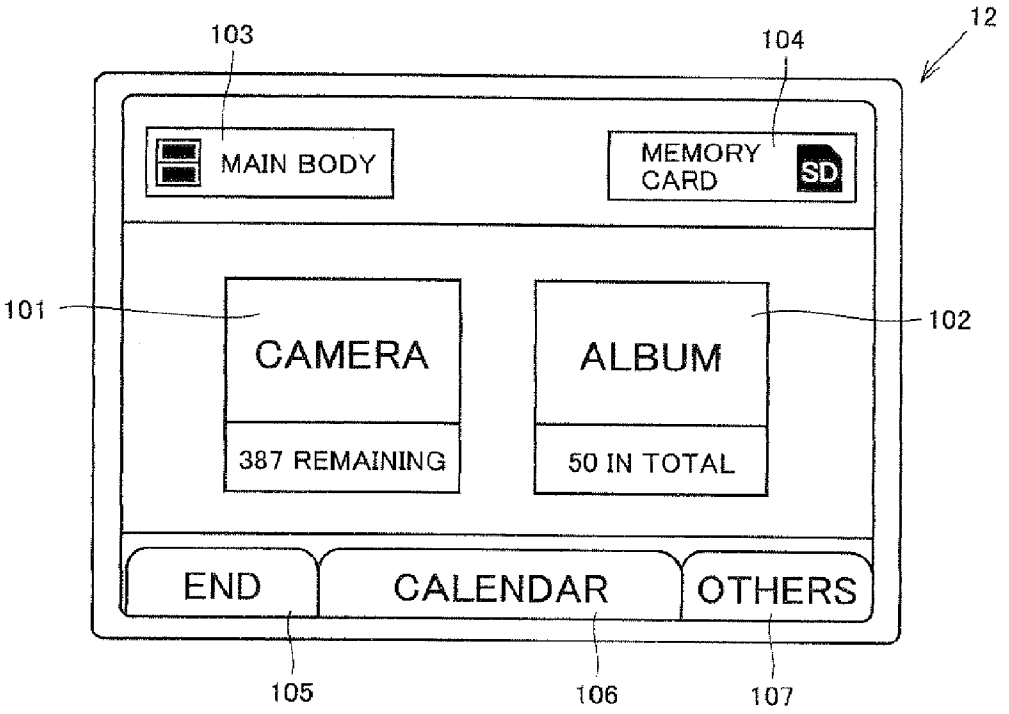

12
103
104
MAIN BODY
MEMORY CARD
SD
101
CAMERA
ALBUM
102
387 REMAINING
50 IN TOTAL
END
CALENDAR
OTHERS
105
106
107

FIG.32

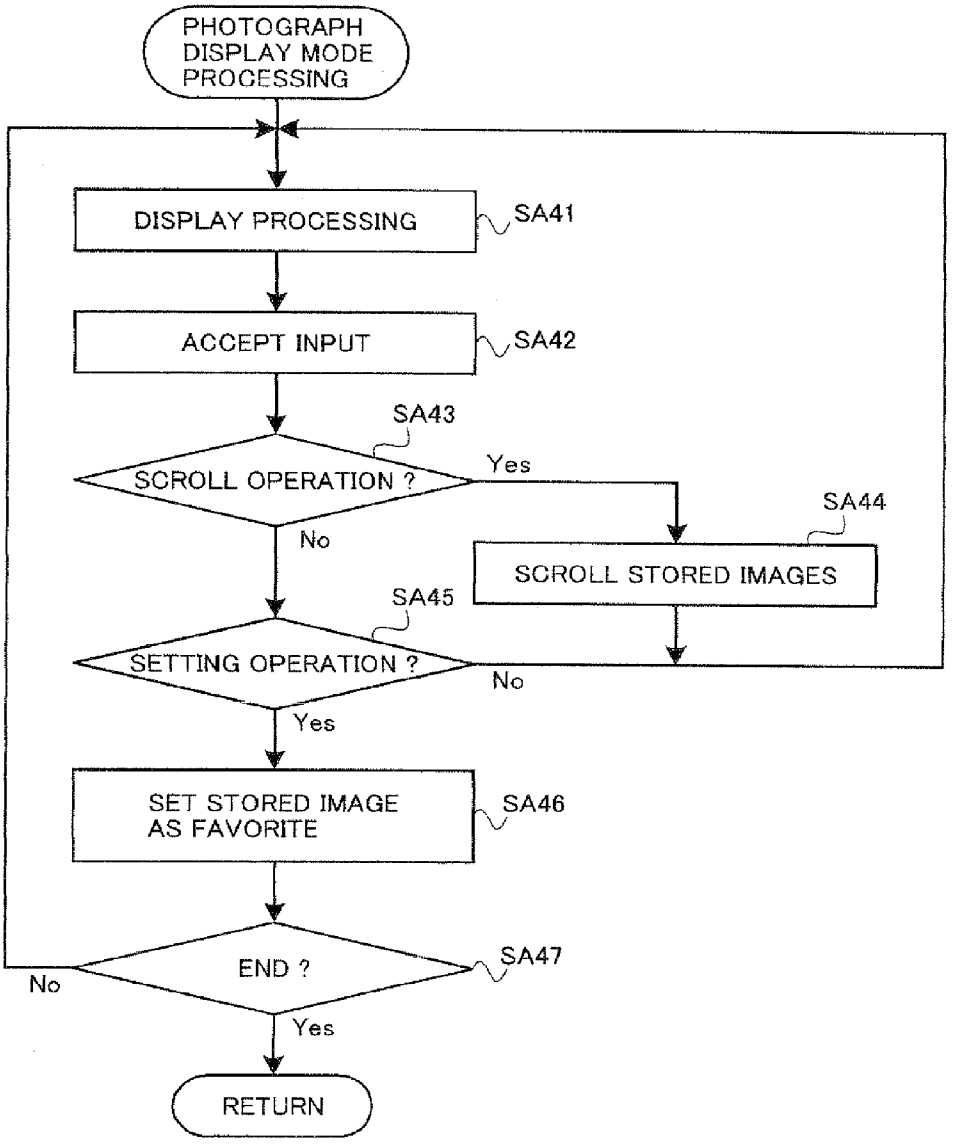

PHOTOGRAPH DISPLAY MODE PROCESSING
DISPLAY PROCESSING
SA41
ACCEPT INPUT
SA42
SA43
SCROLL OPERATION ?
Yes
No
SA44
SCROLL STORED IMAGES
SA45
SETTING OPERATION ?
No
Yes
SET STORED IMAGE AS FAVORITE
SA46
END ?
SA47
No
Yes
RETURN

FIG.33

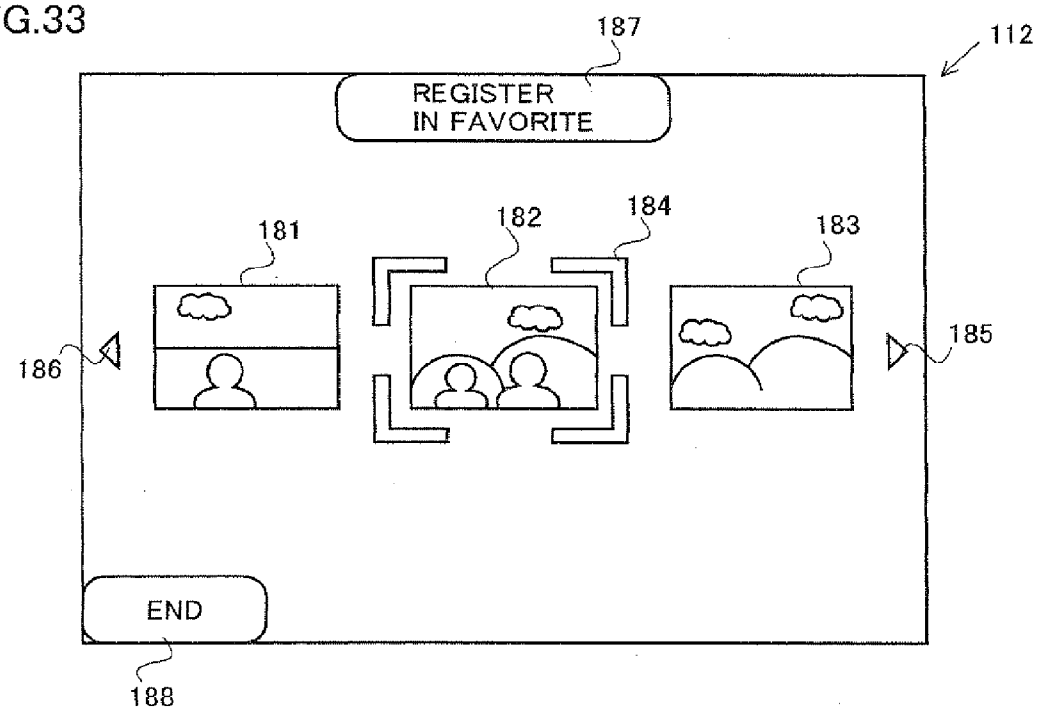


FIG.34

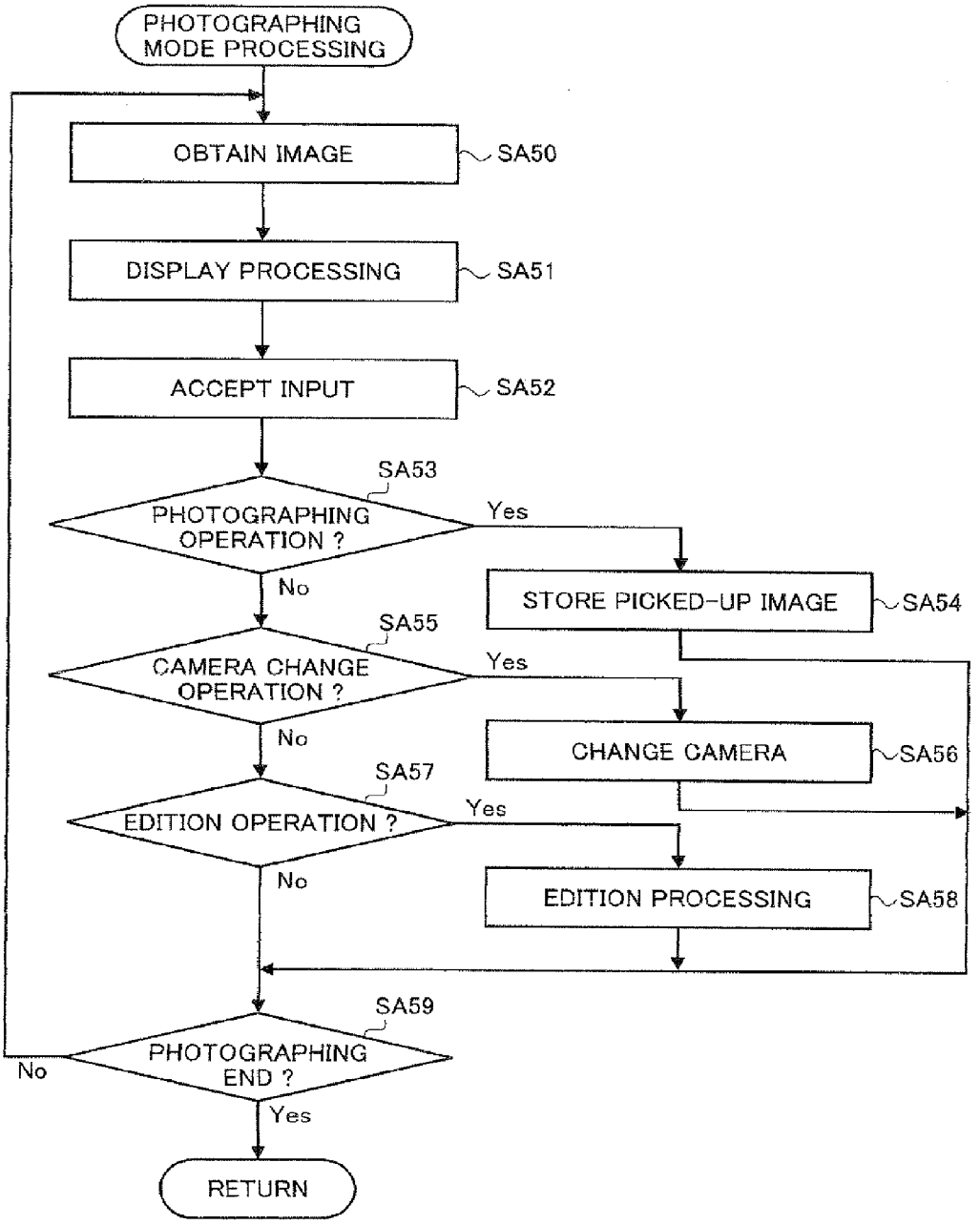

PHOTOGRAPHING MODE PROCESSING
OBTAIN IMAGE
SA50
DISPLAY PROCESSING
SA51
ACCEPT INPUT
SA52
SA53
PHOTOGRAPHING OPERATION ?
Yes
No
STORE PICKED-UP IMAGE
SA54
SA55
CAMERA CHANGE OPERATION ?
Yes
No
CHANGE CAMERA
SA56
SA57
EDITION OPERATION ?
Yes
No
EDITION PROCESSING
SA58
SA59
PHOTOGRAPHING END ?
No
Yes
RETURN

FIG.35

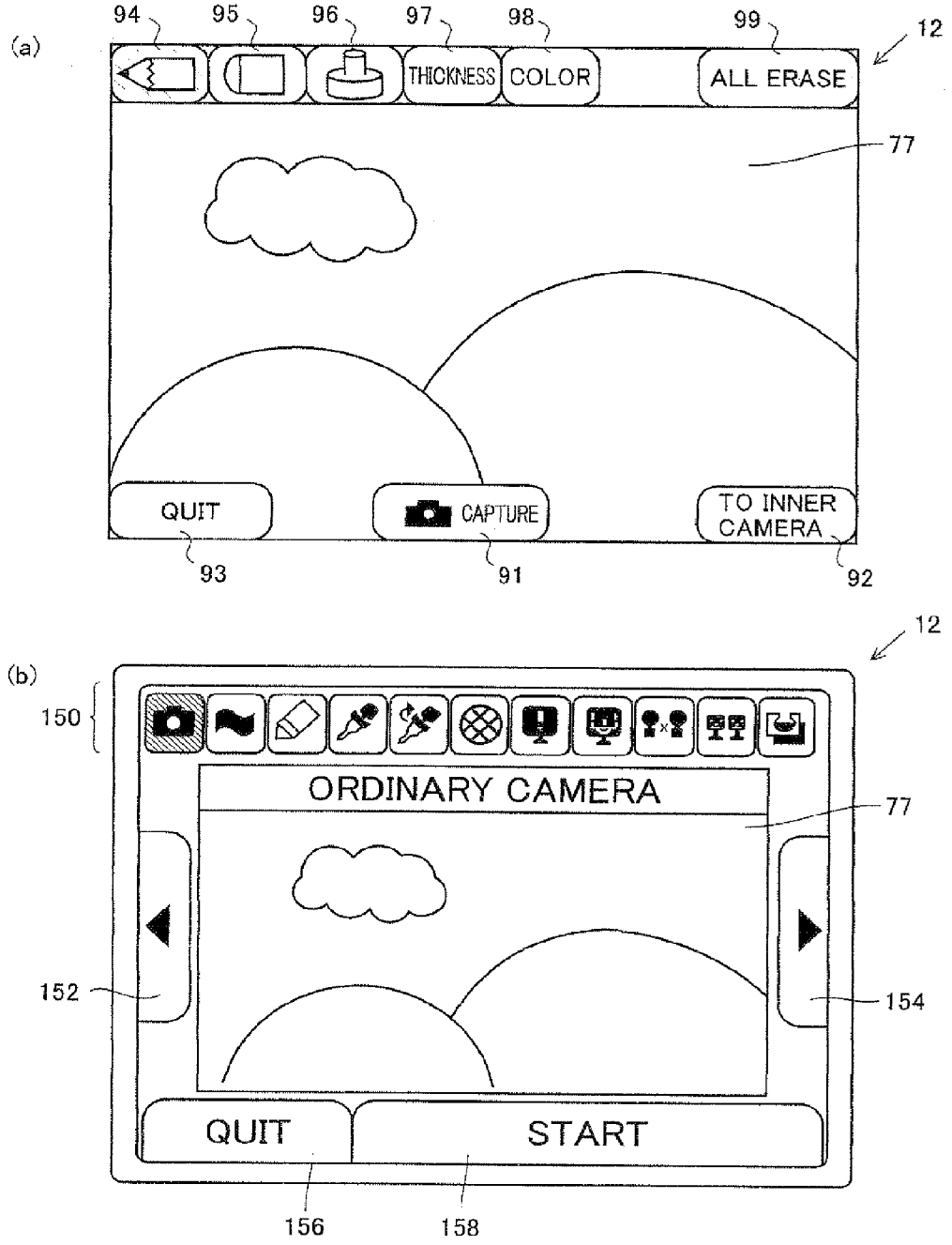

(a)
94
95
96
97
98
99
12
THICKNESS
COLOR
ALL ERASE
77
QUIT
CAPTURE
TO INNER CAMERA
93
91
92
(b)
12
150
ORDINARY CAMERA
77
152
154
QUIT
START
156
158

FIG.36

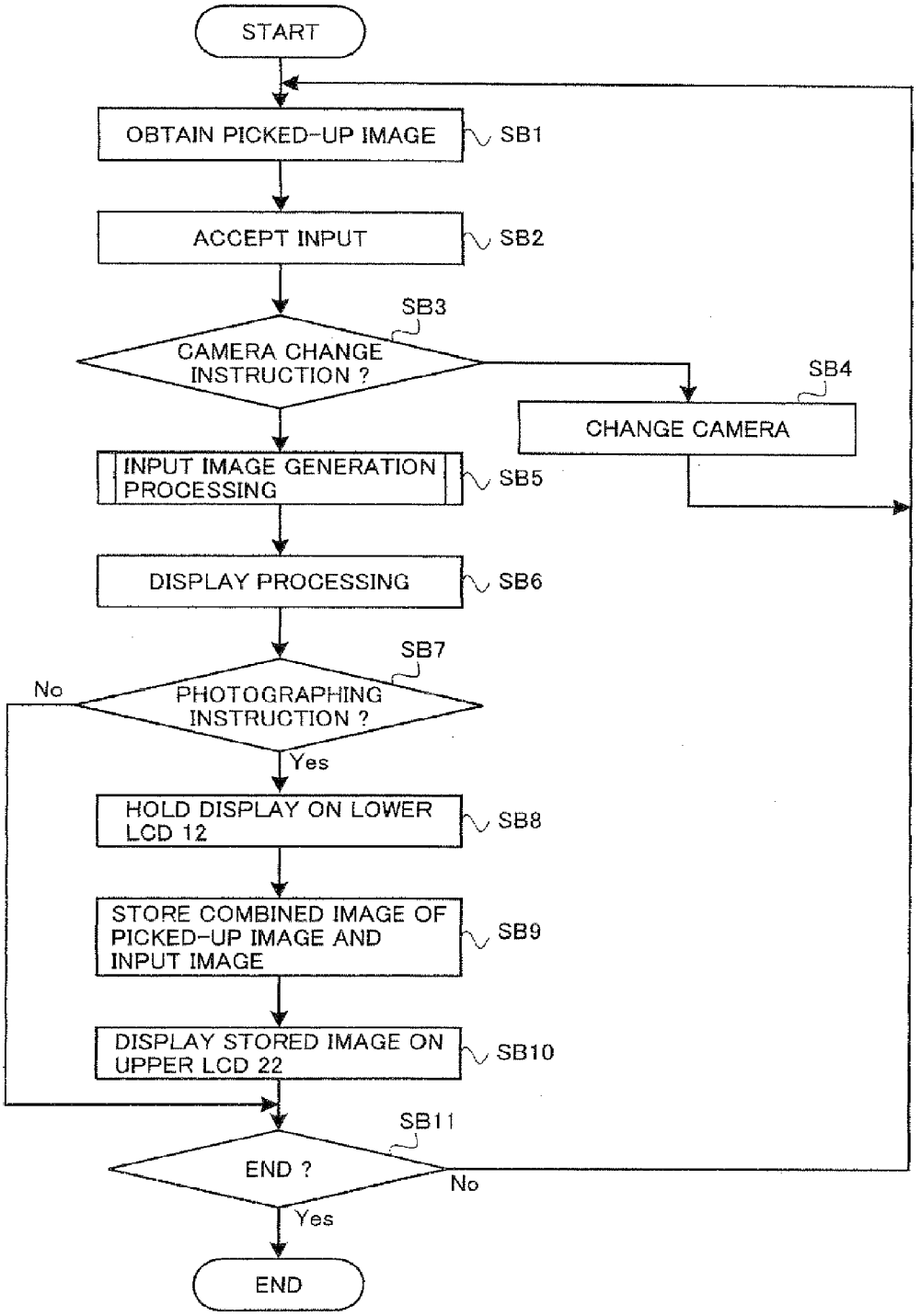

START
OBTAIN PICKED-UP IMAGE
SB1
ACCEPT INPUT
SB2
SB3
CAMERA CHANGE INSTRUCTION ?
SB4
CHANGE CAMERA
INPUT IMAGE GENERATION PROCESSING
SB5
DISPLAY PROCESSING
SB6
SB7
No
PHOTOGRAPHING INSTRUCTION ?
Yes
HOLD DISPLAY ON LOWER LCD 12
SB8
STORE COMBINED IMAGE OF PICKED-UP IMAGE AND INPUT IMAGE
SB9
DISPLAY STORED IMAGE ON UPPER LCD 22
SB10
SB11
END ?
No
Yes
END

FIG.37

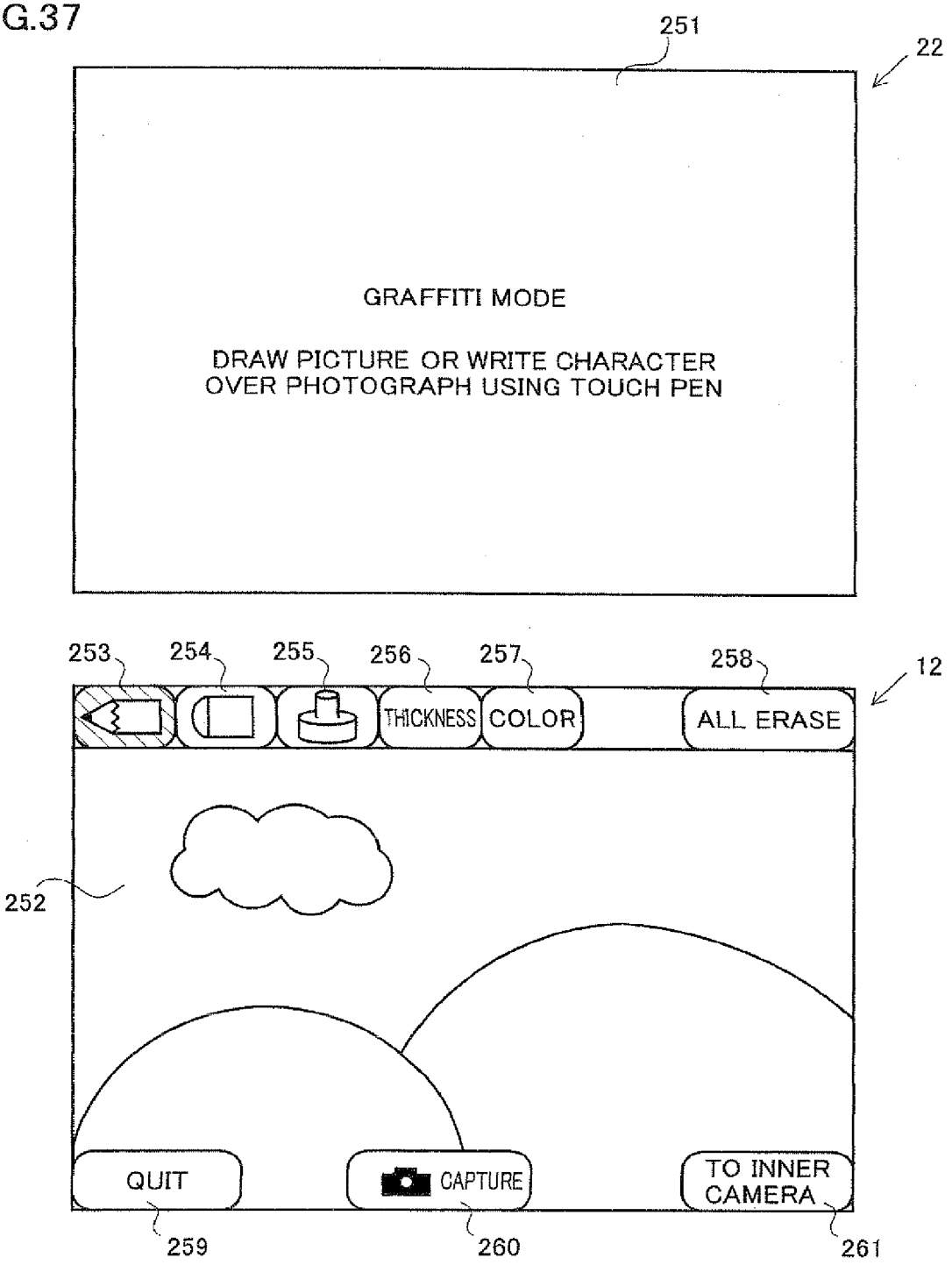

251
22
GRAFFITI MODE
DRAW PICTURE OR WRITE CHARACTER
OVER PHOTOGRAPH USING TOUCH PEN
253
254
255
256
257
258
12
THICKNESS
COLOR
ALL ERASE
252
QUIT
CAPTURE
TO INNER CAMERA
259
260
261

FIG.38

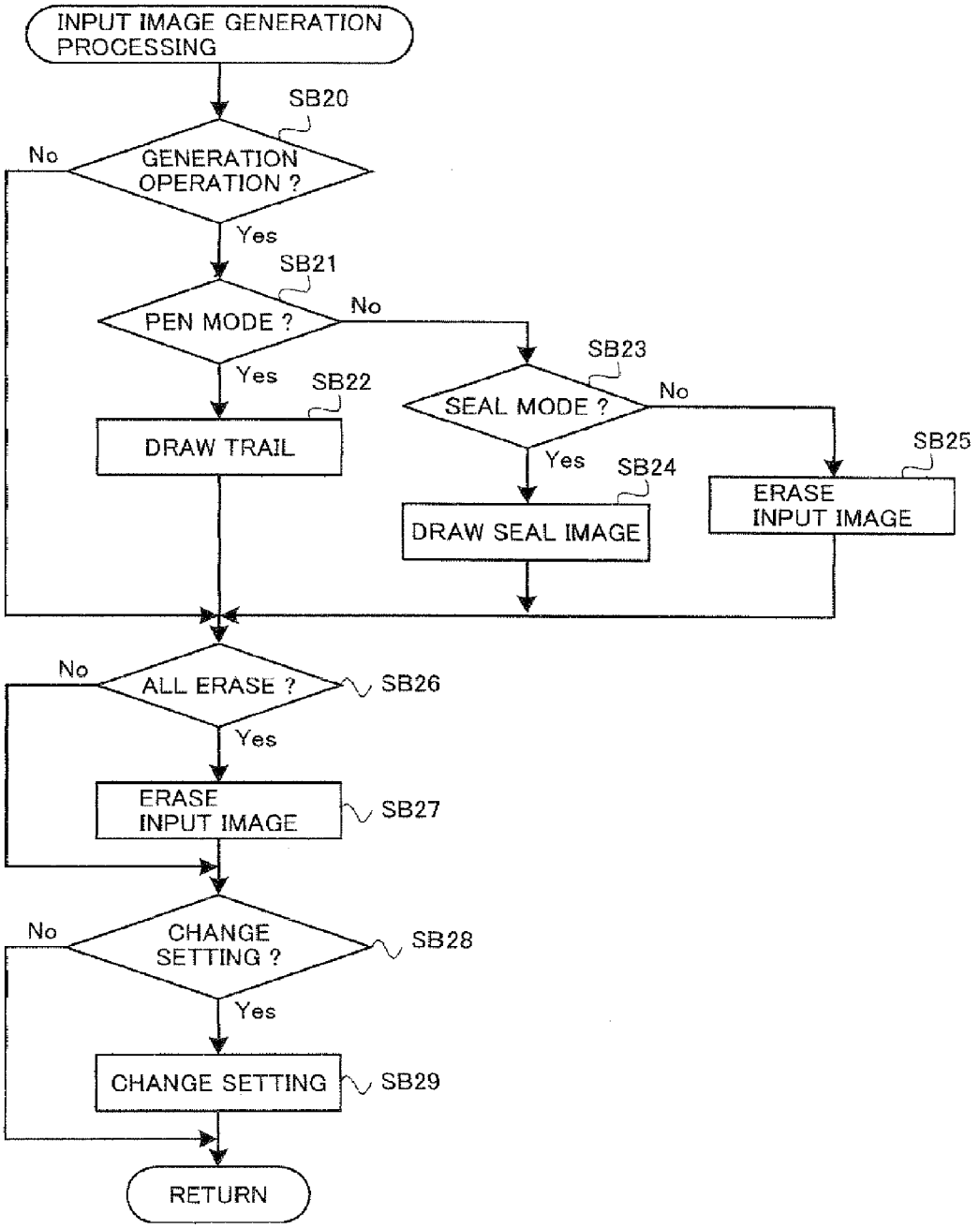

INPUT IMAGE GENERATION PROCESSING
SB20
GENERATION OPERATION ?
No
Yes
SB21
PEN MODE ?
No
Yes
SB22
DRAW TRAIL
SB23
SEAL MODE ?
No
Yes
SB24
DRAW SEAL IMAGE
SB25
ERASE INPUT IMAGE
No
ALL ERASE ?
SB26
Yes
ERASE INPUT IMAGE
SB27
No
CHANGE SETTING ?
SB28
Yes
CHANGE SETTING
SB29
RETURN

FIG.39

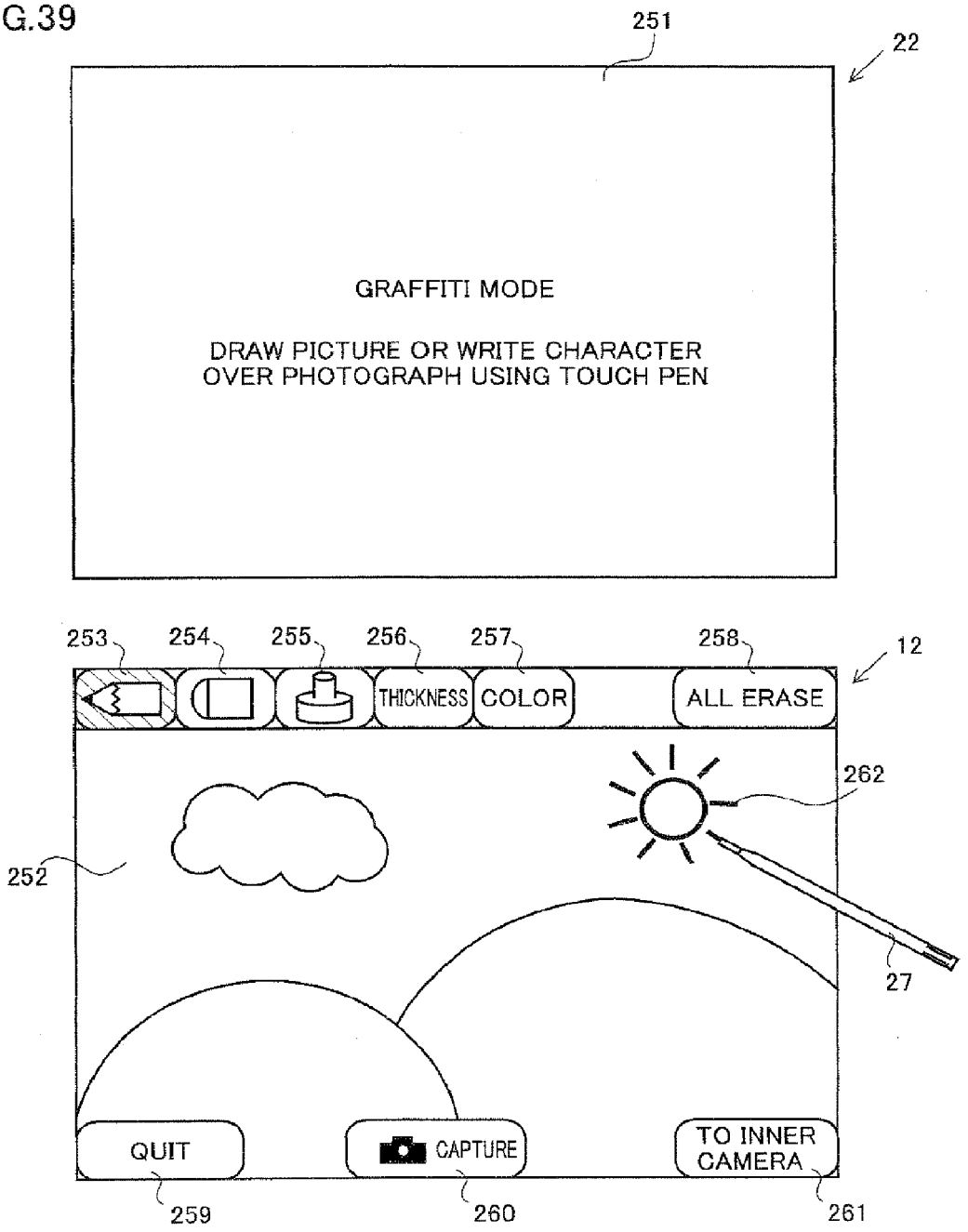

251
22
GRAFFITI MODE
DRAW PICTURE OR WRITE CHARACTER
OVER PHOTOGRAPH USING TOUCH PEN
253
254
255
256
257
258
12
THICKNESS
COLOR
ALL ERASE
262
252
27
QUIT
CAPTURE
TO INNER CAMERA
259
260
261

FIG.40

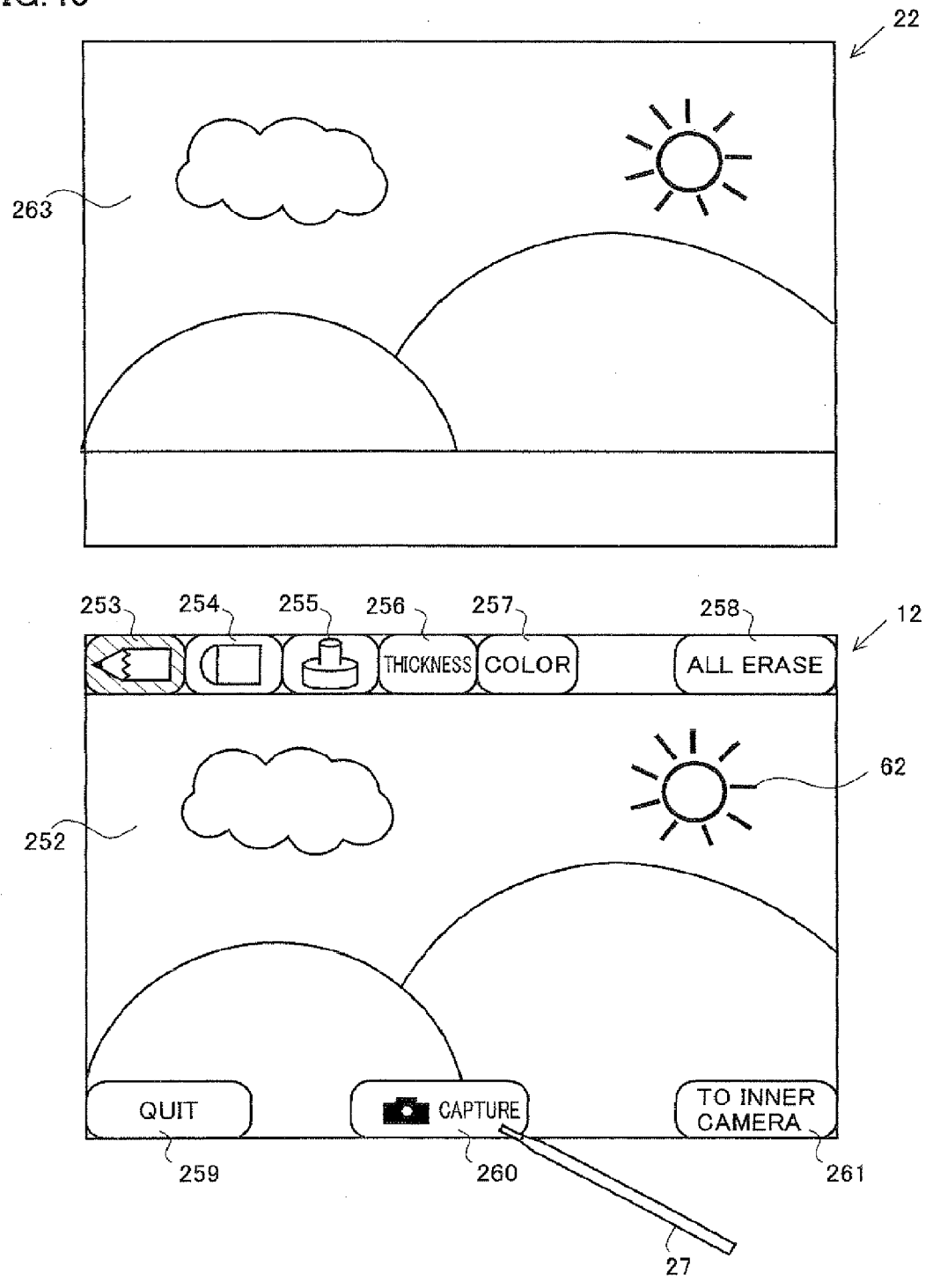

22
263
253
254
255
256
257
258
12
THICKNESS
COLOR
ALL ERASE
62
252
QUIT
CAPTURE
TO INNER CAMERA
259
260
261
27

FIG.41

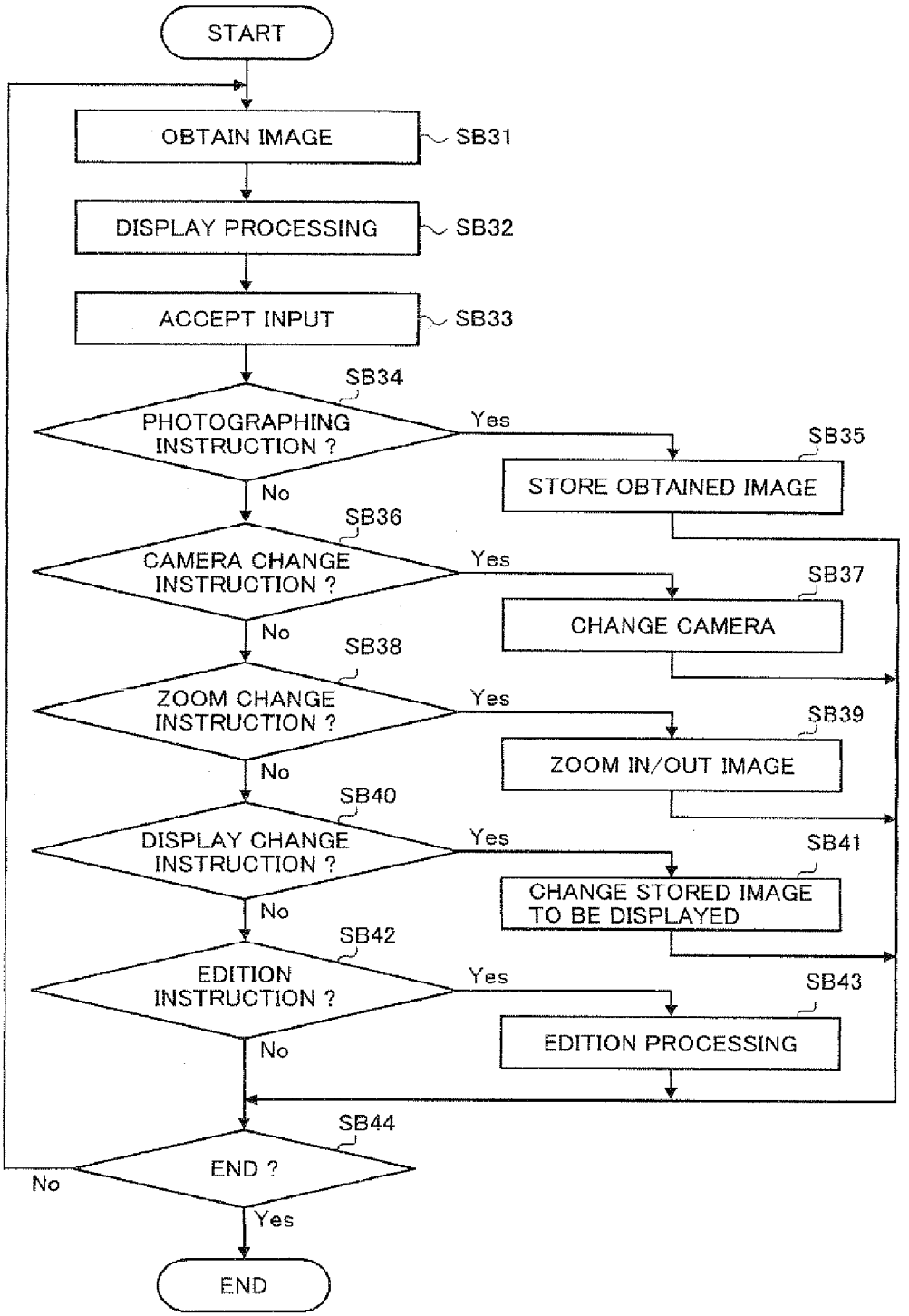

START
OBTAIN IMAGE
SB31
DISPLAY PROCESSING
SB32
ACCEPT INPUT
SB33
SB34
PHOTOGRAPHING INSTRUCTION ?
Yes
SB35
STORE OBTAINED IMAGE
No
SB36
CAMERA CHANGE INSTRUCTION ?
Yes
SB37
CHANGE CAMERA
No
SB38
ZOOM CHANGE INSTRUCTION ?
Yes
SB39
ZOOM IN/OUT IMAGE
No
SB40
DISPLAY CHANGE INSTRUCTION ?
Yes
SB41
CHANGE STORED IMAGE TO BE DISPLAYED
No
SB42
EDITION INSTRUCTION ?
Yes
SB43
EDITION PROCESSING
No
SB44
END ?
No
Yes
END

FIG.42

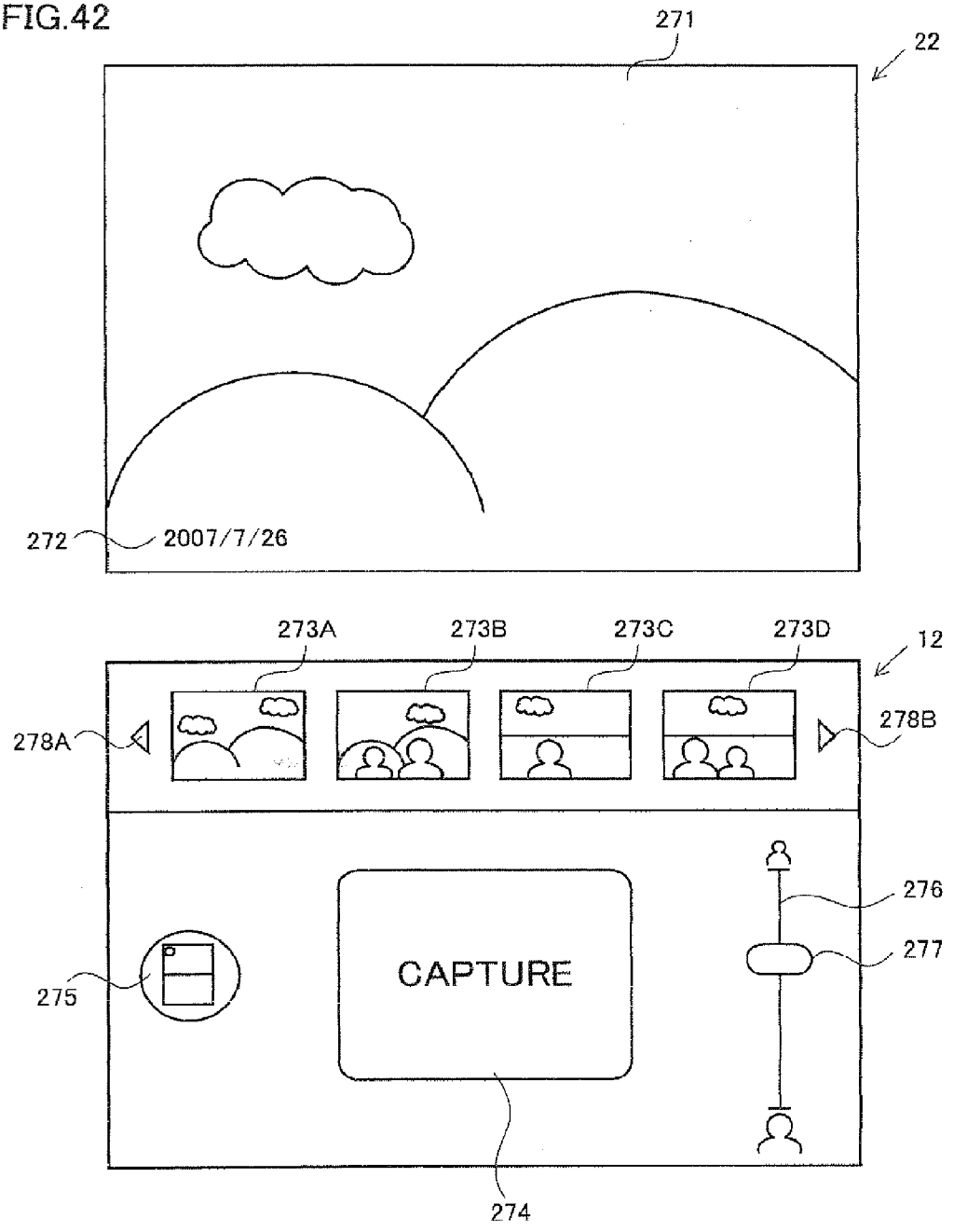

271
22
272
2007/7/26
273A
273B
273C
273D
12
278A
278B
276
277
CAPTURE
275
274

FIG.43

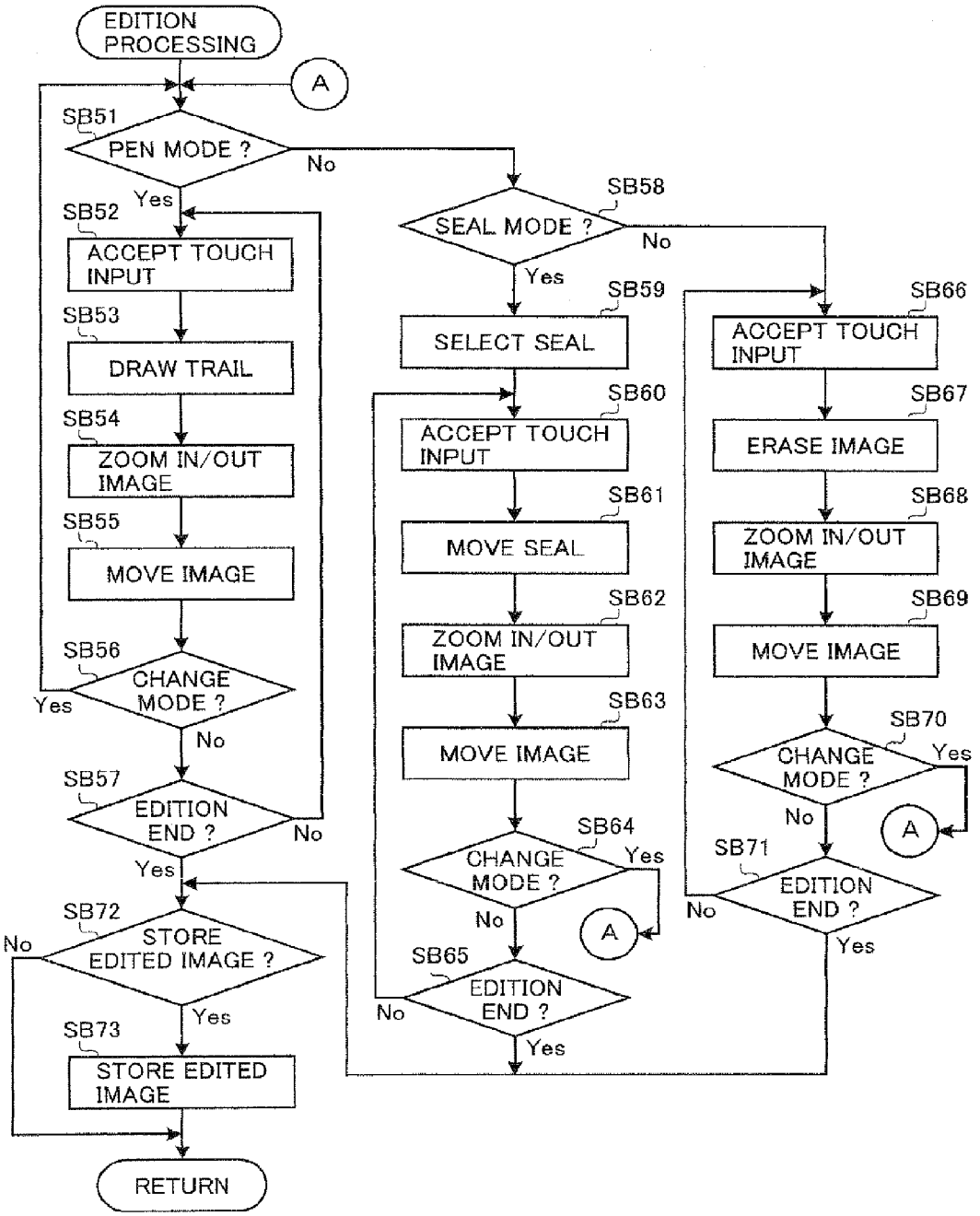

EDITION PROCESSING
A
SB51
PEN MODE ?
No
Yes
SB52
ACCEPT TOUCH INPUT
SB53
DRAW TRAIL
SB54
ZOOM IN/OUT IMAGE
SB55
MOVE IMAGE
SB56
CHANGE MODE ?
Yes
No
SB57
EDITION END ?
No
Yes
SB72
STORE EDITED IMAGE ?
No
Yes
SB73
STORE EDITED IMAGE
RETURN
SB58
SEAL MODE ?
No
Yes
SB59
SELECT SEAL
SB60
ACCEPT TOUCH INPUT
SB61
MOVE SEAL
SB62
ZOOM IN/OUT IMAGE
SB63
MOVE IMAGE
SB64
CHANGE MODE ?
Yes
No
A
SB65
EDITION END ?
No
Yes
SB66
ACCEPT TOUCH INPUT
SB67
ERASE IMAGE
SB68
ZOOM IN/OUT IMAGE
SB69
MOVE IMAGE
SB70
CHANGE MODE ?
Yes
No
A
SB71
EDITION END ?
No
Yes

FIG.44

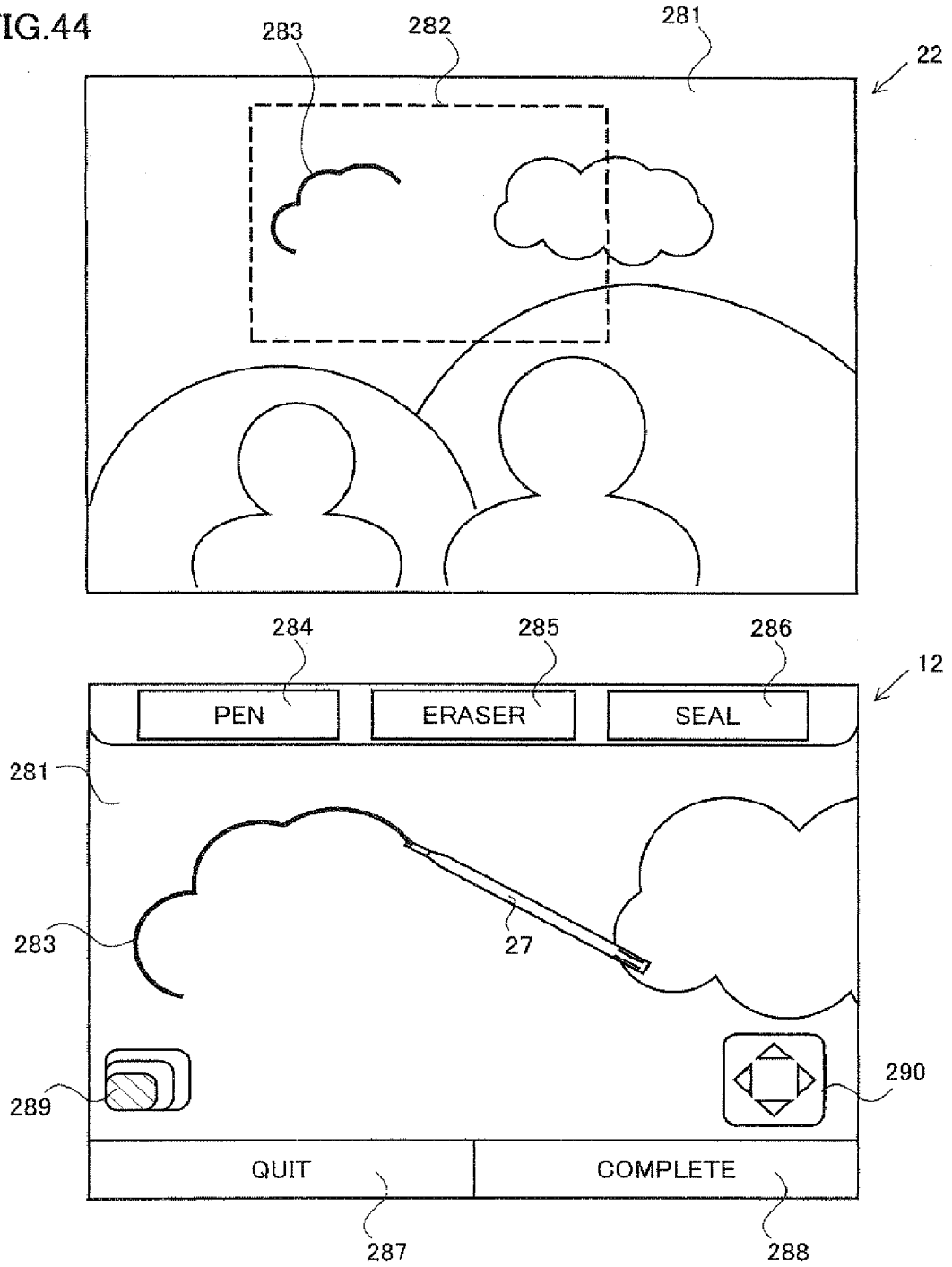

283
282
281
22
284
285
286
12
PEN
ERASER
SEAL
281
283
27
289
290
QUIT
COMPLETE
287
288

FIG.45

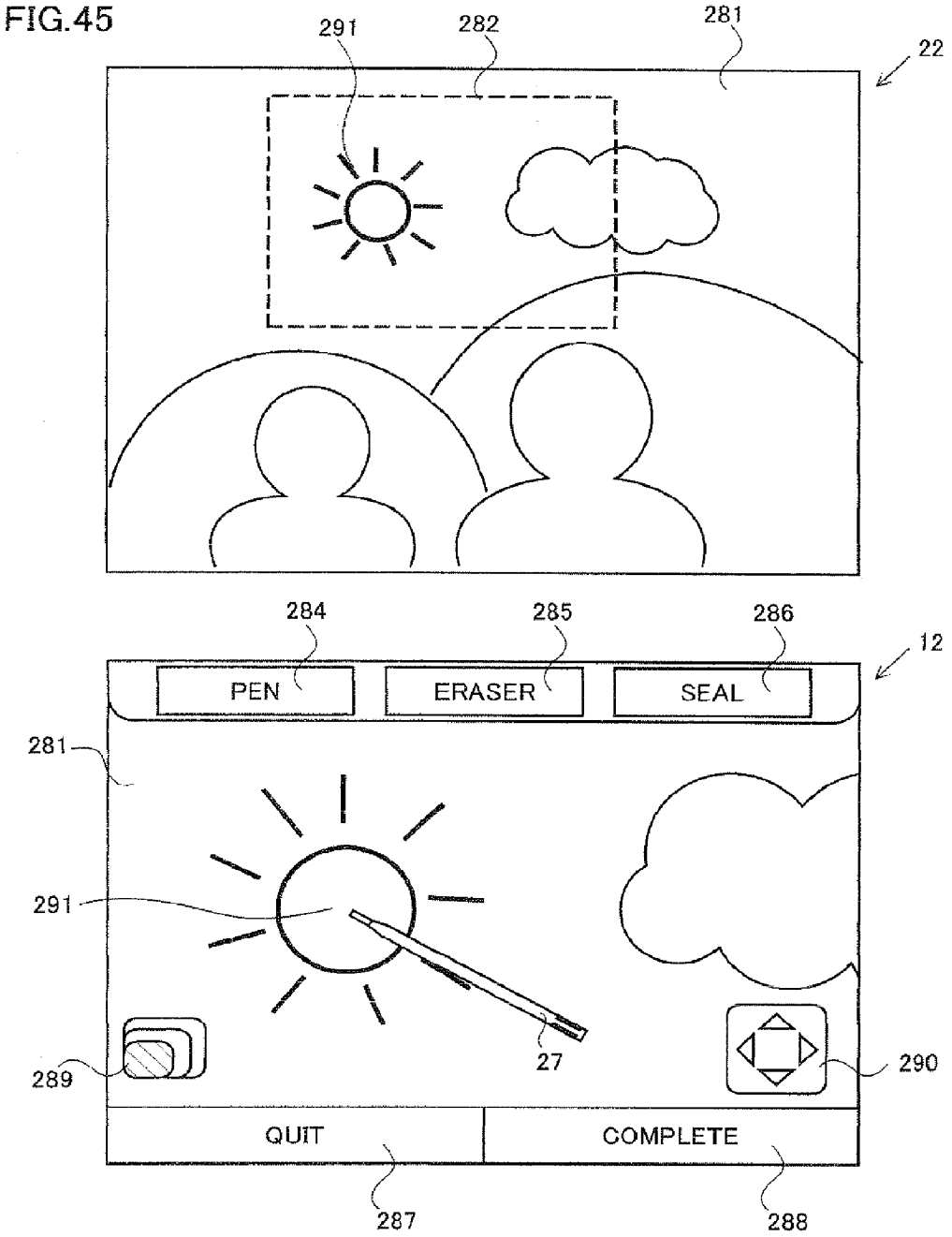

291
282
281
22
284
285
286
12
PEN
ERASER
SEAL
281
291
289
27
290
QUIT
COMPLETE
287
288

FIG.46

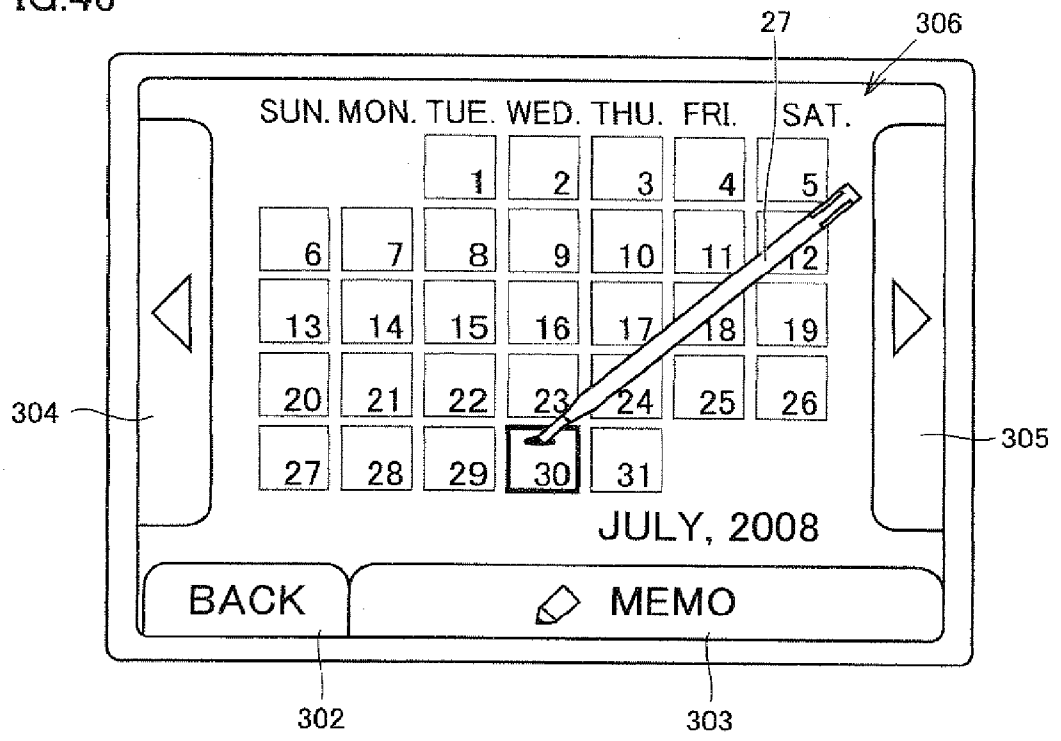

27
306
SUN. MON. TUE. WED. THU. FRI. SAT.
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31
JULY, 2008
304
305
BACK
MEMO
302
303

FIG.47

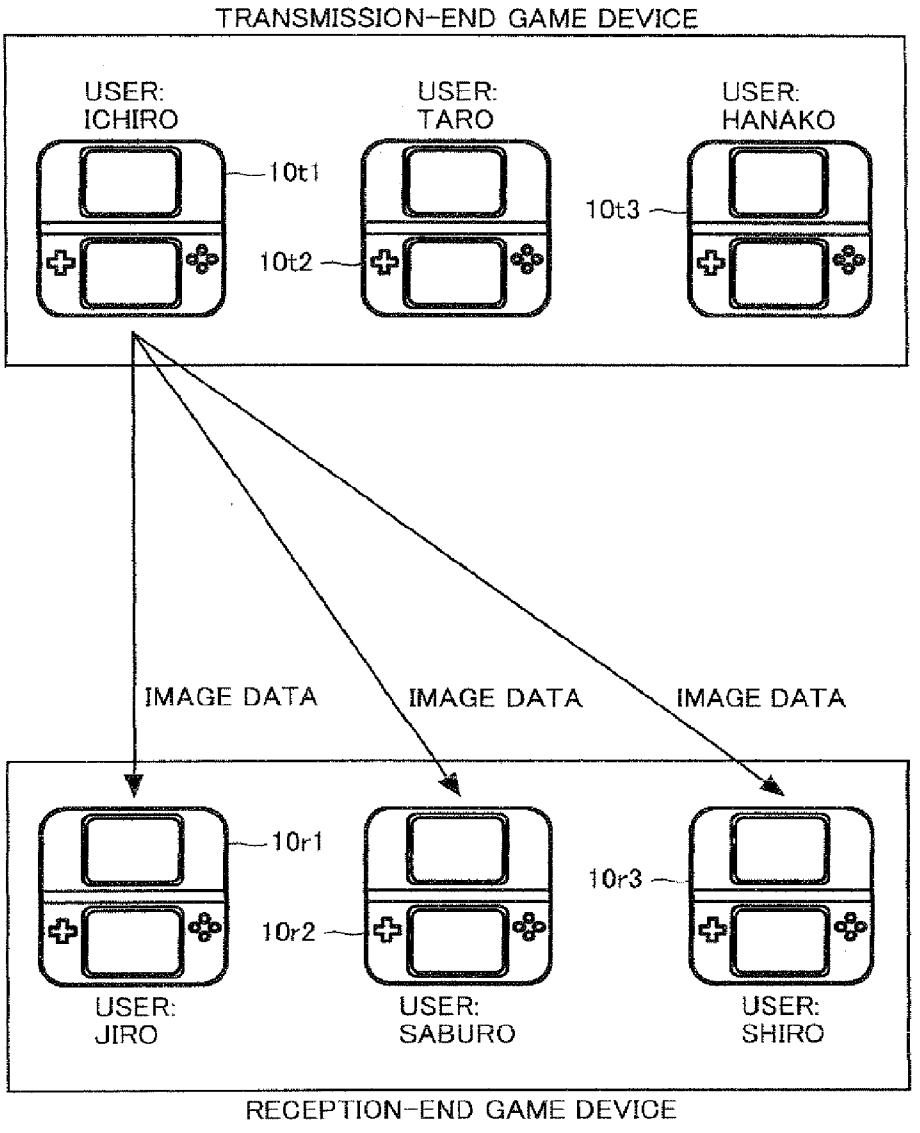

TRANSMISSION-END GAME DEVICE
USER: ICHIRO
USER: TARO
USER: HANAKO
10t1
10t2
10t3
IMAGE DATA
IMAGE DATA
IMAGE DATA
10r1
10r2
10r3
USER: JIRO
USER: SABURO
USER: SHIRO
RECEPTION-END GAME DEVICE

FIG.48

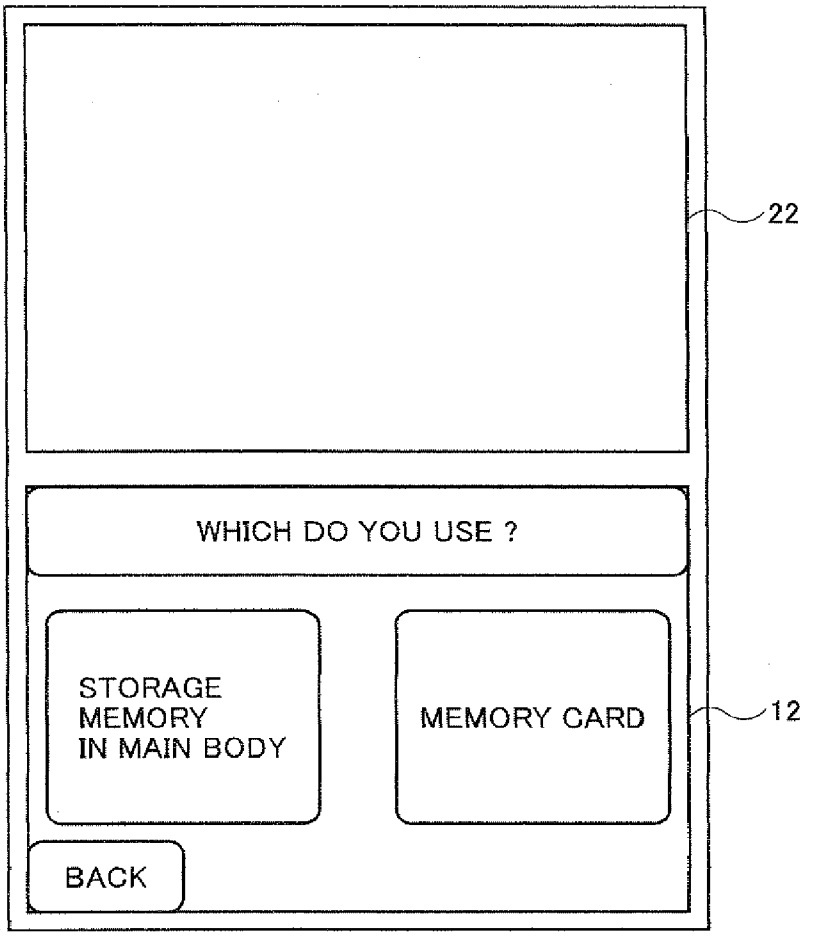

22
WHICH DO YOU USE ?
STORAGE MEMORY IN MAIN BODY
MEMORY CARD
12
BACK

FIG.49

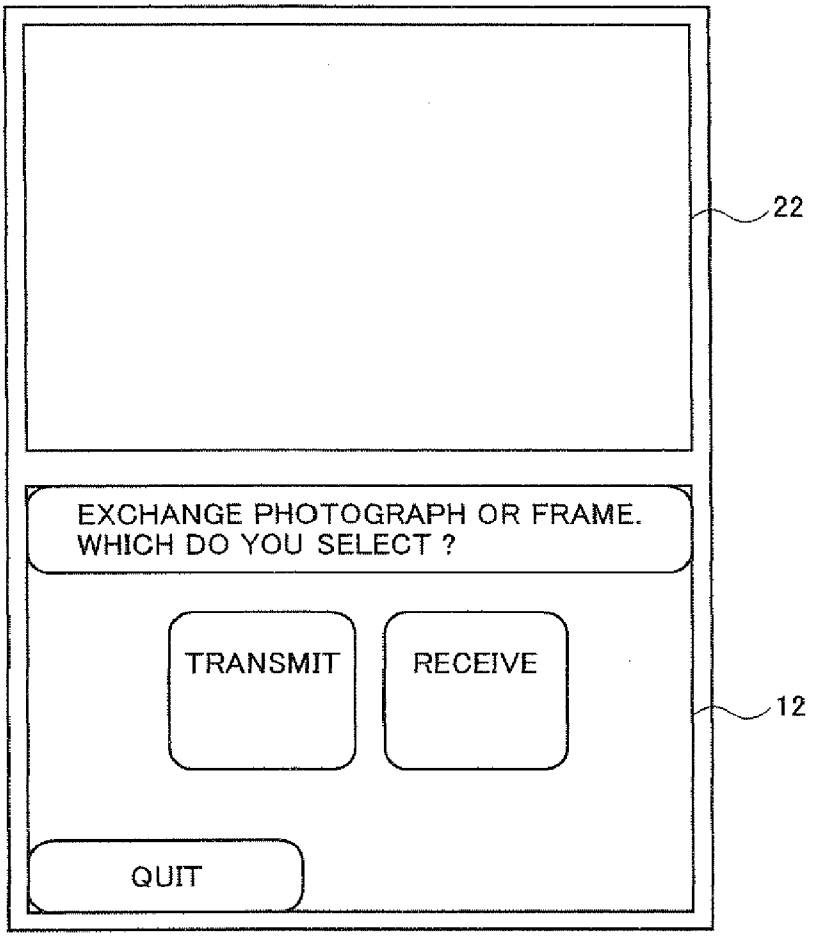

22
EXCHANGE PHOTOGRAPH OR FRAME.
WHICH DO YOU SELECT ?
TRANSMIT
RECEIVE
12
QUIT

FIG.50

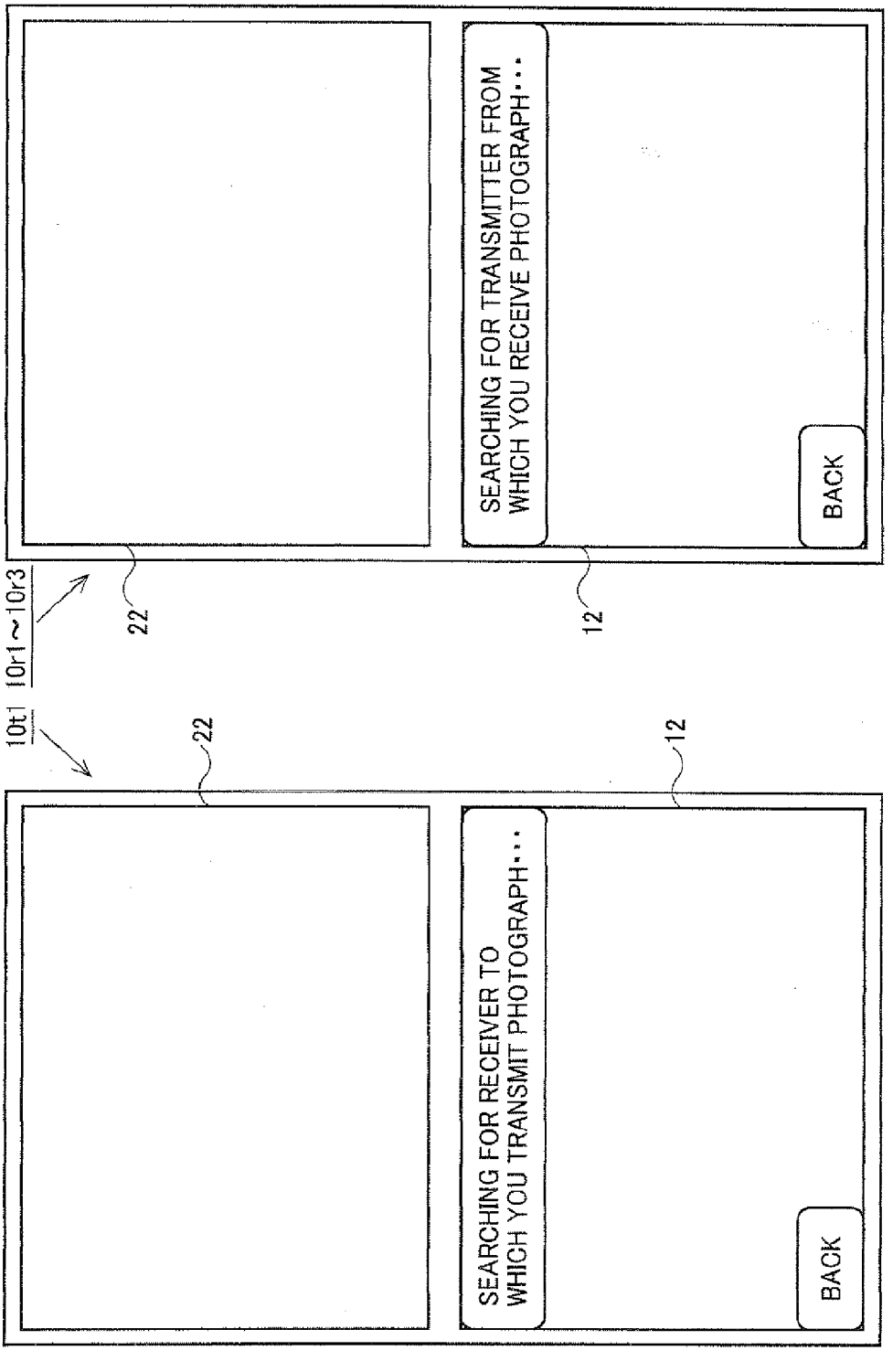

10t1
10r1~10r3
22
12
SEARCHING FOR RECEIVER TO WHICH YOU TRANSMIT PHOTOGRAPH・・・
BACK
SEARCHING FOR TRANSMITTER FROM WHICH YOU RECEIVE PHOTOGRAPH・・・
BACK

FIG.51

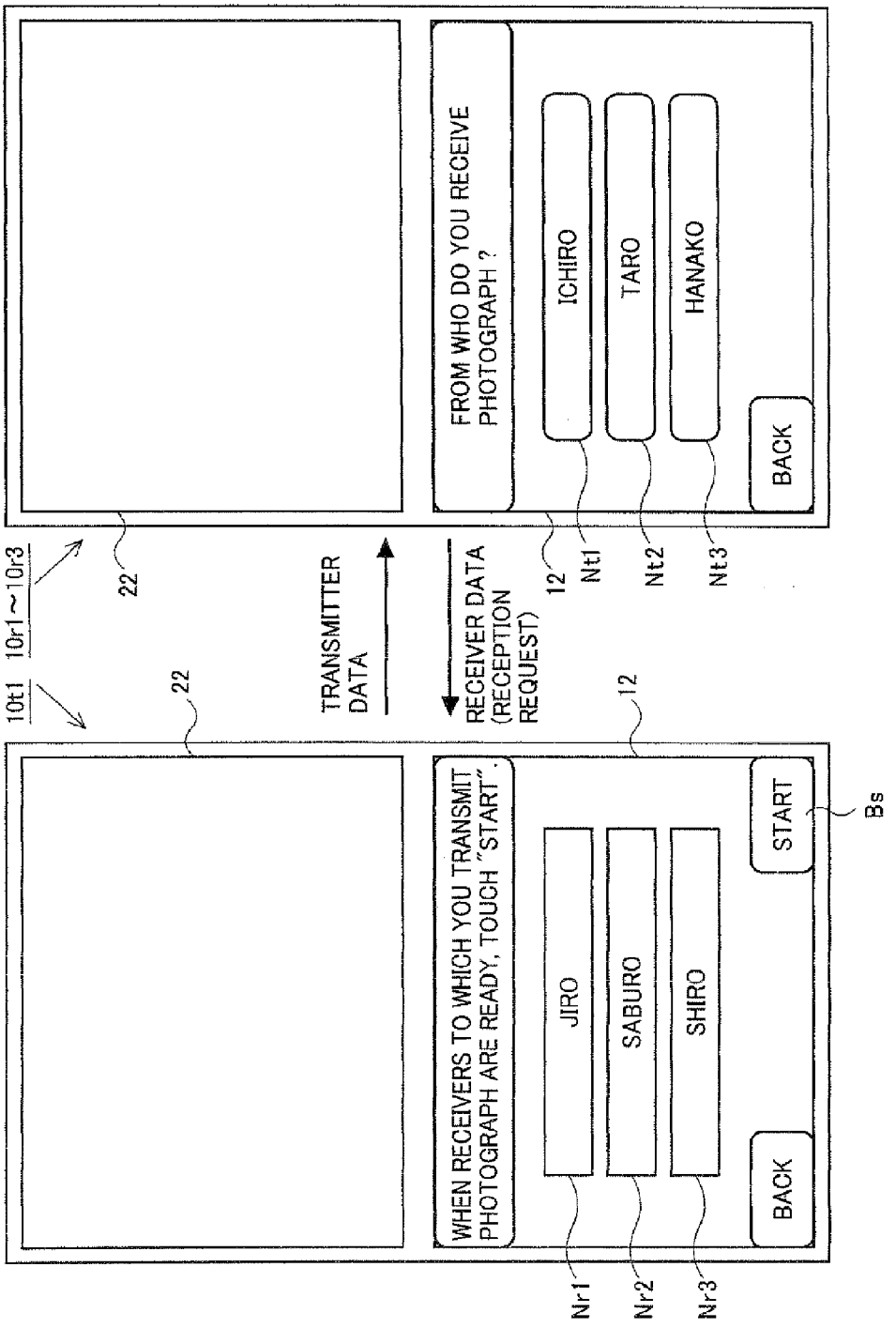

10t1
10r1~10r3
22
22
TRANSMITTER DATA
RECEIVER DATA (RECEPTION REQUEST)
12
12
Nt1
Nt2
Nt3
FROM WHO DO YOU RECEIVE PHOTOGRAPH ?
ICHIRO
TARO
HANAKO
BACK
WHEN RECEIVERS TO WHICH YOU TRANSMIT PHOTOGRAPH ARE READY, TOUCH "START".
JIRO
SABURO
SHIRO
START
BACK
Bs
Nr1
Nr2
Nr3

FIG.52

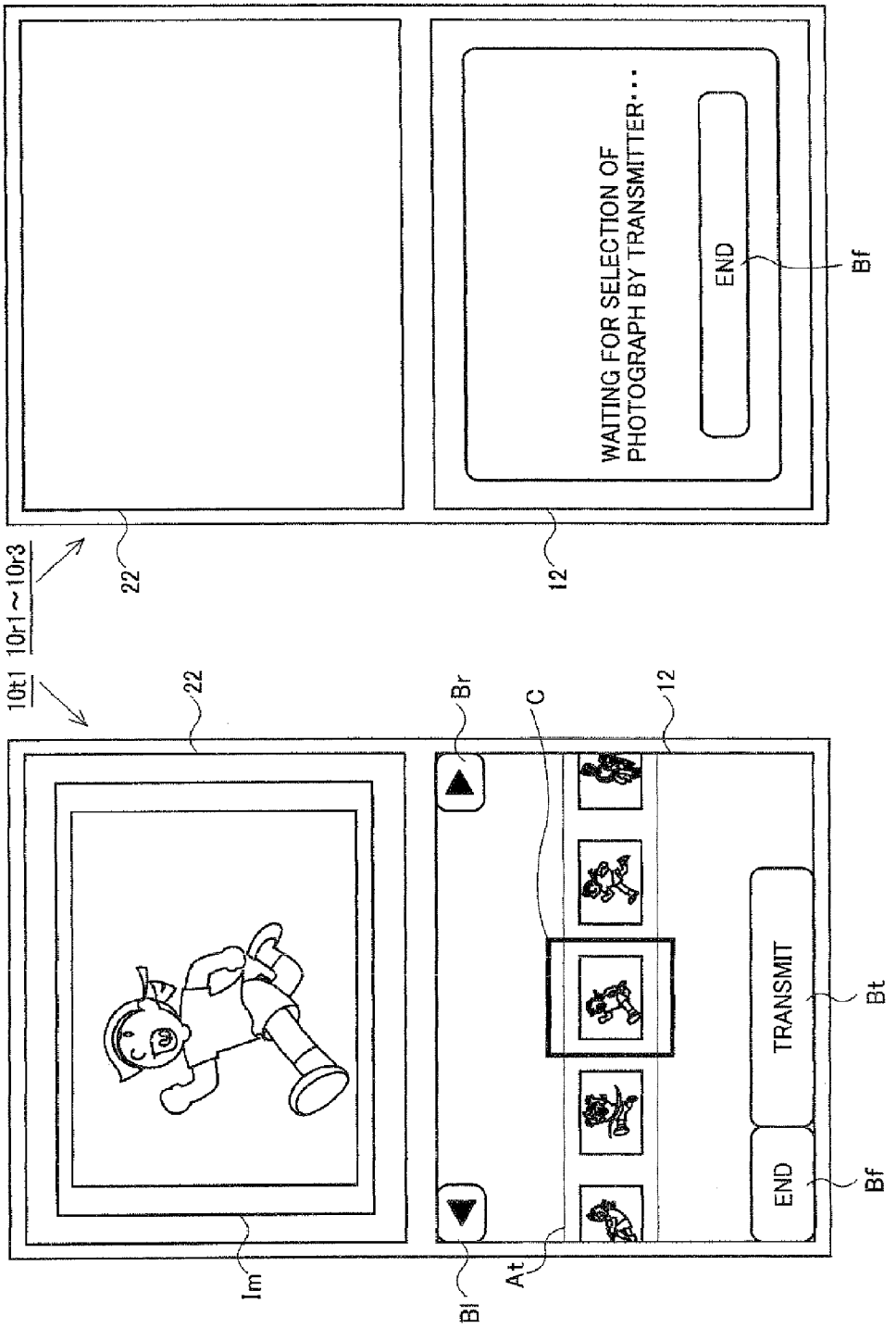

10t1
10r1~10r3
22
12
Br
C
Im
Bl
At
Bt
Bf
TRANSMIT
END
WAITING FOR SELECTION OF PHOTOGRAPH BY TRANSMITTER...

FIG.53

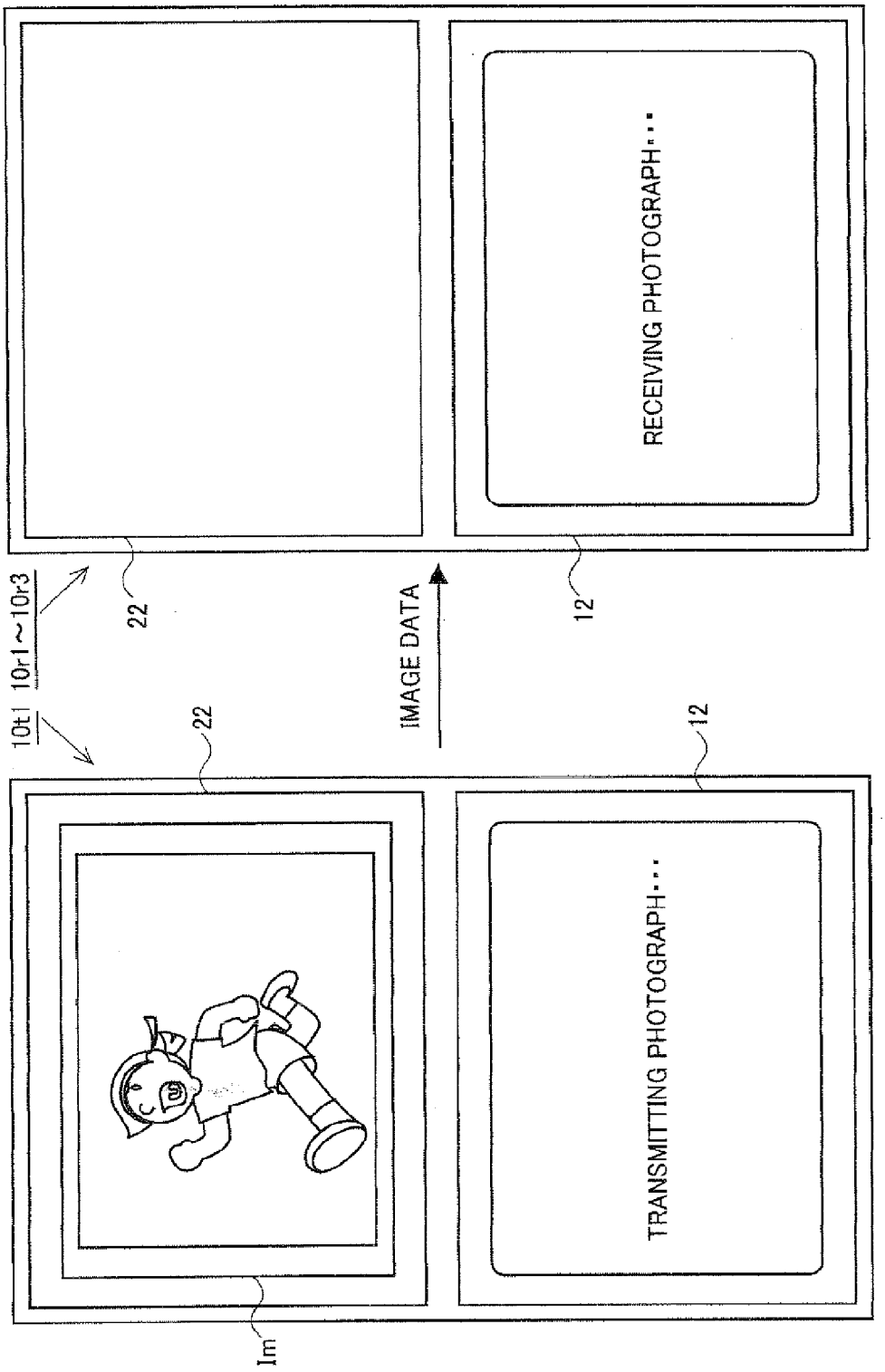

10t1
10r1~10r3
22
12
IMAGE DATA
TRANSMITTING PHOTOGRAPH・・・
RECEIVING PHOTOGRAPH・・・
Im

FIG.54

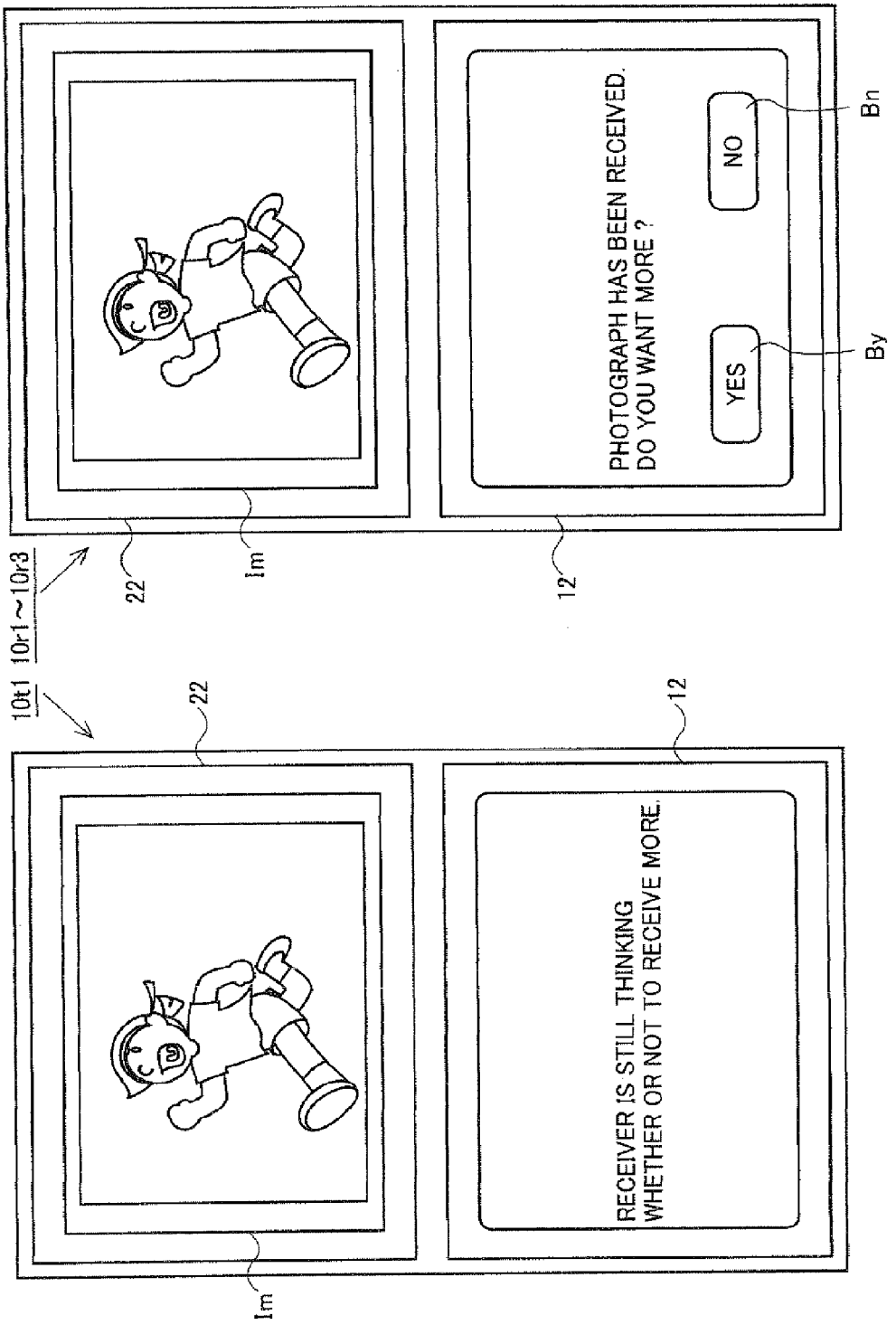

10t1
10r1~10r3
22
Im
12
RECEIVER IS STILL THINKING
WHETHER OR NOT TO RECEIVE MORE.
PHOTOGRAPH HAS BEEN RECEIVED.
DO YOU WANT MORE ?
YES
NO
By
Bn

FIG.55

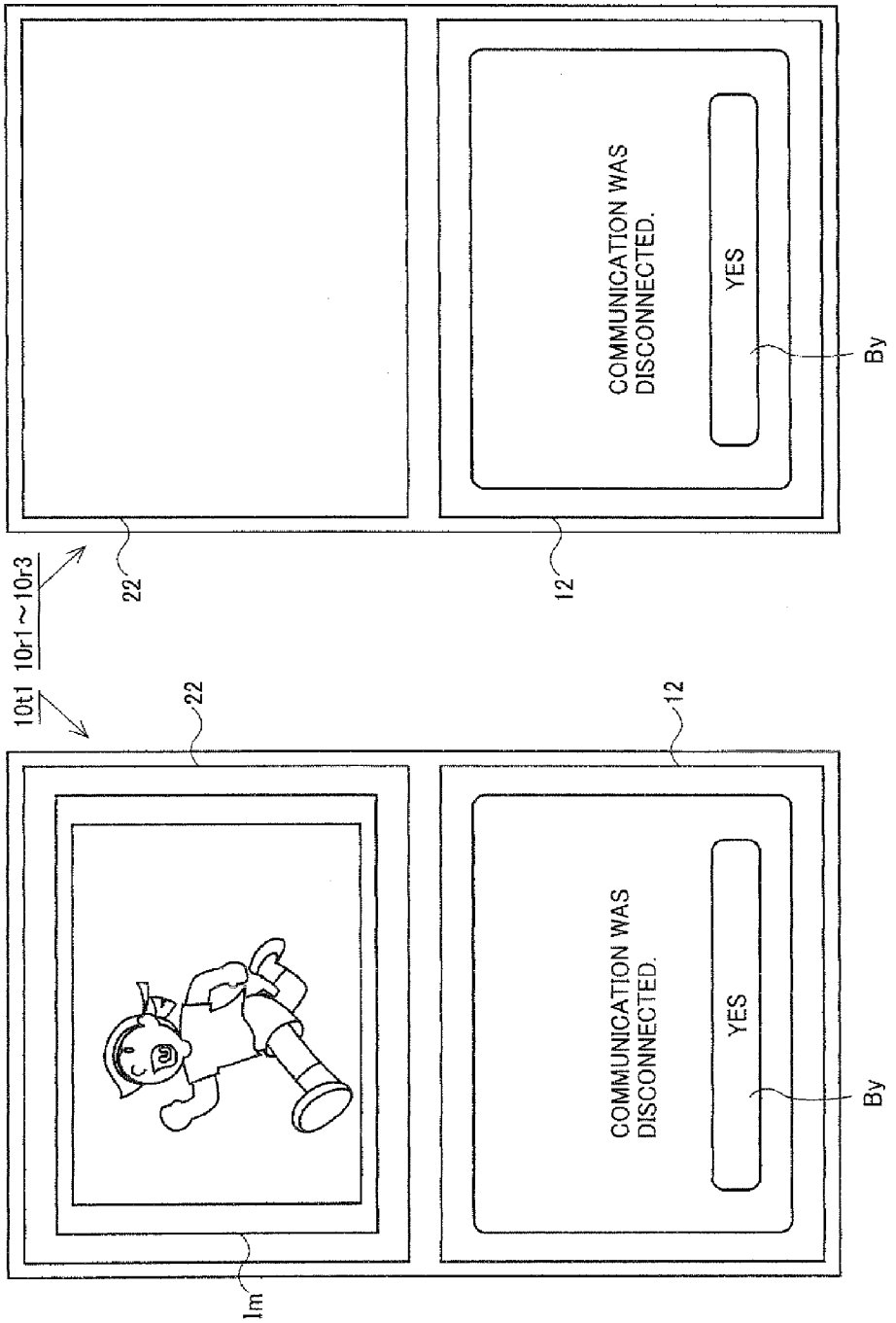

10t1
10r1～10r3
22
12
COMMUNICATION WAS DISCONNECTED.
YES
By
Im

FIG.56

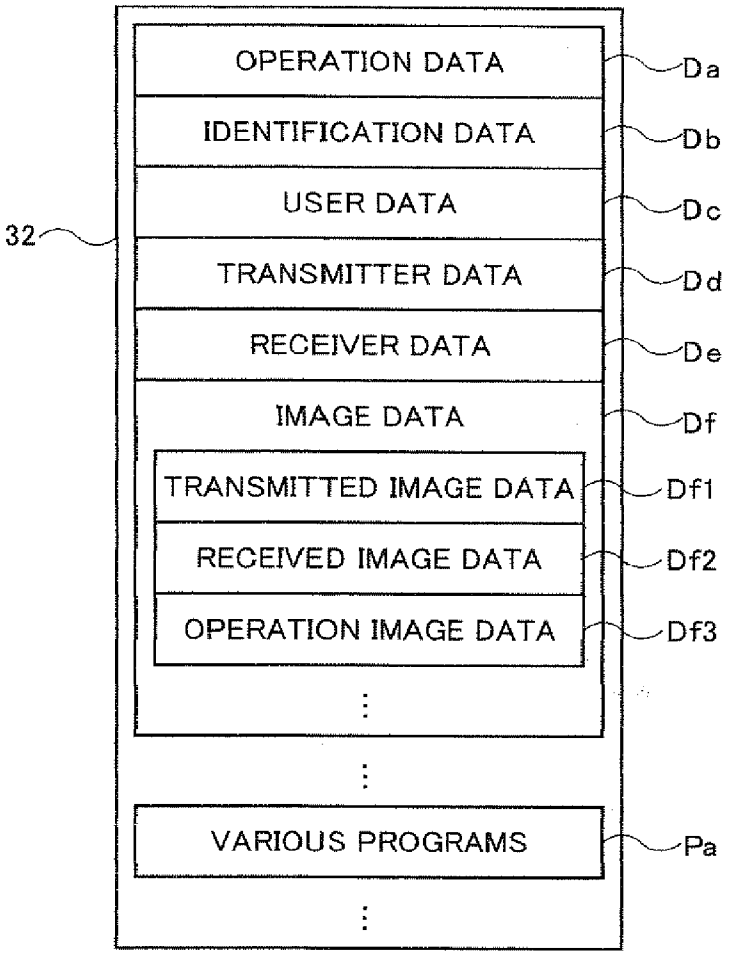

32
OPERATION DATA
Da
IDENTIFICATION DATA
Db
USER DATA
Dc
TRANSMITTER DATA
Dd
RECEIVER DATA
De
IMAGE DATA
Df
TRANSMITTED IMAGE DATA
Df1
RECEIVED IMAGE DATA
Df2
OPERATION IMAGE DATA
Df3
VARIOUS PROGRAMS
Pa

FIG.57

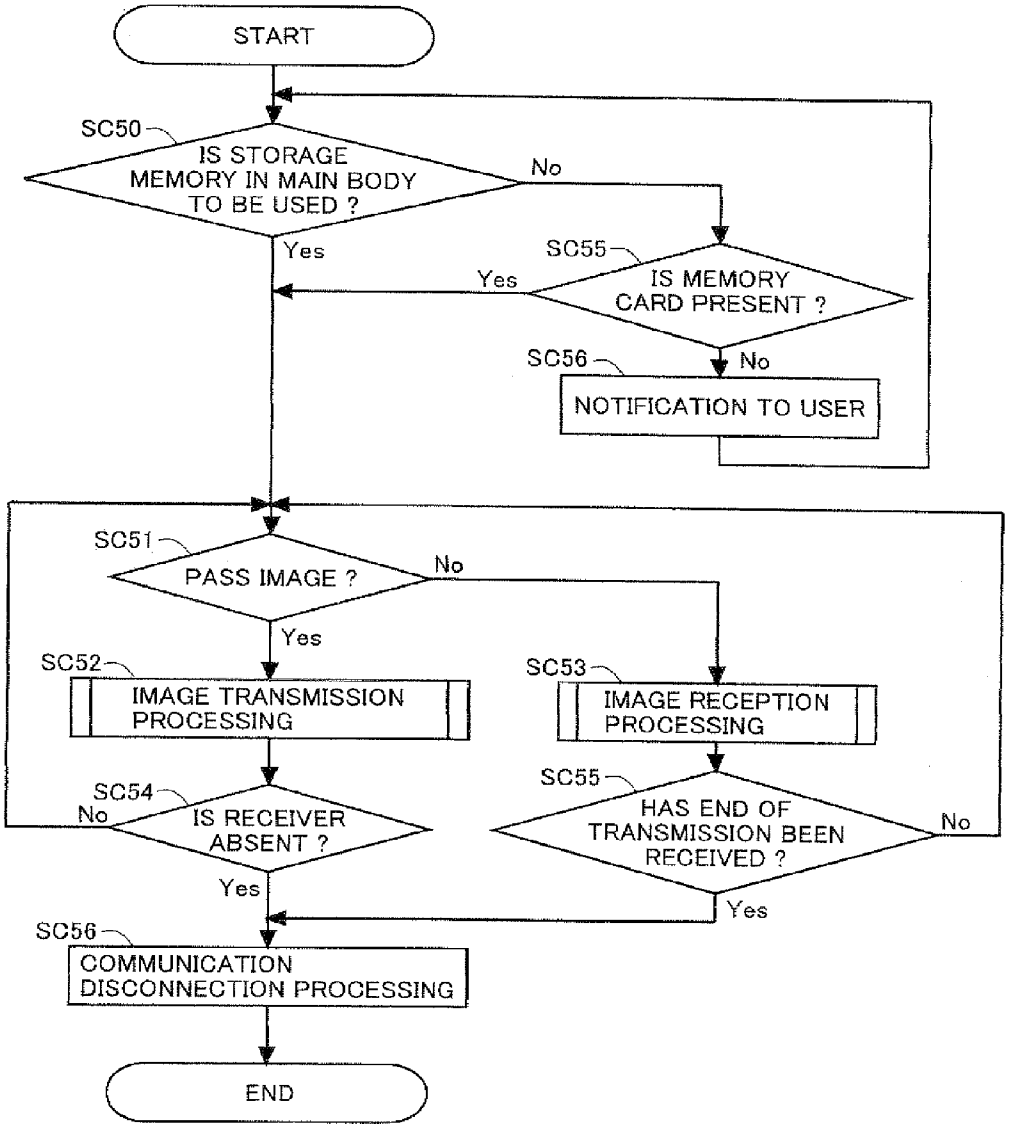

START
SC50
IS STORAGE MEMORY IN MAIN BODY TO BE USED ?
No
Yes
SC55
IS MEMORY CARD PRESENT ?
Yes
No
SC56
NOTIFICATION TO USER
SC51
PASS IMAGE ?
No
Yes
SC52
IMAGE TRANSMISSION PROCESSING
SC53
IMAGE RECEPTION PROCESSING
SC54
IS RECEIVER ABSENT ?
No
SC55
HAS END OF TRANSMISSION BEEN RECEIVED ?
No
Yes
Yes
SC56
COMMUNICATION DISCONNECTION PROCESSING
END

FIG.58

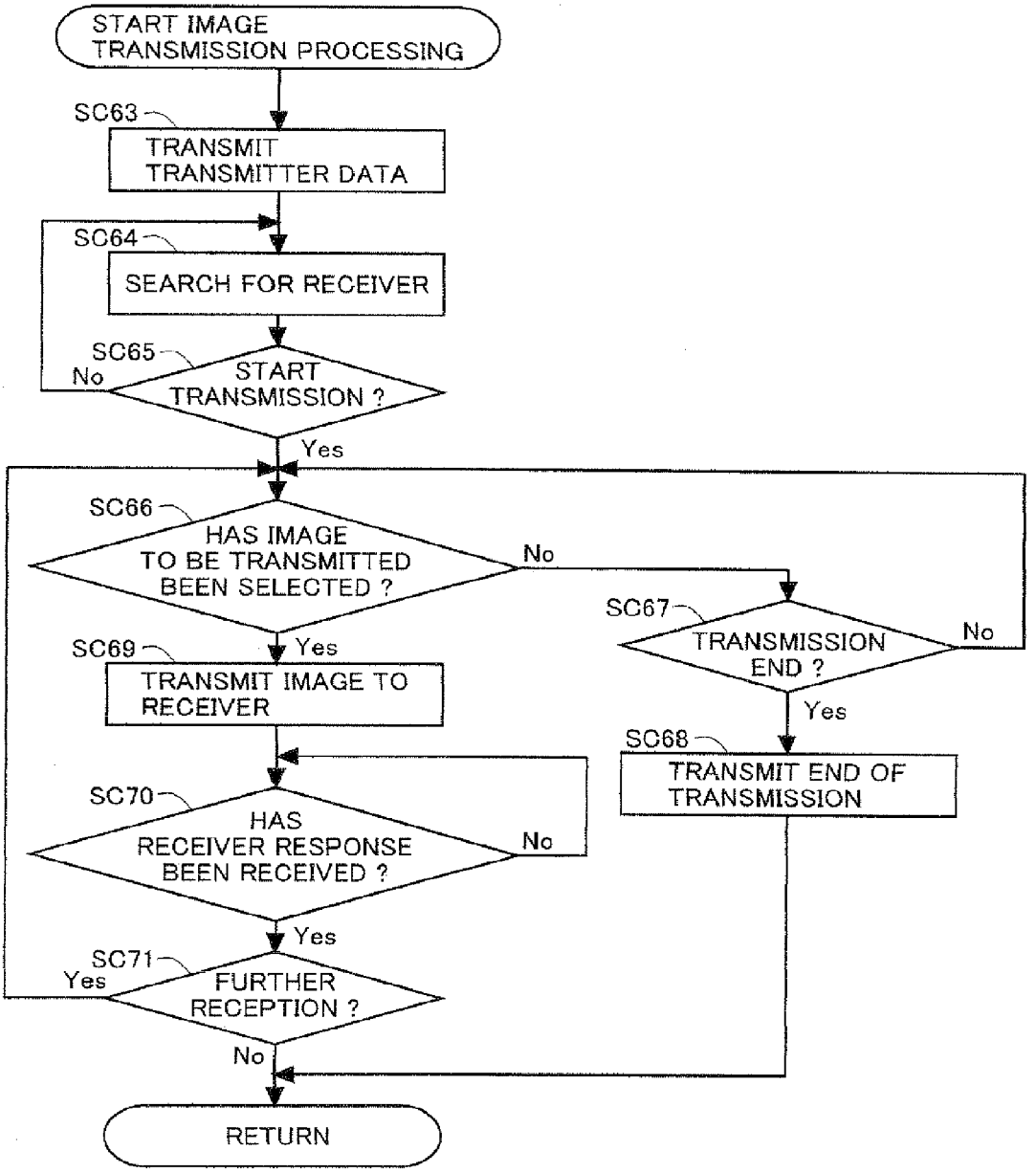

START IMAGE TRANSMISSION PROCESSING
SC63
TRANSMIT TRANSMITTER DATA
SC64
SEARCH FOR RECEIVER
SC65
START TRANSMISSION ?
No
Yes
SC66
HAS IMAGE TO BE TRANSMITTED BEEN SELECTED ?
No
Yes
SC67
TRANSMISSION END ?
No
Yes
SC68
TRANSMIT END OF TRANSMISSION
SC69
TRANSMIT IMAGE TO RECEIVER
SC70
HAS RECEIVER RESPONSE BEEN RECEIVED ?
No
Yes
SC71
FURTHER RECEPTION ?
Yes
No
RETURN

FIG.59

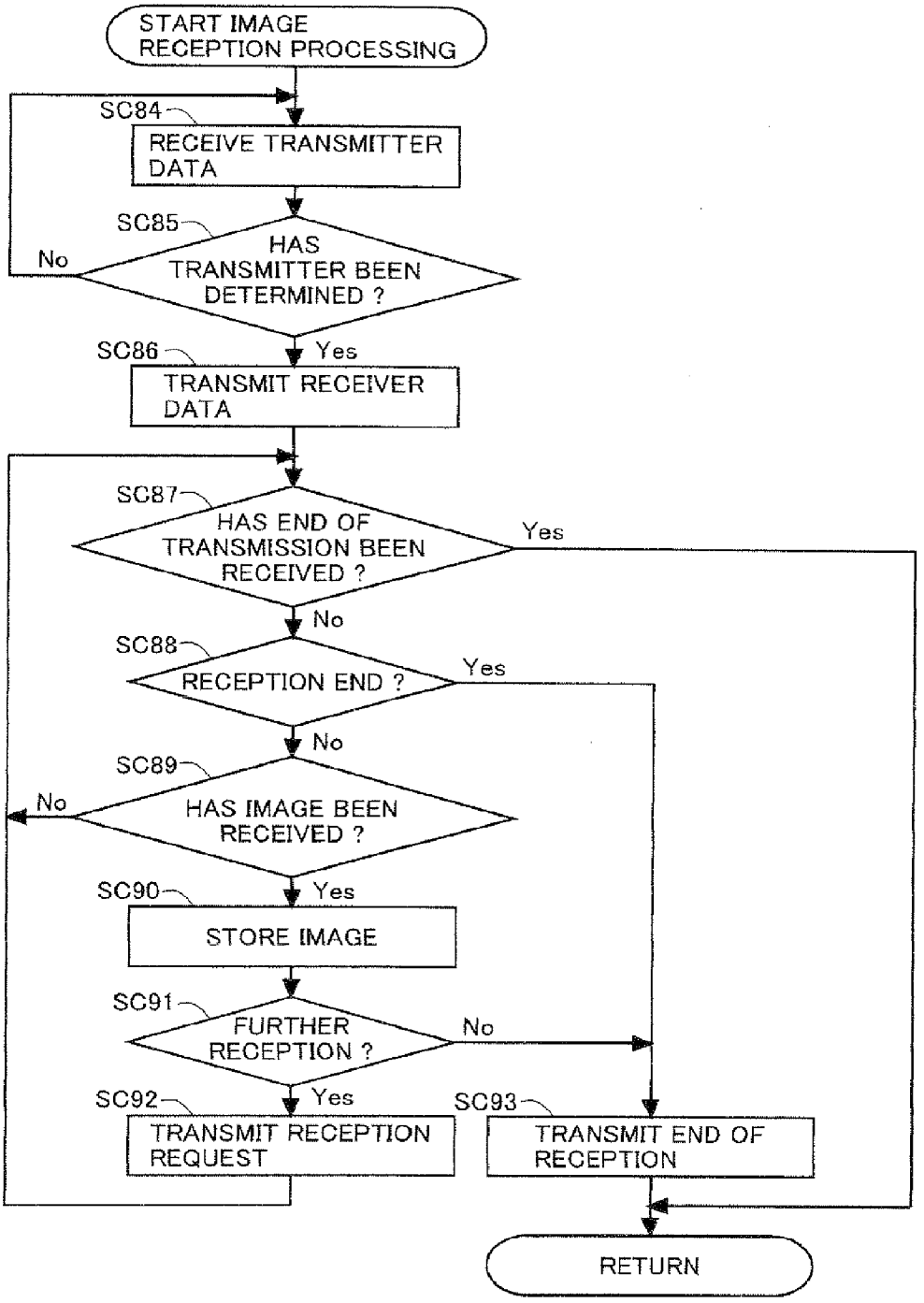

START IMAGE RECEPTION PROCESSING
SC84
RECEIVE TRANSMITTER DATA
SC85
HAS TRANSMITTER BEEN DETERMINED ?
No
Yes
SC86
TRANSMIT RECEIVER DATA
SC87
HAS END OF TRANSMISSION BEEN RECEIVED ?
Yes
No
SC88
RECEPTION END ?
Yes
No
SC89
HAS IMAGE BEEN RECEIVED ?
No
Yes
SC90
STORE IMAGE
SC91
FURTHER RECEPTION ?
No
Yes
SC92
TRANSMIT RECEPTION REQUEST
SC93
TRANSMIT END OF RECEPTION
RETURN

FIG.60

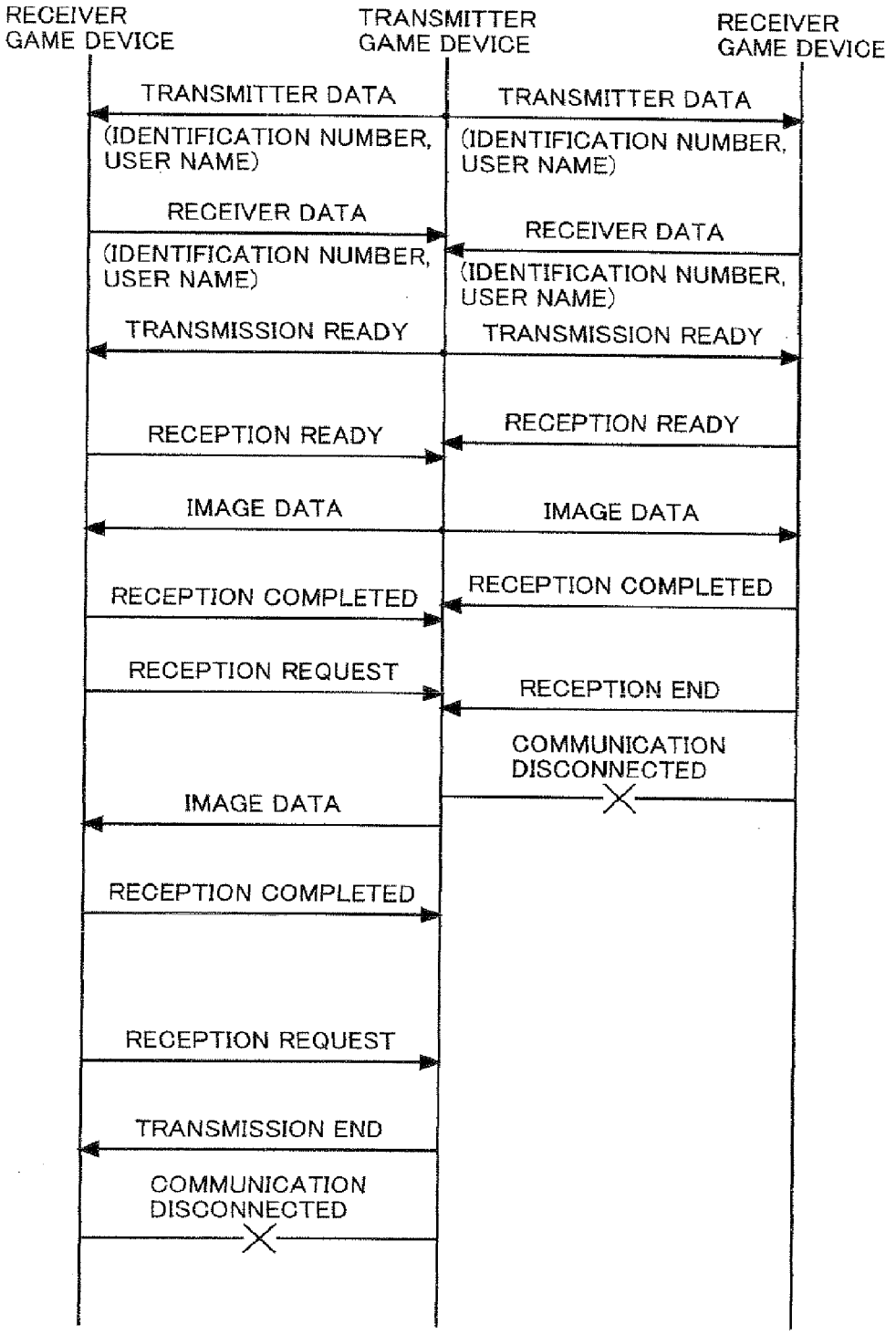

RECEIVER GAME DEVICE
TRANSMITTER GAME DEVICE
RECEIVER GAME DEVICE
TRANSMITTER DATA
(IDENTIFICATION NUMBER, USER NAME)
TRANSMITTER DATA
(IDENTIFICATION NUMBER, USER NAME)
RECEIVER DATA
(IDENTIFICATION NUMBER, USER NAME)
RECEIVER DATA
(IDENTIFICATION NUMBER, USER NAME)
TRANSMISSION READY
TRANSMISSION READY
RECEPTION READY
RECEPTION READY
IMAGE DATA
IMAGE DATA
RECEPTION COMPLETED
RECEPTION COMPLETED
RECEPTION REQUEST
RECEPTION END
COMMUNICATION DISCONNECTED
IMAGE DATA
RECEPTION COMPLETED
RECEPTION REQUEST
TRANSMISSION END
COMMUNICATION DISCONNECTED

FIG.61

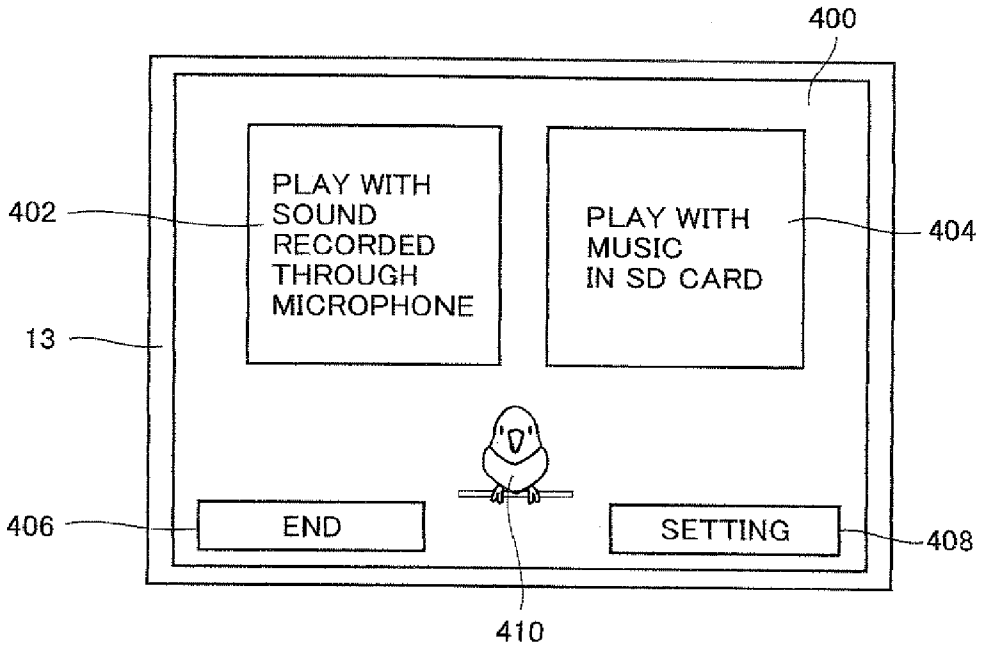
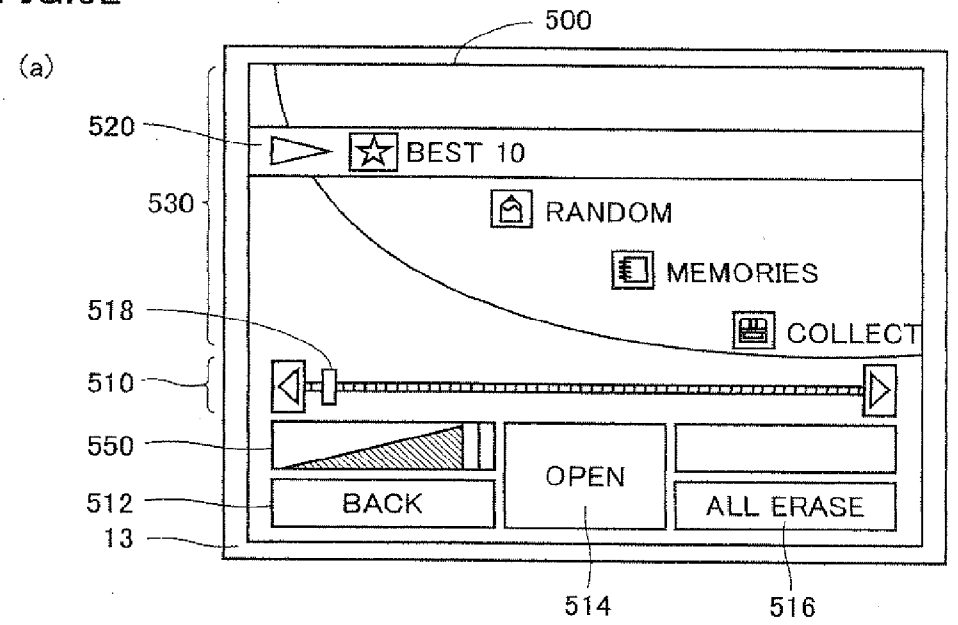

400
PLAY WITH SOUND RECORDED THROUGH MICROPHONE
PLAY WITH MUSIC IN SD CARD
402
404
13
406
END
SETTING
408
410

FIG.62


(a)
500
520
530
518
510
550
512
13
BEST 10
RANDOM
MEMORIES
COLLECT
BACK
OPEN
ALL ERASE
514
516

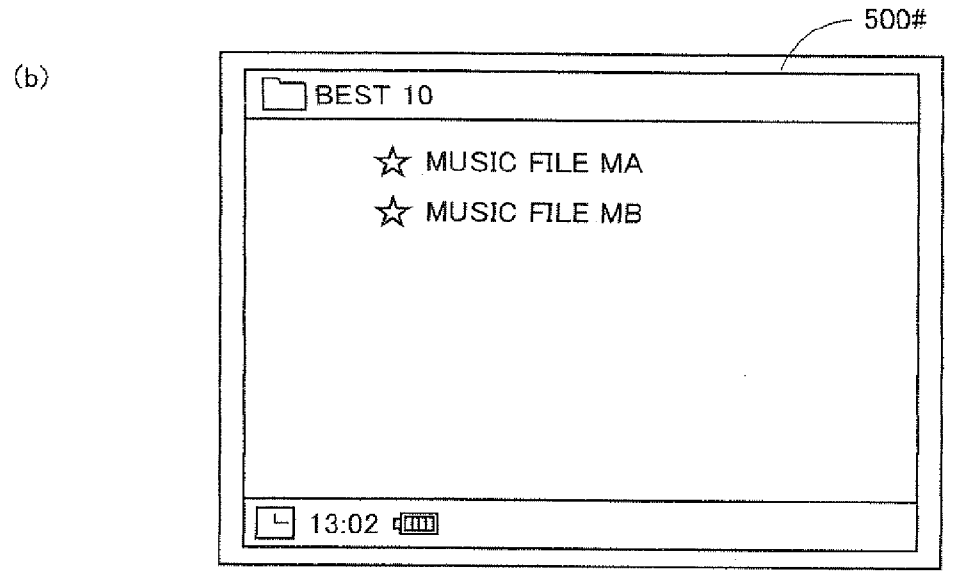
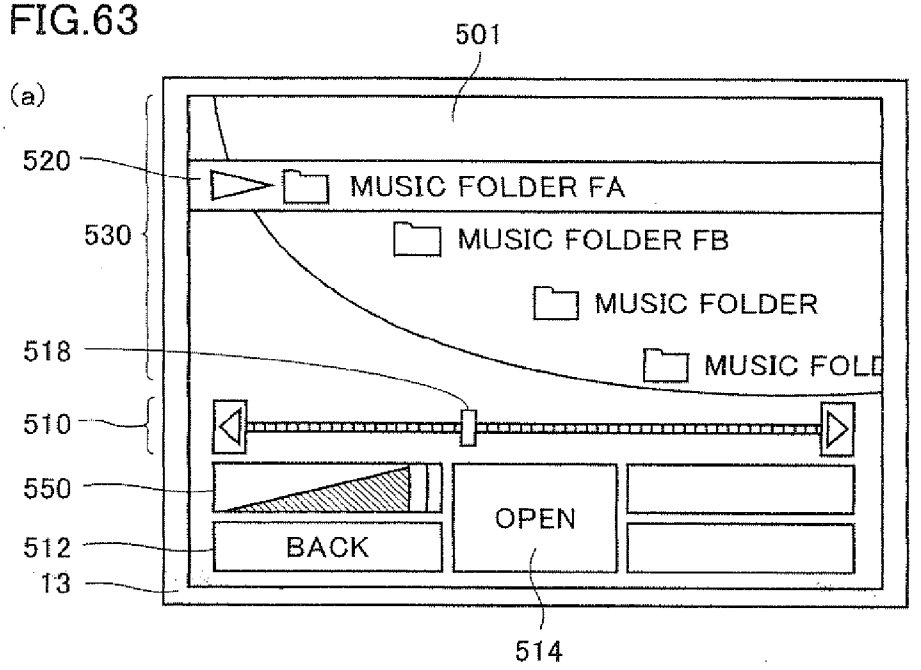

(b)
500#
BEST 10
MUSIC FILE MA
MUSIC FILE MB
13:02

FIG.63


501
(a)
520
530
518
510
550
512
13
MUSIC FOLDER FA
MUSIC FOLDER FB
MUSIC FOLDER
MUSIC FOLD
OPEN
BACK
514

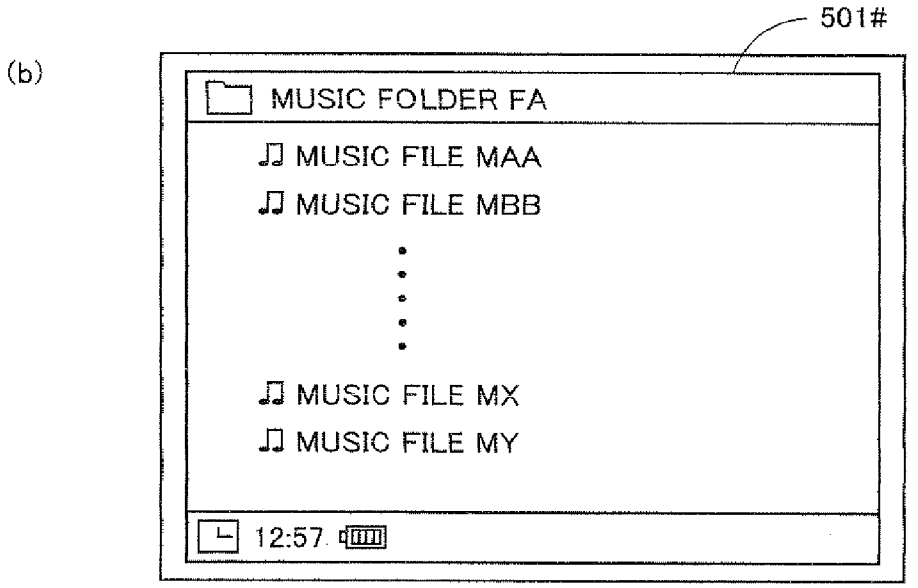
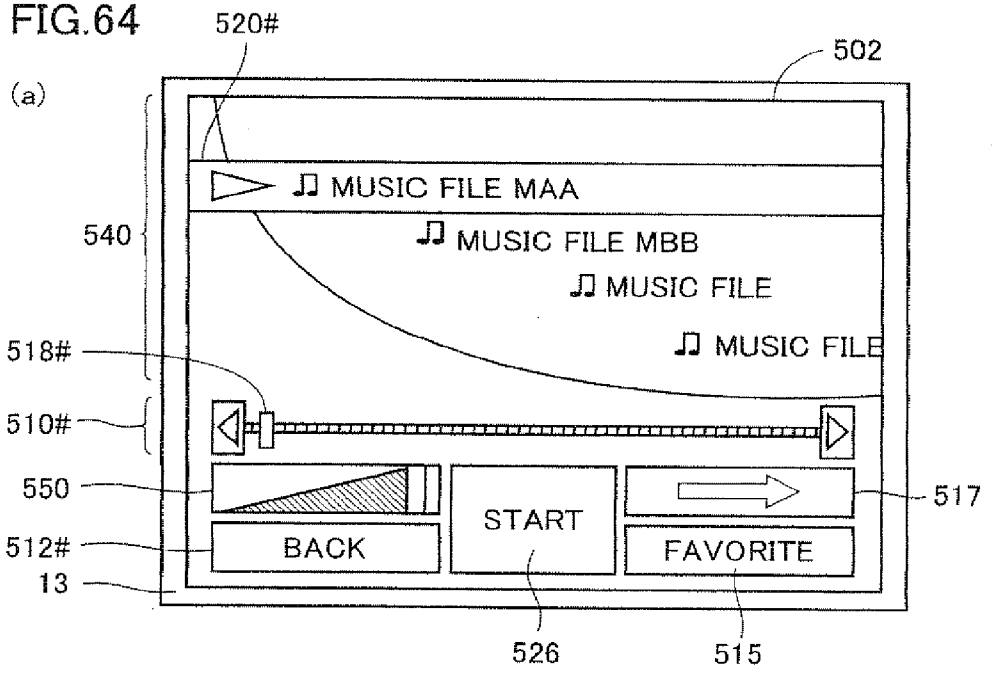

501#
(b)
MUSIC FOLDER FA
MUSIC FILE MAA
MUSIC FILE MBB
MUSIC FILE MX
MUSIC FILE MY
12:57

FIG.64


(a)
520#
502
MUSIC FILE MAA
MUSIC FILE MBB
MUSIC FILE
MUSIC FILE
540
518#
510#
550
512#
13
517
START
BACK
FAVORITE
526
515

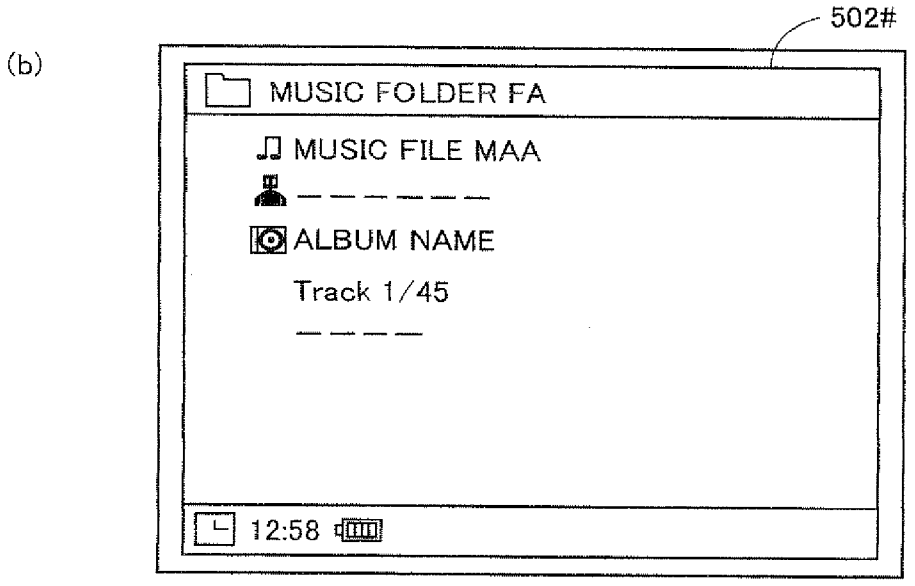
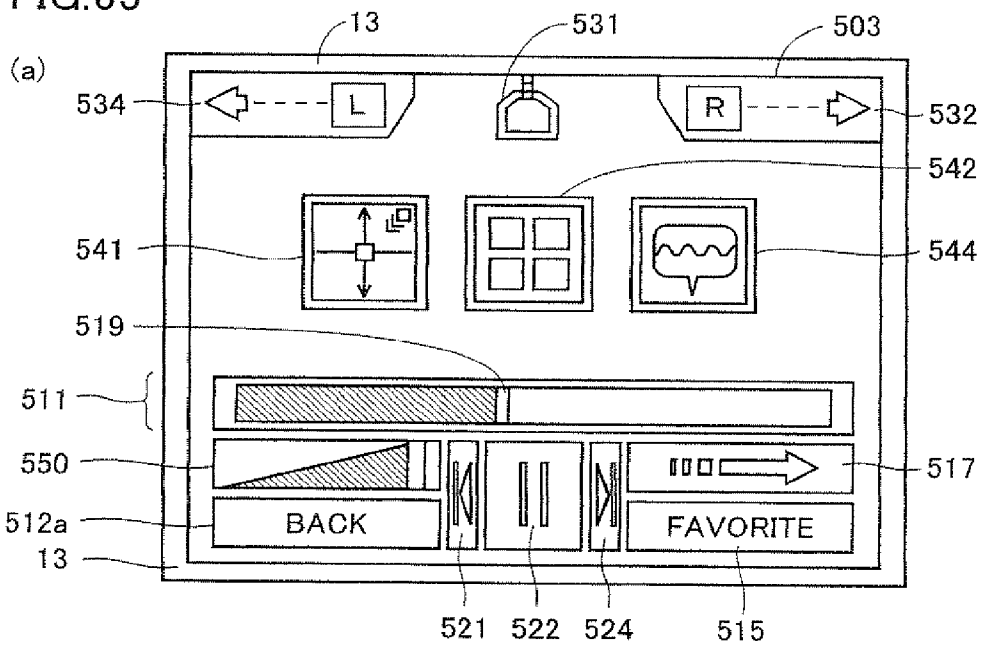

(b)
502#
MUSIC FOLDER FA
MUSIC FILE MAA
ALBUM NAME
Track 1/45
12:58

FIG.65


(a)
13
531
503
534
L
R
532
542
541
544
519
511
550
517
512a
BACK
FAVORITE
13
521
522
524
515

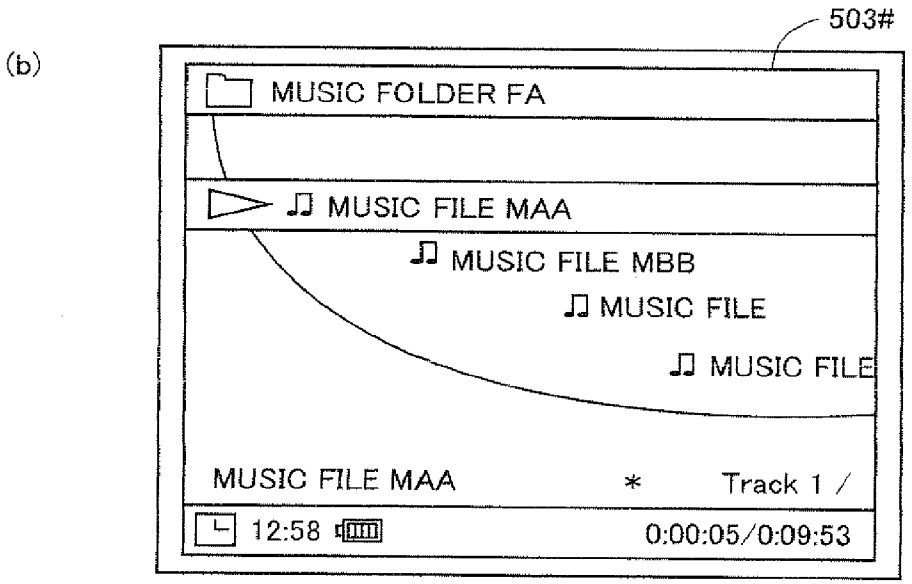

(b)
503#
MUSIC FOLDER FA
MUSIC FILE MAA
MUSIC FILE MBB
MUSIC FILE
MUSIC FILE
MUSIC FILE MAA
*
Track 1 /
12:58
0:00:05/0:09:53

FIG.66

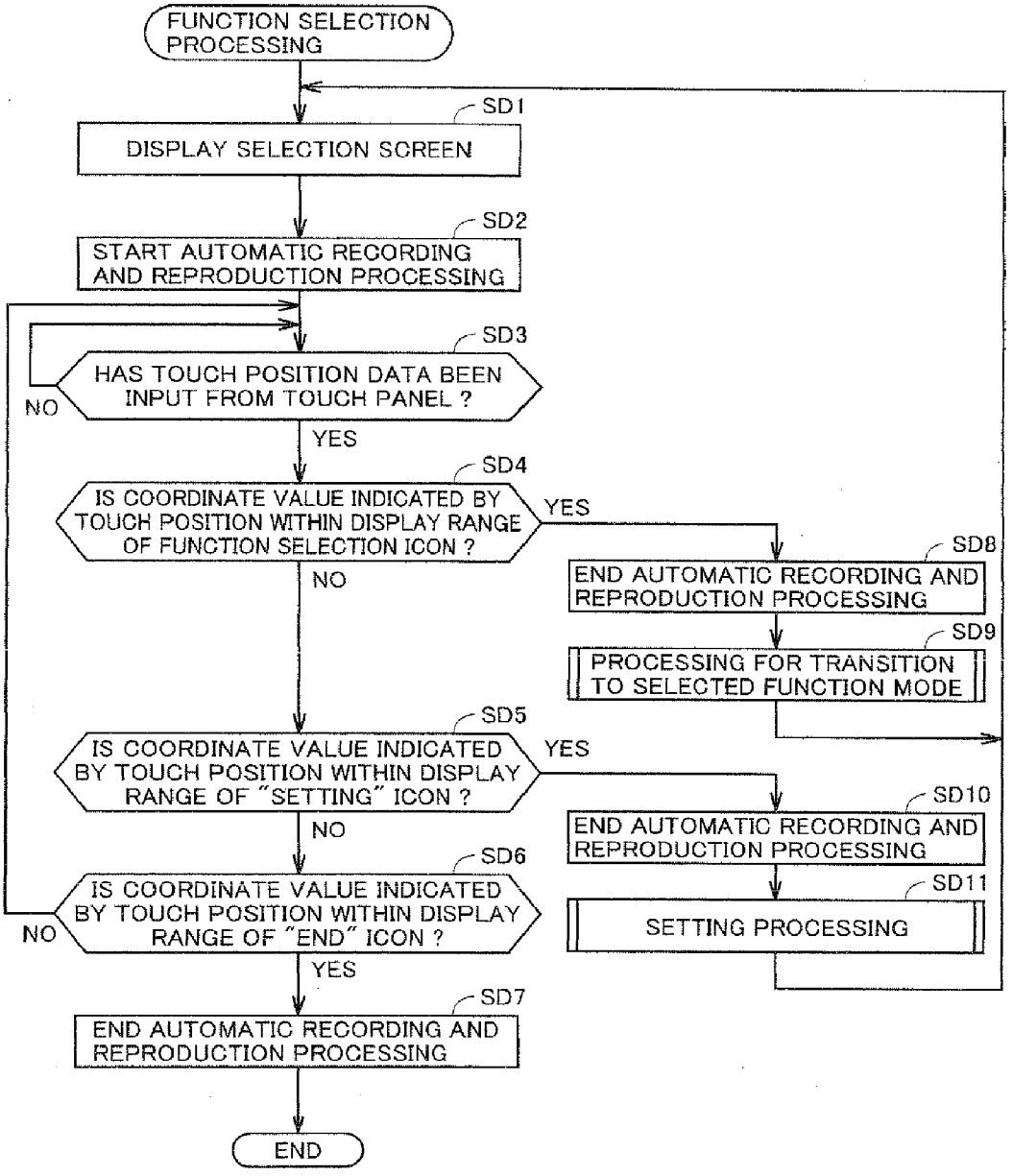

FUNCTION SELECTION PROCESSING
SD1
DISPLAY SELECTION SCREEN
SD2
START AUTOMATIC RECORDING AND REPRODUCTION PROCESSING
SD3
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
NO
YES
SD4
IS COORDINATE VALUE INDICATED BY TOUCH POSITION WITHIN DISPLAY RANGE OF FUNCTION SELECTION ICON ?
YES
NO
SD8
END AUTOMATIC RECORDING AND REPRODUCTION PROCESSING
SD9
PROCESSING FOR TRANSITION TO SELECTED FUNCTION MODE
SD5
IS COORDINATE VALUE INDICATED BY TOUCH POSITION WITHIN DISPLAY RANGE OF "SETTING" ICON ?
YES
NO
SD10
END AUTOMATIC RECORDING AND REPRODUCTION PROCESSING
SD6
IS COORDINATE VALUE INDICATED BY TOUCH POSITION WITHIN DISPLAY RANGE OF "END" ICON ?
NO
YES
SD11
SETTING PROCESSING
SD7
END AUTOMATIC RECORDING AND REPRODUCTION PROCESSING
END

FIG.67

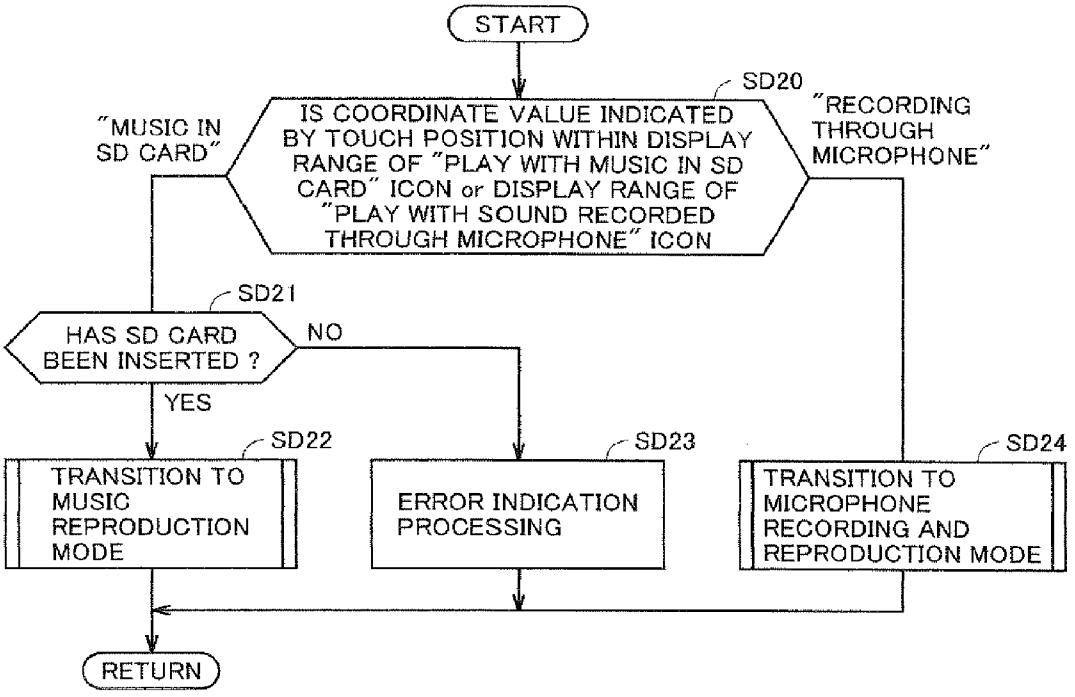

START
SD20
IS COORDINATE VALUE INDICATED BY TOUCH POSITION WITHIN DISPLAY RANGE OF "PLAY WITH MUSIC IN SD CARD" ICON or DISPLAY RANGE OF "PLAY WITH SOUND RECORDED THROUGH MICROPHONE" ICON
"MUSIC IN SD CARD"
"RECORDING THROUGH MICROPHONE"
SD21
HAS SD CARD BEEN INSERTED ?
NO
YES
SD22
TRANSITION TO MUSIC REPRODUCTION MODE
SD23
ERROR INDICATION PROCESSING
SD24
TRANSITION TO MICROPHONE RECORDING AND REPRODUCTION MODE
RETURN

FIG.68

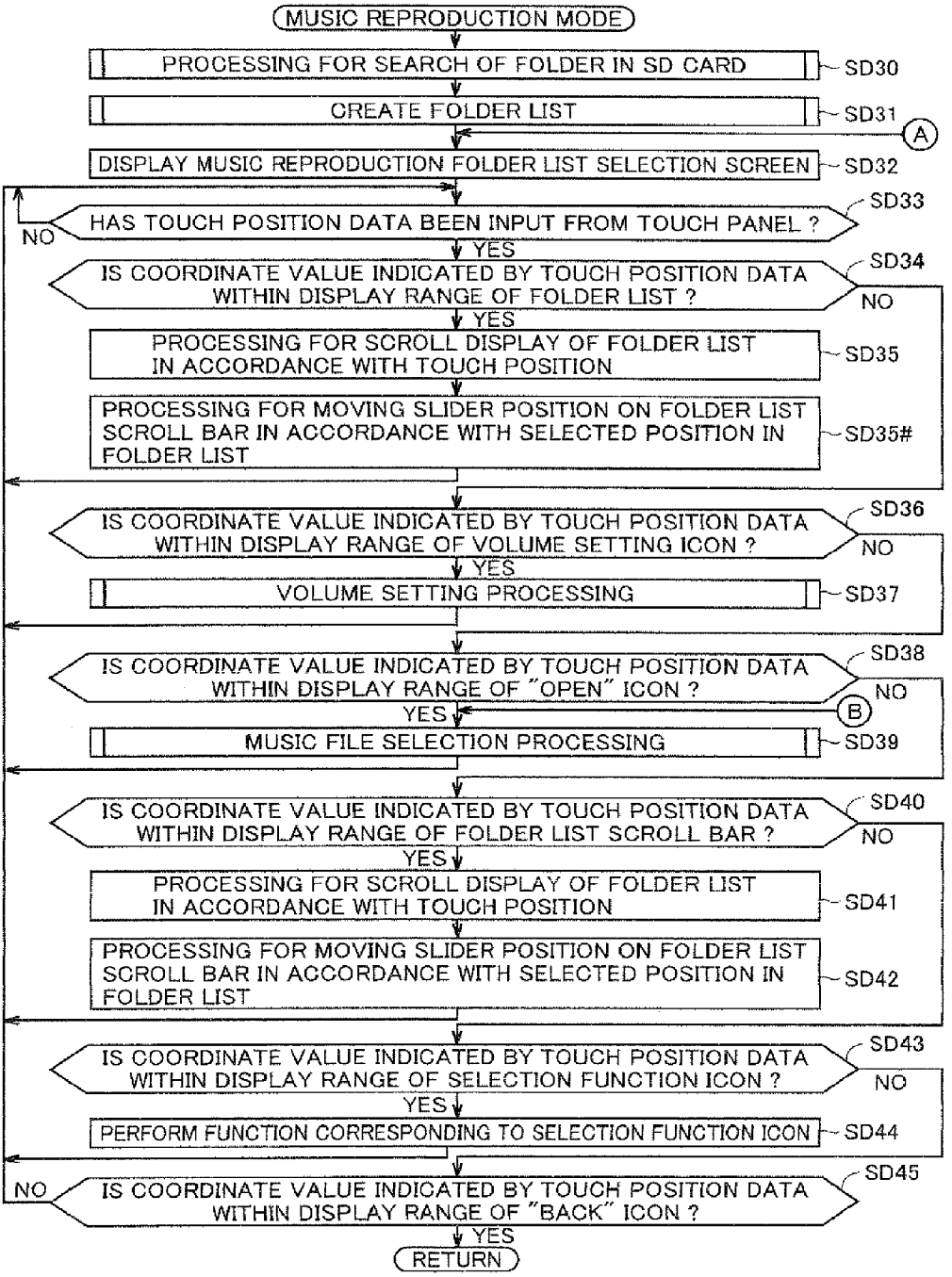

MUSIC REPRODUCTION MODE
PROCESSING FOR SEARCH OF FOLDER IN SD CARD
SD30
CREATE FOLDER LIST
SD31
A
DISPLAY MUSIC REPRODUCTION FOLDER LIST SELECTION SCREEN
SD32
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
SD33
NO
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF FOLDER LIST ?
SD34
NO
YES
PROCESSING FOR SCROLL DISPLAY OF FOLDER LIST IN ACCORDANCE WITH TOUCH POSITION
SD35
PROCESSING FOR MOVING SLIDER POSITION ON FOLDER LIST SCROLL BAR IN ACCORDANCE WITH SELECTED POSITION IN FOLDER LIST
SD35#
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF VOLUME SETTING ICON ?
SD36
NO
YES
VOLUME SETTING PROCESSING
SD37
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "OPEN" ICON ?
SD38
NO
YES
B
MUSIC FILE SELECTION PROCESSING
SD39
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF FOLDER LIST SCROLL BAR ?
SD40
NO
YES
PROCESSING FOR SCROLL DISPLAY OF FOLDER LIST IN ACCORDANCE WITH TOUCH POSITION
SD41
PROCESSING FOR MOVING SLIDER POSITION ON FOLDER LIST SCROLL BAR IN ACCORDANCE WITH SELECTED POSITION IN FOLDER LIST
SD42
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF SELECTION FUNCTION ICON ?
SD43
NO
YES
PERFORM FUNCTION CORRESPONDING TO SELECTION FUNCTION ICON
SD44
NO
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "BACK" ICON ?
SD45
YES
RETURN

FIG.69

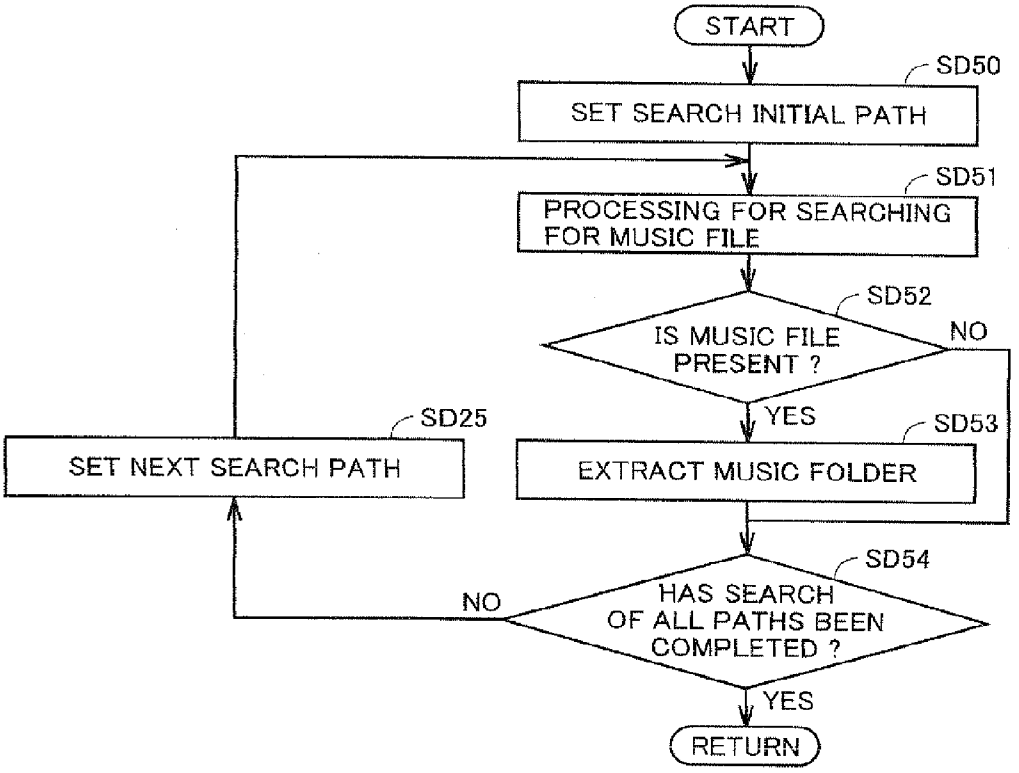

START
SD50
SET SEARCH INITIAL PATH
SD51
PROCESSING FOR SEARCHING FOR MUSIC FILE
SD52
IS MUSIC FILE PRESENT ?
NO
YES
SD53
EXTRACT MUSIC FOLDER
SD54
HAS SEARCH OF ALL PATHS BEEN COMPLETED ?
NO
YES
SD25
SET NEXT SEARCH PATH
RETURN

FIG.70

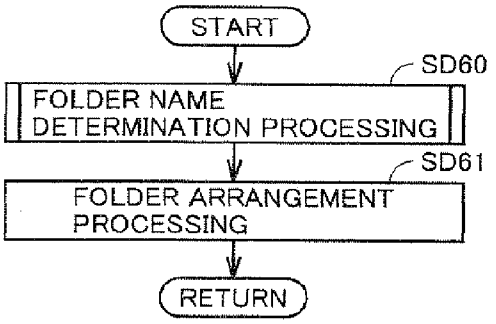

START
SD60
FOLDER NAME DETERMINATION PROCESSING
SD61
FOLDER ARRANGEMENT PROCESSING
RETURN

FIG.71

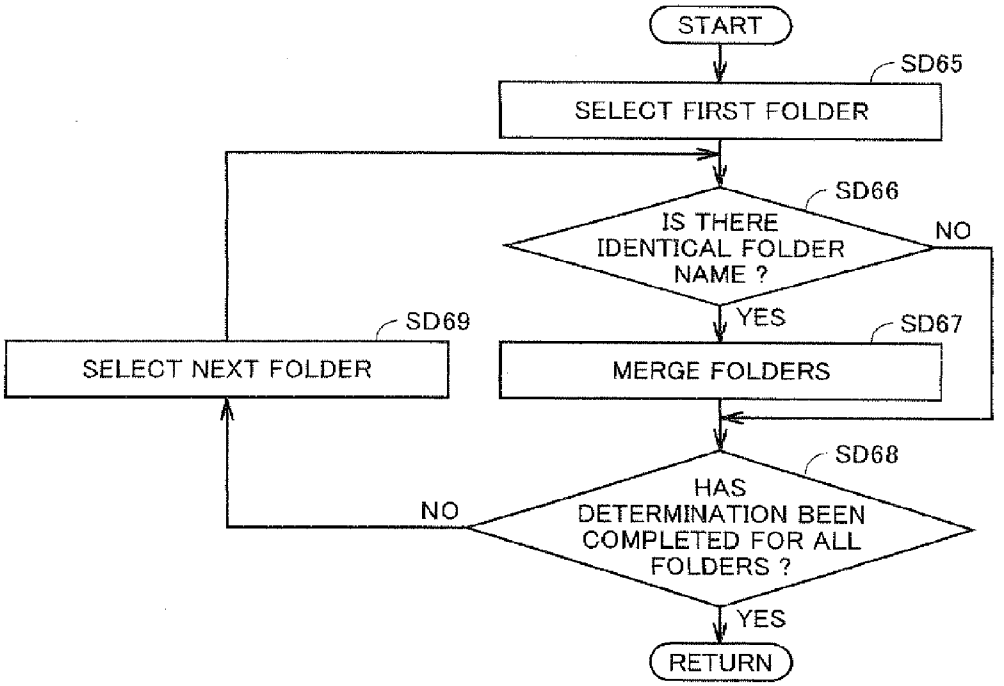

START
SD65
SELECT FIRST FOLDER
SD66
IS THERE IDENTICAL FOLDER NAME ?
NO
YES
SD67
MERGE FOLDERS
SD69
SELECT NEXT FOLDER
SD68
HAS DETERMINATION BEEN COMPLETED FOR ALL FOLDERS ?
NO
YES
RETURN

FIG.72

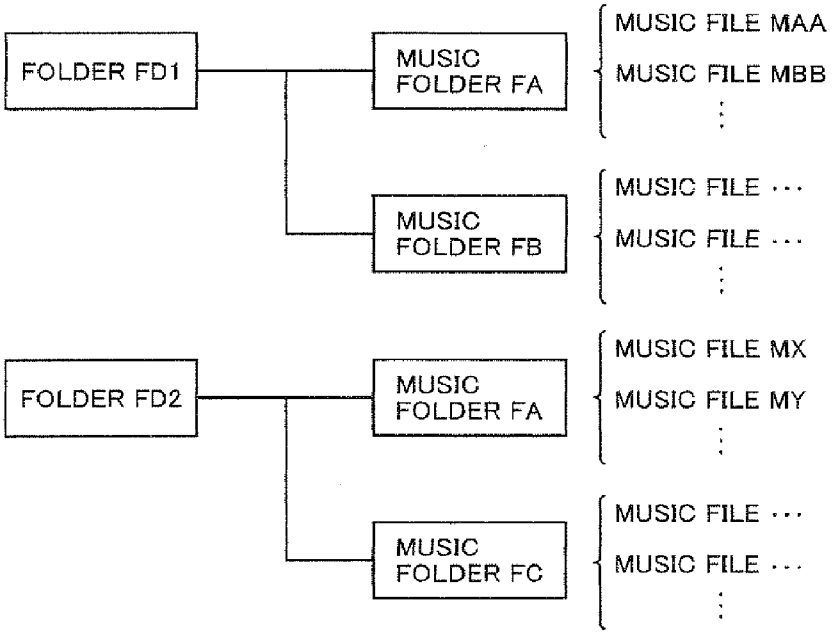

FOLDER FD1
MUSIC FOLDER FA
MUSIC FILE MAA
MUSIC FILE MBB
MUSIC FOLDER FB
MUSIC FILE ···
MUSIC FILE ···
FOLDER FD2
MUSIC FOLDER FA
MUSIC FILE MX
MUSIC FILE MY
MUSIC FOLDER FC
MUSIC FILE ···
MUSIC FILE ···

FIG.73

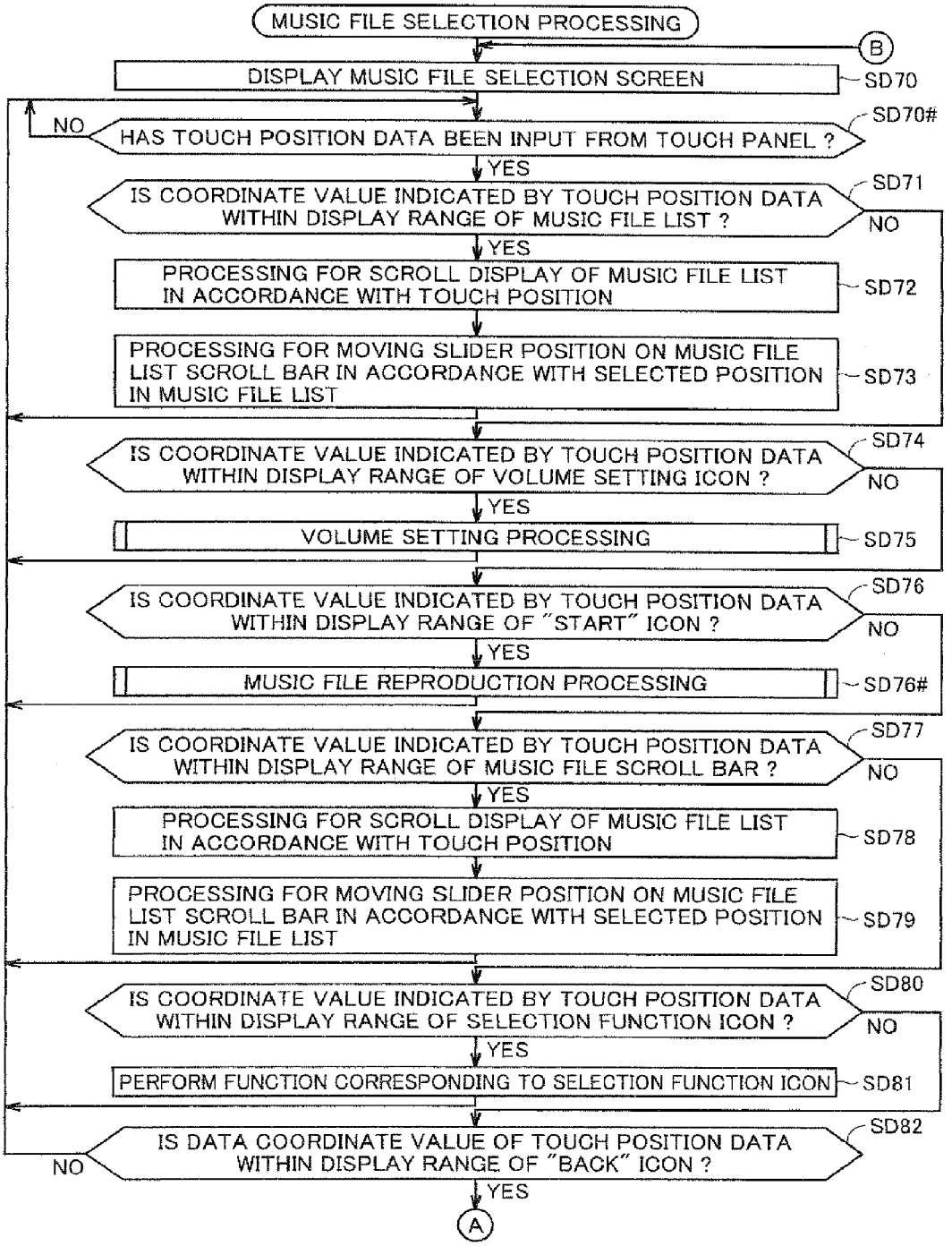

MUSIC FILE SELECTION PROCESSING
B
DISPLAY MUSIC FILE SELECTION SCREEN
SD70
NO
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
SD70#
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF MUSIC FILE LIST ?
SD71
NO
YES
PROCESSING FOR SCROLL DISPLAY OF MUSIC FILE LIST IN ACCORDANCE WITH TOUCH POSITION
SD72
PROCESSING FOR MOVING SLIDER POSITION ON MUSIC FILE LIST SCROLL BAR IN ACCORDANCE WITH SELECTED POSITION IN MUSIC FILE LIST
SD73
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF VOLUME SETTING ICON ?
SD74
NO
YES
VOLUME SETTING PROCESSING
SD75
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "START" ICON ?
SD76
NO
YES
MUSIC FILE REPRODUCTION PROCESSING
SD76#
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF MUSIC FILE SCROLL BAR ?
SD77
NO
YES
PROCESSING FOR SCROLL DISPLAY OF MUSIC FILE LIST IN ACCORDANCE WITH TOUCH POSITION
SD78
PROCESSING FOR MOVING SLIDER POSITION ON MUSIC FILE LIST SCROLL BAR IN ACCORDANCE WITH SELECTED POSITION IN MUSIC FILE LIST
SD79
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF SELECTION FUNCTION ICON ?
SD80
NO
YES
PERFORM FUNCTION CORRESPONDING TO SELECTION FUNCTION ICON
SD81
IS DATA COORDINATE VALUE OF TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "BACK" ICON ?
SD82
NO
YES
A

FIG.74

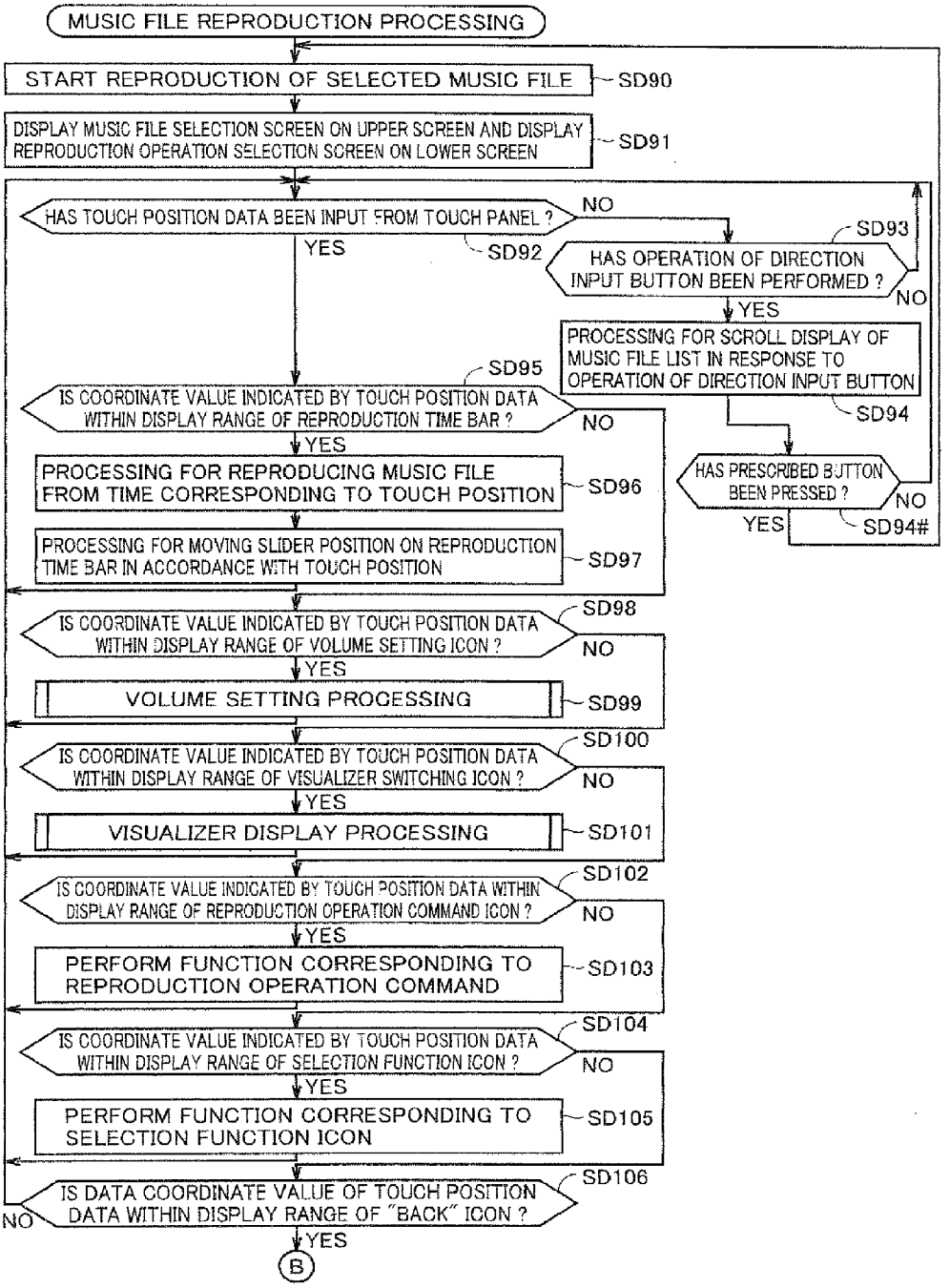

MUSIC FILE REPRODUCTION PROCESSING
START REPRODUCTION OF SELECTED MUSIC FILE
SD90
DISPLAY MUSIC FILE SELECTION SCREEN ON UPPER SCREEN AND DISPLAY REPRODUCTION OPERATION SELECTION SCREEN ON LOWER SCREEN
SD91
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
NO
YES
SD92
SD93
HAS OPERATION OF DIRECTION INPUT BUTTON BEEN PERFORMED ?
NO
YES
PROCESSING FOR SCROLL DISPLAY OF MUSIC FILE LIST IN RESPONSE TO OPERATION OF DIRECTION INPUT BUTTON
SD94
SD95
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF REPRODUCTION TIME BAR ?
NO
YES
PROCESSING FOR REPRODUCING MUSIC FILE FROM TIME CORRESPONDING TO TOUCH POSITION
SD96
PROCESSING FOR MOVING SLIDER POSITION ON REPRODUCTION TIME BAR IN ACCORDANCE WITH TOUCH POSITION
SD97
HAS PRESCRIBED BUTTON BEEN PRESSED ?
NO
YES
SD94#
SD98
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF VOLUME SETTING ICON ?
NO
YES
VOLUME SETTING PROCESSING
SD99
SD100
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF VISUALIZER SWITCHING ICON ?
NO
YES
VISUALIZER DISPLAY PROCESSING
SD101
SD102
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF REPRODUCTION OPERATION COMMAND ICON ?
NO
YES
PERFORM FUNCTION CORRESPONDING TO REPRODUCTION OPERATION COMMAND
SD103
SD104
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF SELECTION FUNCTION ICON ?
NO
YES
PERFORM FUNCTION CORRESPONDING TO SELECTION FUNCTION ICON
SD105
SD106
IS DATA COORDINATE VALUE OF TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "BACK" ICON ?
NO
YES
B

FIG.75

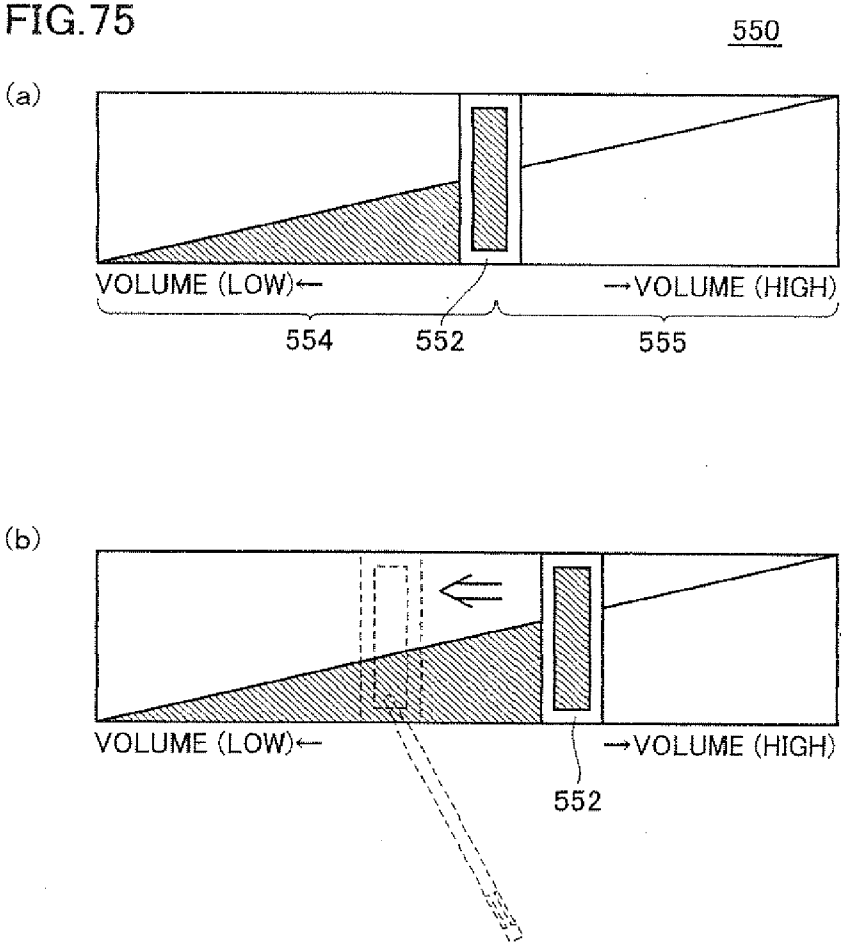

550
(a)
VOLUME (LOW)←
→VOLUME (HIGH)
554
552
555
(b)
VOLUME (LOW)←
→VOLUME (HIGH)
552

FIG.76

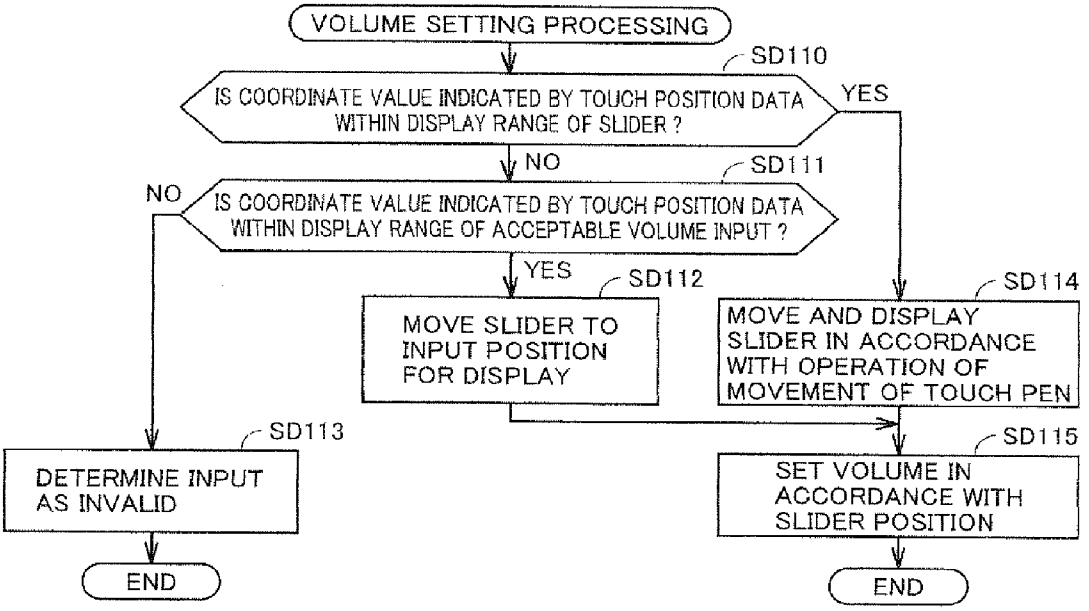

VOLUME SETTING PROCESSING
SD110
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF SLIDER ?
YES
NO
SD111
NO
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF ACCEPTABLE VOLUME INPUT ?
YES
SD112
MOVE SLIDER TO INPUT POSITION FOR DISPLAY
SD114
MOVE AND DISPLAY SLIDER IN ACCORDANCE WITH OPERATION OF MOVEMENT OF TOUCH PEN
SD113
DETERMINE INPUT AS INVALID
SD115
SET VOLUME IN ACCORDANCE WITH SLIDER POSITION
END
END

FIG.77

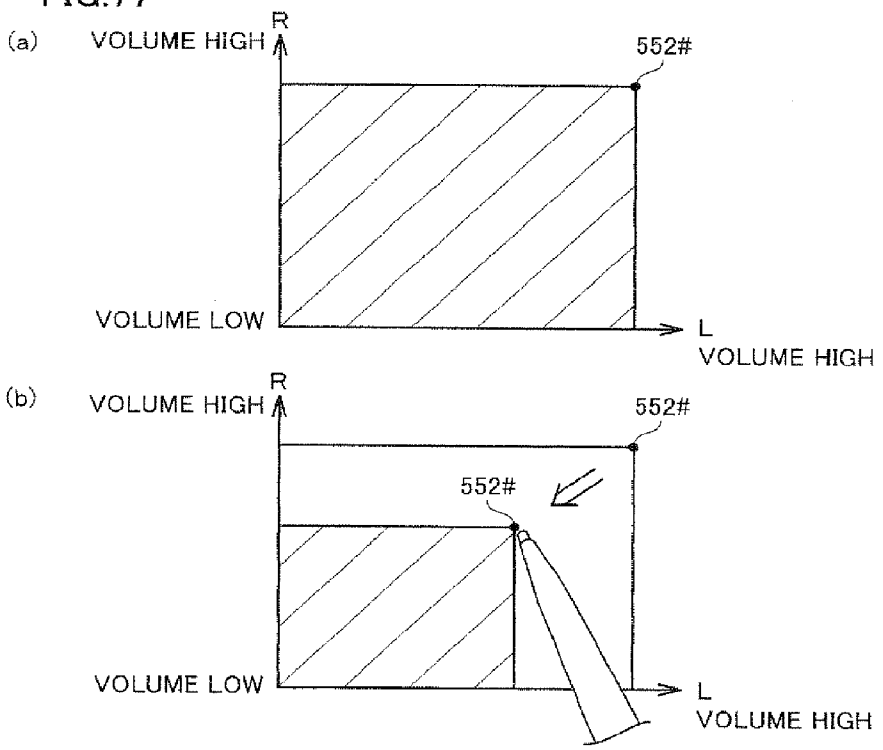

(a)
VOLUME HIGH
R
552#
VOLUME LOW
L
VOLUME HIGH
(b)
VOLUME HIGH
R
552#
552#
VOLUME LOW
L
VOLUME HIGH

FIG.78

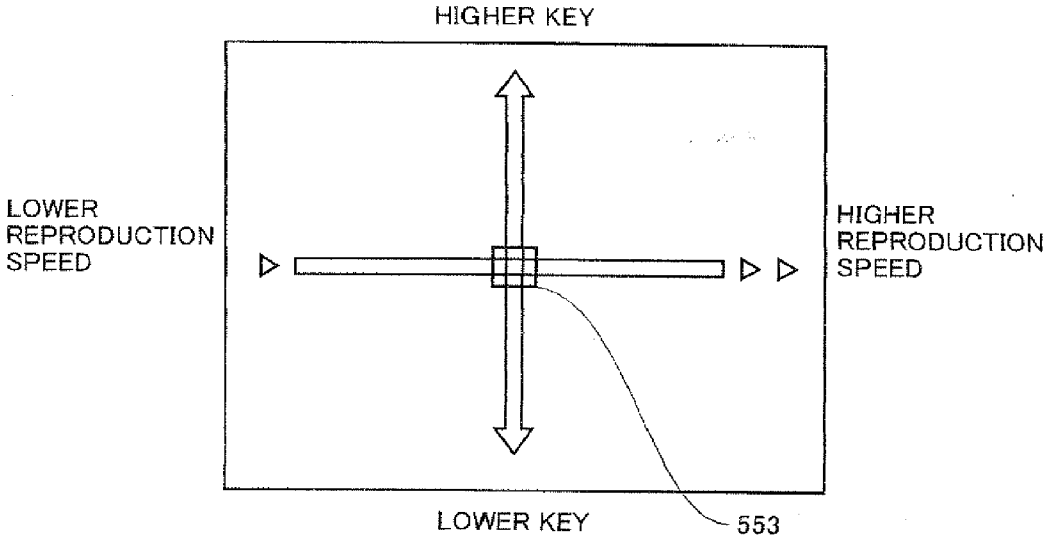

HIGHER KEY
LOWER REPRODUCTION SPEED
HIGHER REPRODUCTION SPEED
LOWER KEY
553

FIG.79

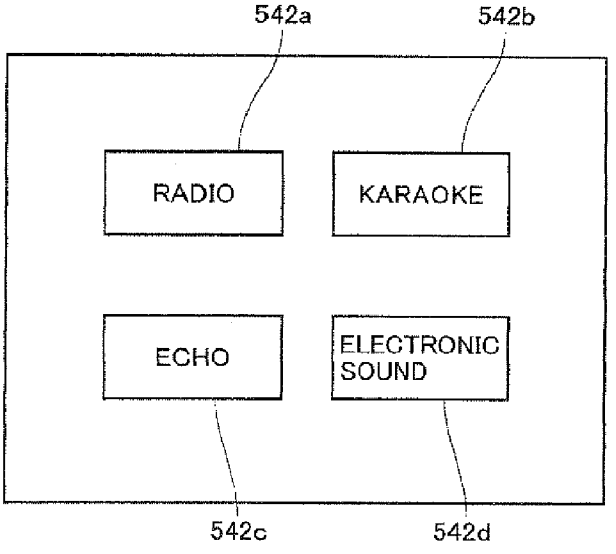

542a
542b
RADIO
KARAOKE
ECHO
ELECTRONIC SOUND
542c
542d

FIG.80

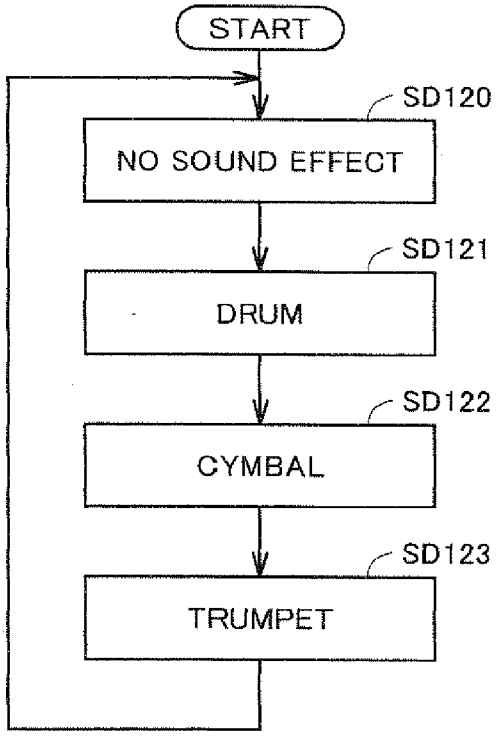

START
SD120
NO SOUND EFFECT
SD121
DRUM
SD122
CYMBAL
SD123
TRUMPET

FIG.81

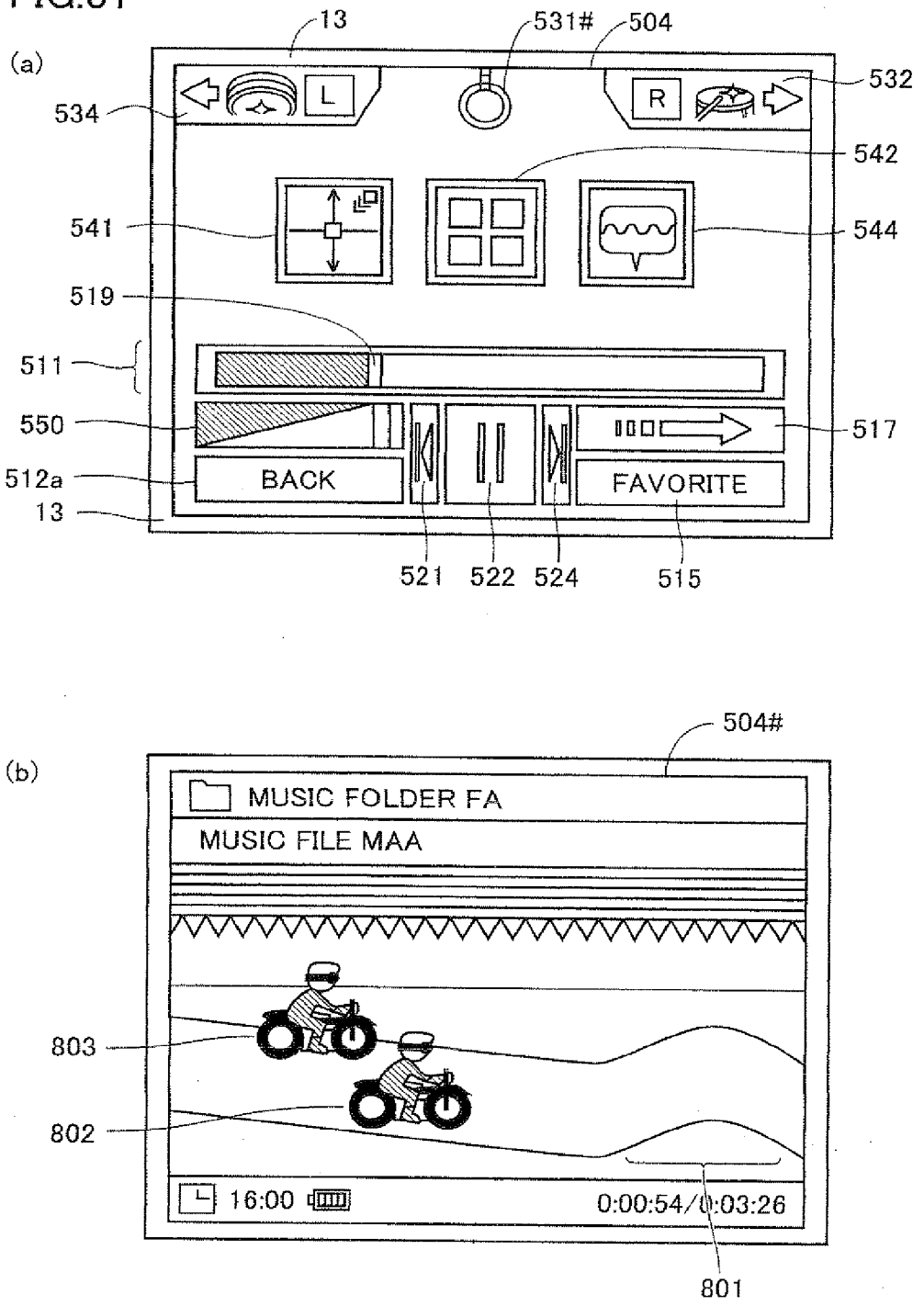

(a)
13
531#
504
532
534
L
R
542
541
544
519
511
550
517
512a
BACK
FAVORITE
13
521
522
524
515
(b)
504#
MUSIC FOLDER FA
MUSIC FILE MAA
803
802
16:00
0:00:54/0:03:26
801

FIG.82

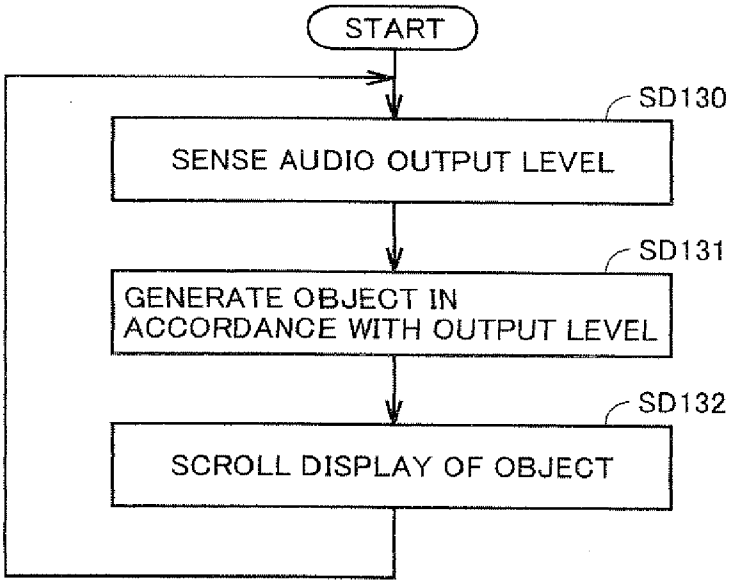
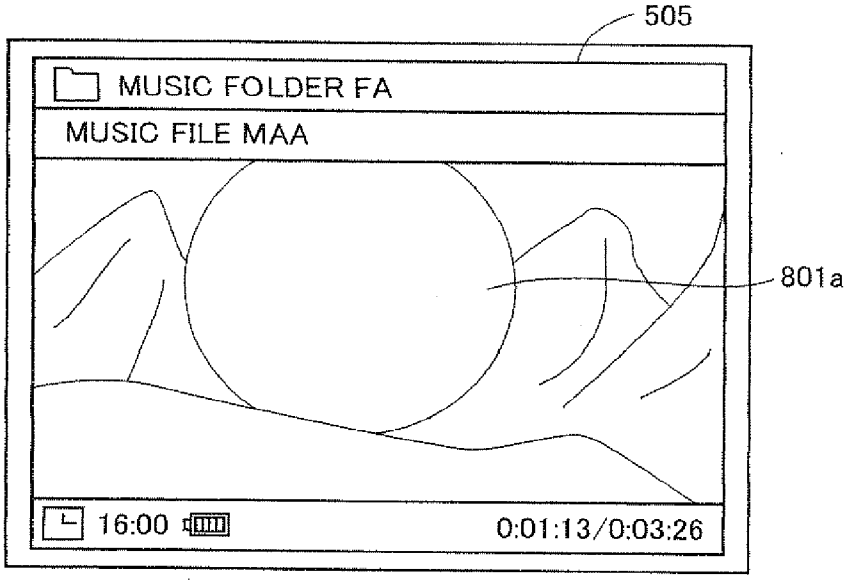

START
SD130
SENSE AUDIO OUTPUT LEVEL
SD131
GENERATE OBJECT IN ACCORDANCE WITH OUTPUT LEVEL
SD132
SCROLL DISPLAY OF OBJECT

FIG.83

(a)


505
MUSIC FOLDER FA
MUSIC FILE MAA
801a
16:00
0:01:13/0:03:26

(b)

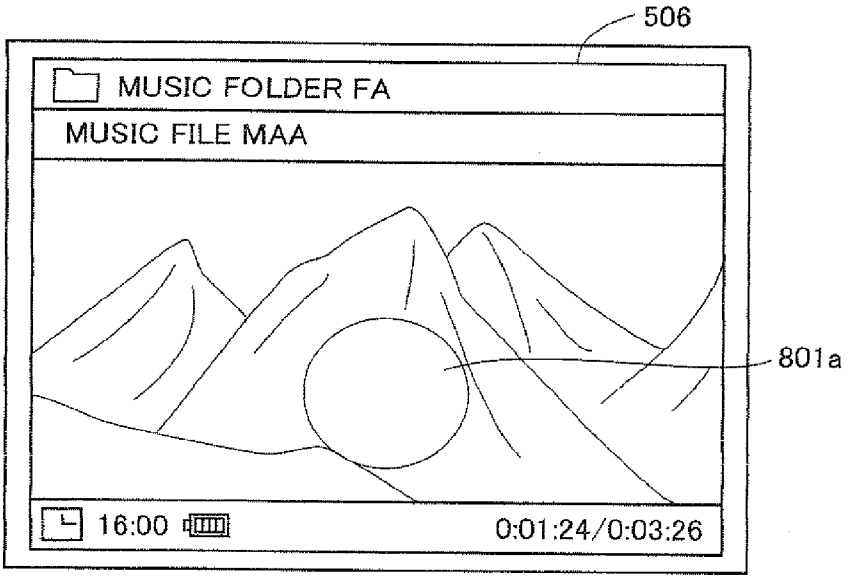

506
MUSIC FOLDER FA
MUSIC FILE MAA
801a
16:00
0:01:24/0:03:26

FIG.84

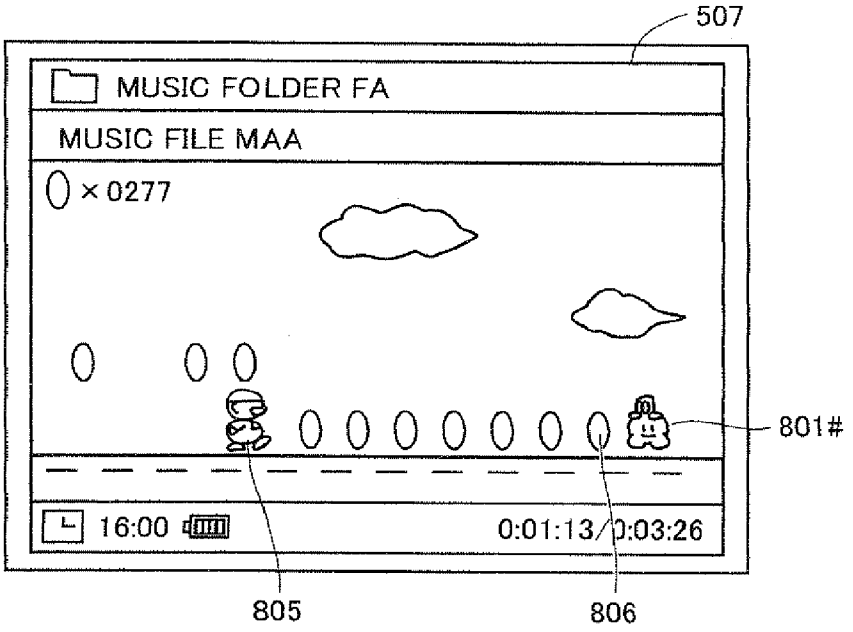

507
MUSIC FOLDER FA
MUSIC FILE MAA
× 0277
801#
16:00
0:01:13/0:03:26
805
806

FIG.85

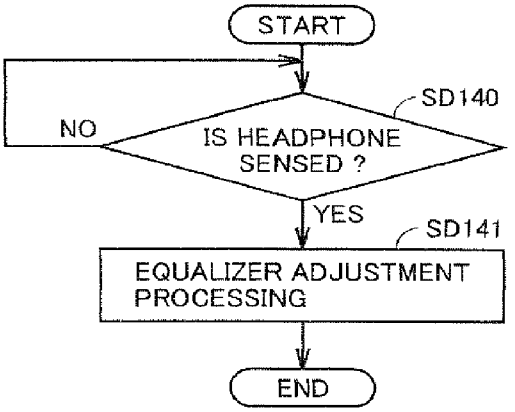

START
SD140
NO
IS HEADPHONE SENSED ?
YES
SD141
EQUALIZER ADJUSTMENT PROCESSING
END

FIG.86

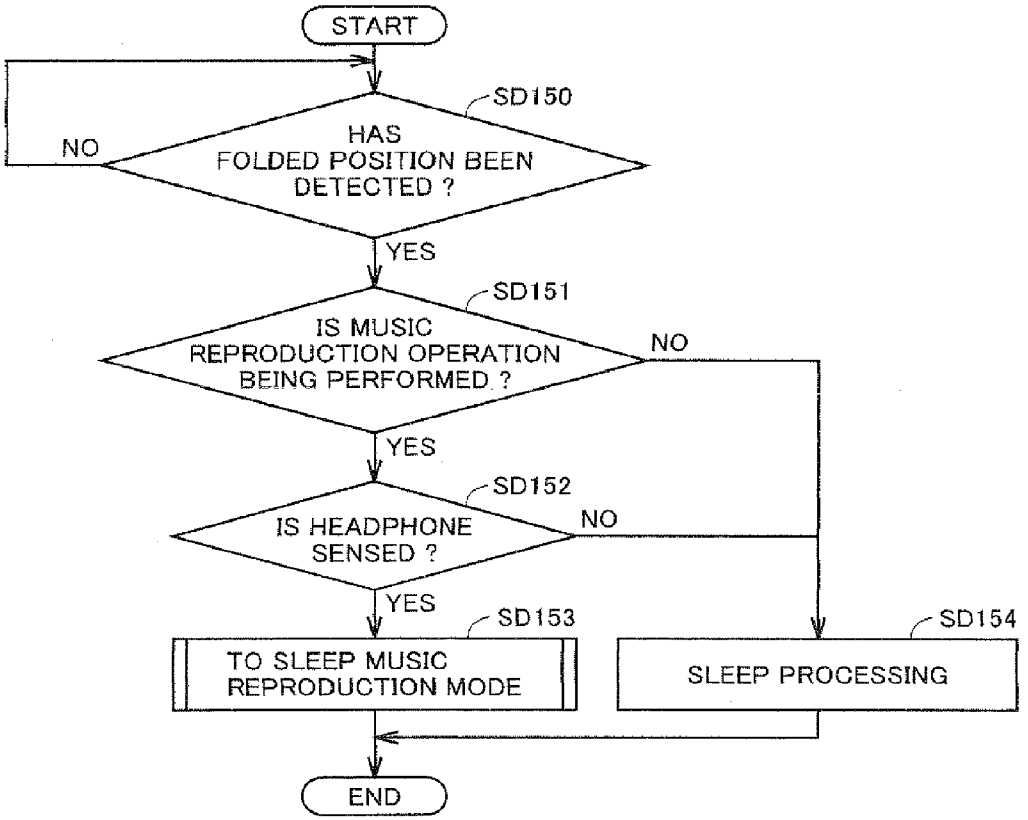

START
SD150
NO
HAS FOLDED POSITION BEEN DETECTED ?
YES
SD151
IS MUSIC REPRODUCTION OPERATION BEING PERFORMED ?
NO
YES
SD152
IS HEADPHONE SENSED ?
NO
YES
SD153
TO SLEEP MUSIC REPRODUCTION MODE
SD154
SLEEP PROCESSING
END

FIG.87

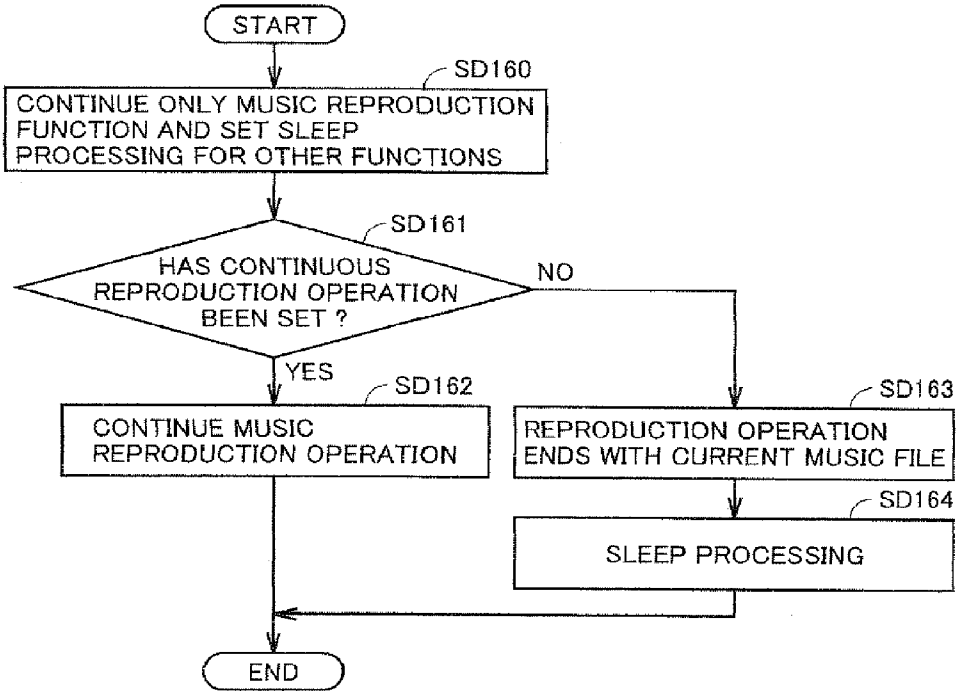

START
SD160
CONTINUE ONLY MUSIC REPRODUCTION FUNCTION AND SET SLEEP PROCESSING FOR OTHER FUNCTIONS
SD161
HAS CONTINUOUS REPRODUCTION OPERATION BEEN SET ?
NO
YES
SD162
CONTINUE MUSIC REPRODUCTION OPERATION
SD163
REPRODUCTION OPERATION ENDS WITH CURRENT MUSIC FILE
SD164
SLEEP PROCESSING
END

FIG.88

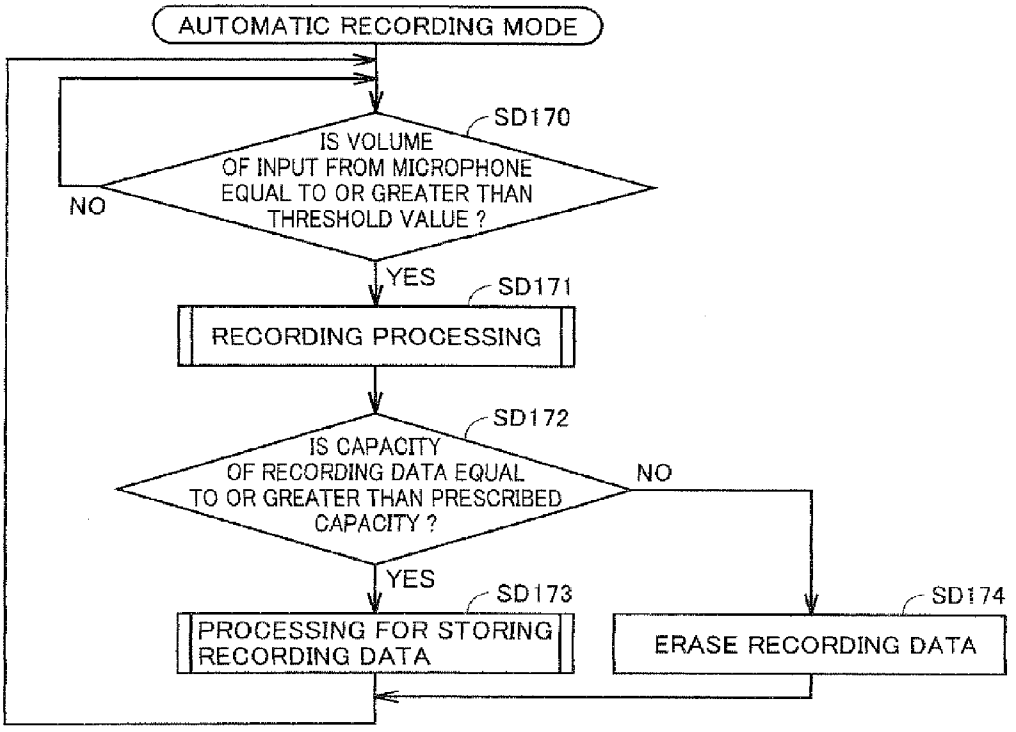

AUTOMATIC RECORDING MODE
SD170
IS VOLUME OF INPUT FROM MICROPHONE EQUAL TO OR GREATER THAN THRESHOLD VALUE ?
NO
YES
SD171
RECORDING PROCESSING
SD172
IS CAPACITY OF RECORDING DATA EQUAL TO OR GREATER THAN PRESCRIBED CAPACITY ?
NO
YES
SD173
PROCESSING FOR STORING RECORDING DATA
SD174
ERASE RECORDING DATA

FIG.89

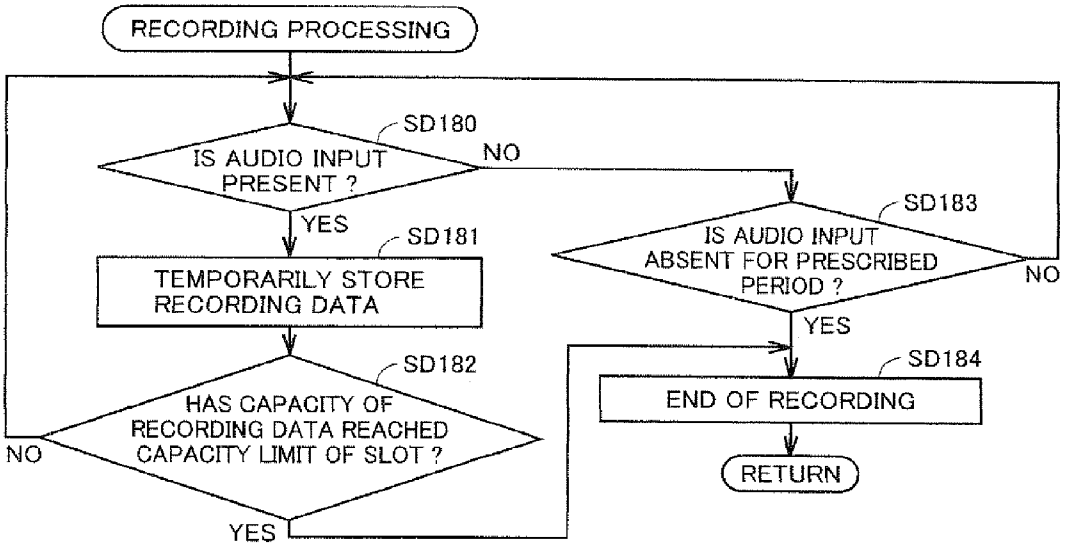

RECORDING PROCESSING
SD180
IS AUDIO INPUT PRESENT ?
NO
YES
SD181
TEMPORARILY STORE RECORDING DATA
SD182
HAS CAPACITY OF RECORDING DATA REACHED CAPACITY LIMIT OF SLOT ?
NO
YES
SD183
IS AUDIO INPUT ABSENT FOR PRESCRIBED PERIOD ?
NO
YES
SD184
END OF RECORDING
RETURN

FIG.90

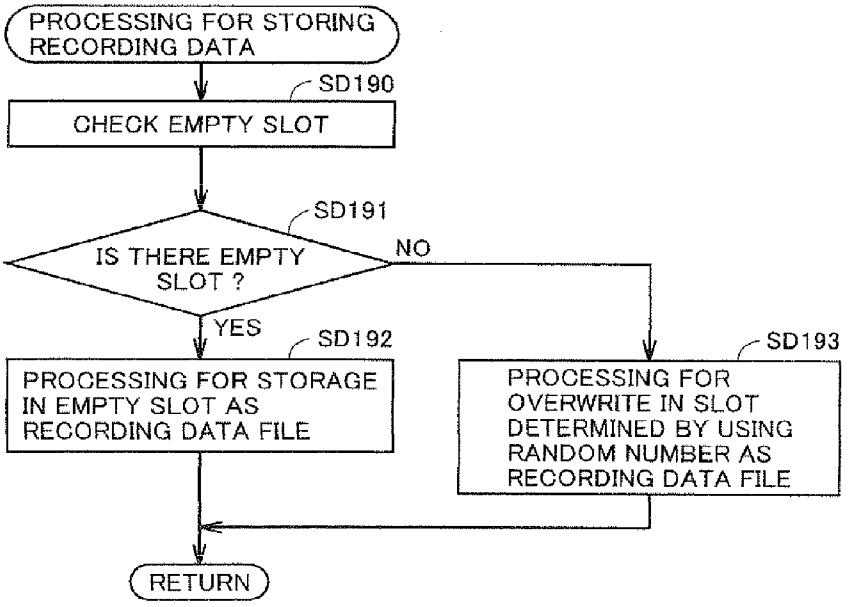

PROCESSING FOR STORING RECORDING DATA
SD190
CHECK EMPTY SLOT
SD191
IS THERE EMPTY SLOT ?
NO
YES
SD192
PROCESSING FOR STORAGE IN EMPTY SLOT AS RECORDING DATA FILE
SD193
PROCESSING FOR OVERWRITE IN SLOT DETERMINED BY USING RANDOM NUMBER AS RECORDING DATA FILE
RETURN

FIG.91

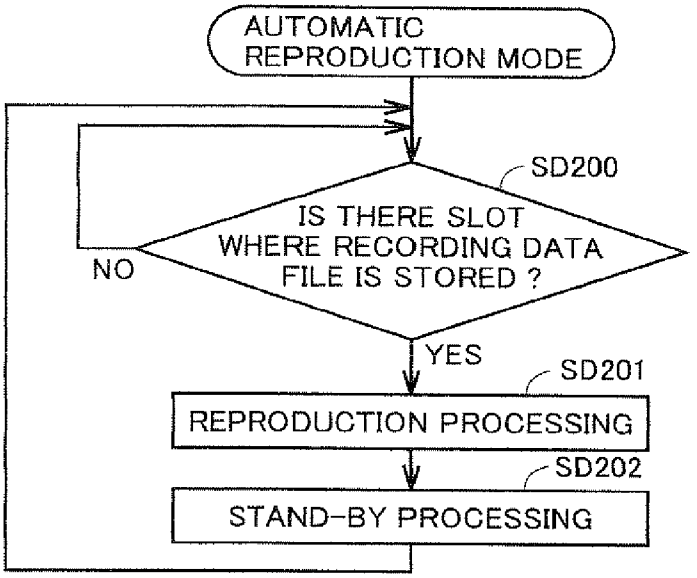

AUTOMATIC REPRODUCTION MODE
SD200
IS THERE SLOT WHERE RECORDING DATA FILE IS STORED ?
NO
YES
SD201
REPRODUCTION PROCESSING
SD202
STAND-BY PROCESSING

FIG.92

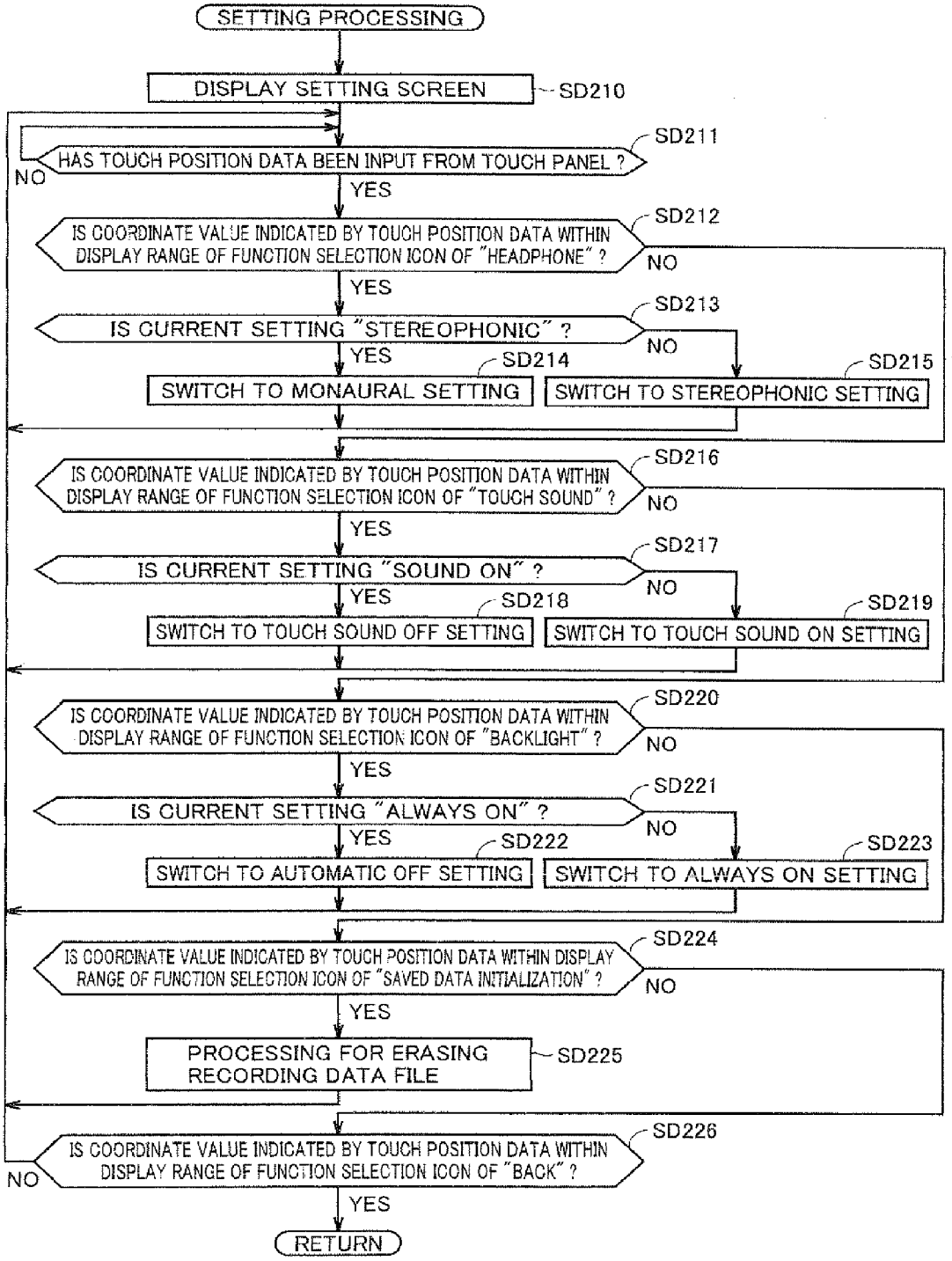

SETTING PROCESSING
DISPLAY SETTING SCREEN
SD210
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
SD211
NO
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF FUNCTION SELECTION ICON OF "HEADPHONE" ?
SD212
NO
YES
IS CURRENT SETTING "STEREOPHONIC" ?
SD213
NO
YES
SWITCH TO MONAURAL SETTING
SD214
SWITCH TO STEREOPHONIC SETTING
SD215
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF FUNCTION SELECTION ICON OF "TOUCH SOUND" ?
SD216
NO
YES
IS CURRENT SETTING "SOUND ON" ?
SD217
NO
YES
SWITCH TO TOUCH SOUND OFF SETTING
SD218
SWITCH TO TOUCH SOUND ON SETTING
SD219
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF FUNCTION SELECTION ICON OF "BACKLIGHT" ?
SD220
NO
YES
IS CURRENT SETTING "ALWAYS ON" ?
SD221
NO
YES
SWITCH TO AUTOMATIC OFF SETTING
SD222
SWITCH TO ALWAYS ON SETTING
SD223
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF FUNCTION SELECTION ICON OF "SAVED DATA INITIALIZATION" ?
SD224
NO
YES
PROCESSING FOR ERASING RECORDING DATA FILE
SD225
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF FUNCTION SELECTION ICON OF "BACK" ?
SD226
NO
YES
RETURN

FIG.93

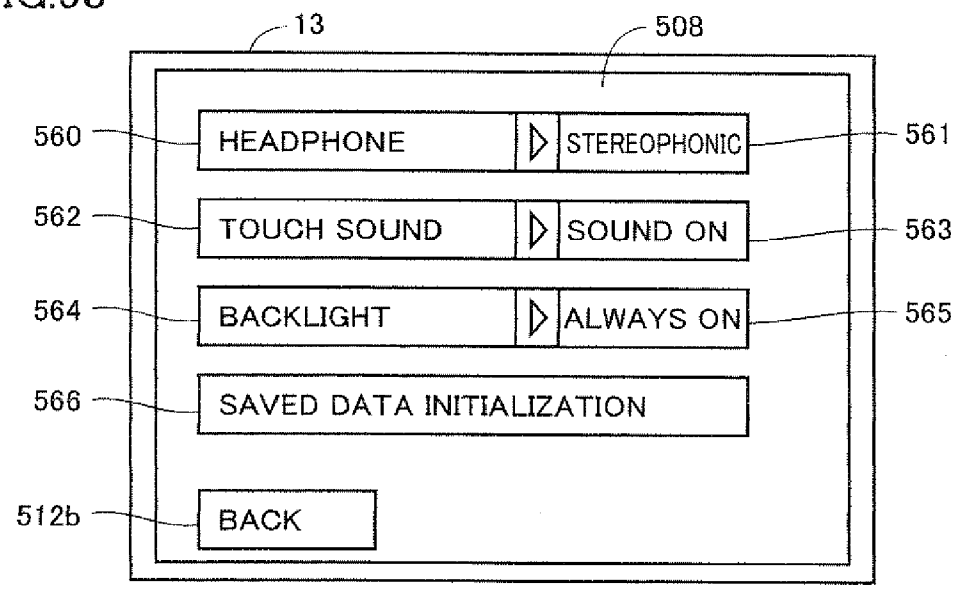

13
508
560
HEADPHONE
STEREOPHONIC
561
562
TOUCH SOUND
SOUND ON
563
564
BACKLIGHT
ALWAYS ON
565
566
SAVED DATA INITIALIZATION
512b
BACK

FIG.94

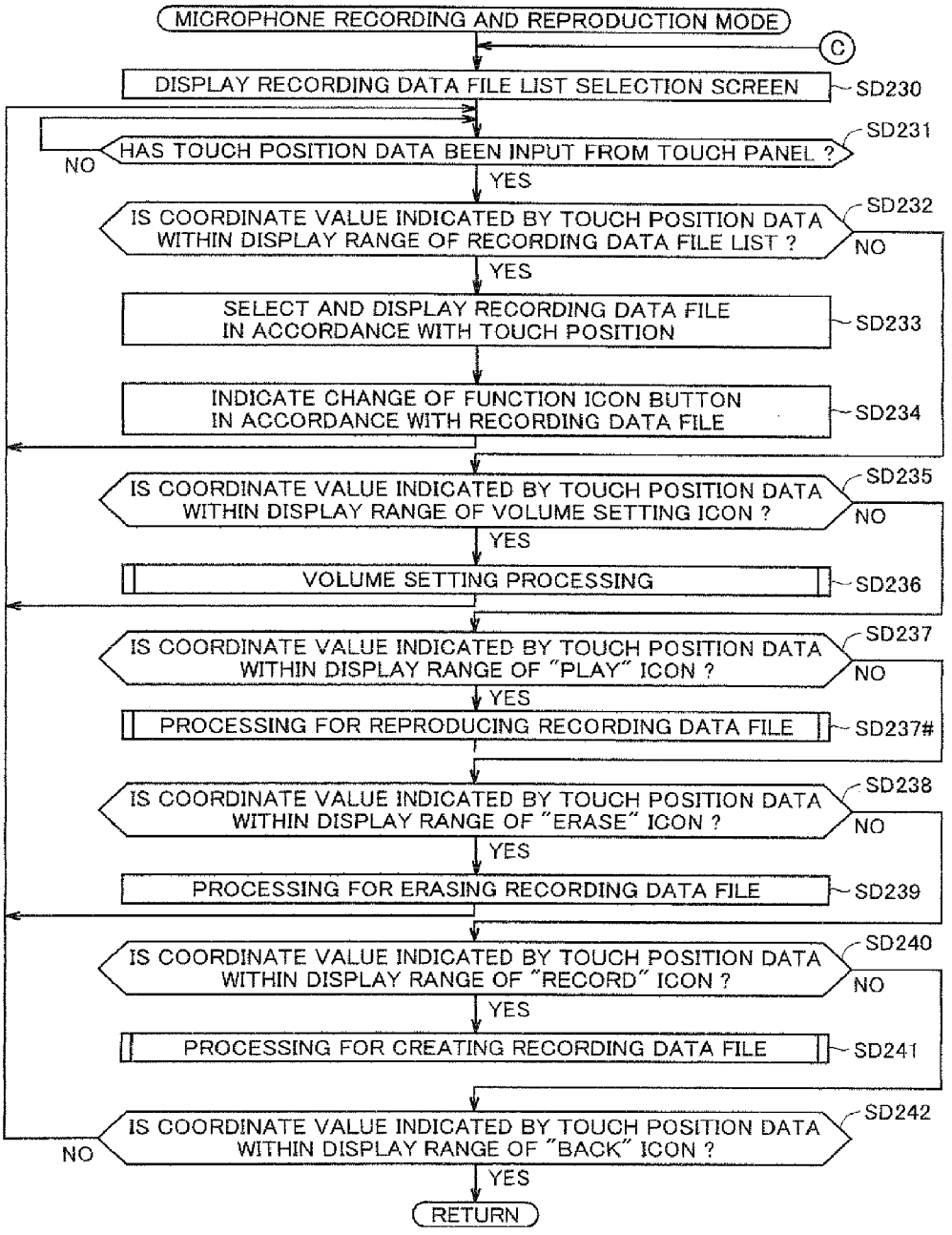

MICROPHONE RECORDING AND REPRODUCTION MODE
C
DISPLAY RECORDING DATA FILE LIST SELECTION SCREEN
SD230
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
SD231
NO
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF RECORDING DATA FILE LIST ?
SD232
NO
YES
SELECT AND DISPLAY RECORDING DATA FILE IN ACCORDANCE WITH TOUCH POSITION
SD233
INDICATE CHANGE OF FUNCTION ICON BUTTON IN ACCORDANCE WITH RECORDING DATA FILE
SD234
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF VOLUME SETTING ICON ?
SD235
NO
YES
VOLUME SETTING PROCESSING
SD236
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "PLAY" ICON ?
SD237
NO
YES
PROCESSING FOR REPRODUCING RECORDING DATA FILE
SD237#
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "ERASE" ICON ?
SD238
NO
YES
PROCESSING FOR ERASING RECORDING DATA FILE
SD239
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "RECORD" ICON ?
SD240
NO
YES
PROCESSING FOR CREATING RECORDING DATA FILE
SD241
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "BACK" ICON ?
SD242
NO
YES
RETURN

FIG.95

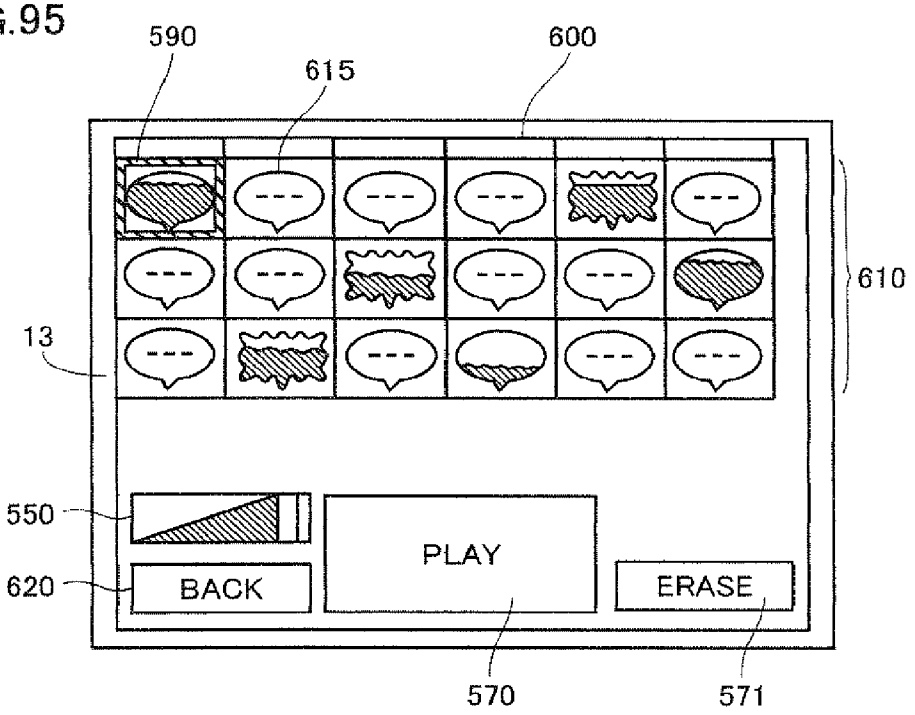


FIG.96

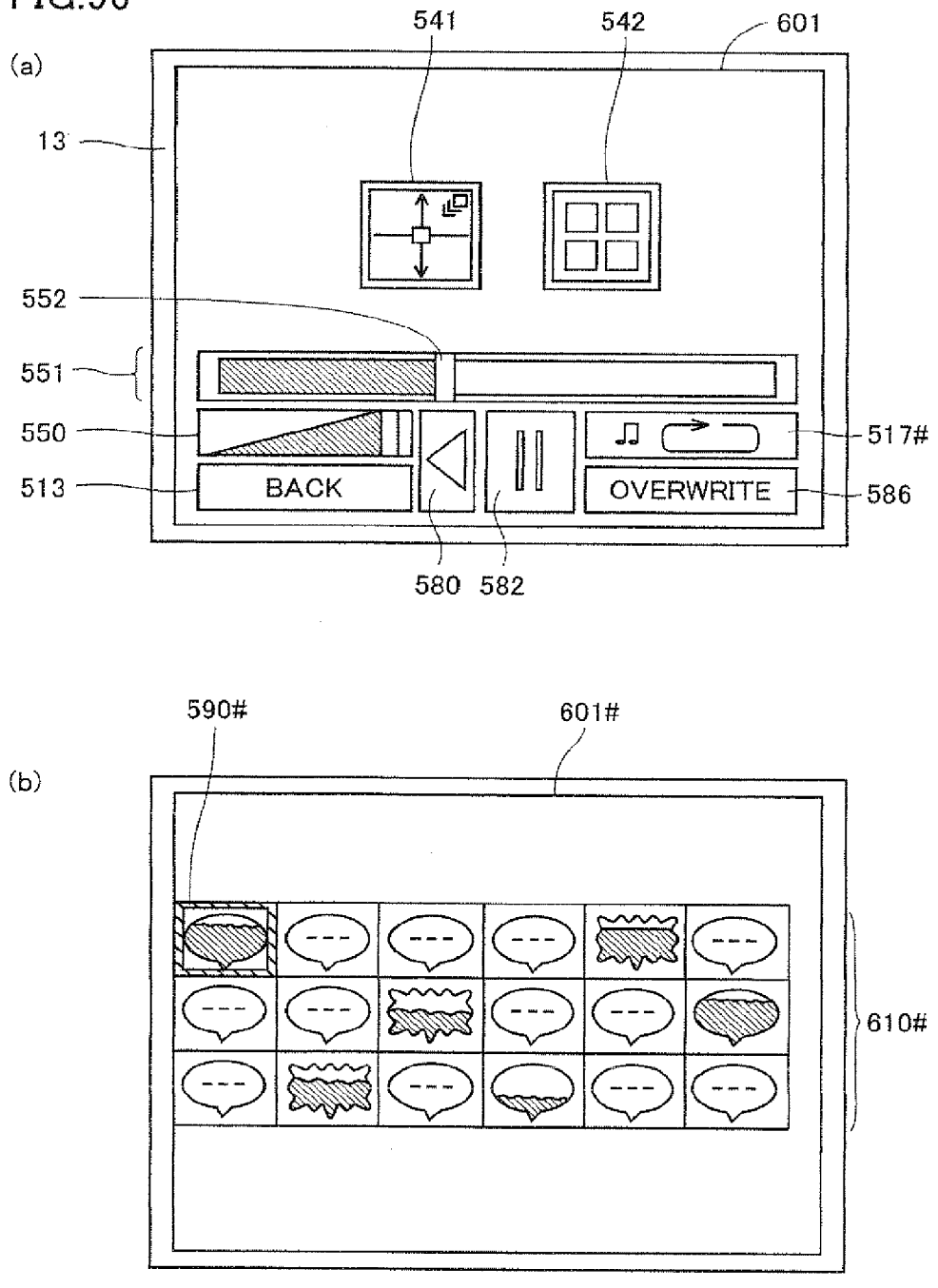

(a)
541
542
601
13
552
551
550
513
BACK
517#
OVERWRITE
586
580
582
(b)
590#
601#
610#

FIG.97

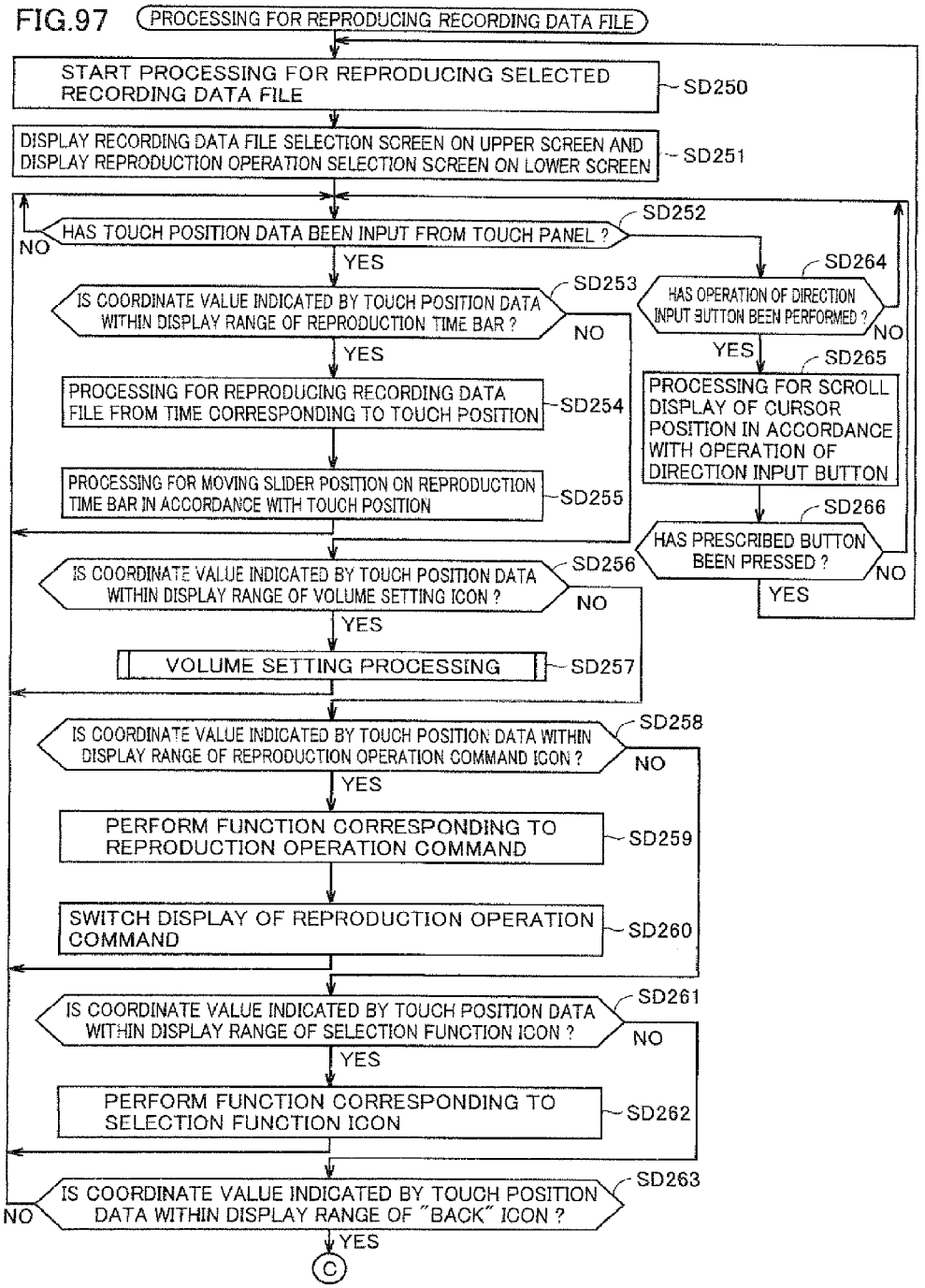

PROCESSING FOR REPRODUCING RECORDING DATA FILE
START PROCESSING FOR REPRODUCING SELECTED RECORDING DATA FILE
SD250
DISPLAY RECORDING DATA FILE SELECTION SCREEN ON UPPER SCREEN AND DISPLAY REPRODUCTION OPERATION SELECTION SCREEN ON LOWER SCREEN
SD251
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
SD252
NO
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF REPRODUCTION TIME BAR ?
SD253
NO
YES
PROCESSING FOR REPRODUCING RECORDING DATA FILE FROM TIME CORRESPONDING TO TOUCH POSITION
SD254
PROCESSING FOR MOVING SLIDER POSITION ON REPRODUCTION TIME BAR IN ACCORDANCE WITH TOUCH POSITION
SD255
HAS OPERATION OF DIRECTION INPUT BUTTON BEEN PERFORMED ?
SD264
NO
YES
PROCESSING FOR SCROLL DISPLAY OF CURSOR POSITION IN ACCORDANCE WITH OPERATION OF DIRECTION INPUT BUTTON
SD265
HAS PRESCRIBED BUTTON BEEN PRESSED ?
SD266
NO
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF VOLUME SETTING ICON ?
SD256
NO
YES
VOLUME SETTING PROCESSING
SD257
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF REPRODUCTION OPERATION COMMAND ICON ?
SD258
NO
YES
PERFORM FUNCTION CORRESPONDING TO REPRODUCTION OPERATION COMMAND
SD259
SWITCH DISPLAY OF REPRODUCTION OPERATION COMMAND
SD260
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF SELECTION FUNCTION ICON ?
SD261
NO
YES
PERFORM FUNCTION CORRESPONDING TO SELECTION FUNCTION ICON
SD262
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "BACK" ICON ?
SD263
NO
YES
C

FIG.98

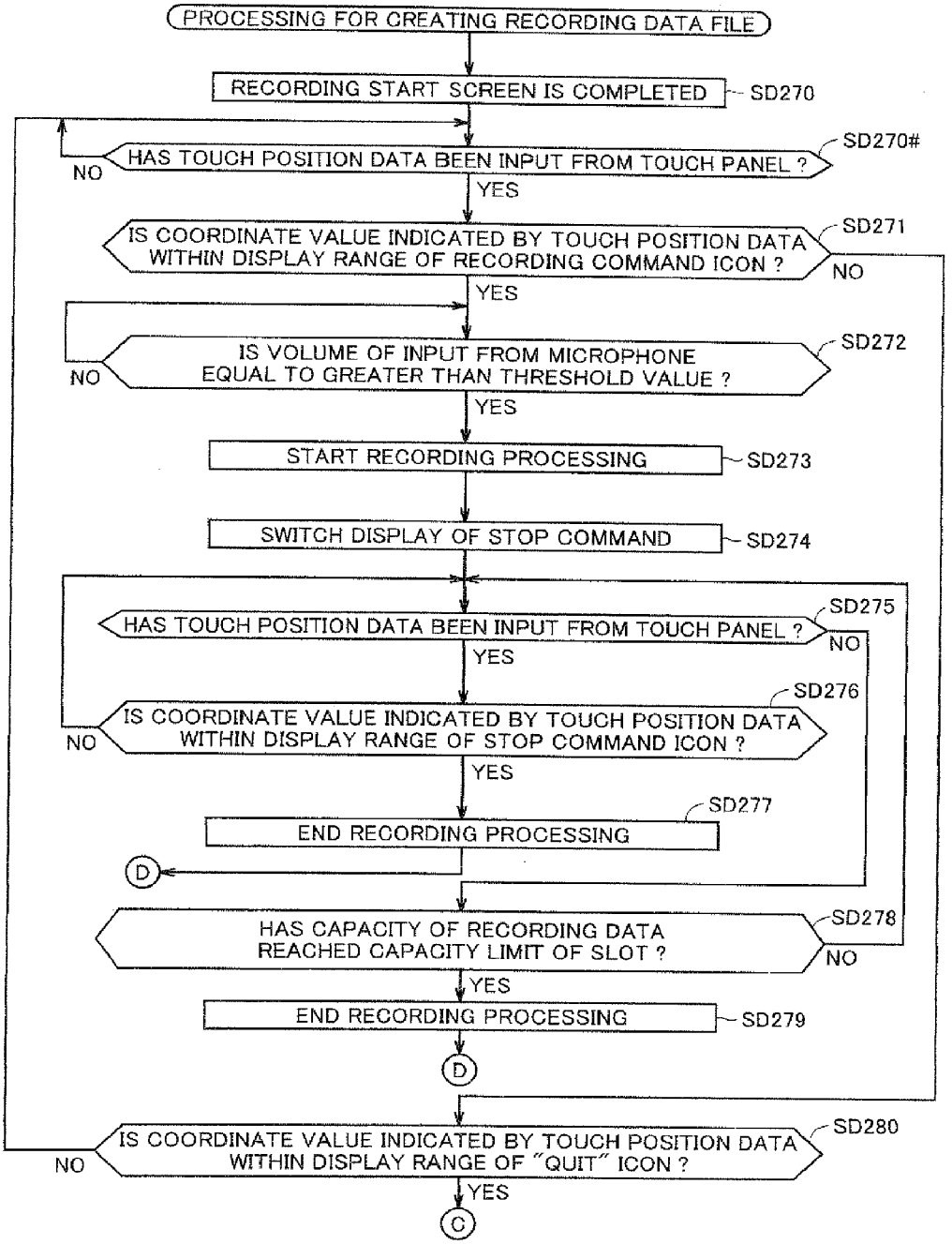

PROCESSING FOR CREATING RECORDING DATA FILE
RECORDING START SCREEN IS COMPLETED
SD270
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
SD270#
NO
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF RECORDING COMMAND ICON ?
SD271
NO
YES
IS VOLUME OF INPUT FROM MICROPHONE EQUAL TO GREATER THAN THRESHOLD VALUE ?
SD272
NO
YES
START RECORDING PROCESSING
SD273
SWITCH DISPLAY OF STOP COMMAND
SD274
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
SD275
NO
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF STOP COMMAND ICON ?
SD276
NO
YES
END RECORDING PROCESSING
SD277
D
HAS CAPACITY OF RECORDING DATA REACHED CAPACITY LIMIT OF SLOT ?
SD278
NO
YES
END RECORDING PROCESSING
SD279
D
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "QUIT" ICON ?
SD280
NO
YES
C

FIG.99

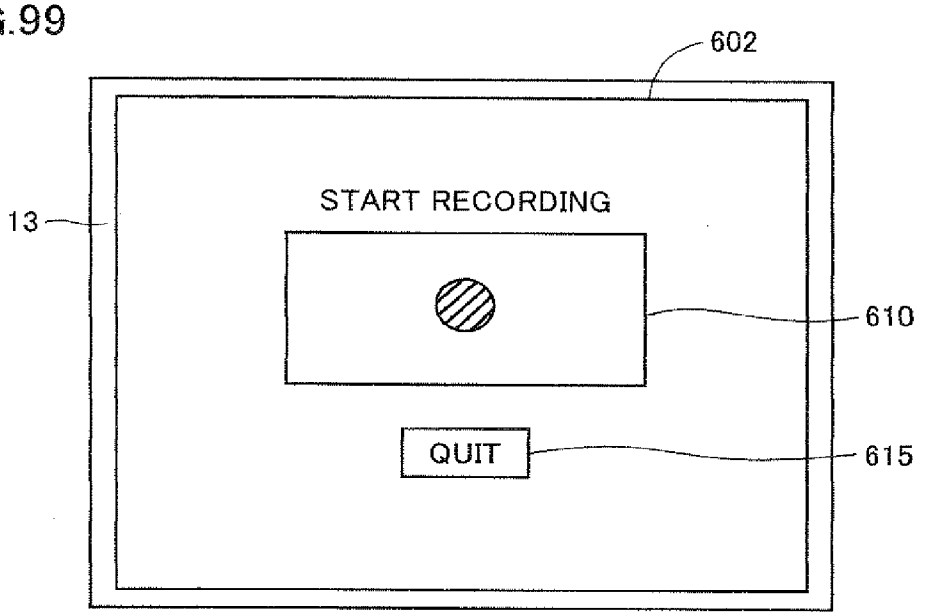


FIG.100

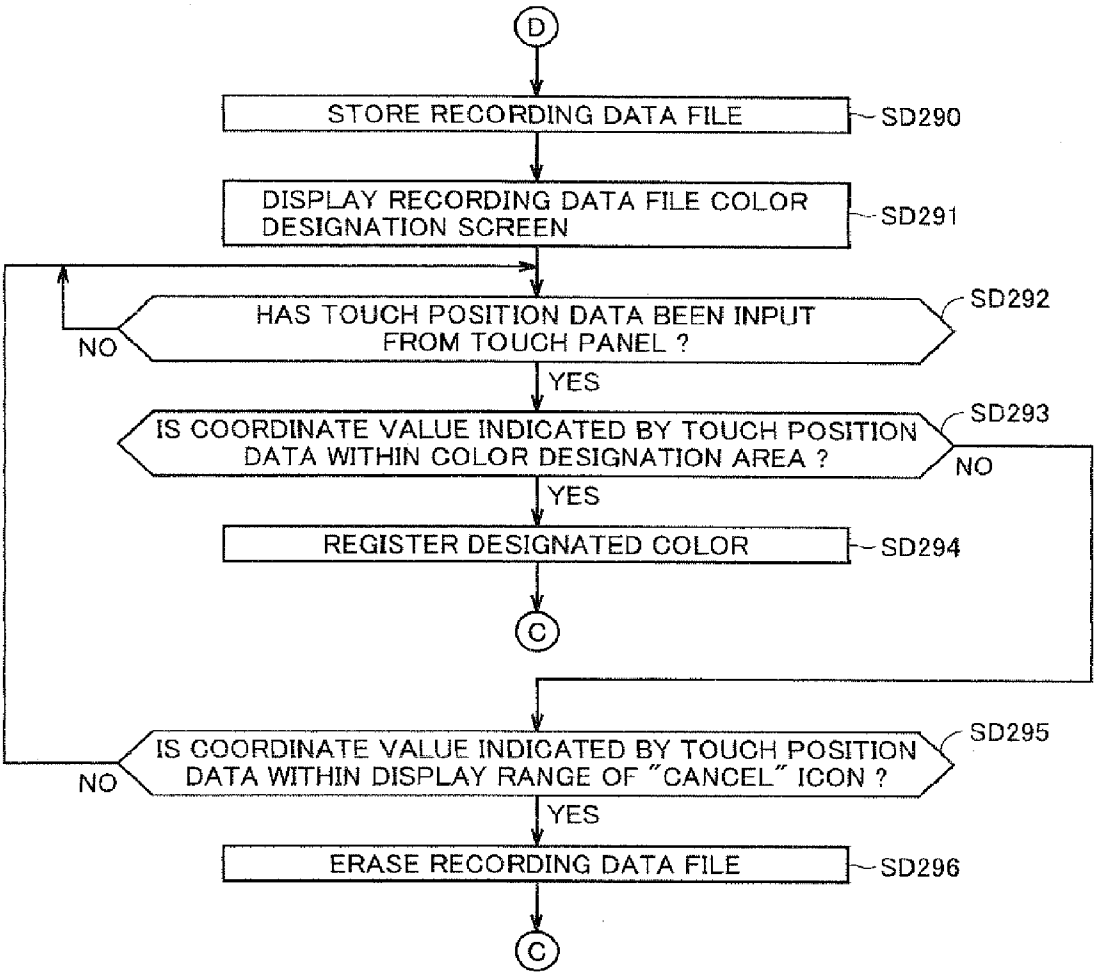

D
STORE RECORDING DATA FILE
SD290
DISPLAY RECORDING DATA FILE COLOR DESIGNATION SCREEN
SD291
HAS TOUCH POSITION DATA BEEN INPUT FROM TOUCH PANEL ?
SD292
NO
YES
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN COLOR DESIGNATION AREA ?
SD293
NO
YES
REGISTER DESIGNATED COLOR
SD294
C
IS COORDINATE VALUE INDICATED BY TOUCH POSITION DATA WITHIN DISPLAY RANGE OF "CANCEL" ICON ?
SD295
NO
YES
ERASE RECORDING DATA FILE
SD296
C

FIG.101

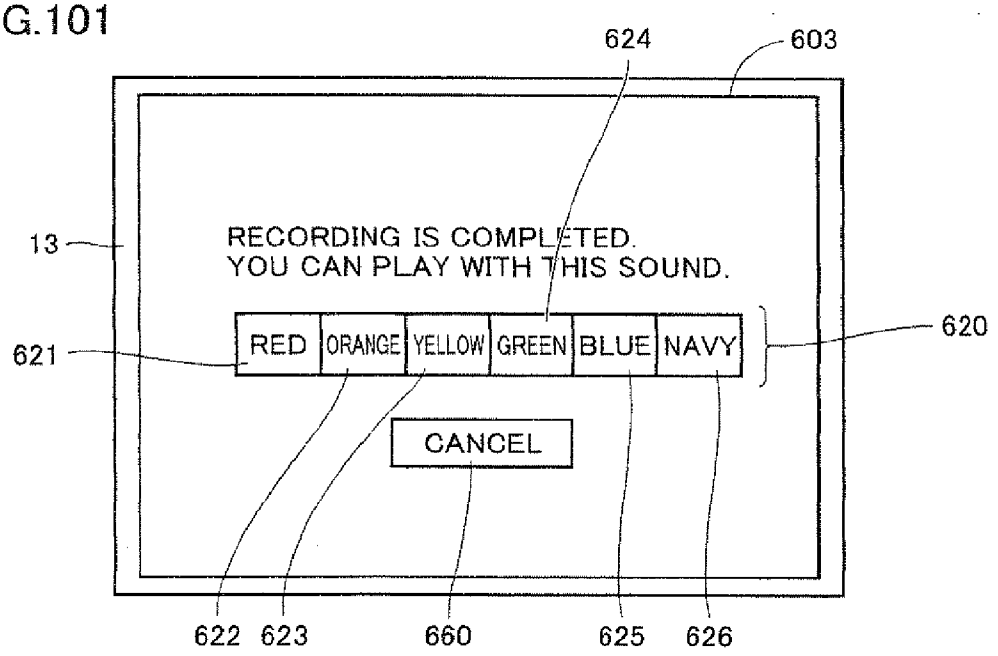


FIG.102

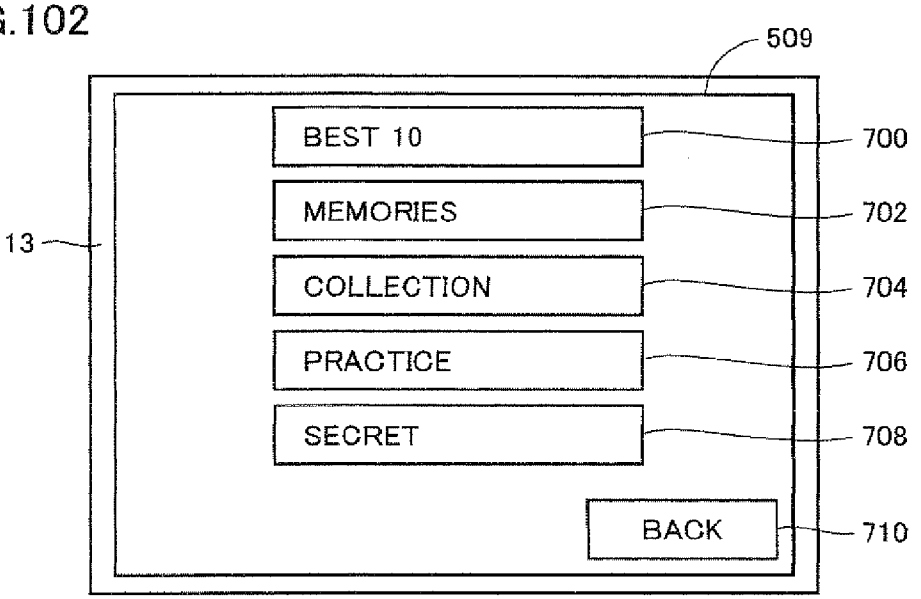
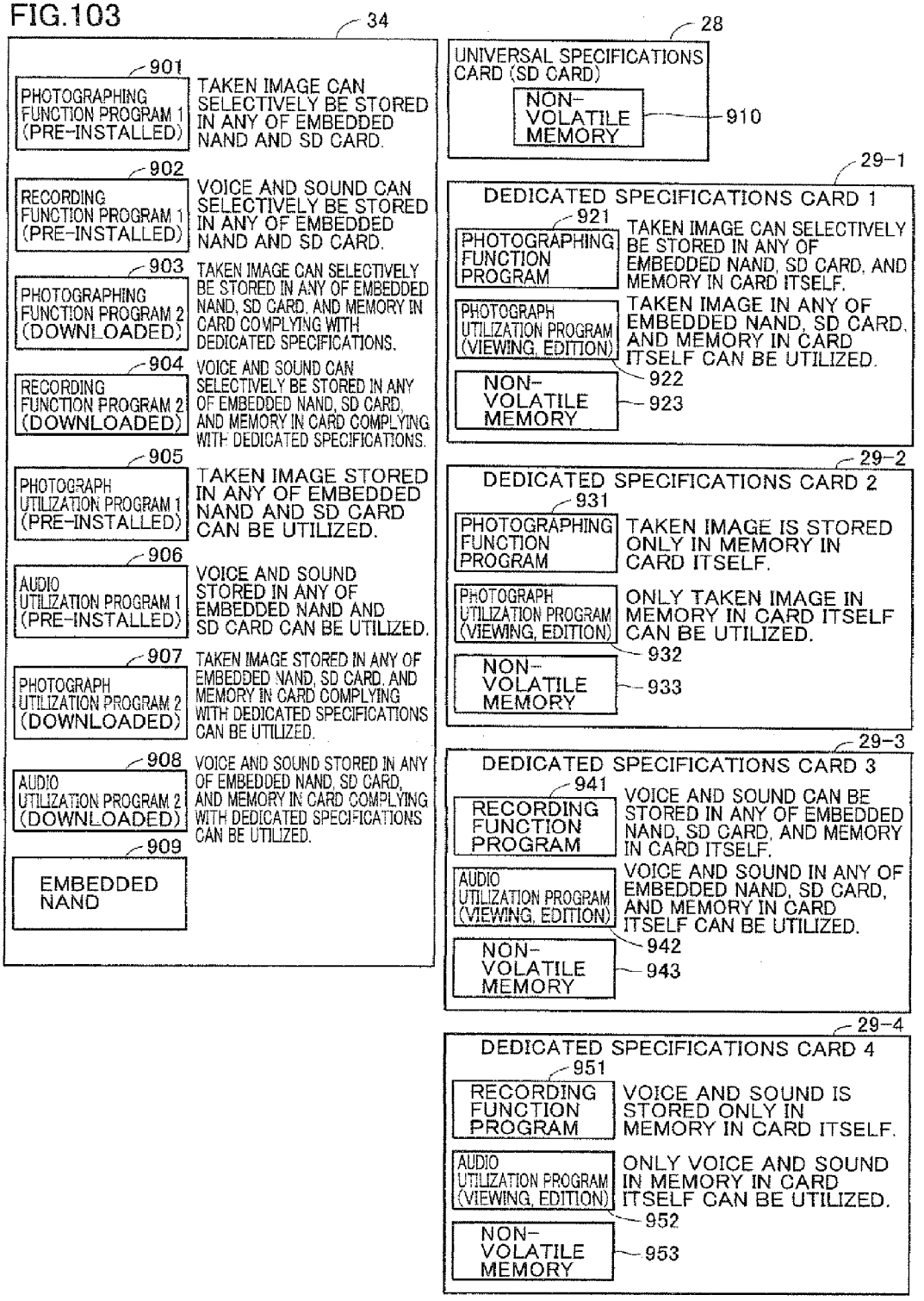


FIG.103


34
901
PHOTOGRAPHING FUNCTION PROGRAM 1 (PRE-INSTALLED)
TAKEN IMAGE CAN SELECTIVELY BE STORED IN ANY OF EMBEDDED NAND AND SD CARD.
902
RECORDING FUNCTION PROGRAM 1 (PRE-INSTALLED)
VOICE AND SOUND CAN SELECTIVELY BE STORED IN ANY OF EMBEDDED NAND AND SD CARD.
903
PHOTOGRAPHING FUNCTION PROGRAM 2 (DOWNLOADED)
TAKEN IMAGE CAN SELECTIVELY BE STORED IN ANY OF EMBEDDED NAND, SD CARD, AND MEMORY IN CARD COMPLYING WITH DEDICATED SPECIFICATIONS.
904
RECORDING FUNCTION PROGRAM 2 (DOWNLOADED)
VOICE AND SOUND CAN SELECTIVELY BE STORED IN ANY OF EMBEDDED NAND, SD CARD, AND MEMORY IN CARD COMPLYING WITH DEDICATED SPECIFICATIONS.
905
PHOTOGRAPH UTILIZATION PROGRAM 1 (PRE-INSTALLED)
TAKEN IMAGE STORED IN ANY OF EMBEDDED NAND AND SD CARD CAN BE UTILIZED.
906
AUDIO UTILIZATION PROGRAM 1 (PRE-INSTALLED)
VOICE AND SOUND STORED IN ANY OF EMBEDDED NAND AND SD CARD CAN BE UTILIZED.
907
PHOTOGRAPH UTILIZATION PROGRAM 2 (DOWNLOADED)
TAKEN IMAGE STORED IN ANY OF EMBEDDED NAND, SD CARD, AND MEMORY IN CARD COMPLYING WITH DEDICATED SPECIFICATIONS CAN BE UTILIZED.
908
AUDIO UTILIZATION PROGRAM 2 (DOWNLOADED)
VOICE AND SOUND STORED IN ANY OF EMBEDDED NAND, SD CARD, AND MEMORY IN CARD COMPLYING WITH DEDICATED SPECIFICATIONS CAN BE UTILIZED.
909
EMBEDDED NAND
28
UNIVERSAL SPECIFICATIONS CARD (SD CARD)
NON-VOLATILE MEMORY
910
29-1
DEDICATED SPECIFICATIONS CARD 1
921
PHOTOGRAPHING FUNCTION PROGRAM
TAKEN IMAGE CAN SELECTIVELY BE STORED IN ANY OF EMBEDDED NAND, SD CARD, AND MEMORY IN CARD ITSELF.
PHOTOGRAPH UTILIZATION PROGRAM (VIEWING, EDITION)
TAKEN IMAGE IN ANY OF EMBEDDED NAND, SD CARD, AND MEMORY IN CARD ITSELF CAN BE UTILIZED.
922
NON-VOLATILE MEMORY
923
29-2
DEDICATED SPECIFICATIONS CARD 2
931
PHOTOGRAPHING FUNCTION PROGRAM
TAKEN IMAGE IS STORED ONLY IN MEMORY IN CARD ITSELF.
PHOTOGRAPH UTILIZATION PROGRAM (VIEWING, EDITION)
ONLY TAKEN IMAGE IN MEMORY IN CARD ITSELF CAN BE UTILIZED.
932
NON-VOLATILE MEMORY
933
29-3
DEDICATED SPECIFICATIONS CARD 3
941
RECORDING FUNCTION PROGRAM
VOICE AND SOUND CAN BE STORED IN ANY OF EMBEDDED NAND, SD CARD, AND MEMORY IN CARD ITSELF.
AUDIO UTILIZATION PROGRAM (VIEWING, EDITION)
VOICE AND SOUND IN ANY OF EMBEDDED NAND, SD CARD, AND MEMORY IN CARD ITSELF CAN BE UTILIZED.
942
NON-VOLATILE MEMORY
943
29-4
DEDICATED SPECIFICATIONS CARD 4
951
RECORDING FUNCTION PROGRAM
VOICE AND SOUND IS STORED ONLY IN MEMORY IN CARD ITSELF.
AUDIO UTILIZATION PROGRAM (VIEWING, EDITION)
ONLY VOICE AND SOUND IN MEMORY IN CARD ITSELF CAN BE UTILIZED.
952
NON-VOLATILE MEMORY
953

DEVICE INCLUDING TOUCHSCREEN

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a divisional of application Ser. No. 12/531,586, filed Sep. 16, 2009, which is the national stage of PCT/JP2008/067864, filed Oct. 1, 2008. The contents of each of these applications are incorporated herein in their entirety.

BACKGROUND AND SUMMARY

[0002] The present invention relates to an information processing device, an information processing system, and a launch program and a storage medium storing the same. More particularly, the present invention relates to a configuration capable of providing a photographing function and/or a voice and sound obtaining function.

[0003] For example, Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1) discloses a portable telephone as a prior portable information processing device having a photographing function. This portable telephone adopts foldable arrangement, in which a display screen is provided on an inner surface of each of two housings. In this portable phone, two cameras serving as image pick-up means are provided in an outer surface and an inner surface of an upper housing, respectively.

[0004] In addition, a portable instrument described in Japanese Patent Laying-Open No. 2004-274304 (Patent Document 2) has a camera and a microphone, in which a screen is provided on each of two surfaces of a housing (casing).

[0005] Moreover, for example, Japanese Patent Laying-Open No. 2007-195830 (Patent Document 3) also discloses an information processing device including two housings that are foldably connected to each other as a portable information processing device adopting foldable arrangement. This information processing device has a display screen on an inner surface of each housing (which is a surface located inside when the information processing device is folded) (two display screens in total).

[0006] Further, Japanese Patent Laying-Open No. 2001-142564 (Patent Document 4) discloses information equipment containing a camera. This information equipment includes a body unit and a display unit pivotably connected to each other by a hinge block. In this information equipment, the camera is arranged in the hinge block.

[0007] In addition, prior arts as listed below have been known.

[0008] Patent Document 1: Japanese Patent Laying-Open No. 2006-311224

[0009] Patent Document 2: Japanese Patent Laying-Open No. 2004-274304

[0010] Patent Document 3: Japanese Patent Laying-Open No. 2007-195830

[0011] Patent Document 4: Japanese Patent Laying-Open No. 2001-142564

[0012] Patent Document 5: Japanese Patent Laying-Open No. 04-156791

[0013] Patent Document 6: Japanese Patent Laying-Open No. 06-276478

[0014] Patent Document 7: Japanese Patent Laying-Open No. 01-297986

[0015] Patent Document 8: Japanese Patent Laying-Open No. 2002-125176

[0016] Patent Document 9: Japanese Patent Laying-Open No. 2004-320091

[0017] Patent Document 10: Japanese Patent Laying-Open No. 2003-333149

[0018] Patent Document 11: Japanese Patent Laying-Open No. 2005-184060

[0019] Patent Document 12: Japanese Patent Laying-Open No. 2007-201727

[0020] Patent Document 13: Japanese Patent Laying-Open No. 09-247634

[0021] Patent Document 14: Japanese Patent Laying-Open No. 10-341388

[0022] Patent Document 15: Japanese Patent Laying-Open No. 2000-56756

[0023] Non-Patent Document 1: "Chotto Shot Camera Instruction Manual," Sony Computer Entertainment Inc., Nov. 2, 2006

[0024] In the portable instruments disclosed in Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1) and Japanese Patent Laying-Open No. 2004-274304 (Patent Document 2), however, the camera serving as the image pick-up means and the microphone serving as the audio input means have not been arranged at positions suitable for the photographing function and the voice and sound obtaining function, respectively.

[0025] In addition, the information processing device disclosed in Japanese Patent Laying-Open No. 2007-195830 (Patent Document 3) has not at all taken into account the photographing function, and the information equipment disclosed in Japanese Patent Laying-Open No. 2001-142564 (Patent Document 4) has not at all taken into account the voice and sound obtaining function.

[0026] Another problem is as follows. In a configuration to cause a computer to execute various programs, various storage media storing programs have been proposed. Here, none of the prior arts discloses or suggests a concept to execute in coordination a program stored in a storage medium embedded in a computer main body (information processing device) and a program stored in a storage medium attached to the computer.

[0027] Yet another problem is as follows. In a configuration to provide a user with a menu screen for selecting a program to be launched from among a plurality of application programs (what is called a launcher function), none of the prior arts discloses or suggests a concept to simultaneously provide a function other than the launcher function.

[0028] The present invention was made to solve at least one of these problems. A first object of the present invention is to provide an information processing device having a structure suitable for a photographing function and/or a voice and sound obtaining function. In addition, a second object of the present invention is to provide an information processing system capable of executing in coordination a program stored in a storage medium embedded in a main body and a program stored in an externally attached storage medium. Moreover, a third object of the present invention is to provide a launch program suitable for an information processing device having a photographing function, and a storage medium storing the program.

[0029] The present invention adopts the following features in order to solve the problems above. It is noted that reference characters, step numbers, supplementary explanations, and the like in parentheses in this section are merely provided to facilitate understanding of the present invention in relation to

embodiments which will be described later, rather than limiting the scope of the present invention in any manner.

[0030] According to one aspect of the present invention, an information processing device (**10**) constituted of a plurality of housings (**11**, **21**) so that the device can be opened and closed is provided. The information processing device (**10**) includes: image pick-up means (**23**) and audio input means (**21**C, **42**) provided in a coupling portion of the plurality of housings; storage means (**34**); image pick-up data obtaining means (**31**, SA**50**) for obtaining image pick-up data with the image pick-up means; image pick-up data storage control means (**31**, SA**54**) for causing the storage means to store the image pick-up data obtained by the data obtaining means; audio data obtaining means (**31**, SD**171**) for obtaining audio data through the audio input means; and audio data storage control means (**33**, SD**173**) for causing the storage means to store the audio data obtained by the audio data obtaining means.

[0031] Here, the image pick-up data includes a still image and a moving image. Moreover, arrangement allowing opening and closing includes not only a foldable type which will be described later but also a sliding type, a rotatable type, and a combination thereof. The information processing device in the subject application can be in various states between a state in which a prescribed surface of at least one housing is hidden by another housing and a state in which the prescribed surface thereof is exposed, as a result of folding, sliding, and rotation. In particular, in an example where a display portion is provided in the prescribed surface, the information processing device may be in various states between a display portion hidden state and a display portion exposed state, as a result of folding, sliding, and rotation.

[0032] According to this aspect, the image pick-up means (**23**) and the audio input means (**21**C, **42**) are provided in the coupling portion of the plurality of housings (**11**, **21**), so that they can maintain substantially the same positional relation without being affected by an angle between the housings. Thus, regardless of usage of the information processing device, relative positional relation of the image pick-up means (**23**) and the audio input means (**21**C, **42**) with respect to the user is maintained substantially constant, and hence a photographing operation and/or a voice and sound obtaining operation can always be appropriate.

[0033] In addition, according to this aspect, as the image pick-up means (**23**) and the audio input means (**21**C, **42**) are provided in the coupling portion, the user can also perform the photographing operation and/or the voice and sound obtaining operation by holding only any one of the plurality of housings (**11**, **21**) with one hand, or perform the photographing operation and/or the voice and sound obtaining operation in a more stable manner by holding both housings (**11**, **21**) with both hands. Thus, use adapted to a situation for photographing and/or obtaining voice and sound can be achieved.

[0034] Preferably, the information processing device (**10**) further includes image pick-up data reproduction means (**31**, SA**41**) for reproducing the image pick-up data stored in the storage means. Thus, the image pick-up data obtained as a result of photographing can immediately be checked.

[0035] Preferably, the information processing device (**10**) further includes image pick-up data edition means (**31**, SA**58**) for editing the image pick-up data stored in the storage means. Thus, the user can subject the image pick-up data obtained as a result of photographing to a desired edition operation for fun.

[0036] Preferably, the information processing device (**10**) further includes audio data reproduction means (**31**, SD**76**#) for reproducing the audio data stored in the storage means. Thus, the user can immediately check the obtained audio data.

[0037] Preferably, the information processing device (**10**) further includes audio data edition means (**31**, SD**262**) for editing the audio data stored in the storage means. Thus, the user can subject the obtained audio data to a desired edition operation for fun.

[0038] Preferably, the information processing device (**10**) further includes: near field communication means (**38**); image pick-up data transmission control means (**31**, SC**52**) for transmitting the image pick-up data stored in the storage means to another information processing device through the near field communication means; and image pick-up data reception control means (**31**, SC**53**) for receiving the image pick-up data from another information processing device through the near field communication means and causing the storage means to store the image pick-up data.

[0039] According to this preferred aspect, the image pick-up data obtained as a result of photographing can be exchanged among users having information processing devices of the same type. Thus, the same image pick-up data can be shared in a group for fun, or the image pick-up data obtained as a result of photographing can be distributed to another user for fun.

[0040] Preferably, the information processing device (**10**) further includes opening and closing detection means (**50**) for detecting opening and closing, and each time the opening and closing detection means detects opening and closing, the image pick-up data reproduction means has a picked-up image displayed based on different image pick-up data in the image pick-up data stored in the storage means (SA**73**). It is noted that the picked-up image is displayed on the display portion that can be in various states between the hidden state and the exposed state as a result of folding, sliding, and rotation.

[0041] According to this preferred aspect, each time the information processing device is opened and closed, displayed image pick-up data is varied, so that the user can look forward to an image displayed at the time when he/she opens the information processing device.

[0042] Preferably, the storage means further stores an image pick-up data obtaining program (**53**) causing a computer representing the information processing device to function as the image pick-up data obtaining means and the image pick-up data storage control means, and an audio data obtaining program (**57**) causing the computer representing the information processing device to function as the audio data obtaining means and the audio data storage control means. The information processing device (**10**) further includes launch control means (**31**, SA**5** to SA**13**) for selecting any of at least the image pick-up data obtaining program and the audio data obtaining program and launching the selected program when the information processing device is started up, and the launch control means has a function (**31**, SA**10**) to obtain the image pick-up data with the image pick-up means and cause the storage means to store the image-pick-up data.

[0043] According to this preferred aspect, in an environment where execution of at least the image pick-up data

obtaining program (**53**) and the audio data obtaining program (**57**) is permitted, the user can readily select and execute a desired program by using launch control means (**31**, SA**5** to SA**13**).

[0044] In addition, according to this preferred aspect, while the photographing function by photographing processing means is performed, the image pick-up data obtaining program (**53**) can directly be launched. Namely, as the photographing function provided by the image pick-up data obtaining program (**53**) can readily be launched from the photographing function provided by the photographing processing means, a user who has experienced the photographing function provided by the photographing processing means can be led to perform the photographing function provided by the image pick-up data obtaining program (**53**).

[0045] Preferably, the information processing device (**10**) further includes first operation means (**14**I, **14**J) provided on an upper surface of one housing out of the plurality of housings, on a side where another housing out of the plurality of housings is located when the information processing device is opened, and the image pick-up data recording means obtains the image pick-up data with the image pick-up means and causes the storage means to store the image pick-up data when the first operation means is operated.

[0046] According to this preferred aspect, the user can perform an operation to obtain image pick-up data by operating the first operation means (**14**I, **14**J) with his/her hand holding the information processing device. Namely, as the user can perform the operation to obtain image pick-up data while he/she holds the information processing device, the user can readily perform the photographing operation. Therefore, arrangement more suitable for a portable information processing device can be provided.

[0047] Preferably, the image pick-up means and the audio input means are provided around a center of the coupling portion. Thus, relative positional relation between the information processing device and the user can substantially be the same in an example where the user holds the information processing device only with his/her right hand and in an example where the user holds the information processing device only with his/her left hand.

[0048] Further preferably, the image pick-up means is provided in the center of the coupling portion and the audio input means is provided at a position offset from the center of the coupling portion. A range of image pick-up by the image pick-up means is determined depending on a location thereof, whereas a range of sound collection by the audio input means is relatively great. Therefore, by preferentially providing the image pick-up means in the center of the coupling portion, photographing in a more appropriate condition can be carried out.

[0049] Preferably, the information processing device (**10**) further includes display means (**12**, **22**) provided in each housing. Thus, an image or the like picked up by the image pick-up means can also be displayed.

[0050] Preferably, the housing is a horizontally long housing. By adopting the horizontally long housing, arrangement is suitable for user's eye movement.

[0051] Preferably, the information processing device (**10**) further includes first and second operation means (**14**A to **14**E) arranged on left and right of the display means respectively in one housing out of the plurality of housings, and first and second audio output means (**21**D, **45**, **47**) arranged on left and right of the display means respectively in another housing out of the plurality of housings.

[0052] According to this preferred aspect, voice and sound or the like obtained by the voice and sound obtaining means can be output.

[0053] Preferably, the information processing device (**10**) further includes connection means (**36**, **37**) for removably attaching a memory card (**28**, **29**). Thus, the memory card in which various types of programs, image pick-up data, or audio data have been stored can freely be attached, so that the information processing device can display or reproduce the data or arbitrarily store the obtained image pick-up data or audio data. Consequently, a degree of freedom and applications of the information processing device can remarkably be enhanced.

[0054] Further preferably, the image pick-up data storage control means can have the image pick-up data selectively stored in the storage means and the memory card.

[0055] Alternatively, further preferably, the audio data storage control means can have the audio data selectively stored in the storage means and the memory card.

[0056] According to these features, as the image pick-up data and/or the audio data can be stored in any storage medium depending on the number of pieces, a type, a size, and the like thereof, a degree of freedom for the user can be enhanced. In addition, the memory card stores the image pick-up data and/or the audio data, so that the image pick-up data and/or the audio data can also be output to a device different from the information processing device.

[0057] Preferably, the information processing device further includes embedded storage means storing a program for causing a computer representing the information processing device to function as the image pick-up data obtaining means and the image pick-up data storage control means, so that the computer representing the information processing device can execute the program. Thus, the information processing device alone can provide the user with the photographing function without external attachment of a memory or the like.

[0058] Further preferably, the information processing device reads an application program stored in the memory card, so that a computer representing the information processing device can execute the application program. Thus, the information processing device can selectively execute a wide variety of application programs regardless of a limited capacity of the embedded storage means.

[0059] An information processing system according to another aspect of the present invention includes: the information processing device above; and the memory card storing as the application program, a program for causing the computer representing the information processing device to function as the image pick-up data obtaining means and the image pick-up data storage control means, in which data can be written, and the image pick-up data storage control means can have the image pick-up data selectively stored in any of the storage means and the memory card.

[0060] According to the information processing system according to this aspect, as the user can have the image pick-up data selectively stored in the embedded storage means and an externally attached memory card, a storage medium in accordance with a situation can be used.

[0061] An information processing system according to yet another aspect of the present invention includes: the information processing device above; and the memory card storing as the application program, a program for causing the computer

representing the information processing device to function as image pick-up data utilization processing means for utilizing the image pick-up data stored in the storage means.

[0062] An information processing system according to yet another aspect of the present invention includes: the information processing device above; and the memory card storing as the application program, a program for causing the computer representing the information processing device to function as image pick-up data utilization processing means for utilizing the image pick-up data stored in the storage means and the memory card.

[0063] An information processing system according to yet another aspect of the present invention includes: the information processing device above; and the memory card storing as the application program, a program for causing the computer representing the information processing device to function as the audio data obtaining means and the audio data storage control means, in which data can be written, and the audio data storage control means can have the audio data selectively stored in any of the storage means and the memory card.

[0064] According to the information processing system according to this aspect, as the user can have the audio data selectively stored in the embedded storage means and an externally attached memory card, a storage medium in accordance with a situation can be used.

[0065] An information processing system according to yet another aspect of the present invention includes: the information processing device above; and the memory card storing as the application program, a program for causing the computer representing the information processing device to function as audio data utilization processing means for utilizing the audio data stored in the storage means.

[0066] An information processing system according to yet another aspect of the present invention includes: the information processing device above; and the memory card storing as the application program, a program for causing a computer representing the information processing device to function as audio data utilization processing means for utilizing the audio data stored in the storage means and the memory card.

[0067] The information processing device (**10**) above preferably includes a plurality of connection means for removably attaching a memory card. Thus, a plurality of memory cards of various types can simultaneously be attached, so that the user can select a desired program from among more application programs and execute the selected program.

[0068] Further preferably, the connection means includes first connection means for removably attaching a memory card (**28**) complying with universal specifications and second connection means for removably attaching a memory card (**29**) complying with dedicated specifications.

[0069] According to this preferred aspect, the user can readily exchange image pick-up data and/or audio data with another user through a memory card complying with the universal specifications, or readily transfer the data to another device. On the other hand, an unauthorized operation can be prevented by storing various types of application programs in a memory card complying with the dedicated specifications. In addition, the memory card complying with the dedicated specifications stores image pick-up data and/or audio data, so that information specific to the information device according to the present invention can together be stored and various types of effects or information can also be displayed.

[0070] Further preferably, the image pick-up data storage control means can have the image pick-up data selectively stored in the storage means, the memory card complying with the universal specifications, and the memory card complying with the dedicated specifications.

[0071] In addition, further preferably, the audio data storage control means can have the audio data selectively stored in the storage means, the memory card complying with the universal specifications, and the memory card complying with the dedicated specifications.

[0072] According to these preferred aspects, the user can have the obtained image pick-up data and/or audio data stored in a more appropriate memory card, depending on contents thereof or the like. In addition, efficiency in organization or the like of the image pick-up data and/or the audio data can also be improved.

[0073] In addition, further preferably, reading and execution of an application program stored in the memory card complying with the dedicated specifications by the computer representing the information processing device is permitted, while reading and execution of an application program stored in the memory card complying with the universal specifications by the computer representing the information processing device is prohibited. Thus, a problem caused by execution of an unauthorized application program or the like stored in a memory card complying with the universal specifications can be avoided.

[0074] An information processing system according to yet another aspect of the present invention includes: the information processing device above; and the memory card complying with the dedicated specifications, for storing as the application program, a program for causing the computer representing the information processing device to function as second image pick-up data obtaining means and second image pick-up data storage control means, and the second image pick-up data storage control means can have the image pick-up data selectively stored in at least one of the storage means, the memory card complying with the universal specifications, and the memory card complying with the dedicated specifications.

[0075] An information processing system according to yet another aspect of the present invention includes: the information processing device above; and the memory card complying with the dedicated specifications, for storing as the application program, a program for causing the computer representing the information processing device to function as second audio data obtaining means and second audio data storage control means, and the second audio data storage control means can have the audio data selectively stored in at least one of the storage means, the memory card complying with the universal specifications, and the memory card complying with the dedicated specifications.

[0076] According to these aspects, as the user can have image pick-up data and/or audio data selectively stored in the embedded storage means and the externally attached memory card complying with the universal specifications and memory card complying with the dedicated specifications, a storage medium can be used in accordance with a situation.

[0077] An information processing system according to yet another aspect of the present invention includes: the information processing device above; and the memory card complying with the dedicated specifications, for storing as the application program, a program for causing the computer representing the information processing device to function as image pick-up data utilization processing means for utilizing the image pick-up data stored in the storage means, the

memory card complying with the universal specifications, and the memory card complying with the dedicated specifications.

[0078] An information processing system according to yet another aspect of the present invention includes: a memory card (**28**, **29**); and an information processing device (**10**) capable of reading an application program stored in the memory card and performing processing. The information processing device (**10**) includes image pick-up means (**23**), embedded storage means (**34**), connection means (**36**, **37**) for removably attaching the memory card, and embedded program storage means (**901** to **908**). The embedded program storage means stores a program for causing a computer representing the information processing device to function as first image pick-up data obtaining means for obtaining image pick-up data with the image pick-up means, and first image pick-up data storage control means for causing the embedded storage means to store the image pick-up data obtained by the image pick-up data obtaining means. The memory card stores as the application program, a program for causing the computer representing the information processing device to function as second image pick-up data obtaining means for obtaining image pick-up data with the image pick-up means, and second image pick-up data storage control means for causing the embedded storage means to store the image pick-up data obtained by the image pick-up data obtaining means.

[0079] An information processing system according to yet another aspect of the present invention includes: a memory card (**28**, **29**); and an information processing device capable of reading an application program stored in the memory card and performing processing. The information processing device (**10**) includes image pick-up means (**23**), embedded storage means (**34**), connection means (**36**, **37**) for removably attaching the memory card, and embedded program storage means (**901** to **908**). The embedded program storage means stores a program for causing a computer representing the information processing device to function as first image pick-up data obtaining means for obtaining image pick-up data with the image pick-up means, and first image pick-up data storage control means for causing the embedded storage means to store the image pick-up data obtained by the image pick-up data obtaining means. The memory card stores as the application program, a program for causing the computer representing the information processing device to function as image pick-up data utilization processing means for utilizing the image pick-up data stored in the embedded storage means.

[0080] According to yet another aspect of the present invention, a launch program (**51**) executed by a computer representing an information processing device (**10**) having image pick-up means (**23**) and capable of storing a plurality of application programs, for selectively launching an application program desired by a user from among the plurality of application programs is provided. The launch program (**51**) causes the computer to function as: first launch operation acceptance means (SA**6**, SA**11**) for accepting a first launch operation for selectively launching the plurality of application programs; first launch means (SA**12**) for reading, when the first launch operation is performed, an application program selected in the first launch operation from among the plurality of application programs into prescribed storage means for storing a program to be executed by the computer and launching that application program; and photographing processing means (SA**10**) for performing photographing processing for storing an image picked up by the image pick-up means in storage means in accordance with a prescribed photographing operation.

[0081] According to this aspect, the user can select an application program to be executed from among the plurality of application programs by performing the first launch operation and also can obtain a picked-up image from photographing means by performing a prescribed photographing operation. Therefore, the user can readily and quickly use the photographing function even in a state prior to launch of an application program. In addition, the photographing processing means can be launched while the photographing function provided by the launch program is being performed.

[0082] Preferably, the photographing processing means has a photographing function to store the image picked up by the image pick-up means in the storage means but does not have a function to edit the image taken by using the photographing function.

[0083] Preferably, the photographing processing means has a photographing function to store the image picked up by the image pick-up means in the storage means but does not have a function to arbitrarily view an image from among images taken by using the photographing function.

[0084] According to these aspects, as the function to edit and/or view an image is not provided by the photographing processing means provided by the launch program, the user will desire use of a photographing application program having these functions. Consequently, the user can be led to use the photographing application program from the photographing processing means.

[0085] Preferably, the information processing device (**10**) stores as the application program, a photographing application program (**53**) having a photographing function to store an image picked up by the image pick-up means in the storage means. Thus, the user will desire use of a more advanced photographing application program, and the user can be led to use the photographing application program.

[0086] Further preferably, the photographing application program further has a function to edit a taken image.

[0087] Preferably, the photographing application program further has a function to arbitrarily view an image from among taken images.

[0088] Preferably, the photographing application program causes the storage means to store a taken image.

[0089] Preferably, the launch program allows exchange of a taken image stored in the storage means with another information processing device.

[0090] Preferably, the photographing application program causes the storage means to store a taken image in accordance with the photographing operation.

[0091] Preferably, a taken image stored in the storage means is displayed together with an image for selectively launching the plurality of application programs (SA**5**).

[0092] Preferably, after a launched application program ends, a taken image different from a previously displayed image among taken images stored in the storage means is displayed (SA**28**) together with the image for selectively launching the plurality of application programs as a result of execution of the launch program.

[0093] According to these aspects, as the photographing application program can provide the user with a more sophisticated function than the photographing processing means provided by the launch program, appeal of the photographing application program can be enhanced.

[0094] According to yet another aspect of the present invention, a storage medium storing the launch program described in any paragraph above is provided.

EFFECTS OF THE INVENTION

[0095] According to the present invention, an information processing device having a structure suitable for a photographing function and/or a voice and sound obtaining function can be provided. In addition, an information processing system capable of executing in coordination a program stored in a storage medium embedded in a main body and a program stored in an externally attached storage medium can be provided. Moreover, a launch program suitable for an information processing device having a photographing function and a storage medium storing the program can be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0096] FIG. **1** is a plan view showing appearance of an image pick-up device according to the present embodiment.

[0097] FIG. **2** is a perspective view showing a back side of a game device according to the present embodiment.

[0098] FIG. **3** is a diagram illustrating an illumination operation of an LED of the game device according to the present embodiment.

[0099] FIG. **4** is a diagram for illustrating an operation of a volume button of the game device according to the present embodiment.

[0100] FIG. **5** is a side view in a state where the game device according to the present embodiment is opened (in an unfolded state).

[0101] FIG. **6** is a side view in a state where the game device according to the present embodiment is closed (in a folded state).

[0102] FIG. **7** is a cross-sectional view of a lower housing shown in FIG. **1** which is taken along the line A-A'.

[0103] FIG. **8** is a cross-sectional view of an upper housing shown in FIG. **1** which is taken along the line B-B'.

[0104] FIG. **9** is a diagram showing a state where a user holds the game device according to the present embodiment with both hands.

[0105] FIG. **10** is a diagram showing a state where the user holds the game device according to the present embodiment with one hand.

[0106] FIG. **11** is a diagram showing a state where the user holds the game device according to the present embodiment lengthwise.

[0107] FIG. **12** is a diagram showing a state where the user holds the game device according to the present embodiment lengthwise.

[0108] FIG. **13** is a diagram showing a state in which the game device according to the present embodiment is held for use.

[0109] FIG. **14** is a diagram showing a state in which the game device according to the present embodiment is placed for use.

[0110] FIG. **15** is a plan view showing appearance of an image pick-up device according to a variation of the present embodiment.

[0111] FIG. **16** is a side view in a state where the game device according to the variation of the present embodiment is opened (in an unfolded state).

[0112] FIG. **17** is a side view in a state where the game device according to the variation of the present embodiment is closed (in a folded state).

[0113] FIG. **18** is a block diagram showing an internal configuration of the game device according to the present embodiment.

[0114] FIG. **19** is a diagram for illustrating a method of launching each application program in the game device according to the present embodiment.

[0115] FIG. **20** is a diagram showing main data stored in a main memory of the game device according to the present embodiment.

[0116] FIG. **21** is a main flowchart showing a flow of launcher processing in the game device according to the present embodiment.

[0117] FIG. **22** is a flowchart showing a flow of simplified photographing processing shown in FIG. **21**.

[0118] FIG. **23** is a diagram showing an example of a menu screen in the launcher processing in the game device according to the present embodiment.

[0119] FIG. **24** is a diagram showing an example of an image displayed in a photographing enabled state in the launcher processing in the game device according to the present embodiment.

[0120] FIG. **25** is a diagram showing an example of an image displayed after a photographing operation in the flowchart shown in FIG. **22** is performed.

[0121] FIG. **26** is a diagram showing an example of an image displayed after simplified photographing processing in the flowchart shown in FIG. **21** is performed.

[0122] FIG. **27** is a flowchart showing a flow of photographing leading processing shown in FIG. **21**.

[0123] FIG. **28** is a flowchart showing details of processing at the time of opening and closing of the game device according to the present embodiment.

[0124] FIG. **29** is a diagram showing a change method in processing for changing a display image in the flowchart shown in FIG. **28**.

[0125] FIG. **30** is a flowchart showing a flow of multifunctional photographing processing according to the present embodiment.

[0126] FIG. **31** is a diagram showing an example of an image displayed in multifunctional photographing processing according to the present embodiment.

[0127] FIG. **32** is a flowchart showing a flow of photograph display mode processing shown in FIG. **30**.

[0128] FIG. **33** is a diagram showing an example of an image displayed in a photograph display mode according to the present embodiment.

[0129] FIG. **34** is a flowchart showing a flow of photographing mode processing shown in FIG. **32**.

[0130] FIG. **35** is a diagram showing an example of an image displayed in a photographing mode according to the present embodiment.

[0131] FIG. **36** is a flowchart showing a flow of photographing processing (No. 1) in the game device according to the present embodiment.

[0132] FIG. **37** is a diagram showing an example of an image displayed in photographing processing in the image pick-up device according to the present embodiment shown in FIG. **36**.

[0133] FIG. **38** is a flowchart showing a flow of input image generation processing shown in FIG. **36**.

[0134] FIG. **39** is a diagram showing an example of an image displayed in a pen mode shown in FIG. **38**.

[0135] FIG. **40** is a diagram showing an example of an image displayed in processing for displaying a stored image shown in FIG. **36**.

[0136] FIG. **41** is a flowchart showing a flow of photographing processing (No. 2) in the game device according to the present embodiment.

[0137] FIG. **42** is a diagram showing an example of an image displayed in display processing shown in FIG. **41**.

[0138] FIG. **43** is a flowchart showing a flow of edition processing shown in FIG. **41**.

[0139] FIG. **44** is a diagram showing an example of an image displayed in the pen mode in the edition processing shown in FIG. **43**.

[0140] FIG. **45** is a diagram showing an example of an image displayed in a seal mode in the edition processing shown in FIG. **43**.

[0141] FIG. **46** is a diagram showing an image displayed in calendar processing according to the present embodiment.

[0142] FIG. **47** is a diagram illustrating an exemplary system in which a plurality of game devices according to the present embodiment are connected to each other.

[0143] FIG. **48** is a diagram showing exemplary screen display (No. 1) displayed before whether the game device according to the present embodiment serves as a transmission-end device or a reception-end device is determined.

[0144] FIG. **49** is a diagram showing exemplary screen display (No. 1) displayed before whether the game device according to the present embodiment serves as a transmission-end device or a reception-end device is determined.

[0145] FIG. **50** is a diagram showing exemplary screen display displayed in a first stage, on a transmission-end game device according to the present embodiment and a reception-end game device according to the present embodiment.

[0146] FIG. **51** is a diagram showing exemplary screen display displayed in a second stage, on the transmission-end game device according to the present embodiment and the reception-end game device according to the present embodiment.

[0147] FIG. **52** is a diagram showing exemplary screen display displayed in a third stage, on the transmission-end game device according to the present embodiment and the reception-end game device according to the present embodiment.

[0148] FIG. **53** is a diagram showing exemplary screen display displayed in a fourth stage, on the transmission-end game device according to the present embodiment and the reception-end game device according to the present embodiment.

[0149] FIG. **54** is a diagram showing exemplary screen display displayed in a fifth stage, on the transmission-end game device according to the present embodiment and the reception-end game device according to the present embodiment.

[0150] FIG. **55** is a diagram showing exemplary screen display displayed when communication is disconnected, on the transmission-end game device according to the present embodiment and the reception-end game device according to the present embodiment.

[0151] FIG. **56** is a diagram showing an example of various data stored in a main memory in accordance with execution of an image communication program according to the present embodiment.

[0152] FIG. **57** is a flowchart showing an example in which the game device according to the present embodiment performs image communication processing.

[0153] FIG. **58** is a flowchart showing sub routine showing detailed operation in image transmission processing shown in FIG. **57**.

[0154] FIG. **59** is a flowchart showing sub routine showing detailed operation in image reception processing shown in FIG. **57**.

[0155] FIG. **60** is a diagram showing an exemplary signal transmitted and received between the game device serving as a transmitter according to the present embodiment and the game device serving as a receiver according to the present embodiment.

[0156] FIG. **61** is a diagram showing an exemplary sound selection screen **400** in a sound function in the game device according to the present embodiment.

[0157] FIG. **62** is a diagram illustrating a music reproduction folder list selection screen according to the present embodiment.

[0158] FIG. **63** is a diagram illustrating another music reproduction folder list selection screen according to the present embodiment.

[0159] FIG. **64** is a diagram illustrating a music file selection screen according to the present embodiment.

[0160] FIG. **65** is a diagram illustrating a reproduction operation selection screen according to the present embodiment.

[0161] FIG. **66** is a flowchart illustrating processing relating to function selection in the game device according to the present embodiment.

[0162] FIG. **67** is a flowchart illustrating sub routine processing of processing for transition to a selection function mode in FIG. **66**.

[0163] FIG. **68** is a flowchart illustrating sub routine processing in a music reproduction mode.

[0164] FIG. **69** is a flowchart illustrating sub routine processing of processing for search of a folder in an SD card.

[0165] FIG. **70** is a flowchart illustrating sub routine processing for generating a folder list.

[0166] FIG. **71** is a flowchart illustrating sub routine processing of processing for determining a folder name.

[0167] FIG. **72** is a diagram illustrating a specific example illustrating folder search processing.

[0168] FIG. **73** is a flowchart illustrating sub routine processing of processing for selecting a music file.

[0169] FIG. **74** is a diagram illustrating sub routine processing of processing for reproducing a music file.

[0170] FIG. **75** is an enlarged view of a volume setting icon.

[0171] FIG. **76** is a flowchart illustrating sub routine processing of volume setting processing according to the present embodiment.

[0172] FIG. **77** is a diagram illustrating another example of the volume setting icon.

[0173] FIG. **78** is a diagram illustrating a function to change a reproduction speed or a key by selecting a speed and key adjustment icon.

[0174] FIG. **79** is a diagram illustrating a function for change to another tone by modulating a frequency of a reproduction signal, performing filtering processing or the like, based on selection of a tone adjustment icon.

[0175] FIG. **80** is a diagram illustrating a case where sound effect output from a speaker or the like is changed in response

to a user's operation of an R button and an L button for selecting a sound effect selection icon.

[0176] FIG. **81** is a diagram illustrating visualizer display processing according to the present embodiment.

[0177] FIG. **82** is a flowchart illustrating sub routine processing of the visualizer display processing.

[0178] FIG. **83** is a diagram illustrating another visualizer display screen.

[0179] FIG. **84** is a diagram illustrating yet another visualizer display screen.

[0180] FIG. **85** is a diagram illustrating a flow when a headphone is sensed according to the present embodiment.

[0181] FIG. **86** is a flowchart illustrating sleep processing in a case where a game device **10** is folded to a folded position.

[0182] FIG. **87** is a flowchart illustrating sub routine processing in a sleep music reproduction mode.

[0183] FIG. **88** is a flowchart illustrating an automatic recording mode according to the present embodiment.

[0184] FIG. **89** is a flowchart illustrating sub routine processing of recording processing according to the present embodiment.

[0185] FIG. **90** is a flowchart illustrating sub routine processing of processing for storing recording data.

[0186] FIG. **91** is a flowchart of an automatic reproduction mode according to the present embodiment.

[0187] FIG. **92** is a flowchart illustrating sub routine processing of setting processing according to the present embodiment.

[0188] FIG. **93** is a diagram illustrating a setting screen according to the present embodiment.

[0189] FIG. **94** is a flowchart illustrating sub routine processing in a microphone recording and reproduction mode.

[0190] FIG. **95** is a diagram illustrating a recording data file list selection screen according to the present embodiment.

[0191] FIG. **96** is a diagram illustrating a recording data reproduction operation selection screen.

[0192] FIG. **97** is a diagram illustrating sub routine processing of processing for reproducing a recording data file.

[0193] FIG. **98** is a flowchart illustrating sub routine processing (No. 1) of processing for creating a recording data file.

[0194] FIG. **99** is a diagram illustrating a recording start screen according to the present embodiment.

[0195] FIG. **100** is a flowchart illustrating sub routine processing (No. 2) of processing for creating a recording data file.

[0196] FIG. **101** is a diagram illustrating a recording data file color designation screen according to the present embodiment.

[0197] FIG. **102** is a diagram illustrating a favorite folder selection screen according to the present embodiment.

[0198] FIG. **103** is a diagram for illustrating a storage medium that can be used in the game device according to the present embodiment.

DESCRIPTION OF THE REFERENCE SIGNS

[0199] **10** game device; **11** lower housing; **12** lower LCD; **13** touch panel; **21** upper housing; **22** upper LCD; **23** inner camera; and **25** outer camera.

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS

[0200] An embodiment of the present invention will be described in detail with reference to the drawings. It is noted that the same or corresponding elements in the drawings have the same reference characters allotted and description thereof will not be repeated.

1. OVERVIEW

[0201] A portable game device **10** according to one embodiment of the present invention will be described hereinafter.

[0202] Game device **10** according to the present embodiment has image pick-up means (camera), and functions also as an image pick-up device. Representatively, game device **10** can pick up an image of a subject with the image pick-up means, display the image obtained as a result of image pick-up on a screen, store data of the picked-up image, and transmit to and receive from another device data of the picked-up image.

[0203] In addition, game device **10** according to the present embodiment is typically provided as a computer including operation means such as a CPU and a memory, and it can execute various application programs relating to image processing or information processing. By executing such a program, game device **10** also functions as an image processing device or an information processing device. Naturally, game device **10** according to the present embodiment can also execute various game programs.

[0204] Namely, though any computer system may execute the program according to the present invention, a configuration in which game device **10** executes the program according to the present invention will be illustrated in the present embodiment. It is noted that functions provided by the program according to the present invention may be implemented by a hardware circuit in a part or in its entirety.

2. DEFINITION OF TERMS

[0205] Obtaining image data from the image pick-up means (camera) is herein referred to as "image pick-up," and storage of picked-up image data is referred to as "photographing".

3. APPEARANCE

[0206] <Overall Appearance>

[0207] FIG. **1** is a plan view showing appearance of game device **10** according to the present embodiment, and FIG. **2** is a perspective view showing a back surface side of game device **10** according to the present embodiment.

[0208] Referring to FIGS. **1** and **2**, game device **10** according to the present embodiment is representatively a foldable portable game device. FIG. **1** shows a state where game device **10** is opened (opened state). Normally, a user uses game device **10** in the opened state and the user stores game device **10** in a closed state when he/she does not use game device **10**. Therefore, game device **10** is preferably configured to have such a size as being held by the user with both hands or one hand, even when game device **10** is opened.

[0209] As shown in FIGS. **1** and **2**, game device **10** includes two housings of a lower housing **11** and an upper housing **21**. Lower housing **11** and upper housing **21** are connected to each other so that the game device can be opened or closed

(foldable). In other words, shaft portions **11**A shown in FIG. **1** are provided at opposing ends of an upper side (a side on a positive side of an x-axis shown in the drawing) of lower housing **11** in a left-right direction (in a y direction shown in the drawing) (shaft portions **11**A are structurally integral with lower housing **11**). Further, a shaft portion **21**A shown in FIG. **1** is provided in a central portion of a lower side (a side on a negative side of the x-axis shown in the drawing) of upper housing **21** in the left-right direction (in the y direction shown in the drawing) (shaft portion **21**A is structurally integral with upper housing **21**). Shaft portions **11**A and shaft portion **21**A are connected to each other by a hinge provided therein in a manner pivotable about an axis in the left-right direction. Thus, lower housing **11** and upper housing **21** are connected to each other in a manner pivotable about the axis in the left-right direction.

[0210] In the present embodiment, housings **11** and **21** each have a horizontally long shape (namely, a dimension of each housing in a lateral direction is greater than that in a vertical direction) and typically have a rectangular shape. Further, housings **11** and **21** each have a plate-like shape (namely, a length in a thickness direction is shorter than those in vertical and lateral directions). Further, upper housing **21** and lower housing **11** each have a thin plate-like shape. Preferably, upper housing **21** is smaller in thickness than lower housing **11**. Lower housing **11** and upper housing **21** are pivotably connected to each other at long sides thereof.

[0211] In an alternative embodiment, game device **10** may be formed of one housing, instead of a foldable type.

[0212] As shown in FIG. **1**, game device **10** includes two display devices of an upper LCD (Liquid Crystal Display) **22** and a lower LCD **12**. Upper LCD **22** is disposed in an inner surface of upper housing **21** (which is a surface located on the inside of game device **10** in a closed state) and lower LCD **12** is disposed in an inner surface of lower housing **11**.

[0213] Though an LCD is used as a display device in the present embodiment, any other display devices such as a display device using EL (Electro Luminescence) may be used. In addition, game device **10** can include a display device of any resolution. Though a case where game device **10** includes two display devices is described by way of example in the present embodiment, in an alternative embodiment, the number of display devices in the game device is not particularly limited.

[0214] <Lower Housing>

[0215] A configuration provided in lower housing **11** of game device **10** will now be described.

[0216] As described above, game device **10** includes lower LCD **12**. Lower LCD **12** has a horizontally long shape, and is arranged such that a long side direction thereof corresponds to a long side direction of lower housing **11**. In addition, lower LCD **12** is accommodated in lower housing **11**. Further, lower LCD **12** is provided in the inner surface of lower housing **11**. Thus, by closing game device **10** when it is not used, a screen of lower LCD **12** can be prevented from getting dirty and being damaged.

[0217] The inner surface of lower housing **11** is formed to be substantially planar. At a center of the inner surface of lower housing **11**, an opening **11**B is formed for exposing lower LCD **12**. On the left side of opening **11**B (on the negative side of the y-axis shown in the drawing), an opening **11**C is formed, and on the right side of opening **11**B, openings **11**D are formed. Openings **11**C and **11**D are for exposing key tops (upper surfaces of buttons **14**A to **14**E). The screen of lower LCD **12** accommodated in lower housing **11** is exposed through opening **11**B and the key tops are exposed through openings **11**C and **11**D.

[0218] Thus, in the inner surface of lower housing **11**, non-screen areas (dotted-line areas A**1** and A**2** shown in FIG. **1**, specifically, areas for arranging buttons **14**A to **14**D; button arrangement areas) are provided on opposing sides of opening **11**B provided at the center of the inner surface of lower housing **11** for lower LCD **12**. Each of the button arrangement areas is designed to have a dimension of 15 mm or more (preferably 20 mm or more, more preferably 30 to 40 mm) in the lateral direction (in the y direction shown in the drawing).

[0219] Buttons **14**A to **14**K and a touch panel **13** are provided as an input device in lower housing **11**. As shown in FIG. **1**, among buttons **14**A to **14**K, a direction input button **14**A, a button **14**B, a button **14**C, a button **14**D, a button **14**E, a power button **14**F, a start button **14**G, and a select button **14**H are provided on the inner surface of lower housing **11**. Here, the inner surface means the inner side when upper housing **21** and lower housing **11** are folded.

[0220] Direction input button **14**A is used, for example, for a selection operation, and buttons **14**B to **14**E, start button **14**G, and select button **14**H are used, for example, for an enter operation or a cancel operation. Power button **14**F is used for turning on/off the power of game device **10**.

[0221] In the present embodiment, direction input button **14**A and power button **14**F are provided on one side (left side in FIG. **1**) of lower LCD **12** provided around the center of lower housing **11**, and buttons **14**B to **14**E are provided on the other side (right side in FIG. **1**) of lower LCD **12**. As shown in FIGS. **16** and **17**(*c*), power button **14**F may be provided on a right side surface of lower housing **11**.

[0222] Direction input button **14**A has a cross shape, and is about 20 mm in length and width. Direction input button **14**A is provided such that a center thereof is located in a position distant from the left end of lower housing **11** by about 20 mm and from the lower end of lower housing **11** by about 40 mm.

[0223] Power button **14**F has a circular shape, and is provided such that a center thereof is located in a position distant from the left end of lower housing **11** by about 25 mm and from the lower end of lower housing **11** by about 10 mm.

[0224] Each of buttons **14**B to **14**E has a circular shape and a radius of approximately 5 mm. Button **14**B is provided such that a center thereof is located in a position distant from the right end of lower housing **11** by about 10 mm and from the lower end of lower housing **11** by about 40 mm. Button **14**C is provided such that a center thereof is located in a position distant from the right end of lower housing **11** by about 20 mm and from the lower end of lower housing **11** by about 40 mm. Button **14**D is provided such that a center thereof is located in a position distant from the right end of lower housing **11** by about 20 mm and from the lower end of lower housing **11** by about 50 mm. Button **14**E is provided such that a center thereof is located in a position distant from the right end of lower housing **11** by about 25 mm and from the lower end of lower housing **11** by about 45 mm.

[0225] Direction input button **14**A and buttons **14**B to **14**E are used for performing various operations (which will be described later) on game device **10**.

[0226] In addition, as shown in FIG. **2**, an L button **14**I is provided at a left end portion of an upper surface of lower housing **11** and an R button **14**J is provided at a right end portion of the upper surface of lower housing **11**. L button **14**I

and R button **14**J are used, for example, for performing a photographing instruction operation (shutter operation).

[0227] In addition, a volume button **14**K is provided on a left side surface of lower housing **11**. Volume button **14**K is used for adjusting a volume of a speaker included in game device **10**. In addition, in the present embodiment, volume button **14**K is used also for adjusting brightness of upper LCD **22** and lower LCD **12** by being operated together with select button **14**H. Such an operation will be described later.

[0228] As shown in FIG. **1**, game device **10** further includes touch panel **13** as another input device in addition to operation buttons **14**A to **14**I. Touch panel **13** is attached to the screen of lower LCD **12**. Touch panel **13** may be of any type such as a resistive film type, an optical type (infrared type), or a capacitive coupling type. Touch panel **13** used in the present embodiment has the same resolution (detection accuracy) as that of lower LCD **12**, however, resolution of touch panel **13** and resolution of lower LCD **12** may not necessarily be equal to each other. In addition, a touch panel based on any principles may be employed as the touch panel in the present embodiment, so long as such a device can detect a contact coordinate on a screen.

[0229] As shown in FIGS. **1** and **2**, in the right side surface of lower housing **11**, an insertion opening **17** is provided. Insertion opening **17** can accommodate a touch pen **27** used for performing an operation on touch panel **13**. An input to touch panel **13** is usually provided by using touch pen **27**, however, in addition to touch pen **27**, a finger of the user can be used for operating touch panel **13**.

[0230] In the right side surface of lower housing **11**, an insertion opening is provided for accommodating a memory card **28**. Inside the insertion opening, a connector (not shown) is provided for electrically connecting game device **10** and memory card **28** to each other. Memory card **28** is removably attached to the connector.

[0231] Memory card **28** is based on universal specifications as defined by any standardization organization, and representatively implemented by an SD (Secure Digital) memory card. Memory card **28** contains a non-volatile rewritable memory, and it is used, for example, for storing (saving) an image picked up by game device **10** or for reading an image generated in another device into game device **10**. Alternatively, memory card **28**, for example, stores in advance a music file which is music data, and reproduction processing can be performed by reading the music file into game device **10**. Some kind of program may be stored in memory card **28** through a personal computer or the like, however, such a program cannot be executed in game device **10**.

[0232] Further, in the upper surface of lower housing **11**, an insertion opening (shown with a chain-dotted line in FIG. **1**) is provided for accommodating a memory card **29**. Inside the insertion opening as well, a connector (not shown) is provided for electrically connecting game device **10** and memory card **29** to each other.

[0233] Memory card **29** is preferably based on specifications dedicated for game device **10** according to the present embodiment. Namely, memory card **29** is designed to have a size different from that of a memory card complying with the universal specifications. Memory card **29** is a storage medium storing an image communication program, a game program or the like, and it is removably attached to the insertion opening provided in lower housing **11**. In addition, memory card **29** may also store a selected application program which will be described later. An application program stored in memory card **29** is read into a main memory **32** and executed by a CPU **31** when execution of the application program is selected with a method as will be described later with reference to FIG. **23**.

[0234] Though memory card **29** may contain an ROM and store a program in the ROM, memory card **29** may contain a non-volatile rewritable memory so that data can be written therein by game device **10**.

[0235] As shown in FIG. **1**, three LEDs **15**A to **15**C are disposed in a left-hand-side portion of shaft portion **11**A of lower housing **11** (LEDs **15**A to **15**C may be disposed in a right-hand-side portion of shaft portion **11**A as shown in FIG. **15**). An illumination operation of these LEDs **15**A to **15**C will be described later.

[0236] <Upper Housing>

[0237] Meanwhile, a feature for picking up an image (a camera) and a feature for displaying the picked-up image (a display device) are provided in upper housing **21**. A feature provided in upper housing **21** will be described hereinafter.

[0238] As shown in FIG. **1**, game device **10** includes upper LCD **22**. Upper LCD **22** is accommodated in upper housing **21**. Upper LCD **22** has a horizontally long shape, and is arranged such that a long side direction thereof corresponds to a long side direction of upper housing **21**. Upper LCD **22** is provided in the inner surface of upper housing **21** (the surface located on the inside of game device **10** in the closed state). Thus, by closing game device **10** when it is not used, a screen of upper LCD **22** can be prevented from getting dirty and being damaged. Similarly to lower LCD **12**, a display device of any other type having any resolution may be used instead of upper LCD **22**. Though details will be described later, upper LCD **22** mainly displays thereon an image concerning an image pick-up operation, such as an image for explaining a manner of operation to the user. In an alternative embodiment, a touch panel may be provided also on upper LCD **22**.

[0239] Game device **10** includes two cameras **23** and **25** as image pick-up means. Each of cameras **23** and **25** is accommodated in upper housing **21**. As shown in FIG. **1**, inner camera **23** is disposed in the inner surface of upper housing **21**. On the other hand, as shown in FIG. **2**, outer camera **25** is disposed in a surface opposite to the surface in which inner camera **23** is disposed, that is, in the outer surface of upper housing **21** (a surface located on the outside of game device **10** in the closed state).

[0240] Though a case where game device **10** includes two cameras as the image pick-up means is described by way of example in the present embodiment, game device **10** may include one camera, or three or more cameras. Further, a camera may be disposed at any position.

[0241] As shown in FIG. **2**, a fourth LED **26** is disposed in the outer surface of upper housing **21**. Fourth LED **26** is disposed around outer camera **25** (on a right side of outer camera **25** in the present embodiment; and above outer camera **25** in the opened state in the example shown in FIG. **17**(*b*)). Fourth LED **26** is turned on at the time when photographing by inner camera **23** or outer camera **25** is performed (when the shutter button is pressed). Further, fourth LED **26** illuminates while a moving picture is taken by inner camera **23** or outer camera **25**.

[0242] Such an operation of fourth LED **26** can notify a subject that photographing is performed (being performed) by game device **10**.

[0243] In addition, an external audio output terminal **19** (shown with a dashed line in FIG. **1**) in which a plug provided

in equipment for external audio output (such as a headphone, an earphone and a bone conduction headphone) is to be inserted is provided in a lower surface of lower housing **11**. In the inside of this external audio output terminal **19**, a jack **62** for electrically connecting game device **1** and the equipment for external audio output with each other is provided. The equipment for external audio output may be equipment for both ears such as a headphone or equipment for one ear such as an earphone, and a plug of the equipment for external audio output is removably attached to a jack. Though a headphone is representatively described hereinafter as the equipment for external audio output, equipment such as an earphone may also be employed.

[0244] Game device **10** includes a microphone (a microphone **43** shown in FIG. **18**) as an audio input device. Microphone **43** is accommodated in upper housing **21**. In the present embodiment, microphone **43** is arranged in shaft portion **21**A of upper housing **21**. More specifically, the microphone is attached around inner camera **23** (in the drawing, on the side on the y-axis), and further specifically, it is arranged on the side of inner camera **23** at a distance of 10 mm therefrom (in the drawing, on the side in the positive direction of the y-axis).

[0245] In addition, in the inner surface of upper housing **21**, a microphone hole **21**C is provided to allow the microphone to sense sound outside game device **10**. Microphone hole **21**C is provided in shaft portion **21**A of upper housing **21**. If microphone hole **21**C is provided in a coupling portion of lower housing **11** and upper housing **21**, it is preferably provided at a position offset from the center by a prescribed distance.

[0246] Alternatively, as shown in FIG. **15**, the microphone may be accommodated in lower housing **11**. In FIG. **15**, a microphone hole **16** is provided in the inner surface of lower housing **11**, specifically in a lower left portion of the inner surface of lower housing **11** (a button arrangement area corresponding to a dotted-line area A**1**). The microphone is arranged in the vicinity of microphone hole **16** in lower housing **11**.

[0247] A position where microphone **43** is accommodated and a position of microphone hole **16** do not necessarily have to be in the coupling portion above, and for example, microphone **43** may be accommodated in lower housing **11** and microphone hole **16** may be provided in lower housing **11** in correspondence with the position of accommodation of microphone **43**. Alternatively, microphone hole **16** may be provided adjacent to external output terminal **19** for insertion of a plug provided in a headphone.

[0248] <Indication by Indicator and Operation Example>

[0249] FIG. **3** is a diagram illustrating an illumination operation of LED **15**A to LED **15**C of game device **10** according to the present embodiment.

[0250] Referring to FIG. **3**(*a*), game device **10** can establish wireless communication with other equipment as will be described later, and a first LED **15**A illuminates when wireless communication is established. Specifically, first LED **15**A illuminates whenever communication with other equipment is enabled. Meanwhile, first LED **15**A blinks while communication with other equipment is in progress (or data transmission is in progress).

[0251] Referring to FIG. **3**(*b*), a second LED **15**B illuminates while game device **10** is being charged.

[0252] Referring to FIG. **3**(*c*), a third LED **15**C illuminates when the power of game device **10** is turned on. In addition, an illumination state of third LED **15**C is varied depending on a state of charge of a battery (battery pack) mounted on game device **10**. Specifically, third LED **15**C illuminates in blue when a battery level is relatively high, while it illuminates in red when the battery level is relatively low. In addition, when the battery level is very low, third LED **15**C blinks in red.

[0253] Thus, three LEDs **15**A to **15**C can notify the user of a state of communication establishment, a state of charge, a battery level, and a state of power on/off of game device **10**.

[0254] FIG. **4** is a diagram for illustrating an operation of volume button **14**K of game device **10** according to the present embodiment. In game device **10**, a volume can be set in a plurality of steps (for example, in five steps), and as shown in FIG. **4**(*a*), the volume is increased in a stepwise fashion each time a "+" (plus) side of volume button **14**K is pressed. On the other hand, the volume is lowered in a stepwise fashion each time a "−" (minus) side of volume button **14**K is pressed.

[0255] Meanwhile, sound effect (shutter sound) or the like output from a speaker at the time when photographing by inner camera **23** or outer camera **25** is carried out (when the shutter button is pressed) is preferably set at a prescribed volume, independently of volume setting.

[0256] In addition, when game device **100** is in a sleep state which will be described later, only lowering in the volume is preferably permitted with regard to the operation of volume button **14**K.

[0257] Referring to FIG. **4**(*b*), when volume button **14**K is operated while select button **14**H has been pressed, brightness of upper LCD **22** and lower LCD **12** is changed. Namely, each time the "+" (plus) side of volume button **14**K is pressed while select button **14**H has been pressed, display on upper LCD **22** and lower LCD **12** becomes brighter in a stepwise fashion. On the other hand, each time the "−" (minus) side of volume button **14**K is pressed while select button **14**H has been pressed, display on upper LCD **22** and lower LCD **12** becomes darker in a stepwise fashion.

4. DETAILED STRUCTURE AND USAGE

[0258] A more detailed structure of game device **10** according to the present embodiment and usage of game device **10** by the user will be described with reference to FIGS. **5** to **14** in addition to FIGS. **1** and **2** above.

[0259] FIG. **5** shows a side view of game device **10** in the opened state (unfolded state), and FIG. **6** shows four orthogonal views of game device **10** in the closed state (folded state). Namely, FIG. **6**(*a*) shows a left side view of game device **10** in the closed state, FIG. **6**(*b*) shows a top view of game device **10**, FIG. **6**(*c*) shows a right side view of game device **10**, and FIG. **6**(*d*) shows a back view of game device **10**.

[0260] Game device **10** according to the present embodiment is small enough in size to be held with both hands or one hand in the opened state. For example, game device **10** can approximately be 50 to 100 mm long and 100 to 200 mm wide with a thickness of 10 to 40 mm in the closed state, and can approximately be 100 to 200 mm long in the opened state. It is noted that a direction of length corresponds to the x direction in the drawings, a direction of width corresponds to the y direction in the drawings, and a direction of thickness corresponds to the z direction in the drawings.

[0261] More preferably, game device **10** can be 60 to 90 mm long and 100 to 150 mm wide with a thickness of 15 to 30 mm in the closed state, and can approximately be 120 to 160 mm long in the opened state.

[0262] Further preferably, game device **10** can be 70 to 80 mm long and 100 to 150 mm wide with a thickness of 15 to 25 mm in the closed state, and can approximately be 135 to 155 mm long in the opened state.

[0263] It is noted that the thickness of lower housing **11** is preferably larger than that of upper housing **21**. Further, the length of game device **10** in the opened state may be substantially the same as the width thereof. A dimension of lower housing **11** in a direction of length is desirably set such that a second joint of an index finger is located around an upper corner of lower housing **11** when a lower corner of lower housing **11** is supported by a center of a palm.

[0264] FIG. **7** shows a cross-sectional view of the lower housing shown in FIG. **1** which is taken along the line A-A', and FIG. **8** shows a cross-sectional view of the upper housing shown in FIG. **1** which is taken along the line B-B'. As shown in FIG. **7**, on the inner surface of lower housing **11** (the surface located on the inside of game device **10** in the closed state), shaft portion **11**A is provided to project in the direction perpendicular to the inner surface (typically, shaft portion **11**A is structurally integral with the lower housing). Shaft portions **11**A are provided at respective opposing ends in the left-right direction (in the y direction in the drawing) (see FIG. **1**). As shown in FIG. **15**, each of shaft portions **11**A may be provided in a position slightly inward of the end with respect to the left-right direction.

[0265] As shown in FIG. **8**, in a lower surface of upper housing **21** (a side surface on the negative side of the x-axis in the drawing), shaft portion **21**A is provided to project in the direction perpendicular to the lower surface (shaft portion **21**A is structurally integral with the upper housing). Shaft portion **21**A is provided to project in the direction perpendicular to the lower surface as well as to project also in the direction perpendicular to the inner surface of upper housing **21** (a surface located on the inside of game device **10** in the closed state). Shaft portion **21**A is provided at the center of the lower end of upper housing **21** in the left-right direction (see FIG. **1**). Shaft portion **11**A and shaft portion **21**A are pivotably connected to each other by a hinge provided therein, thereby forming an integral projection portion. As constructed above, the projection portion projects from the inner surface of each of housings **11** and **21** (see FIG. **5**).

[0266] Since shaft portion **11**A is provided to project from the inner surface of lower housing **11** and shaft portion **21**A is provided to project downwardly from upper housing **21**, a step is formed between an outer surface of lower housing **11** (a surface located on the outside of game device **10** in the closed state) and an outer surface of upper housing **21** by the thickness of lower housing **11** in a state where two housings **11** and **21** are connected to each other (see FIG. **5**).

[0267] As described above, upper housing **21** is pivotably supported by a part of an upper portion of lower housing **11**. Thus, game device **10** can be in the closed state (a state where an angle between lower housing **11** and upper housing **21** is about 0° (see FIG. **5**)) or in the opened state (a state where the angle between lower housing **11** and upper housing **21** is about 180° (see FIG. **1**)). Further, in addition to the closed state and the opened state, game device **10** in the present embodiment can maintain an angle between lower housing **11** and upper housing **21** at any angle ranging between the closed state and the opened state by frictional force generated at the hinge or the like. In other words, upper housing **21** can be stationary at any angle with respect to lower housing **11**.

[0268] Alternatively, the hinge may have a mechanism for temporarily fixing upper housing **21** and lower housing **11** at a prescribed angle smaller than 180° with click feeling. In other words, upper housing **21** and lower housing **11** may temporarily be fixed in the opened state at a prescribed angle smaller than 180° with click feeling. Specifically, for example, the prescribed angle ranges from 150° to 175°, and is 160° in the present embodiment. In the present embodiment, housings **11** and **21** can be opened up to an angle of 180°, however, in an alternative embodiment, housings **11** and **21** may be opened only up to the prescribed angle above or up to an angle of 180° or greater.

[0269] As shown in FIGS. **2**, **6**(*a*), and **6**(*c*), volume button **14**K is provided on the left side surface of lower housing **11**. Volume button **14**K is used for adjusting volume of a speaker of game device **10**. As shown in FIG. **6**(*d*), button **14**J is provided at a right end of an upper surface of lower housing **11**. Button **14**I is provided at a left end of the upper surface of lower housing **11**. Preferably, the right end of button **14**J extends to the right end of lower housing **11**, however, it does not have to be in that way. In the former case, design is preferably made such that a right side surface of button **14**J is substantially flush with the right side surface of lower housing **11**. Further, a back end of button **14**J preferably extends to reach a back surface of lower housing **11**, however, it does not have to be in that way. In the former case, design is preferably made such that the back surface of button **14**J is substantially flush with the back surface of lower housing **11**. It is noted that the above is also applicable to button **14**I.

[0270] Specifically, buttons **14**J and **14**I have a length of about 20 mm in the left-right direction and a width (a length in the thickness direction, that is, a length in the z direction shown in the drawing) of about 10 mm. Each of buttons **14**I and **14**J is used, for example, for performing a photographing instruction operation (a shutter operation) on game device **10**. It is noted that buttons **14**J and **14**I preferably have a width at least 50% as large as the thickness of lower housing **11**.

[0271] Both buttons **14**I and **14**H may function as a shutter button. Here, a right-handed user can use button **14**J and a left-handed user can use button **14**I. Thus, game device **10** is user-friendly for either user.

[0272] In game device **10**, buttons **14**I and **14**J may be set to constantly serve as valid shutter buttons, or alternatively, only button **14**J may be set as valid in the case of setting for right-handedness and only button **14**I may be set as valid in the case of setting for left-handedness by setting game device **10** to right-handedness or left-handedness (by having the user provide an input for setting through a menu program or the like so that set data is stored). Further, in an alternative embodiment, only a single button for performing a photographing instruction operation may be provided on the upper surface of lower housing **11**.

[0273] A cover is provided on the right side surface of lower housing **11** in such a manner that it can be opened or closed. Inside this cover, a connector (not shown) is provided for connecting memory card **28**.

[0274] As described above, in lower housing **11**, input devices (touch panel **13** and buttons **14**A to **14**I) are provided for providing an operation input to game device **10**. Thus, in using game device **10**, the user can hold lower housing **11** and perform an operation on game device **10**.

[0275] FIG. **9** is a diagram showing a state where the user holds game device **10** with both hands. As shown in FIG. **9**, the user holds the side surfaces and the outer surface (the

surface opposite to the inner surface) of lower housing **11** with palms, middle fingers, ring fingers, and little fingers of both hands in a state where LCDs **12** and **22** face the user. By thus holding the game device, the user can perform an operation of buttons **14**A to **14**E with thumbs and perform an operation of buttons **14**I and **14**J with index fingers while holding lower housing **11**.

[0276] In the present embodiment, lower housing **11** is formed in the horizontally long shape and provided with buttons on both sides of lower LCD **12**. Thus, the image pick-up device can easily be held and operated. Further, as described above, the button arrangement areas (dotted-line areas A**1** and A**2** shown in FIG. **1**) are provided to have a dimension of at least 15 mm in the lateral direction thereof. Thus, thumbs can be prevented from being located on lower LCD **12** while lower housing **11** is held.

[0277] FIG. **10** is a diagram showing a state where the user holds game device **10** with one hand. In providing an input to touch panel **13**, as shown in FIG. **10**, one hand holding lower housing **11** is released from lower housing **11** and lower housing **11** is held only with the other hand, thereby allowing an input to touch panel **13** with that one hand. In this case as well, a thumb holding lower housing **11** can be prevented from being located on lower LCD **12**.

[0278] Alternatively, while holding lower housing **11** with both hands, the user can provide an input to touch panel **13** with a thumb of one hand (a thumb of a right hand if the user is right-handed). In this case as well, a thumb of the other hand holding lower housing **11** (a thumb of a left hand if the user is right-handed) can be prevented from being located on touch panel **13**.

[0279] As described above, inner camera **23** is disposed in the inner surface of upper housing **21** (see FIG. **1**). On the other hand, outer camera **25** is disposed in the surface opposite to the surface in which inner camera **23** is disposed, that is, in the outer surface of upper housing **21** (the surface located on the outside of game device **10** in the closed state) (see FIGS. **2**, **6**(*b*) and the like).

[0280] Thus, inner camera **23** is capable of picking up an image in a direction in which the inner surface of upper housing **21** faces and outer camera **25** is capable of picking up an image in a direction opposite to an image pick-up direction of inner camera **23**, that is, in a direction in which the outer surface of upper housing **21** faces.

[0281] As described above, game device **100** according to the present embodiment is provided with two cameras **23** and **25** such that the image pick-up directions thereof are opposite to each other. Therefore, the user can pick up images in two different directions without changing a manner of holding game device **10**. For example, the user can photograph a view seen from game device **10** toward the user with inner camera **23** as well as a view seen from game device **10** in a direction opposite to the user with outer camera **25**.

[0282] In addition, according to the feature above, a photographing direction of outer camera **25** is opposite to (180° different from) a direction in which the display screen of upper LCD **22** faces and a photographing direction of inner camera **23** is the same as the direction in which the display screen of upper LCD **22** faces. Thus, since a line-of-sight direction of the user looking at the display screen of upper LCD **22** is substantially the same as the photographing direction of outer camera **25** when an image taken by outer camera **25** is displayed on upper LCD **22**, it is easy for the user to recognize the photographing direction. Further, since the line-of-sight direction of the user looking at the display screen of upper LCD **22** is substantially opposite to the photographing direction of inner camera **23** when an image taken by inner camera **23** is displayed on upper LCD **22**, it is easy for the user to recognize the photographing direction.

[0283] Further, inner camera **23** is disposed at a center of shaft portion **21**A formed in the lower center portion of upper housing **21**. In other words, inner camera **23** is disposed at a center of a portion where two housings **11** and **21** are connected to each other.

[0284] Thus, when game device **10** is in the opened state, inner camera **23** is located between two LCDs **12** and **22** (see FIG. **1**). In other words, inner camera **23** is arranged around the center of game device **10**. It is noted that the "center of game device **10**" means a center of an operation surface of game device **10** (including the inner surfaces of housings **11** and **21** in the opened state).

[0285] Alternatively, it can also be said that inner camera **23** is arranged around a center in the lateral direction of LCDs **12** and **22**.

[0286] In the present embodiment, since shaft portion **21**A is integral with upper housing **21** and inner camera **23** is arranged in shaft portion **21**A in a fixed manner, the photographing direction of inner camera **23** is changed in accordance with opening and closing of upper housing **21**. Thus, change in the photographing direction can be achieved without providing an additional mechanism for changing the photographing direction of the camera. Further, since inner camera **23** is arranged in the inner surface of a second housing (on the same side of shaft portion **21**A as the inner surface of the second housing), inner camera **23** faces lower housing **11** as a result of closing of upper housing **21**. Thus, inner camera **23** can be protected automatically by closing game device **10**.

[0287] As described above, in the present embodiment, inner camera **23** is provided in shaft portion **21**A such that it is arranged around the center of the operation surface of game device **10**. In an alternative embodiment, however, inner camera **23** may be provided in a position other than the shaft portion of lower housing **11** or upper housing **21**. For example, inner camera **23** may be provided in the inner surface of upper housing **21**, between shaft portion **21**A and upper LCD **22**. When inner camera **23** is provided substantially at the center in the left-right direction of the operation surface of game device **10**, the user can easily set a position of game device **10** at least in the left-right direction, for example, in photographing the user himself/herself.

[0288] Here, for example, the case where inner camera **23** is arranged at an end of the operation surface of game device **10** (for example, at an upper end of the inner surface of upper housing **21**) is considered. In operating a portable instrument such as game device **10**, the user usually holds game device **10** such that the user faces game device **10** for better viewing the screen.

[0289] In the case where inner camera **23** is arranged at the end of game device **10**, however, the user cannot be located within an image pick-up range of inner camera **23** when game device **10** is held in a usual holding position (in a position where the user faces game device **10**). For example, in the case where inner camera **23** is arranged at an upper end of the operation surface, the image pick-up range is slightly above the user when the user remains holding game device **10** in the usual holding position, and hence a face of the user cannot successfully be located within the image pick-up range.

[0290] Thus, in the case where inner camera **23** is arranged at the end of the operation surface of game device **10**, game device **10** has to be moved from the usual holding position such that the user is successfully located within the image pick-up range.

[0291] On the other hand, when a view seen from game device **10** toward the user is to be photographed, the line-of-sight direction of the user is opposite to the image pick-up direction of the camera and game device **10** has to be held in a position different from the usual holding position. Therefore, it is difficult for the user to arrange game device **10** such that the user is successfully located within the image pick-up range.

[0292] On the other hand, in the present embodiment, when game device **10** is in the opened state, inner camera **23** is located around the center of game device **10**. Thus, when photographing the user himself/herself with inner camera **23**, the user has only to hold game device **10** in a position in which the user faces game device **10**. In other words, by holding the image pick-up device in the usual holding position, the user is located around the center of the image pick-up range, and hence the user is readily located within the image pick-up range. As described above, by arranging inner camera **23** in a position around the center of game device **10** when viewed from the user, the user is readily photographed with the user being successfully located within the image pick-up range.

[0293] In addition, as shown in FIG. **6**(*b*), outer camera **25** is arranged in an upper portion of upper housing **21** (in a portion distant from lower housing **11** (more distant from lower housing **11** than a center of upper housing **21**)) when game device **10** is in the opened state. This is because the user holds lower housing **11** in using game device **10**, and if outer camera **25** is arranged close to lower housing **11**, a hand of the user may be located within an image pick-up range of outer camera **25**.

[0294] In the present embodiment, outer camera **25** is provided such that a center thereof is located in a position distant from a right end of upper housing **21** by about 20 mm and from an upper end of upper housing **21** by about 20 mm when game device **10** is in the opened state. Since outer camera **25** is not for photographing the user holding game device **10**, there is a low need for providing outer camera **25** at the center of game device **10**. Further, since the user basically holds lower housing **11**, it would be easier for the user to hold game device **10** having an appropriate thickness. On the other hand, since portability of game device **10** having a small thickness in the folded state is high, upper housing **21** is preferably as thin as possible. Thus, in the present embodiment, upper LCD **22** is arranged at the center of upper housing **21** in view of visibility and outer camera **25** is arranged in an upper portion of upper housing **21** (that is, in an area on a back side of a non-screen area B**2** shown in FIG. **1**) avoiding a position where upper LCD **22** is arranged.

[0295] Thus, since a position where upper LCD **22** is arranged does not overlap with that of outer camera **25**, upper housing **21** can be made thinner. Further, since the user basically holds lower housing **11**, by providing outer camera **25** in upper housing **21**, a finger holding lower housing **11** can be prevented from being located within the image pick-up range of outer camera **25**.

[0296] The inner surface of upper housing **21** is formed to be substantially planar. As shown in FIG. **1**, at the center of the inner surface of upper housing **21**, an opening **21**B is formed for exposing upper LCD **22**. The screen of upper LCD **22** accommodated in upper housing **21** is exposed through opening **21**B. Further, a sound emission hole **21**D is formed on each side of opening **21**B. A not-shown speaker is accommodated in upper housing **21** in the rear of sound emission hole **21**D. Sound emission hole **21**D is a hole for emitting sound from the speaker to the outside. These sound emission holes **21**D are provided on both of left and right sides of upper LCD **22**.

[0297] Thus, in the inner surface of upper housing **21**, non-screen areas (dotted-line areas B**1** and B**2** shown in FIG. **1**, specifically an area for arranging a speaker; a speaker arrangement area) are provided on respective sides of opening **21**B for upper LCD **22** provided at the center of the inner surface of upper housing **21**.

[0298] Here, in the present embodiment, lower housing **11** and upper housing **21** are equal in lengths (widths) in the left-right direction thereof (in the y direction shown in the drawing). Further, lower LCD **12** and upper LCD **22** are equal in widths in the left-right direction and they are arranged in the same position with respect to the left-right direction. Thus, the speaker arrangement area is provided such that the position thereof in the left-right direction corresponds to the position of the button arrangement area. Similarly to the button arrangement area, the speaker arrangement area is designed to have a dimension of 15 mm or more (preferably 20 mm or more, more preferably approximately 30 to 40 mm; 32 mm in the present embodiment) in the lateral direction.

[0299] In the present embodiment, regarding the left-right direction, two sound emission holes **21**D are arranged around the centers of the speaker arrangement areas in the left-right direction, respectively. Further, regarding an up-down direction, sound emission hole **21**D is arranged in a lower area of the speaker arrangement area (in an area close to lower housing **11**). Alternatively, as shown in FIG. **15**, the speakers and sound emission holes **21**D may be arranged at a position slightly higher than that in FIG. **1**. Further, as shown in FIG. **15**, a plurality of sound emission holes **21**D (six in FIG. **15**) may be provided for one speaker.

[0300] As described above, in the present embodiment, the non-screen area is provided in lower housing **11** and upper housing **21** in the same position with respect to the left-right direction. Thus, game device **10** is easily held when held sideways as shown in FIG. **9** as well as when held lengthwise (in a state where game device **10** is rotated 90° clockwise or counterclockwise relative to the state shown in FIG. **9**).

[0301] FIGS. **11** and **12** are diagrams showing a state where the user holds game device **10** lengthwise. FIG. **11** shows a state where game device **10** is held with a left hand, and FIG. **12** shows a state where game device **10** is held with a right hand. A right-handed user may rotate game device **10** 90° counterclockwise from the state shown in FIG. **9**, and hold game device **10** with a left hand as shown in FIG. **11**. A left-handed user may rotate game device **10** 90° clockwise from the state shown in FIG. **9**, and hold game device **10** with a right hand as shown in FIG. **12**. In any case, the user can hold game device **10** while touching the projection portion (shaft portions **11**A and **21**A) with his/her thumb and the upper surface of lower housing **11** with his/her index finger.

[0302] As described above, as the step is formed between the outer surface of lower housing **11** and the outer surface of upper housing **21** (see FIG. **5**), game device **10** can be held in a stable manner by touching the step with the index finger. In addition, the shutter button (button **14**I or **14**J) can easily be pressed by a dominant hand not holding game device **10**.

[0303] Since the non-screen area is provided on each side of LCDs **12** and **22** as described above, a thumb is not located on the screen even when game device **10** is held lengthwise with either hand. In other words, even when game device **10** is held lengthwise, game device **10** is easily held and visibility of the screen and operability of the touch panel are ensured.

[0304] Further, as shown in FIG. **7**, the projection portion projects from lower housing **11** further than the key tops of buttons **14**A to **14**E (direction input button **14**A in FIG. **7**). Thus, even if a thumb holding game device **10** lengthwise is located above a button, the user is less likely to accidentally press the button, and an erroneous input can be prevented.

[0305] Further, since game device **10** has a dimension of 100 to 200 mm in length in the opened state, game device **10** held lengthwise has a sufficient width substantially equal to the width of game device **10** held sideways, and hence it is not difficult to hold the game device.

[0306] When game device **10** is held lengthwise, the angle between the housings may be set to the prescribed angle smaller than 180°. By setting the angle between the housings to an angle slightly smaller than 180°, the outer surfaces of housings **11** and **21** fit to a shape of a hand, and hence it becomes easier to hold game device **10**.

[0307] In addition, as described above, in game device **10** according to the present embodiment, cameras **23** and **25** are provided in upper housing **21** and a live image picked up by camera **23** or **25** can be displayed on lower LCD **12** provided in lower housing **11**. According to this structure, when game device **10** is held for use or when game device **10** is placed on a desk for use, it is extremely easy to perform an edition operation on a live image while changing a photographing direction as appropriate.

[0308] FIG. **13** is a diagram showing a state in which game device **10** is held for use. When game device **10** is held for use, as shown in FIG. **13**, the user holds lower housing **11** with one hand (a left hand in FIG. **13**). Then, as a live image is displayed on lower LCD **12**, the user performs an edition operation on the live image using touch pen **27** with the other hand. Here, since an angle of lower housing **11** and an angle of upper housing **21** can individually be changed, the user can hold game device **10** with the angle of lower housing **11** being adjusted such that the user can easily perform an operation on the touch panel, while aiming camera **23** or **25** in upper housing **21** at an image pick-up object.

[0309] In addition, since the user holds lower housing **11** with one hand, the user can perform an edition operation through touch panel **13** in a stable manner. As described above, when game device **10** is held for use, it is extremely easy to perform an edition operation on a live image.

[0310] In addition, game device **10** is also suitable for photographing in a state where game device **10** is placed on a stand or the like, in addition to photographing in a state where game device **10** is held by the user.

[0311] FIG. **14** is a diagram showing a state in which game device **10** is placed for use. Even when game device **10** is placed on a desk or the like for use as shown in FIG. **14**, it is easy for the user to operate touch panel **13** because a live image is displayed on lower LCD **12**.

[0312] In addition, the user can place lower housing **11** on a placement surface and adjust an angle between two housings **11** and **21** such that upper housing **21** is set at a desired angle with respect to lower housing **11**. Thus, even when the user places game device **10**, the user can perform photographing with upper housing **21** (the photographing direction of the camera) being set at any angle. Thus, even when game device **10** is placed for use, it is extremely easy to perform an edition operation on a live image.

[0313] Since game device **10** includes two cameras **23** and **25**, photographing in different directions can be performed by changing a photographing camera between inner camera **23** and outer camera **25** without moving game device **10** placed on a stand. It is noted that the photographing direction can be changed by adjusting the angle between two housings **11** and **21** in photographing with either camera. In addition, game device **10** may have a self-timer function with which photographing is performed in a prescribed period of time after the timing of pressing of the shutter button. In photographing with the self-timer function, the user does not hold game device **10**. Therefore, ability to set the photographing direction of the camera to any direction as in the present embodiment is particularly convenient.

[0314] Further, in the present embodiment, two cameras **23** and **25** for image pick-up in different directions are both provided in upper housing **21**. Therefore, even when game device **10** is placed for photographing, both of two cameras **23** and **25** can be used.

[0315] Further, in the present embodiment, since lower housing **11** is formed to have a horizontally long shape, stability in placing game device **10** is increased and game device **10** can be less likely to fall down.

[0316] In addition, in game device **10**, an LCD for displaying a real-time image (a live image) picked-up by camera **23** or **25** may be switched between upper LCD **22** and lower LCD **12**, for example, in accordance with a switch instruction from the user. Here, for example, when game device **10** is placed on a stand for use, switching may be made to display a real-time image on lower LCD **12**. This is because, when game device **10** is placed on a stand for use, the angle of upper housing **21** should be changed in order to adjust the photographing direction of the camera, and hence the user can easily view a real-time image displayed on lower LCD **12** of lower housing **11** of which angle does not have to be changed.

[0317] In an alternative embodiment, a picked-up image may be displayed on upper LCD **22**. Since an input device (touch panel **13** and buttons **14**A to **14**I) for providing an operation input to game device **10** is provided in lower housing **11**, in using game device **10**, the user can provide an input to the input device while viewing a picked-up image (an image picked up by a camera) displayed on upper LCD **22** and holding lower housing **11**.

[0318] According to the feature above, game device **10** includes the buttons and the touch panel as input devices. Thus, game device **10** can select an appropriate input device as an input device to be used for performing an input operation depending on a type (characteristic) of an input operation. For example, regarding a shutter operation, preferably, the user has actual feeling of the operation and the operation has a prescribed stroke. Thus, the shutter operation may be performed by using the button. Further, regarding an operation in edition processing which will be described later, an operation is preferably performed by using the touch panel.

[0319] In the present embodiment, game device **10** is structured to be foldable by pivotably connecting (coupling) lower housing **11** and upper housing **12** to each other. In an alternative embodiment, lower housing **11** may be coupled to upper housing **12** with another feature or in another manner.

[0320] For example, two plate-like housings may be connected to each other such that one of the housings is slidable

or pivotable with respect to the other housing with one being in parallel with the other. By doing so, as in the embodiment above, the two housings can be in an opened state and in a closed state.

[0321] Alternatively, in the embodiment above, upper housing **21** may be structured such that shaft portion **21**A and other portions thereof are pivotable around an axis in the up-down direction. According to this structure, only by providing one camera in upper housing **21**, the camera can easily be directed to the line-of-sight direction of the user or a direction opposite thereto.

[0322] An image pick-up device **110** shown in FIGS. **15** to **17** is an image pick-up device obtained by changing arrangement, the number, a shape, or the like of some components of game device **10** according to the present embodiment, and basic functions thereof are the same as those of game device **10**.

5. INTERNAL CONFIGURATION OF GAME DEVICE

[0323] An internal configuration of game device **10** will be described hereinafter with reference to FIG. **18**.

[0324] FIG. **18** is a block diagram showing the internal configuration of game device **10** according to the present embodiment. As shown in FIG. **18**, game device **10** includes such electronic parts as CPU **31**, main memory **32**, a memory control circuit **33**, a data memory **34** for storage, a memory **35** for preset data, memory card interfaces (memory card UF) **36** and **37**, a wireless communication module **38**, a local communication module **39**, a real time clock (RTC) **40**, a power supply circuit **41**, an interface circuit (I/F circuit) **42**, and a folded position detection sensor **50**. These electronic parts are mounted on an electronic circuit board and accommodated in lower housing **11** (or may be accommodated in upper housing **21**).

[0325] Though various electronic circuits and a battery mounted on game device **10** may be accommodated in either upper housing **21** or lower housing **11**, game device **10** is preferably designed such that a weight of lower housing **11** is greater than that of upper housing **21**. Specifically, preferably, the weight of lower housing **11** ranges from 100 to 200 g and the weight of upper housing **21** ranges from 50 to 100 g. Further, more preferably, the weight of lower housing **11** ranges from 130 to 150 g and the weight of upper housing **21** ranges from 70 to 90 g.

[0326] In the present embodiment, the weight of lower housing **11** is about 150 g and the weight of the upper housing is about 75 g. Further, preferably, a ratio between the weight of lower housing **11** and the weight of upper housing **21** (the weight of lower housing **11**):(the weight of upper housing **21**) ranges from 1.5:1 to 3:1 (more preferably, 2:1). For example, the battery, the circuit board on which the CPU is mounted, the card connector, and the like are preferably accommodated in lower housing **11**.

[0327] Further, preferably, minimal parts such as an LCD unit (upper LCD **22** and the like), an image pick-up unit (cameras **23** and **25** and the like), a speaker unit, and the like are accommodated in upper housing **21**.

[0328] By designing game device **10** such that the weight of lower housing **11** is greater than that of upper housing **21**, game device **10** is less likely to fall down when placed on a stand or the like. Further, by making lower housing **11** held by the user heavier than upper housing **21**, stability when game device **10** is held is increased and hand movement in photographing can be prevented.

[0329] CPU **31** is information processing means for executing various programs (including a launch program, a selected application program, or the like which will be described later). In game device **10** according to the present embodiment, various programs are stored in an embedded memory (for example, data memory **34** for storage) or in memory card **28** and/or **29**, and CPU **31** performs various types of processing which will be described later by executing a necessary program. It is noted that the program executed by CPU **31** may be recorded in advance in a memory within game device **10**, may be obtained from memory card **28** and/or **29**, or may be obtained from another instrument through communication with another instrument.

[0330] In addition, the program according to the present invention may be supplied not only to a computer represented by game device **10** through an external storage medium such as memory card **29** but also to a computer through a wired or wireless communication line. Alternatively, the program according to the present invention may be stored in advance in a non-volatile storage device within the computer. A computer-readable storage medium storing such a program is not limited to the non-volatile storage device above, and an optical disc medium such as a CD-ROM, a DVD, or a similar medium may be employed.

[0331] Main memory **32**, memory control circuit **33** and memory **35** for preset data are connected to CPU **31**. In addition, data memory **34** for storage is connected to memory control circuit **33**.

[0332] Main memory **32** is storage means used as a work area or a buffer area of CPU **31**. Namely, main memory **32** stores a program read from the outside (memory card **28**, other equipment, and the like), holds a work memory necessary for various types of processing in a non-volatile manner, or store various types of data necessary for various types of information processing. In the present embodiment, for example, a PSRAM (Pseudo-SRAM) is employed as main memory **32**.

[0333] Data memory **34** for storage is storage means for storing a program executed by CPU **31**, data of images picked up by camera **23** or **25**, and the like. Data memory **34** for storage is implemented, for example, by a NAND-type flash memory.

[0334] Memory control circuit **33** is a circuit controlling reading and writing of data from/to data memory **34** for storage in accordance with an instruction from CPU **31**. Memory **35** for preset data is storage means for storing data such as various parameters set in advance in game device **10** (preset data). A flash memory connected to CPU **31** through an SPI (Serial Peripheral Interface) bus may be employed as memory **35** for preset data.

[0335] It is noted that an image obtained as a result of image pick-up by camera **23** or **25** can selectively be stored in data memory **34** for storage, memory card **28**, memory card **29**, or the like.

[0336] Memory card I/F **36** is connected to CPU **31**. Memory card I/F **36** reads data from memory card **28** attached to the connector or writes data therein in accordance with an instruction from CPU **31**. In the present embodiment, data of images picked-up by cameras **23** and **25** is written in memory card **28**, and the image data stored in memory card **28** is read

from memory card **28** to be stored in data memory **34** for storage. In addition, in the present embodiment, a music file which is music data stored in memory card **28** is read from memory card **28** and stored in main memory **32** or data memory **34** for storage.

[0337] A cartridge I/F **37** is connected to CPU **31**. Cartridge I/F **37** reads data from memory card **29** attached to the connector or writes data therein in accordance with an instruction from CPU **31**. In the present embodiment, an application program executable by game device **10** is read from memory card **29** and executed by CPU **31**, or data relating to the application program (including a selected application program which will be described later) (for example, saved data of a game or the like in a case where the application program is a game program) is written in memory card **29**.

[0338] Wireless communication module **38** has a function to connect to wireless LAN with a scheme complying with the standard of IEEE802.11.b/g. In addition, local communication module **39** has a function to establish wireless communication with game device **10** of the same type with a prescribed communication scheme. Wireless communication module **38** and local communication module **39** are connected to CPU **31**. CPU **31** can transmit and receive data to and from other equipment via the Internet through wireless communication module **38**, and can transmit and receive data to and from another image pick-up device of the same type through local communication module **39**.

[0339] In addition, RTC **40** and power supply circuit **41** are connected to CPU **31**. RTC **40** counts a time and outputs the time to CPU **31**. CPU **31** calculates a current time (date) based on the time counted by RTC **40**. Power supply circuit **41** controls electric power from a power supply (the battery; accommodated in lower housing **11**) of game device **10** to supply electric power to each part of game device **10**.

[0340] In addition, folded position detection sensor **50** is connected to CPU **31**. Folded position detection sensor **50** detects an angle between lower housing **11** and upper housing **21**, and outputs a determination signal indicating the closed state or the opened state to CPU **31** based on a result of detection. Specifically, when the angle between lower housing **11** and upper housing **21** is smaller than a prescribed threshold value, determination as the closed state is made and the determination signal indicating the closed state is output. On the other hand, when the angle between lower housing **11** and upper housing **21** is not smaller than the prescribed threshold value, determination as the opened state is made and the determination signal indicating the opened state is output. For example, when game device **1** is operating, that is, when music data reproduction processing is in progress, receiving input of the determination signal indicating the closed state output from folded position detection sensor **50**, CPU **31** stops the operation of the reproduction processing depending on sensing of connection with prescribed external output equipment and sets what is called a sleep state in which data of that state of operation is stored. Regarding processing other than the reproduction processing such as display processing, such processing is stopped and the sleep state is set regardless of sensing of connection with prescribed external output equipment. On the other hand, receiving input of the determination signal indicating the opened state output from folded position detection sensor **50** after game device **1** enters the sleep state, CPU **31** performs processing for recovering from the sleep state to the original state based on the stored data of the state of operation. As a result of this processing, the function set to the sleep state can directly be set to an active state for operation.

[0341] In the present example, folded position detection sensor **50** of such a type as detecting an angle between lower housing **11** and upper housing **21** and outputting a determination signal has been described, however, the opened and closed state may be detected based on magnetic force. For example, magnetic force generated by the speaker provided in the upper housing can be measured with a sensor measuring magnetic force provided in the lower housing and the opened and closed state may be detected based on strength of the magnetic force. Alternatively, such a type as optically or electrically detecting the opened and closed state may be adopted as the folded position detection sensor.

[0342] Moreover, game device **10** includes microphone **43** and amplifiers **44** and **46**. Microphone **43** and amplifiers **44** and **46** are each connected to I/F circuit **42**. Microphone **43** senses voice and sound of the user issued toward game device **10** and outputs an audio signal indicating the voice and sound to I/F circuit **42**. Amplifier **44** amplifies the audio signal from I/F circuit **42** and causes the audio signal to be output from a right speaker **45**. Amplifier **46** amplifies the audio signal from I/F circuit **42** and causes the audio signal to be output from a left speaker **47**. I/F circuit **42** is connected to CPU **31**. In addition, game device **10** includes a headphone amplifier **48** and a jack **49**. Headphone amplifier **48** and jack **49** are each connected to I/F circuit **42**. Headphone amplifier **48** amplifies an audio signal from I/F circuit **42** for output from a not-shown headphone through a plug of the headphone connected to jack **49**. I/F circuit **42** senses insertion of the plug of the headphone into the jack by sensing turn-on of a mechanical switch, for example, resulting from insertion of a plug of a headphone into jack **49**. Alternatively, I/F circuit **42** senses insertion of the plug of the headphone into the jack by sensing an electrically conducting state resulting from insertion of the plug of the headphone into jack **49**.

[0343] I/F circuit **42** includes an audio input control circuit **42***b* receiving input of an audio signal from microphone **43**, an audio output control circuit **42***c* controlling output of an audio signal to amplifiers **44** and **46** (right speaker **45** and left speaker **47**) or headphone amplifier **48**, a touch panel control circuit **42***a* controlling touch panel **13**, an output level sensing circuit **42***d* sensing an output level of an audio signal output to amplifiers **44** and **46** (right speaker **45** and left speaker **47**) or headphone amplifier **48** (headphone) by audio output control circuit **42***c*, and a headphone sensing circuit **42***e* sensing attachment of the headphone.

[0344] Audio input control circuit **42***b* senses an input level of an audio signal from microphone **43**, and performs A/D conversion of the audio signal and converts the audio signal to audio data in a prescribed format.

[0345] Headphone sensing circuit **42***e* senses insertion of the plug of the headphone into the jack by sensing turn-on of the mechanical switch resulting from insertion of the plug of the headphone into jack **49** or an electrically conducting state resulting from insertion of the plug of the headphone into jack **49**. Then, the result of sensing is output to CPU **31**, and CPU **31** receives a signal indicating the result of sensing from headphone sensing circuit **42***e* and determines that the head-

phone has been attached. Here, insertion of the plug of the headphone should only be sensed, and a method of sensing is not limited.

[0346] When the plug of the headphone is inserted into the jack and headphone sensing circuit **42***e* senses attachment of the headphone, audio output control circuit **42***c* switches the output of the audio signal from amplifiers **44**, **46** to headphone amplifier **48** in response to an instruction from CPU **31**, and adjusts the audio signal to be output to headphone amplifier **48** in accordance with whether the output signal is stereophonic or monaural. In the present example, though only a single headphone amplifier **48** is shown in FIG. **18**, stereophonic sound can be heard through a headphone for both ears and hence it is assumed that headphone amplifiers are provided for respective ears.

[0347] Touch panel **13** is connected to I/F circuit **42**. Touch panel control circuit **42***a* generates touch position data in a prescribed format based on a signal from touch panel **13** and outputs the data to CPU **31**. The touch position data indicates a coordinate of a position where input to an input surface of touch panel **13** was made. Here, the touch panel control circuit performs reading of a signal from touch panel **13** and generation of the touch position data once in a prescribed period of time. CPU **31** can know a position at which an input to touch panel **13** was made by obtaining the touch position data.

[0348] Operation button group **14** is constituted of operation buttons **14**A to **14**K above and connected to CPU **31**. Operation data indicating a state of input to each of operation buttons **14**A to **14**K (whether the button was pressed or not) is output from operation button group **14** to CPU **31**. CPU **31** performs processing in accordance with the input to operation button group **14** by obtaining the operation data from operation button group **14**.

[0349] Inner camera **23** and outer camera **25** are each connected to CPU **31**. Inner camera **23** and outer camera **25** pick up an image in accordance with an instruction from CPU **31**, and output picked-up image data to CPU **31**. For example, CPU **31** gives an image pick-up instruction to any one of inner camera **23** and outer camera **25** and the camera that received the instruction picks up an image and sends image data to CPU **31**.

[0350] In addition, lower LCD **12** and upper LCD **22** are each connected to CPU **31**. Each of lower LCD **12** and upper LCD **22** displays an image thereon in accordance with an instruction from CPU **31**. For example, CPU **31** causes one of lower LCD **12** and upper LCD **22** to display an image obtained from any of inner camera **23** and outer camera **25** and causes the other of lower LCD **12** and upper LCD **22** to display an operation guidance picture generated through prescribed processing.

[0351] Though not shown, game device **10** has a vibration function to vibrate itself. The vibration function is used, for example, for giving some notification to the user (for example, for notifying the user of error in operation, excess of memory capacity, and the like). In the present embodiment, since it is assumed that the user holds lower housing **11** during use, a device for achieving the vibration function (for example, a vibrator such as a vibration motor or a solenoid) is preferably accommodated in lower housing **11**. Thus, vibration can be conveyed to the user's hand holding game device **10** (lower housing **11**).

6. LAUNCHER PROCESSING AND PHOTOGRAPHING FUNCTION

[0352] <Overview>

[0353] Game device **100** according to the present embodiment can execute a plurality of application programs as will be described later. In order to facilitate an operation for selection from such a plurality of application programs by the user, game device **100** has a launcher function. In particular, game device **100** can provide a relatively simple photographing function on a screen providing this launcher function.

[0354] Processing supporting selective launching of an application by the user will be described hereinafter with reference to FIG. **19**.

[0355] FIG. **19** is a diagram for illustrating a method of launching each application program in game device **10**. Game device **10** selectively launches an application program desired by the user among a plurality of application programs **53** to **57**. Application programs **53** to **57** to selectively be launched in game device **10** may also be referred to as selected application programs.

[0356] The plurality of selected application programs above include a photographing application program **53**. Photographing application program **53** is an application program for performing photographing with camera **23** or **25**. Photographing application program **53** is typically stored in advance (pre-installed) in game device **10**.

[0357] Further, the plurality of selected application programs above include application programs having various functions in addition to photographing application program **53** above. In FIG. **19**, for example, a setting application program **54** for making various settings of game device **10**, a communication application program **55** for game device **10** to establish communication with external equipment, a game application program **56** for playing a prescribed game, and a sound application program **57** for reproducing music or recording voice and sound are included. In the present embodiment, photographing application program **53** and communication application program **55** are implemented as one integrated program.

[0358] It is noted that various selected application programs in addition to five selected application programs **53** to **57** shown in FIG. **19** may be stored.

[0359] Some or all of the selected application programs above do not have to be pre-installed in game device **10**. When executed, for example, a selected application program may be downloaded from another device via a network such as the Internet, or may be read from a removable storage medium such as memory card **28** or memory card **29** into a memory within game device **10**.

[0360] Further, in the present embodiment, processing for selectively launching selected application programs **53** to **57** is performed by a launch function program **51**. Launch function program **51** is a program for selecting a selected application program to be launched from among the plurality of selected application programs **53** to **57**. Namely, launch function program **51** is what is called a launcher program. Launch function program **51** is one of programs included in launch programs (a launch program **61** shown in FIG. **20**) according to the present embodiment.

[0361] Selected application programs **53** to **57** are subjected to a selection operation that can be performed by the user as a result of execution of launch function program **51**, and they are executed by being selected in the selection operation.

[0362] Detailed contents of processing in photographing application program **53**, communication application program **55** and sound application program **57** executed by launch function program **51** in response to a user's selection operation will be described later.

[0363] <Control Structure>

[0364] Game device **10** according to the present embodiment includes (a) first launch operation acceptance means, (b) first launch means, (c) photographing processing means, (d) photographing enabling operation acceptance means, (e) photographing operation acceptance means, (f) second launch operation acceptance means, and (g) second launch means as the control structure. In the present embodiment, each of these means is implemented as a result that a program (launch program **61**) executed by a computer (CPU **31**) of game device **10** causes the computer to function as that means.

[0365] (a) First Launch Operation Acceptance Means

[0366] The first launch operation acceptance means accepts a first launch operation for selectively launching the plurality of application programs above (step SA**6** and SA**11** which will be described later). Thus, the user can select a selected application program that the user desires to launch (execute) for execution. As the first launch operation is an operation for selectively launching a selected application program, the first launch operation is also hereinafter referred to as a "selection launch operation." It is noted that a state of accepting the first launch operation (a state where the first launch operation can be performed) is referred to as a "launch acceptance state" (FIG. **19**).

[0367] (b) First Launch Means

[0368] When the first launch operation above is performed, the first launch means launches an application program selected in the first launch operation from among the plurality of application programs above (step SA**12** which will be described later). In other words, for example, when photographing application program **53** is selected in the first launch operation, photographing application program **53** is launched.

[0369] In the present embodiment, the launch acceptance state corresponds to a state where what is called a menu screen is displayed, and game device **10** is initially in the launch acceptance state after it is started up (power is turned on) (except for start-up for the first time). Though details will be described later, the menu screen (FIG. **23**) showing icons indicating selected application programs **53** to **57** is displayed on lower LCD **12** in the launch acceptance state in the present embodiment. The user can launch a selected application program by performing an operation to touch a position of the icon on touch panel **13** as the first launch operation.

[0370] (c) Photographing Processing Means

[0371] The photographing processing means performs photographing processing (step SA**10** which will be described later). The photographing processing is processing for storing an image picked-up by camera **23** or **25** in storage means in the information processing device in accordance with a prescribed photographing operation. In the present embodiment, the photographing operation is an operation to press a prescribed button (more specifically, L button **14**I or R button **14**J). The photographing processing means above is means implemented by execution of launch program **61** according to the present invention by CPU **31** of game device **10**, and it is different from means implemented by photographing application program **53** above. It is noted that the photographing processing means has only to have at least a function to perform photographing processing (a function to store an image picked-up by camera **23** or **25** in the storage means of game device **10**), however, it may have other functions relating to photographing (for example, a function to display or edit a stored image).

[0372] In the present embodiment, launch program **61** according to the present invention includes a photographing function program **52** shown in FIG. **19**. The photographing processing means above is implemented by execution of photographing function program **52** by CPU **31** of game device **10**. In other words, game device **10** according to the present embodiment stores two types of programs for executing photographing processing of photographing function program **52** and photographing application program **53**.

[0373] Further, in the present embodiment, though launch program **61** includes the two types of programs of launch function program **51** and photographing function program **52**, launch function program **51** and photographing function program **52** may be one integrated program. Launch program **61** (launch function program **51** and photographing function program **52**) is pre-installed in game device **10**.

[0374] Here, a function attained by the photographing processing means is different from a function enabled by execution of photographing application program **53** above. In the present embodiment, the photographing processing means has only a part of functions attained by photographing application program **53**. In an alternative embodiment, the photographing processing means may have a function not attained by photographing application program **53**.

[0375] (d) Photographing Enabling Operation Acceptance Means

[0376] In the launch acceptance state, the photographing enabling operation acceptance means accepts a photographing enabling operation for causing (a state of game device **10** to enter) a photographing enabled state (steps SA**6** and SA**9** which will be described later). The photographing enabled state is a state where photographing processing by the photographing processing means above can be performed in accordance with the photographing operation above (a state of accepting the photographing enabling operation). In other words, in the launch acceptance state, the user can launch selected application programs **53** to **57** with the first launch operation, and can also activate a photographing function attained by the photographing processing means with the photographing enabling operation (FIG. **19**). In the present embodiment, the photographing enabling operation is an operation to press a prescribed button (more specifically, L button **14**I or R button **14**J).

[0377] In the present embodiment, the photographing enabling operation is an operation different from the first launch operation in a manner of operation. Specifically, in the present embodiment, the first launch operation is an input operation to touch panel **13** while the photographing enabling operation is an operation to press a prescribed button (more specifically, L button **14**I or R button **14**J). It is noted that the phrase "different in a manner of operation" naturally means that an input device to be operated is different and also means that an operation performed on the same input device is different. In an alternative embodiment, the first launch operation and the photographing enabling operation may be operations to touch different positions on touch panel **13**, may be operations to input different trails on touch panel **13**, or may be operations to press different buttons. In order to easily

and quickly activate the photographing function attained by the photographing processing means (launch photographing function program **52**), the photographing enabling operation is preferably a simple operation such as an operation to press a prescribed button.

[0378] (e) Photographing Operation Acceptance Means

[0379] When the photographing enabling operation above is performed, the photographing operation acceptance means accepts the photographing operation (steps SA**24** and SA**25** which will be described later). In other words, when the photographing enabling operation is performed, the state of game device **10** enters the photographing enabled state (FIG. **19**). Thus, the user can take a photograph (cause game device **10** to perform the photographing processing) by performing the photographing operation after the photographing enabling operation.

[0380] In the present embodiment, the launch acceptance state and the photographing enabled state are mutually exclusive, and game device **10** is alternatively in either the launch acceptance state or the photographing enabled state. In other words, the photographing operation (in the photographing enabled state) is not accepted in the launch acceptance state while the first launch operation (in the launch acceptance state) is not accepted in the photographing enabled state. In an alternative embodiment, however, the launch acceptance state and the photographing enabled state do not have to be mutually exclusive, and game device **10** can be in the launch acceptance state and the photographing enabled state. For example, game device **10** may accept the first launch operation in the photographing enabled state.

[0381] (f) Second Launch Operation Acceptance Means

[0382] In the photographing enabled state above, the second launch operation acceptance means accepts a second launch operation for launching photographing application program **53** (steps SA**24** and SA**29** which will be described later). Thus, in the photographing enabled state, the user can perform the second launch operation in addition to the photographing operation. The second launch operation is an operation for launching photographing application program **53** directly from the photographing enabled state without returning to the launch acceptance state, and thus it is also hereinafter referred to as a "shortcut launch operation."

[0383] In the present embodiment, in the photographing enabled state, an image picked-up by camera **23** or **24** is displayed on lower LCD **12** while a button image (a button image **78** shown in FIG. **24**) for performing the second launch operation is displayed on lower LCD **12** (FIG. **24**). The user can perform the second launch operation by performing an operation to touch the button image. In order to easily and quickly launch photographing application program **53**, the second launch operation is preferably a simple operation.

[0384] (g) Second Launch Means

[0385] When the second launch operation above is performed, the second launch means launches photographing application program **53** (step SA**30** which will be described later). Thus, the user can launch photographing application program **53** in any of the launch acceptance state and the photographing enabled state. Photographing application program **53** is launched (executed) with any of the first launch operation in the launch acceptance state above and the second launch operation in the photographing enabled state above.

[0386] As described above, according to the present embodiment, in the launch acceptance state, the user can launch selected application programs **53** to **57** with the selection launch operation (the first launch operation) and also can perform the photographing function attained by the photographing processing means with the photographing enabling operation. In addition, in the photographing enabled state where photographing based on the photographing function can be performed, the user can launch photographing application program **53** with the shortcut launch operation (the second launch operation). Thus, even during photographing based on the photographing processing means, the user can easily and quickly launch photographing application program **53** with the shortcut launch operation. In other words, according to the present embodiment, even though the user desires to use a function (of photographing application program **53**) not provided by the photographing processing means during photographing based on the photographing processing means, the user can easily and quickly use the function by performing the shortcut launch operation.

[0387] <Data Structure>

[0388] Data used in the processing in game device **10** will now be described with reference to FIG. **20**.

[0389] FIG. **20** is a diagram showing main data stored in main memory **32** of game device **10**. As shown in FIG. **20**, a program storage area **60** and a data storage area **64** are provided in main memory **32**.

[0390] In program storage area **60**, various programs (application programs) executed by CPU **31** are stored. Specifically, launch program **61**, photographing application program **53**, other selected application programs **62**, and the like are stored. These programs are read from data memory **34** for storage, memory card **28** or memory card **29** and stored in main memory **32** at appropriate timing after start-up of game device **10** (for example, at the timing of launch of a program).

[0391] Launch program **61** is a program for performing main processing in game device **10**. Launch program **61** is read into the main memory and executed after start-up of game device **10**. Launch program **61** includes launch function program **51** and photographing function program **52** above.

[0392] Launch function program **51** is a program for selecting a selected application program to be launched as described above.

[0393] Photographing function program **52** is a program which is not a selected application program, and it is a program for performing the photographing processing. In the present embodiment, photographing function program **52** has only a part of functions attained by photographing application program **53**. In other words, in the present embodiment, photographing function program **52** is a photographing processing program having a relatively simple function, and photographing application program **53** is a relatively multifunctional photographing processing program. Further, photographing function program **52** has a data size smaller than that of photographing application program **53**. Since programs **52** and **53** have a common function, a part of data thereof may be stored in common Hereinafter, photographing function program **52** having a relatively simple function is also referred to as a "simplified photographing program **52**," and relatively multifunctional photographing application program **53** is also referred to as a "multifunctional photographing application program **53**."

[0394] The phrase "(relatively) simple function" herein encompasses both meaning of having (relatively) few functions and meaning of having a (relatively) low function. In other words, the phrase "(relatively) multifunctional" encompasses meaning of having (relatively) many functions as well

as meaning of having a (relatively) high function. In other words, simplified photographing program **52** may have a relatively low function (for example, photographing with a small number of pixels, a small number of types of stamps available in editing a picked-up image, and the like) while multifunctional photographing application program **53** may have a relatively high function (for example, photographing with a large number of pixels, a large number of types of stamps available in editing a picked-up image, and the like).

[0395] Further, simplified photographing program **52** may have relatively few functions (for example, adjustment of exposure and white balance is impossible, a prescribed edition operation on a picked-up image is impossible, and the like) while multifunctional photographing application program **53** may have relatively many functions (for example, adjustment of exposure and white balance is possible, a prescribed edition operation on a picked-up image is possible, and the like).

[0396] Further, other selected application programs **62** refer to selected application programs other than multifunctional photographing application program **53**, and include setting application program **54**, communication application program **55**, game application program **56**, sound application program **57** for reproducing music or recording voice and sound described above, and the like.

[0397] The selected application programs (including multifunctional photographing application program **53**) are stored in data memory **34** for storage or memory card **28**, and read into main memory **32** when launched. It is noted that the selected application programs may be obtained (downloaded) from external equipment through communication and stored in data memory **34** for storage.

[0398] Meanwhile, in data storage area **64**, display image data **65**, setting data **66**, and the like are stored. In addition to these data **65** and **66**, various data used in the processing in game device **10** are stored in data storage area **64**.

[0399] Display image data **65** is data indicative of a display image. Here, in the present embodiment, one of stored images taken in the past is displayed on the menu screen, and an image being displayed is referred to as a display image. Specifically, display image data **65** indicates a file name and the like of a display image. Though details of a method of selecting a display image will be described later, a favorite image which will be described later, an image immediately after photographing (storage) by means of simplified photographing program **52**, or the like is selected as a display image in the present embodiment.

[0400] Setting data **66** is data indicative of setting information used in each program for photographing (simplified photographing program **52** and multifunctional photographing application program **53**). Setting data **66** is passed as an argument to each of programs **52** and **53** at the time of launch of each of programs **52** and **53** for photographing. Setting data **66** includes camera change data **67** and storage destination data **68**.

[0401] Camera change data **67** indicates a camera for picking up an image, out of inner camera **23** and outer camera **25**. In other words, camera change data **67** is data indicative of either inner camera **23** or outer camera **25**.

[0402] Storage destination data **68** indicates a storage destination of a picked-up image stored as a result of the photographing operation (referred to as a stored image). In the present embodiment, a picked-up image stored (saved) as a result of the photographing operation is stored in data memory **34** for storage or memory card **28**. Thus, storage destination data **68** indicates either data memory **34** for storage or memory card **28**.

[0403] It is noted that information such as a file name is attached to the stored image and information relating to favorite is also attached. Here, in the present embodiment, the user can set some of stored images as "favorite" (step SA**46** which will be described later). A stored image set as favorite is hereinafter referred to as a "favorite image". Information indicative of "favorite" is added to data of a favorite image. In addition, in the present embodiment, information indicative of any of first to third groups is added to the data of the favorite image. In other words, in the present embodiment, favorite images can be managed in three groups of first to third groups (FIG. **29**).

[0404] <Processing Procedure>

[0405] With reference to FIGS. **21** to **30**, a flow of the processing relating to the launcher function in game device **10** will now be described. FIG. **21** is a main flowchart showing the flow of the launch processing in game device **10**. When power of game device **10** is turned on by pressing power button **14**F, CPU **31** of game device **10** initializes main memory **32** or the like, and then starts execution of launch program **61**. Thus, processing in subsequent steps SA**1** to SA**13** is started.

[0406] In step SA**1**, CPU **31** determines whether game device **10** is started up for the first time or not. Determination in step SA**1** can be made, for example, by storing time and date of previous start-up of game device **10**. In other words, if time and date of previous start-up have been stored, it can be determined that the present start-up of game device **10** is not start-up for the first time. On the other hand, if time and date of the previous start-up have not been stored, it can be determined that the present start-up of game device **10** is start-up for the first time.

[0407] When a result of determination in step SA**1** indicates Yes, the processing in step SA**2** is performed. On the other hand, when the result of determination in step SA**1** indicates No, the processing in step SA**2** is skipped and the processing in step SA**3** is performed.

[0408] In step SA**2**, CPU **31** performs photographing leading processing. The photographing leading processing is processing for leading the user to experience a photographing operation with a simple function. In other words, in the photographing leading processing, the user is caused to select whether or not to perform photographing processing using simplified photographing program **52** above. When the user selects to perform the photographing processing, the user is caused to experience a simple photographing operation based on simplified photographing program **52** above. Details of the photographing leading processing will be described later with reference to FIG. **27**. CPU **31** performs the processing in step SA**3** following step SA**2**.

[0409] In step SA**3**, CPU **31** selects a display image from among favorite images in a random manner. Specifically, CPU **31** selects one favorite image from among favorite images stored in data memory **34** for storage in a random manner, and causes main memory **32** to store data indicative of information (for example, a file name) identifying the selected favorite image as display image data **65**. Subsequent to step SA**3**, the processing in step SA**4** is performed.

[0410] In step SA**4**, CPU **31** launches launch function program **51**. In other words, CPU **31** reads launch function program **51** from data memory **34** for storage, causes main

memory **32** to store the program, and executes launch function program **51**. The processing in step SA**5** and subsequent steps is performed as a result of execution of launch function program **51** by CPU **31**. Further, in the present embodiment, CPU **31** reads simplified photographing program **52** into main memory **32** together with launch function program **51** at the timing of reading of launch function program **51**. In an alternative embodiment, simplified photographing program **52** may be read into main memory **32** at the timing of execution of simplified photographing processing (step SA**11**) which will be described later. Subsequent to step SA**4**, the processing in step SA**5** is performed.

[0411] In step SA**5**, CPU **31** has a menu screen displayed. The menu screen is a screen (an image) for causing the user to select a selected application program to be launched from among the selected application programs. The launch acceptance state shown in FIG. **19** is a state where the menu screen is displayed. The menu screen in the present embodiment will be described hereinafter with reference to FIG. **23**.

[0412] FIG. **23** is a diagram showing an example of the menu screen. As shown in FIG. **23**, in step SA**5**, an image for causing the user to select a selected application program to be executed is displayed on lower LCD **12**. Specifically, icon images **71***a* to **71***c*, a scroll bar **72**, a marker **73**, and scroll buttons **74***a* and **74***b* are displayed on lower LCD **12**.

[0413] Icon image **71** is an image representing a selected application program. Icon image **71** is an icon for launching an application program in memory card **29**. When memory card **29** is not attached, an icon indicating absence of a card is displayed together with a message that "card is not attached."

[0414] The user can launch a selected application program indicated by a touched icon image, by performing an operation to touch icon image **71** displayed at a center of the screen (in the left-right direction) as the first launch operation above.

[0415] In the present embodiment, a prescribed number of icon images (four icon images in FIG. **23**) among icon images corresponding to a plurality of application programs respectively are displayed on the screen. The (types of) icon images being displayed are changed in accordance with an operation for scrolling the screen. In other words, though icon images indicating selected application programs other than the displayed selected application programs are not shown in FIG. **23**, the icon images are displayed by scrolling the screen on lower LCD **12**.

[0416] The screen of lower LCD **12** can be scrolled by an operation to touch an icon image other than the icon image displayed at the center of the screen, or by an operation to touch marker **73** or scroll button **74***a* or **74***b*. In other words, when the user touches the icon image (icon image **71***a* or **71***c* in FIG. **23**) other than the icon image displayed at the center of the screen, the screen of lower LCD **12** is scrolled and the touched icon image is displayed at the center of the screen. Alternatively, the user can move marker **73** along scroll bar **72** by performing an operation to move a touched position along scroll bar **72** to the right and left while touching marker **73**, thereby scrolling the screen of lower LCD **12** in accordance with movement of marker **73**. Alternatively, the screen of lower LCD **12** can be scrolled to the left by an operation to touch scroll button **74***a* on the left of scroll bar **72**, and the screen of lower LCD **12** can be scrolled to the right by an operation to touch scroll button **74***b* on the right of scroll bar **72**.

[0417] As described above, in the state where the menu screen is displayed, the user can change the icon image displayed at the center of the screen by performing the operation to scroll the screen, and also can launch the selected application program indicated by the icon image with the operation to touch the icon image displayed at the center of the screen.

[0418] In the present embodiment, all of the plurality of selected application programs are not concurrently displayed but some of the plurality of selected application programs are displayed in a list and replaced with the rest by scrolling or the like so that the rest is in turn displayed. Here, in an alternative embodiment, all of the plurality of selected application programs may concurrently be displayed. Alternatively, (icon images of) selected application programs displayed in a list may be displayed in a line as in the present embodiment or may be displayed in matrix of 2×2 or more.

[0419] Meanwhile, as shown in FIG. **23**, in step SA**5**, a display image **75** and photographing button images **76***a* and **76***b* are displayed on upper LCD **22**. Display image **75** is a stored image shown based on display image data **65** stored in main memory **32** and selected in step SA**3** or the like. In this manner, in the present embodiment, an image taken in the past is displayed on the menu screen. Thus, a user using game device **10** for the first time is made aware that game device **10** has the photographing function. Further, as the menu screen of game device **10** is different for each user (for each information processing device), the menu screen can have individuality.

[0420] As display image **75** is randomly selected in step SA**3**, the user cannot designate as display image **75**, an arbitrary image from among images stored in data memory **34** for storage. As will be described later, though multifunctional photographing application program **53** has a function to set a favorite image, the launch function program and simplified photographing program **52** do not have a function to set a favorite image. Further, photographing button images **76***a* and **76***b* are images indicating an operation to make transition to a state where photographing based on simplified photographing program **52** can be performed (the photographing enabled state shown in FIG. **19**), that is, the photographing enabling operation above. Thus, in the present embodiment, by displaying the operation to make transition to the photographing enabled state on the menu screen (the launch acceptance state), it can clearly be presented to the user that photographing based on simplified photographing program **52** can be performed through the menu screen (without selecting a selected application program).

[0421] As shown in FIG. **23**, the photographing enabling operation is typically an operation to press L button **14**I or R button **14**J. Therefore, the user can set the state where photographing based on simplified photographing program **52** can be performed by pressing a button (L button **14**I or R button **14**J) once in the launch acceptance state.

[0422] In the present embodiment, except for start-up for the first time (Yes in step SA**1**), the menu screen is initially displayed after the start-up of game device **10**. In other words, in the present embodiment, game device **10** sets a first state after the start-up of game device **10** to the launch acceptance state. Therefore, the user can launch simplified photographing program **52** immediately after start-up.

[0423] Referring back to the description in connection with FIG. **21**, subsequent to step SA**5**, the processing in step SA**6** is performed. In step SA**6**, CPU **31** accepts an input to each input device. In other words, CPU **31** obtains operation data from operation button group **14** and obtains input position data from touch panel **13**. The obtained operation data and

input position data are stored in main memory **32**. In the launch acceptance state, the processing in step SA**6** is performed once in a prescribed time period (for example, one frame time (1/60 sec.)). Subsequent to step SA**6**, processing in step SA**7** is performed.

[0424] In step SA**7**, CPU **31** determines whether an operation to scroll the screen of lower LCD **12** has been performed or not. Determination in step SA**7** can be made by referring to the input position data stored in main memory **32** in step SA**6**. In other words, in the determination processing in step SA**7**, CPU **31** determines whether an input to touch an area where marker **73** or scroll button **74***a* or **74***b* is displayed has been provided or not.

[0425] When a result of determination in step SA**7** indicates Yes, processing in step SA**8** is performed. On the other hand, when the result of determination in step SA**7** indicates No, processing in step SA**9** which will be described later is performed.

[0426] In step SA**8**, CPU **31** scrolls display of the icon images (the screen of lower LCD **12**). In other words, when a touch input of scroll button **74***a* is provided, the icon images are scrolled to the left, and when a touch input of scroll button **74***b* is provided, the icon images are scrolled to the right. Thus, an icon image that has not been displayed on the screen of lower LCD **12** can be displayed. Subsequent to step SA**8**, the processing in step SA**5** is performed again.

[0427] Meanwhile, in step SA**9**, CPU **31** determines whether the photographing enabling operation has been performed or not. Determination in step SA**9** can be made by referring to the operation data stored in main memory **32** in step SA**6**. In other words, in the determination processing in step SA**9**, CPU **31** determines whether L button **14**I or R button **14**J has been pressed or not.

[0428] When a result of determination in step SA**9** indicates Yes, processing in step SA**10** is performed. On the other hand, when the result of determination in step SA**9** indicates No, processing in step SA**11** which will be described later is performed.

[0429] In step SA**10**, CPU **31** performs the simplified photographing processing. The simplified photographing processing is processing for causing the user to perform photographing with a simple function based on simplified photographing program **52**. Details of the simplified photographing processing will be described hereinafter with reference to FIG. **22**.

[0430] FIG. **22** is a flowchart showing a flow of the simplified photographing processing (step SA**10**) shown in FIG. **21**. In input image generation processing, initially in step SA**21**, CPU **31** launches simplified photographing program **52**. In the present embodiment, since simplified photographing program **52** has been read into main memory **32** together with launch function program **51**, CPU **31** starts execution of simplified photographing program **52**. Here, data **67** and **68** included in setting data **66** stored in main memory **32** are input (set) as arguments for simplified photographing program **52**. Processing in steps SA**22** to SA**28** subsequent to step SA**21** is performed by using simplified photographing program **52** (by executing simplified photographing program **52**).

[0431] In step SA**22**, CPU **31** obtains data of an image picked-up by inner camera **23** or outer camera **25**. In the present embodiment, an image is picked-up by only any one of cameras **23** and **25**, and CPU **31** obtains image data only from one camera. Which camera out of cameras **23** and **25** is used for image pick-up is determined in accordance with content of camera change data **67** that was passed as the argument at the time of launch of simplified photographing program **52** (step SA**21**). Subsequent to step SA**22**, processing in step SA**23** is performed.

[0432] In step SA**23**, CPU **31** performs display processing. In step SA**23** in the photographing enabled state, an image picked-up by camera **23** or **25** or the like is displayed. An image displayed in the photographing enabled state will be described hereinafter with reference to FIG. **24**.

[0433] FIG. **24** is a diagram showing an example of the image displayed in the photographing enabled state. As shown in FIG. **24**, in step SA**23**, an image **77** picked-up by camera **23** or **24** that was obtained in step SA**22** is displayed on lower LCD **12**. The processing in steps SA**22** and SA**23** is repeatedly performed once in a prescribed time period (for example, 1/60 sec.). By repeatedly performing the processing in these steps SA**22** and SA**23**, a real-time image picked-up by camera **23** or **24** is displayed on lower LCD **12**. In an alternative embodiment, the real-time image may be displayed on upper LCD **22**. Here, an image stored by performing the photographing operation may also be displayed on lower LCD **12**.

[0434] In addition, a button image **78** for performing an operation for executing multifunctional photographing application program **53** (the second launch operation above) is displayed on lower LCD **12**. Unlike the icon images displayed on the menu screen, button image **78** is displayed in a fixed manner at a prescribed position (at an upper right position in FIG. **24**) on the screen. Though details will be described later, the user can easily make transition from a state of execution of simplified photographing program **52** to a state of execution of multifunctional photographing application program **53** by pressing button image **78**.

[0435] Further, as in FIG. **23**, display image **75** and photographing button images **76***a* and **76***b* are displayed on upper LCD **22**. In the present embodiment, as in the photographing enabling operation, the photographing operation is an operation to press L button **14**I or R button **14**J (see photographing button images **76***a* and **76***b* shown in FIG. **24**). In an alternative embodiment, the photographing operation may not be the same as the photographing enabling operation. For example, a button image for performing the photographing operation may be displayed on lower LCD **12** and an operation to touch the button image may serve as the photographing operation. Further, game device **10** may accept both the operation to press L button **14**I or R button **14**J and the operation to touch the button image as the photographing operation.

[0436] Referring back to the description in connection with FIG. **22**, subsequent to step SA**23**, processing in step SA**24** is performed. In step SA**24**, CPU **31** accepts an input to each input device. The processing in step SA**24** is the same as the processing in step SA**6** above. Subsequent to step SA**24**, processing in step SA**25** is performed.

[0437] In step SA**25**, CPU **31** determines whether the photographing operation has been performed or not. Determination in step SA**25** can be made by referring to operation data stored in main memory **32** in step SA**24**. In the present embodiment, since the first launch operation and the photographing operation are performed by performing the same operation, the processing in step SA**25** can be performed as in step SA**9**.

[0438] When a result of determination in step SA**25** indicates Yes, processing in step SA**26** is performed. On the other

hand, when the result of determination in step SA**25** indicates No, processing in step SA**29** which will be described later is performed.

[0439] An image displayed subsequent to the photographing operation will be described hereinafter with reference to FIG. **25**.

[0440] FIG. **25** is a diagram showing an example of an image displayed after the photographing operation is performed. As shown in FIG. **25**, when the result of determination in step SA**25** indicates Yes, the picked up image obtained in step SA**22** or image **77** picked up by camera **23** or **24** is displayed on lower LCD **12**. In addition, a button image ("store") for performing an operation to store a taken, picked-up image and a button image ("capture again") for performing an operation for photographing again are displayed in addition to button image **78** for performing an operation to execute multifunctional photographing application program **53** (the second launch operation above) on lower LCD **12**.

[0441] In addition, as in FIG. **23**, display image **75** as well as photographing button images **76***a* and **76***b* are displayed on upper LCD **22**. Referring back to the description in connection with FIG. **22**, in step SA**26**, CPU **31** determines whether an operation for storage has been performed or not. Determination in step SA**26** can be made by referring to operation data stored in main memory **32** in step SA**24** as in step SA**25**.

[0442] When a result of determination in step SA**26** indicates Yes (when "store" in FIG. **25** is touched), processing in step SA**27** is performed. On the other hand, when the result of determination in step SA**26** indicates No (when "capture again" in FIG. **25** is touched), processing in step SA**22** described above is performed again. It is noted that determination in step SA**26** may be skipped so that the process may proceed to step SA**27** directly from step SA**25**.

[0443] In step SA**27**, CPU **31** has a picked-up image stored. In other words, CPU **31** causes data memory **34** for storage or memory card **28** to store (save) the picked-up image obtained in step SA**22**. A storage destination of the picked-up image is determined in accordance with content of storage destination data **68** that was passed as the argument at the time of launch of simplified photographing program **52** (step SA**21**). It is noted that the storage destination of the picked-up image can be changed by the user in the multifunctional photographing processing based on multifunctional photographing application program **53** which will be described later. Subsequent to step SA**27**, processing in step SA**28** is performed.

[0444] In step SA**28**, CPU **31** selects the stored image stored in immediately preceding step SA**27** as a display image. Specifically, CPU **31** causes main memory **32** to store as display image data **65**, data indicative of the stored image that was stored in immediately preceding step SA**27**. After the processing in step SA**28**, CPU **31** ends execution of simplified photographing program **52** and ends the simplified photographing processing. Then, the processing in step SA**4** shown in FIG. **21** is performed again.

[0445] An image displayed subsequent to the simplified photographing processing will be described hereinafter with reference to FIG. **26**.

[0446] FIG. **26** is a diagram showing an example of an image displayed after the simplified photographing processing. As shown in FIG. **26**, after the simplified photographing processing, the picked-up image obtained in the simplified photographing processing is displayed on upper LCD **22** as new display image **75**. Namely, comparing the image shown in FIG. **22** with the image shown in FIG. **26**, it can be seen that the display image displayed on upper LCD **22** has been updated.

[0447] As described above, in the present embodiment, in response to the photographing operation performed in the photographing enabled state (the simplified photographing processing), the simplified photographing processing ends, and transition from the photographing enabled state to the launch acceptance state is made. In other words, when the user stores one taken image in the simplified photographing processing, a screen display on game device **10** returns to the menu screen, and thus even a novice user who has not read an instruction manual or the like can naturally return to the launch acceptance state (in an example where the process proceeds to step SA**27** from step SA**25**, the screen returns to the menu screen when the user performs one photographing operation in the simplified photographing processing). Further, in the present embodiment, since the photographing enabling operation and the photographing operation are performed by performing the same operation, transition from the launch acceptance state to the photographing enabled state and transition from the photographing enabled state to the launch acceptance state can be made by performing the same operation. Thus, even if the user accidentally presses L button **14**I or R button **14**J or presses a button without fully understanding a manner of operation to result in transition to the photographing enabled state, the user can return to the original state (the launch acceptance state) by pressing the same button. Thus, game device **10** which is easy for the novice user to operate can be provided.

[0448] Further, in the present embodiment, as described above, the state of game device **10** makes transition to the launch acceptance state after the photographing operation. Thus, transition to the launch acceptance state is made without display of the image stored in the processing in step SA**26** above based on simplified photographing program **52**. Here, in the present embodiment, in the processing in step SA**27**, CPU **31** sets the image stored in the processing in step SA**26** as a display image after transition to the launch acceptance state. Thus, the stored image taken based on simplified photographing program **52** is displayed as the display image immediately after transition to the launch acceptance state. Therefore, according to the present embodiment, though transition to the launch acceptance state is made as a result of the photographing operation, the user can quickly check the image taken based on simplified photographing program **52**.

[0449] Meanwhile, in step SA**29**, CPU **31** determines whether the second launch operation has been performed or not. Determination in step SA**29** can be made by referring to input position data stored in main memory **32** in step SA**24**. In other words, in the determination processing in step SA**29**, CPU **31** determines whether an input to touch an area where button image **78** for performing the second launch operation is displayed has been provided or not. When a result of determination in step SA**29** indicates Yes, the multifunctional photographing processing which will be described later (FIG. **30**) is performed. On the other hand, when the result of determination in step SA**29** indicates No, the processing in step SA**22** is performed again. This is the end of the description of the simplified photographing processing shown in FIG. **22**.

[0450] Referring back to the description in connection with FIG. **21**, in step SA**11**, CPU **31** determines whether the first launch operation has been performed or not. Determination in step SA**11** can be made by referring to the input position data

stored in main memory **32** in step SA**6**. In other words, in the determination processing in step SA**11**, CPU **31** determines whether an input to touch an area where the icon image is displayed has been provided or not. When a result of determination in step SA**11** indicates Yes, processing in step SA**12** is performed. On the other hand, when the result of determination in step SA**11** indicates No, processing in step SA**13** which will be described later is performed.

[0451] In step SA**12**, CPU **31** performs processing for executing a selected application program. In other words, CPU **31** reads a selected application program corresponding to the icon image selected in the first launch operation into main memory **32**, and executes the selected application program. Thus, the selected application program is started and the user can utilize the selected application program. The processing in step SA**12** ends with the end of the selected application program, and the processing in step SA**3** is performed again subsequent to step SA**12**.

[0452] Here, a case where multifunctional photographing application program **53** is executed as the selected application program in step SA**12** above will be described in detail. FIG. **30** is a flowchart showing a flow of processing based on multifunctional photographing application program **53** (the multifunctional photographing processing).

[0453] In the multifunctional photographing processing, initially in step SA**30**, CPU **31** launches multifunctional photographing application program **53**. In other words, CPU **31** reads multifunctional photographing application program **53** into main memory **32** and starts execution thereof. Here, data **67** and **68** included in setting data **66** stored in main memory **32** are input (set) as arguments for simplified photographing program **52**. Subsequent to step SA**30**, processing in step SA**31** is performed. Processing in steps SA**31** to SA**39** subsequent to step SA**30** is performed by using multifunctional photographing application program **53** (by executing multifunctional photographing application program **53**).

[0454] In step SA**31**, CPU **31** performs display processing. Here, in the present embodiment, in the multifunctional photographing processing, there are a photographing mode for performing photographing using the image pick-up means and a photograph display mode for displaying an image (a stored image) taken in the past. In the display processing in step SA**31**, an image for causing the user to select either one of the two modes (the photograph display mode and the photographing mode) in the multifunctional photographing processing, and an image for setting a storage destination of a picked-up image to be stored by performing the photographing operation are displayed on at least one of LCDs **12** and **22**. An image displayed in display processing in step SSA**31** will be described hereinafter with reference to FIG. **31**.

[0455] FIG. **31** is a diagram showing an example of an image displayed in the multifunctional photographing processing. As shown in FIG. **31**, in step SA**31**, a button image **101** for indicating selection of the photographing mode and a button image **102** for indicating selection of the photograph display mode are displayed on lower LCD **12**. In addition, button image **101** includes indication of the number of shootings available (for example, xx remaining) in accordance with a currently remaining capacity of the storage destination of taken images. Moreover, button image **102** includes indication of the current number of picked up images (for example, xx in total) that have already been stored in the storage destination of taken images. Further, button images **103** and **104** indicating change of the storage destination of picked up images are also displayed on lower LCD **12**. When button image **103** is touched, a non-volatile memory embedded in the main body (embedded memory; data memory **34** for storage) is set to the selected state, and when button image **104** is touched, a removable memory card (card memory; memory card **28**) is set to the selected state. When the embedded memory is selected, a manner of display of button image **103** is varied, and when the card memory is selected, a manner of display of button image **104** is varied. When button image **101** or **102** is touched, transition to the photographing mode or the photograph display mode is made at that timing of touching.

[0456] Namely, the present embodiment is configured such that the user can select any of the embedded memory and the card memory at the time of launch of the multifunctional photographing application, and selection is not yet fixed as of the timing of selection. The present embodiment is configured such that the user can select any of the photographing mode and the photograph display mode on the same screen. Then, selection between the embedded memory and the card memory is fixed at the timing of selection between the photographing mode and the photograph display mode. Namely, when the photographing mode is selected while the embedded memory is selected, the photographing mode is launched and images that will be taken in the subsequent photographing mode are stored in the embedded memory. Alternatively, when the photographing mode is selected while the card memory is selected, the photographing mode is launched and images that will be taken in the subsequent photographing mode are stored in the card memory. Alternatively, when the photograph display mode is selected while the embedded memory is selected, the photograph display mode is launched and a taken image stored in the embedded memory is displayed in the subsequent photograph display mode. Alternatively, when the photograph display mode is selected while the card memory is selected, the photograph display mode is launched and a taken image stored in the card memory is displayed in the subsequent photograph display mode.

[0457] In addition, various button images **105** to **107** are displayed on the lower LCD. An end button **105** is a button image for performing an operation to end the multifunctional photographing processing. Namely, when a touch input of end button **105** is made, the multifunctional photographing processing ends and the processing by CPU **31** returns to the processing in step SA**4**.

[0458] A calendar button **106** is a button image for performing an operation to launch a calendar function which will be described later. Namely, when a touch input of calendar button **106** is made, the calendar function which will be described later is performed. An others button **107** is a button image for performing an operation for making various types of setting or the like.

[0459] In step SA**32**, CPU **31** accepts an input to each input device. Processing in step SA**32** is the same as the processing in step SA**6** above. Subsequent to step SA**32**, processing in step SA**33** is performed.

[0460] In step SA**33**, CPU **31** determines whether the photograph display mode has been selected or not. Determination in step SA**33** can be made by referring to input position data stored in main memory **32** in step SA**32**. In other words, in the determination processing in step SA**33**, CPU **31** determines whether an input to touch an area where image **102** indicating the photograph display mode is displayed has been provided or not as shown in FIG. **31**.

[0461] When a result of determination in step SA**33** indicates Yes, processing in step SA**34** is performed. On the other hand, when the result of determination in step SA**33** indicates No, processing in step SA**35** which will be described later is performed.

[0462] In step SA**34**, CPU **31** performs processing to be performed in the photograph display mode (photograph display mode processing). Details of the photograph display mode processing will be described hereinafter with reference to FIG. **32**.

[0463] FIG. **32** is a flowchart showing a flow of the photograph display mode processing (step SA**34**) shown in FIG. **30**. In the photograph display mode processing, initially in step SA**41**, CPU **31** performs display processing. In step SA**41** in the photograph display mode, a stored image taken in the past or the like is displayed. An image displayed in the photograph display mode will be described with reference to FIG. **33**.

[0464] FIG. **33** is a diagram showing an example of an image displayed in the photograph display mode. As shown in FIG. **33**, in step SA**41**, a plurality of (three in the drawing) stored images **181** to **183**, a cursor **184**, scroll buttons **185** and **186**, a setting button **187**, and an end button **188** are displayed on lower LCD **12**.

[0465] In FIG. **33**, stored images **181** to **183** are (some of) stored images that are stored in data memory **34** for storage or memory card **28**. Stored image **182** surrounded by cursor **184** is an image currently selected by cursor **184**. Scroll buttons **185** and **186** are buttons for scrolling stored images **181** to **183** to the right and left. In other words, when a touch input of scroll button **185** on the right of the screen is made, stored images **181** to **183** are scrolled to the right, and when a touch input of scroll button **186** on the left of the screen is made, stored images **181** to **183** are scrolled to the left. As a result of scroll of the stored images to the right or left, the stored image displayed on lower LCD **12** is changed and the stored image selected by cursor **184** is changed.

[0466] In the present embodiment, in the photograph display mode, a picked-up image stored in any of the simplified photographing processing and the multifunctional photographing processing is displayed. In the present embodiment, a stored image stored in the simplified photographing processing and a stored image stored in the multifunctional photographing processing are stored without distinction. Specifically, a rule for attaching a file name to a data file of the stored image (for example, attaching a file name using time and date of photographing, a total number of images taken by game device **10**, and the like) is the same for any stored image. Since the stored images stored in any photographing processing are stored without distinction, stored images stored in any photographing processing can both be displayed in the photograph display mode.

[0467] Setting button **187** is a button image for performing an operation for newly setting the stored image selected by cursor **184** as a favorite image. In other words, when a touch input of setting button **187** is made, the stored image selected by cursor **184** is set as a favorite image.

[0468] End button **188** is a button image for performing an operation for ending the photograph display mode. In other words, when a touch input of end button **188** is made, the photograph display mode ends and the processing by CPU **31** returns to the processing in step SA**31**.

[0469] In step SA**41**, some information may or may not be displayed on upper LCD **22**. In the present embodiment, CPU **31** causes upper LCD **22** to display the stored image selected with cursor **184**.

[0470] Referring back to the description in connection with FIG. **32**, subsequent to step SA**41**, processing in step SA**42** is performed. In step SA**42**, CPU **31** accepts an input to each input device. The processing in step SA**42** is the same as the processing in step SA**6** above. Subsequent to step SA**42**, processing in step SA**43** is performed.

[0471] In step SA**43**, CPU **31** determines whether an operation to scroll the stored image displayed on lower LCD **12** has been performed or not. Determination in step SA**43** can be made by referring to input position data stored in main memory **32** in step SA**42**. In other words, in the determination processing in step SA**43**, CPU **31** determines whether an input to touch an area where scroll button **185** or **186** is displayed has been provided or not.

[0472] When a result of determination in step SA**43** indicates Yes, processing in step SA**44** is performed. On the other hand, when the result of determination in step SA**43** indicates No, processing in step SA**45** which will be described later is performed.

[0473] In step SA**44**, CPU **31** scrolls the stored image displayed on lower LCD **12**. In other words, when a touch input of scroll button **185** is made, CPU **31** scrolls the stored image to the right, and when a touch input of scroll button **186** is made, CPU **31** scrolls the stored image to the left. Thus, a stored image that has not been displayed so far on the screen of lower LCD **12** is displayed. Subsequent to step SA**44**, the processing in step SA**41** above is performed again.

[0474] Meanwhile, in step SA**45**, CPU **31** determines whether an operation for setting a stored image as a favorite image has been performed or not. Determination in step SA**45** can be made by referring to the input position data stored in main memory **32** in step SA**42**. In other words, in the determination processing in step SA**45**, CPU **31** determines whether an input to touch an area where setting button **187** is displayed has been provided or not. When a result of determination in step SA**45** indicates Yes, processing in step SA**46** is performed. On the other hand, when the result of determination in step SA**45** indicates No, the processing in step SA**41** above is performed again.

[0475] In step SA**46**, CPU **31** sets a stored image currently selected with cursor **184** as a favorite image. Specifically, CPU **31** adds information indicative of the favorite image to data of the stored image stored in data memory **34** for storage or memory card **28**. In addition, in the present embodiment, in step SA**46**, CPU **31** causes the user to select to which of the first to third groups the stored image should belong. Therefore, information indicative of a group selected by the user among the first to third groups is added to the data of the stored image above. Subsequent to step SA**46** above, processing in step SA**47** is performed.

[0476] In step SA**47**, CPU **31** determines whether to end the photograph display mode or not. Determination in step SA**47** can be made by referring to the input position data stored in main memory **32** in step SA**42**. In other words, in the determination processing in step SA**47**, CPU **31** determines whether an input to touch an area where end button **188** is displayed has been provided or not. When a result of determination in step SA**47** indicates Yes, CPU **31** ends the photograph display mode processing shown in FIG. **32**. On the

other hand, when the result of determination in step SA**47** indicates No, the processing in step SA**41** above is performed again.

[0477] In the photograph display mode described above, the user can view the stored images taken in the past and also can set the stored image as a favorite image. As described above, in step SA**3** above, the display image displayed on the menu screen (display image **75** shown in FIG. **23**) is selected from among favorite images. Therefore, the user can select an image to be displayed as a display image by himself or herself.

[0478] Referring back to the description in connection with FIG. **30**, when the processing in step SA**34** above ends, the processing in step SA**31** is performed again. Therefore, when the photograph display mode ends, the screen for causing the user to select any of the photograph display mode and the photographing mode is displayed again (step SA**31**).

[0479] Meanwhile, in step SA**35**, CPU **31** determines whether the photographing mode has been selected or not. Determination in step SA**35** can be made by referring to the input position data stored in main memory **32** in step SA**32**. In other words, in the determination processing in step SA**35**, CPU **31** determines whether an input to touch an area where image **101** indicating the photographing mode is displayed has been provided or not. When a result of determination in step SA**35** indicates Yes, processing in step SA**36** is performed. On the other hand, when the result of determination in step SA**35** indicates No, processing in step SA**37** which will be described later is performed.

[0480] In step SA**36**, CPU **31** performs processing to be performed in the photographing mode (photographing mode processing). Details of the photographing mode processing will be described hereinafter with reference to FIG. **34**.

[0481] FIG. **34** is a flowchart showing a flow of the photographing mode processing (step SA**36**) shown in FIG. **32**. In the photographing mode processing, initially in step SA**50**, CPU **31** obtains data of an image picked-up by inner camera **23** or outer camera **25**. Processing in step SA**50** is the same as the processing in step SA**22** above (FIG. **22**). Subsequent to step SA**50**, processing in step SA**51** is performed.

[0482] In step SA**51**, CPU **31** performs display processing. In step SA**51** in the photographing mode, the image picked-up by camera **23** or **24** or the like is displayed. An image displayed in the photographing mode will be described hereinafter with reference to FIG. **35**(*a*).

[0483] FIG. **35**(*a*) is a diagram showing an example of the image displayed in the photographing mode. As shown in FIG. **35**(*a*), in step SA**51**, in addition to picked-up image **77** as in FIG. **24**, various buttons **91** to **99** are displayed on lower LCD **12**. Each of buttons **91** to **99** is an image for giving an instruction to game device **10** in response to the user's touch input to a position on the image. Buttons **91** to **99** will be described hereinafter.

[0484] A photographing button **91** is a button image for performing the photographing operation. In other words, when a touch input of photographing button **91** is made, processing for storing a picked-up image is performed. It is noted that photographing button **91** is preferably displayed substantially at a center of lower housing **11** (in the left-right direction) such that the user can easily operate photographing button **91** with either a right hand or a left hand.

[0485] A camera change button **92** is an image for performing a camera change operation. In other words, when a touch input of camera change button **92** is made, a camera for picking up an image is changed between inner camera **23** and outer camera **25**.

[0486] An end button **93** is a button image for performing an operation for ending the photographing mode. In other words, when a touch input of end button **93** is made, the photographing mode ends and the processing by CPU **31** returns to the processing in step SA**31**.

[0487] Each of buttons **94** to **99** is a button image for giving an instruction in edition processing. A pen mode button **94**, an eraser mode button **95**, and a stamp mode button **96** are button images for performing an operation for changing an edition mode. Here, in the present embodiment, three modes of a pen mode, a stamp mode and an eraser mode are prepared in advance. In the pen mode, an image of an input trail input to touch panel **13** can be added to a picked-up image. In the stamp mode, a stamp image prepared in advance can be added to a picked-up image. In the eraser mode, an image added in the pen mode or the stamp mode can be erased. Pen mode button **94** is an image for giving an instruction to change the edition mode to the pen mode. Eraser mode button **95** is an image for giving an instruction to change the edition mode to the eraser mode. Stamp mode button **96** is an image for giving an instruction to change the edition mode to the stamp mode.

[0488] A thickness change button **97** is an image for giving an instruction to change a thickness of a line to be input in the pen mode. A color change button **98** is an image for giving an instruction to change a color of a line to be input in the pen mode. An all erase button **99** is an image for giving an instruction to erase all images added in the pen mode or the stamp mode.

[0489] By giving an instruction using each of buttons **94** to **99** above, the user can input an image over the picked-up image displayed on lower LCD **12** (in a manner superimposed on the picked-up image). It is noted that FIG. **35**(*a*) shows an image in the case where there is no image input by the user in the edition processing which will be described later. Further, in the present embodiment, an image for explaining a manner of operation in the photographing mode to the user is displayed on upper LCD **22**.

[0490] Referring back to the description in connection with FIG. **34**, in step SA**52**, CPU **31** accepts an input to each input device. Processing in step SA**52** is the same as the processing in step SA**6** above. Subsequent to step SA**52**, processing in step SA**33** is performed.

[0491] In step SA**53**, CPU **31** determines whether the photographing operation has been performed or not. Determination in step SA**53** can be made by referring to operation data and input position data stored in main memory **32** in step SA**52**. In other words, in the determination processing in step SA**53**, CPU **31** determines whether L button **14**I or R button **14**J has been pressed or not or whether an input to touch an area where photographing button **91** is displayed has been provided or not.

[0492] Thus, in the multifunctional photographing processing, the user can perform an operation the same as the photographing operation in the simplified photographing processing (the operation of pressing L button **14**I or R button **14**J) as the photographing operation and can perform an operation to touch photographing button **91** as the photographing operation. When a result of determination in step SA**53** indicates Yes, processing in step SA**54** is performed.

On the other hand, when the result of determination in step SA**53** indicates No, processing in step SA**55** which will be described later is performed.

[0493] As described in connection with step SA**53** above, in the present embodiment, the photographing processing function attained in common by simplified photographing program **52** and multifunctional photographing application program **53** is performed by performing the same operation (the operation of pressing L button **14**I or R button **14**J). Since the same function is attained by the same operation in spite of change of a program, a user-friendly operation system can be provided.

[0494] It is noted that the phrase "the function attained in common is performed by performing the same operation" means that a certain identical function should only be performed by performing a certain operation in both of simplified photographing program **52** and multifunctional photographing application program **53**, and it does not intend to exclude such meaning that the function is attained also by performing an operation different from the certain operation in any one of simplified photographing program **52** and multifunctional photographing application program **53**. In other words, as in the present embodiment, in multifunctional photographing application program **53**, the photographing processing may be performed by performing the operation to touch photographing button **91** other than the operation to press L button **14**I or R button **14**J.

[0495] In step SA**54**, CPU **31** has a picked-up image stored. Processing in step SA**54** is the same as the processing in step SA**26** in the simplified photographing processing above. Therefore, in the present embodiment, processing for storing a picked-up image is similarly performed in the simplified photographing processing and the multifunctional photographing processing. Specifically, a method of deciding a camera used for image pick-up and a method of deciding a storage destination in the simplified photographing processing are the same as those in the multifunctional photographing processing. Subsequent to step SA**54**, processing in step SA**59** which will be described later is performed.

[0496] In step SA**55**, CPU **31** determines whether the camera change operation has been performed or not. Determination in step SA**55** can be made by referring to the input position data stored in main memory **32** in step SA**52**. In other words, in the determination processing in step SA**55**, CPU **31** determines whether an input to touch an area where camera change button **92** is displayed has been provided or not. When a result of determination in step SA**55** indicates Yes, processing in step SA**56** is performed. On the other hand, when the result of determination in step SA**55** indicates No, processing in step SA**57** which will be described later is performed.

[0497] In step SA**56**, CPU **31** changes the camera for picking up an image. In other words, when the camera for picking up an image is inner camera **23**, CPU **31** changes the camera for picking up an image to outer camera **25**. When the camera for picking up an image is outer camera **25**, CPU **31** changes the camera for picking up an image to inner camera **23**. Specifically, CPU **31** gives an instruction to stop an operation to one of cameras **23** and **25** that is picking up an image, and gives an instruction to perform image pick-up to the other camera. If the processing in step SA**56** above is performed, in step SA**50** that will subsequently be performed, data of an image picked-up by the camera after the change is obtained by CPU **31**, and in subsequent step SA**51**, the image picked-up by the camera after the change is displayed on lower LCD **12**. Further, in step SA**56**, CPU **31** causes main memory **32** to store data indicative of the camera after the change as camera change data **67**. Thus, when the multifunctional photographing processing is performed next time and when the simplified photographing processing is performed next time, image pick-up will be performed by the camera after the change. Subsequent to step SA**56**, processing in step SA**59** which will be described later is performed.

[0498] In step SA**57**, CPU **31** determines whether an edition operation has been performed or not. Determination in step SA**57** can be made by referring to the input position data stored in main memory **32** in step SA**52**. In other words, in the determination processing in step SA**57**, CPU **31** determines whether an input to touch an area where any of buttons **94** to **99** is displayed or an area where picked-up image **77** is displayed has been provided or not. When a result of determination in step SA**57** indicates Yes, processing in step SA**58** is performed. On the other hand, when the result of determination in step SA**57** indicates No, the processing in step SA**59** which will be described later is performed.

[0499] In step SA**58**, CPU **31** performs various types of edition processing in accordance with a touch input made by the user. For example, when any of buttons **94** to **98** is touched, CPU **31** changes setting (the edition mode and the setting relating to a thickness or a color of a line) in accordance with a touched button. When the area of picked-up image **77** is touched, CPU **31** performs processing in accordance with the edition mode with respect to a touched position. In other words, when the edition mode is set to the pen mode, an image of trail of touch input is added to picked-up image **77**. When the edition mode is set to the stamp mode, a stamp image prepared in advance is added to picked-up image **77** at the touched position. When the edition mode is set to the eraser mode, the image added at the touched position in the pen mode or the stamp mode is erased. When all erase button **99** is touched, all images added to picked-up image **77** in the pen mode or the stamp mode are erased. Details of the processing in accordance with the edition mode in step SA**58** will be described later.

[0500] Subsequent to step SA**58** above, the processing in step SA**59** is performed.

[0501] In step SA**59**, CPU **31** determines whether to end the photographing mode or not. Determination in step SA**59** can be made by referring to the input position data stored in main memory **32** in step SA**452**. In other words, in the determination processing in step SA**59**, CPU **31** determines whether an input to touch an area where end button **93** is displayed has been provided or not. When a result in step SA**59** indicates Yes, CPU **31** ends the photographing mode processing shown in FIG. **34**. On the other hand, when the result of determination in step SA**59** indicates No, the processing in step SA**50** above is performed again. This is the end of the description of the photographing mode processing shown in FIG. **34**.

[0502] Multifunctional photographing application program **53** described above may have a function to subject picked-up image **77** to other types of edition operations or an operation for providing effect, in addition to the edition function described above. In such a case, the menu screen for allowing the user to select a desired function is preferably displayed prior to the display processing in step SA**51**. An example of the menu screen displayed in the photographing mode will be described hereinafter with reference to FIG. **35**(*b*).

[0503] FIG. **35**(*b*) is a diagram showing an example of the menu screen displayed in the photographing mode. As shown in FIG. **35**(*b*), the menu screen including a button group **150** and various buttons **152**, **154**, **156**, and **158** in addition to picked-up image **77** as in FIG. **24** is displayed on lower LCD **12**. Each icon image included in button group **150** is an image for instructing game device **10** to select a corresponding function included in multifunctional photographing application program **53**. Each button **152**, **154**, **156**, and **158** will be described hereinafter.

[0504] Scroll buttons **152** and **154** are button images for selecting each icon image included in button group **150**. Namely, when a touch input of scroll button **152** or **154** is made, an icon image in a selected (active) state among the icon images included in button group **150** is successively changed.

[0505] An end button **156** is a button image for performing an operation to end the photographing mode. Namely, when a touch input of end button **152** is made, the photographing mode ends and the processing by CPU **31** returns to the processing in step SA**31**.

[0506] A start button **158** is a button image for performing an operation to indicate execution of a function selected from among the functions included in the multifunctional photographing application program. Namely, when a touch input of start button **158** subsequent to selection of any icon image included in button group **150** is made, the function corresponding to the selected icon image is performed.

[0507] Referring back to the description in connection with FIG. **30**, when the processing in step SA**36** above ends, the processing in step SA**31** is performed again. Therefore, when the photographing mode ends, the screen for causing the user to select any of the photograph display mode and the photographing mode is displayed again (step SA**31**).

[0508] Meanwhile, in step SA**37**, CPU **31** determines whether an operation for changing a storage destination of a stored image has been performed or not. Determination in step SA**37** can be made by referring to the input position data stored in main memory **32** in step SA**32**. In other words, in the determination processing in step SA**37**, CPU **31** determines whether an input to touch an area where the image indicating change of a storage destination of a picked-up image has been provided or not. When a result of determination in step SA**37** indicates Yes, processing in step SA**38** is performed. On the other hand, when the result of determination in step SA**37** indicates No, processing in step SA**39** which will be described later is performed.

[0509] In step SA**38**, CPU **31** changes a storage destination of a picked-up image. In other words, when a current storage destination is set to data memory **34** for storage, the storage destination is changed to memory card **28**, and when the current storage destination is set to memory card **28**, the storage destination is changed to data memory **34** for storage. Specifically, CPU **31** causes main memory **32** to store data indicative of the storage destination after the change as storage destination data **68**. Subsequent to step SA**38**, the processing in step SA**31** is performed again.

[0510] In step SA**39**, CPU **31** determines whether to end the multifunctional photographing processing or not. Determination is made based on whether or not an instruction to end the multifunctional photographing processing has been given by the user. For example, the instruction to end the multifunctional photographing processing may be given in such a manner that a button image for performing an operation to end the multifunctional photographing processing is displayed in the display processing in step SA**31** and that button image is touched. Alternatively, the instruction may be given also by pressing a predetermined prescribed button. When a result of determination in step SA**39** indicates No, the processing in step SA**31** is performed again. On the other hand, when the result of determination in step SA**39** indicates Yes, CPU **31** ends execution of multifunctional photographing application program **53** and ends the multifunctional photographing processing. Thereafter, the processing in step SA**3** shown in FIG. **21** is performed again.

[0511] Referring back to the description in connection with FIG. **21**, in step SA**13**, CPU **31** determines whether to end the processing in game device **10** or not. Determination in step SA**13** is made, for example, based on whether a prescribed end instruction operation (specifically, an operation to press power button **14**F or the like) has been performed by the user or not. When a result of determination in step SA**13** indicates No, the processing in step SA**5** is performed again. On the other hand, when the result of determination in step SA**13** indicates Yes, CPU **31** ends the processing shown in FIG. **21**.

[0512] As described above, according to the present embodiment, in the state where the menu screen is displayed (in the launch acceptance state; in step SA**5**), game device **10** accepts the first launch operation for launching a selected application program (steps SAl **1** and SAl**2**) and the photographing enabling operation for launching simplified photographing program **52** (steps SA**9** and SA**10**). Therefore, since simplified photographing program **52** can immediately be launched by performing the photographing enabling operation from the state where the menu screen is displayed, the user can easily launch simplified photographing program **52**. Particularly, in the present embodiment, in order to launch a desired selected application program, the user has to perform the first launch operation after a scrolling operation as necessary, while the user has only to perform the photographing enabling operation in order to launch simplified photographing program **52**. Therefore, in the present embodiment, simplified photographing program **52** can more easily be launched than the selected application program.

[0513] In addition, according to the embodiment above, during execution of simplified photographing program **52** (in the photographing enabled state; in steps SA**22** to SA**29**), CPU **31** accepts the second launch operation for launching photographing application program **53** (step SA**29**). Thus, the user can launch multifunctional photographing application program **53** by performing the second launch operation even during photographing based on simplified photographing program **52**. Therefore, even when the user desires to use a function of multifunctional photographing application program **53** not attained by simplified photographing program **52** during photographing based on simplified photographing program **52**, the user can easily and quickly use the function by performing the second launch operation.

[0514] Further, in the present embodiment, simplified photographing program **52** having a relatively simple function can quickly be launched from the menu screen, and multifunctional photographing application program **53** having more functions can immediately be launched during execution of simplified photographing program **52**.

[0515] Therefore, according to the present embodiment, the user can be caused to use game device **10** in such a manner of use that "game device **10** is initially operated based on a photographing program having a simple function and then

various photographing functions of game device **10** are utilized based on a photographing program having more functions," and the user can be caused to use game device **10** in such a manner that he/she gradually gets used to an operation of game device **10**.

[0516] Further, simplified photographing program **52** can be assumed as an introduction (a trial version) for multifunctional photographing application program **53**, and from the viewpoint of a supplier of game device **10**, the user can be prompted to use multifunctional photographing application program **53** by allowing quick launch of simplified photographing program **52** from the menu screen.

[0517] Further, in the present embodiment, since the function of simplified photographing program **52** is a part of the functions of multifunctional photographing application program **53**, the data size of simplified photographing program **52** is smaller than that of multifunctional photographing application program **53**. Therefore, by setting a program launched with the photographing enabling operation above from the menu screen to simplified photographing program **52** having the smaller data size, a program for photographing can quickly be launched from the menu screen.

[0518] <Photographing Leading Processing>

[0519] Details of the photographing leading processing in step SA**2** above will now be described. FIG. **27** is a flowchart showing a flow of the photographing leading processing (step SA**2**) shown in FIG. **21**. In the photographing leading processing, initially in step SA**61**, CPU **31** has a selection screen displayed for causing the user to select whether to perform photographing or not (that is, whether to make transition of the state of game device **10** to the photographing enabled state or not). For example, together with a message that "Why don't you take a picture," a button image for giving an instruction to perform photographing and a button image for giving an instruction not to perform photographing are displayed on lower LCD **12**. Subsequent to step SA**61**, processing in step SA**62** is performed.

[0520] In step SA**62**, CPU **31** accepts an input to each input device. The processing in step SA**62** is the same as the processing in step SA**6** above. Subsequent to step SA**62**, processing in step SA**63** is performed.

[0521] In step SA**63**, CPU **31** determines whether the instruction to perform photographing has been selected or not. Determination in step SA**63** can be made by referring to input position data stored in main memory **32** in step SA**62**. In other words, in the determination processing in step SA**63**, CPU **31** determines whether an input to touch an area where the button image for giving the instruction to perform photographing has been provided or not. When a result of determination in step SA**63** indicates Yes, processing in step SA**64** is performed. On the other hand, when the result of determination in step SA**63** indicates No, processing in step SA**65** which will be described later is performed.

[0522] In step SA**64**, CPU **31** performs the simplified photographing processing. As this simplified photographing processing is the same as in step SA**10** above, detailed description thereof will not be provided. Since the photographing enabled state can be set as a result of the simplified photographing processing, the user can perform the photographing operation. After the simplified photographing processing in step SA**64** ends, CPU **31** ends the photographing leading processing shown in FIG. **27**. In the present embodiment, since the processing in step SA**64** is the same as the processing in step SA**10**, multifunctional photographing application program **53** can also be launched during the simplified photographing processing in step SA**64**, as in step SA**10**. In an alternative embodiment, however, in the simplified photographing processing in step SA**64**, button image **78** for performing the second launch operation may not be displayed such that launch of multifunctional photographing application program **53** is not permitted.

[0523] On the other hand, in step SA**65**, CPU **31** has an image for introducing a photographing function displayed. For example, an image or the like for explaining functions relating to simplified photographing program **52** and multifunctional photographing application program **53** is displayed on LCDs **12** and **22**. After step SA**65**, CPU **31** ends the photographing leading processing shown in FIG. **27**.

[0524] As described above, in the present embodiment, game device **10** determines whether game device **10** is started up for the first time or not (step SA**1**). When game device **10** is started up for the first time (Yes in step SA**1**), game device **10** provides display for causing the user to select whether to make transition of the state of game device **10** to the photographing enabled state or not (step SA**61**). Then, when the user selects to perform photographing (Yes in step SA**63**), game device **10** causes the user to actually experience the photographing operation (step SA**64**).

[0525] Thus, the user can be led to initially experience the photographing operation in game device **10**. In other words, through the photographing leading processing, a user using game device **10** for the first time can be caused to initially perform the photographing operation to get used to the photographing operation. Further, in the present embodiment, since the user is caused to experience the simple photographing operation based on simplified photographing program **52** above in step SA**64**, the user can perform the photographing operation more easily than in an example where the user is caused to initially experience the photographing operation based on multifunctional photographing application program **53**.

[0526] Further, from the viewpoint of a manufacturer of game device **10**, the photographing function of game device **10** can be introduced to the user in a manner easy to understand, by having the user initially actually experience the simple photographing operation.

[0527] In the present embodiment, the user is caused to select whether or not to make transition to the photographing enabled state in step SA**61**. In an alternative embodiment, however, in the photographing leading processing, transition to the photographing enabled state may be made without user's selection. In other words, the photographing processing based on photographing program **52** or **53** may be performed without user's selection.

[0528] <As to Change of Display Screen>

[0529] In the present embodiment, game device **10** changes content of the display image on the menu screen at prescribed timing (automatically without an instruction from the user), which produces variation in the menu screen and the user can be prevented from getting bored.

[0530] Further, in the present embodiment, the prescribed timing above includes timing of start-up of game device **10** and timing of end of the selected application program. Namely, as described above, when game device **10** is started up and when a selected application program ends, the display processing in step SA**5** is performed after the processing in step SA**3** and thus the display image on the menu screen is

changed. In other words, each time game device **10** is started up and each time a selected application program is executed, the display image is changed.

[0531] According to this feature, as the user can have things to look forward to (regarding "which image will be displayed") at the time of start-up and end of execution of the selected application program, from the viewpoint of the supplier of game device **10**, an effect to prompt the user to start up game device **10** and to execute a selected application program (that is, to use game device **10**) is achieved.

[0532] In addition, in the present embodiment, the prescribed timing above includes timing of opening foldable information processing device **10**. In the present embodiment, since game device **10** in the closed state is in a sleep mode state, "timing of start-up of game device **10**" above may well be said to include "timing of opening of game device **10** from the closed state (sleep mode) (re-start of game device **10** from the sleep mode)." When game device **10** is opened again after game device **10** in the opened state is once closed, CPU **31** changes the display image between before and after closing.

[0533] Thus, as the user has things to look forward to in opening game device **10**, from the viewpoint of the supplier of game device **10**, an effect to prompt the user to use game device **10** is achieved by making the user open game device **10**. In the present embodiment, at the timing of opening of game device **10** from the closed state, the display image is changed not in a random manner but in a prescribed order. Details of processing for changing the display image in response to opening and closing will be described hereinafter with reference to FIG. **28**.

[0534] FIG. **28** is a flowchart showing details of processing (processing at the time of opening and closing) performed when game device **10** is opened and closed. The processing shown in FIG. **28** is started in response to closing of game device **10** at any timing during the processing shown in FIG. **21**.

[0535] In the processing at the time of opening and closing, initially in step SA**71**, CPU **31** causes game device **10** to make transition to the sleep mode. Specifically, CPU **31** stops image display on each of LCDs **12** and **22** or temporarily stops processing in an application program being executed. Subsequent to step SA**71**, processing in step SA**72** is performed.

[0536] In step SA**72**, CPU **31** determines whether game device **10** has been opened or not. When a result of determination in step SA**72** indicates Yes, processing in step SA**73** is performed. On the other hand, when the result of determination in step SA**72** indicates No, the processing in step SA**72** is performed again. In other words, CPU **31** waits until game device **10** is opened.

[0537] In step SA**73**, CPU **31** changes the display image from a state before the processing at the time of opening and closing is started. Here, in step SA**73**, the display image is changed by successively selecting a display image from among the favorite images in a prescribed order. A method of changing the display image will be described hereinafter with reference to FIG. **29**.

[0538] FIG. **29** is a diagram showing the method of changing the display image in step SA**73**. FIG. **29** shows a case where the first group includes three favorite images, the second group includes two favorite images, and the third group includes four favorite images by way of example. In the present embodiment, the favorite images included in each group are managed with the favorite images being arranged in a prescribed order. For example, the prescribed order may be an order of time and date of photographing (storage), an order of time and date of setting as a favorite image, or an order set by the user. In step SA**73**, a favorite image is successively changed in this order. In other words, CPU **31** sets a favorite image immediately following a display image before change (in the state before the processing at the time of opening and closing is started) as a display image after change. Further, when a display image before change is the last favorite image in a group, a first favorite image in a next group is set as a display image after change. Further, when a display image before change is the last favorite image in the third group, a first favorite image in the first group is set as a display image after change. As described above, in step SA**73**, the display image is changed in an order indicated by an arrow in FIG. **29**. Subsequent to step SA**73**, CPU **31** ends the processing at the time of opening and closing, and returns to a state immediately before the processing at the time of opening and closing is started.

[0539] As described above, in the present embodiment, each time game device **10** is opened, the display image is changed in the prescribed order. Thus, the user can enjoy change of display images one after another by performing an operation to open and close game device **10**. For example, the user can create a four-panel cartoon of which picture (display image) changes every time game device **10** is opened, or can successively view a series of photographs arranged in chronological order by repeatedly opening and closing game device **10**. Here, in step SA**3** above, CPU **31** may select a display image from among first favorite images in respective groups in a random manner. Thus, all images included in these groups can successively be displayed in a prescribed order.

[0540] In an alternative embodiment, game device **10** may change the display image in a prescribed order in accordance with a prescribed operation (for example, an operation to press a prescribed button). In other words, the prescribed timing above may be the timing of a prescribed operation.

[0541] <Variation>

[0542] In the embodiment above, prescribed information (data) is commonly used in simplified photographing program **52** and multifunctional photographing application program **53**. Specifically, two programs **52** and **53** commonly use information on the camera for image pick-up and information on a storage destination of a stored image. Here, in an alternative embodiment, two programs **52** and **53** may commonly use other information. For example, in the case where a file name of a stored image is determined based on a total number of images taken by game device **10**, information on the total number of images may commonly be used.

[0543] Further, in an alternative embodiment, game device **10** may cause content of an argument to be passed to multifunctional photographing application program **53** to be different between when multifunctional photographing application program **53** is launched in the photographing enabled state (Yes in step SA**29**) and when multifunctional photographing application program **53** is launched in the launch acceptance state (Yes in step SA**11**).

[0544] For example, the argument above may be set as information indicative of a mode at the time of start of execution of multifunctional photographing application program **53**. In other words, the mode at the time of start of execution of multifunctional photographing application program **53**

may be different between when multifunctional photographing application program **53** is launched in the photographing enabled state and when multifunctional photographing application program **53** is launched in the launch acceptance state.

[0545] Specifically, when multifunctional photographing application program **53** is launched in the launch acceptance state, the mode at the time of start of execution thereof may be set to a mode for causing the user to select between the photographing mode and the photograph display mode as in the embodiment above. On the other hand, when multifunctional photographing application program **53** is launched in the photographing enabled state, a mode at the time of start of execution thereof may be set to the photographing mode.

[0546] This is because, when multifunctional photographing application program **53** is launched in the photographing enabled state, it can be assumed that the user launched multifunctional photographing application program **53** for performing photographing with a function not attained by simplified photographing program **52**.

[0547] Further, in an alternative embodiment, when multifunctional photographing application program **53** is launched in the photographing enabled state, the mode at the time of start of execution of multifunctional photographing application program **53** may be set to the photograph display mode, and in addition, an image relating to a display image that has been displayed in the photographing enabled state (for example, a favorite image in the same group as the display image, an image taken on the same day as the display image, and the like) may be displayed.

[0548] Further, in the embodiment above, a single button image for launching multifunctional photographing application program **53** in the photographing enabled state (button image **78** shown in FIG. **24**) is provided. In an alternative embodiment, however, two button images may be displayed. Here, one of the two button images is a button for launching multifunctional photographing application program **53** with the mode at the time of start of execution thereof being set to the photographing mode, and the other button image is a button for launching multifunctional photographing application program **53** with the mode at the time of start of execution thereof being set to the photograph display mode. Thus, in an alternative embodiment, game device **10** may prepare a plurality of types of second launch operations, so that the mode at the time of start of execution (of multifunctional photographing application program **53**) is different depending on a type of a performed second launch operation.

[0549] Further, in the embodiment above, simplified photographing program **52** is different from launch function program **51** and it is launched by a launch program separately from launch function program **51**. Here, in an alternative embodiment, simplified photographing program **52** may be implemented as a part of launch function program **51** (that is, launch function program **51** and simplified photographing program **52** may implement one program in launch program **61**). In an alternative embodiment, launch function program **51** may launch simplified photographing program **52**.

[0550] In other words, an instruction (an operation) for launching simplified photographing program **52** should only be different from that for launching multifunctional photographing application program **53**, and simplified photographing program **52** and multifunctional photographing application program **53** may be launched by the same program or by different programs.

7. DETAILS OF FUNCTION IN MULTIFUNCTIONAL PHOTOGRAPHING APPLICATION

[0551] <Overview>

[0552] As described above, as a result of execution of multifunctional photographing application program **53**, a large number of functions not attained by simplified photographing program **52** are provided. Details of two typical functions provided by multifunctional photographing application program **53** according to the present embodiment will be described hereinafter.

First Example

Processing Procedure

[0553] FIG. **36** is a flowchart showing a flow of photographing processing (No. 1) in the multifunctional photographing application in game device **10**. It is noted that a processing loop of steps SB**1** to SB**11** shown in FIG. **36** (except for a case where processing in steps SB**8** to SB **10** are performed) is performed once in a prescribed time period (for example, 1/60 sec.).

[0554] In step SB**1** shown in FIG. **36**, CPU **31** obtains data of an image picked-up by inner camera **23** or outer camera **25**. In the present embodiment, an image is picked-up by any one of cameras **23** and **25**. In step SB**1**, CPU **31** obtains image data only from one camera. In the present embodiment, at the time of start of the photographing processing, a camera for picking up an image is set to outer camera **25**. Subsequent to step SB**1**, processing in step SB**2** is performed.

[0555] The image data obtained from camera **23** or **25** in step SB **1** above is displayed on lower LCD **12**. FIG. **37** is a diagram showing an example of an image displayed on each of LCDs **12** and **22**. FIG. **37** shows an image in the case where there is no image input by the user in input image generation processing which will be described later. As shown in FIG. **37**, CPU **31** causes lower LCD **12** to display a real-time image (a picked-up image) **52** picked-up by camera **23** or **25**. It is noted that an image **252** for explaining a manner of operation to the user is displayed on upper LCD **22**. In the present embodiment, CPU **31** causes lower LCD **12** to display various button images **253** to **261** together with picked-up image **252**. Each of button images **253** to **261** is an image for giving an instruction to game device **10** by the user's touch input onto a position of the image. Button images **253** to **261** will be described hereinafter.

[0556] A pen mode image **253**, an eraser mode image **254**, and a seal mode image **255** are images for changing an edition mode. Here, in the present embodiment, three modes of a pen mode, a seal mode and an eraser mode are prepared in advance. In the pen mode, an image of an input trail input to touch panel **13** can be added to the picked-up image. In the seal mode, a seal image prepared in advance can be added to the picked-up image. In the eraser mode, an image added in the pen mode or the seal mode can be erased. Pen mode image **253** is an image for giving an instruction to change the edition mode to the pen mode. Eraser mode image **254** is an image for giving an instruction to change the edition mode to the eraser mode. Seal mode image **255** is an image for giving an instruction to change the edition mode to the seal mode.

[0557] A thickness change image **256** is an image for giving an instruction to change a thickness of a line input in the pen mode. A color change image **257** is an image for giving an

instruction to change a color of a line input in the pen mode. An all erase image **258** is an image for giving an instruction to erase all images added in the pen mode or the seal mode.

[0558] By giving instructions using button images **253** to **258** above, the user can input an image over the picked-up image displayed on lower LCD **12** (in a manner superimposed on the picked-up image). Processing for generating an input image (input image generation processing) will be described in detail later.

[0559] An end image **259** is an image for giving an instruction to end the photographing processing. A photographing instruction image **260** is an image for giving a photographing instruction. In the present embodiment, the photographing instruction is an instruction to store (record) an image displayed on lower LCD **12** (an image obtained by superimposing an input image on a picked-up image). It is noted that photographing instruction image **260** is preferably displayed substantially at the center of lower housing **11** (in the left-right direction) for facilitating a user's operation with either a right hand or a left hand. Therefore, if lower LCD **12** is not arranged substantially at the center of lower housing **11**, CPU **31** preferably has photographing instruction image **260** displayed such that it is arranged substantially at the center of lower housing **11**, not at the center of lower LCD **12**. A camera change image **261** is an image for giving a camera change instruction. The camera change instruction is an instruction to change a camera for image pick-up between inner camera **223** and outer camera **225**.

[0560] In step SB**2**, CPU **31** accepts an input to each input device. In other words, CPU **31** obtains operation data from operation button group **14** and obtains touch position data from touch panel **13**. The obtained operation data and touch position data are stored in main memory **32**. Subsequent to step SB**2**, processing in step SB**3** is performed.

[0561] In step SB**3**, CPU **31** determines whether the camera change instruction has been given or not. In the present embodiment, the camera change instruction is given by pressing a prescribed button (for example, button **14**B, button **14**C, button **14**D, or button **14**E) or by providing an input to touch panel **13** by touching an area where camera change image **261** is displayed. Therefore, in the determination processing in step SB**3**, CPU **31** determines whether or not the prescribed button above has been pressed or whether or not an input to touch the area where camera change image **261** is displayed has been performed. Determination in step SB**3** can be made by referring to the operation data and the touch position data stored in main memory **32** in step SB**2**. When a result of determination in step SB**3** indicates Yes, processing in step SB**4** is performed. On the other hand, when the result of determination in step SB**3** indicates No, processing in step SB**5** which will be described later is performed.

[0562] In step SB**4**, CPU **31** changes the camera for image pick-up. In other words, when the camera for image pick-up is set to inner camera **23**, CPU **31** changes the camera for image pick-up to outer camera **25**. When the camera for image pick-up is set to outer camera **25**, CPU **31** changes the camera for image pick-up to inner camera **23**. Specifically, CPU **31** gives an instruction to stop an operation to one of cameras **23** and **25** picking up an image, and gives an instruction to perform image pick-up (an image pick-up execution instruction) to the other camera. If the processing in step SB**4** above is performed, in step SB **1** that will subsequently be performed, data of an image picked-up by the camera after the change is obtained by CPU **31**, and in subsequent step SB**6**, the image (live image) picked-up by the camera after the change is displayed on lower LCD **12**. Subsequent to step SB**4**, the processing in step SB**1** is performed again.

[0563] In step SB**5**, CPU **31** performs the input image generation processing. The input image generation processing is processing for generating an input image based on user's input. The input image generation processing will be described hereinafter in detail with reference to FIGS. **38** and **39**.

[0564] FIG. **38** is a flowchart showing a flow of the input image generation processing (step SB**5**) shown in FIG. **36**. In the input image generation processing, initially in step SB**20**, CPU **31** determines whether an operation for generating an input image has been performed or not. In other words, CPU **31** determines whether an input to touch an area where the picked-up image is displayed in the input surface of touch panel **13** has been provided or not. Determination in step SB**20** can be made by determining whether or not the touch position data obtained in step SB**2** indicates a position in the area where the picked-up image is displayed. When a result of determination in step SB**20** indicates Yes, processing in step SB**21** is performed. On the other hand, when the result of determination in step SB**20** indicates No, processing in step SB**26** which will be described later is performed.

[0565] In step SB**21**, CPU **31** determines whether or not a current edition mode is set to the pen mode. In the present embodiment, it is assumed that the edition mode has been set to the pen mode at the time of start of the edition processing. When a result of determination in step SB**21** indicates Yes, processing in step SB**22** is performed. On the other hand, when the result of determination in step SB**21** indicates No, processing in step SB**23** which will be described later is performed.

[0566] In step SB**22**, processing in the pen mode is performed. In other words, CPU **31** draws an image of a trail of touch input provided on the picked-up image. Specifically, an image of a line connecting positions indicated by the touch position data that has been obtained in step SB**2** by now is drawn in a memory (a frame buffer) storing image data to be displayed on LCDs **12** and **22**. It is noted that a thickness and a color of a drawn line are determined in accordance with contents set in step SB**29** which will be described later. The processing in step SB**22** may be any processing so long as the processing is processing for generating and drawing an image representing a trail of positions of user's input to touch panel **13**. An example of such processing is shown in steps SB**52** and SB**53** which will be described later. FIG. **39** is a diagram showing an example of an image displayed on each of LCDs **12** and **22** in the pen mode. When the processing in step SB**22** is performed, in display processing which will be described later (step SB**6**), an input image **262** showing a trail drawn by the user is displayed in a manner superimposed on the picked-up image displayed on lower LCD **12** (see FIG. **39**). Subsequent to step SB**22**, processing in step SB**26** which will be described later is performed.

[0567] On the other hand, in step SB**23**, CPU **31** determines whether the current edition mode is set to the seal mode or not. When a result of determination in step SB**23** indicates Yes (namely, when the current edition mode is set to the seal mode), processing in step SB**24** is performed. On the other hand, when the result of determination in step SB**23** indicates No (namely, when the current edition mode is set to the eraser mode), processing in step SB**25** which will be described later is performed.

[0568] In step SB**24**, processing in the seal mode is performed. In other words, CPU **31** draws a prescribed seal image at a position of touch input on the picked-up image. Specifically, CPU **31** draws the prescribed seal image at a position indicated by the touch position data obtained in step SB**2**. It is noted that the processing in step SB**24** may be any processing so long as the processing is processing for generating and drawing the prescribed seal image at a position of user's input to touch panel **13**. An example of such processing is shown in steps SB**60** and SB**61** which will be described later. When the processing in step SB**24** is performed, in display processing which will be described later (step SB**6**), an input image which is the prescribed seal image is displayed in a manner superimposed on the picked-up image displayed on lower LCD **12**. It is noted that CPU **31** may prepare a plurality of seal images in advance and cause the user to select a seal image to be drawn from among the plurality of seal images. Subsequent to step SB**24**, the processing in step SB**26** which will be described later is performed.

[0569] On the other hand, in step SB**25**, processing in the eraser mode is performed. In other words, CPU **31** erases the input image (the image of the trail or the seal image) on an edited image in accordance with an input to touch panel **13**. Specifically, the input image drawn at the position indicated by the touch position data obtained in step SB**2** is erased. Subsequent to step SB**25**, the processing in step SB**26** is performed.

[0570] In step SB**26**, CPU **31** determines whether an instruction to erase all input images has been given or not. Specifically, CPU **31** determines whether an input to touch an area where all erase image **258** above is displayed has been provided or not. When a result of determination in step SB**26** indicates Yes, processing in step SB**27** is performed. On the other hand, when the result of determination in step SB**26** indicates No, the processing in step SB**27** is skipped and processing in step SB**28** which will be described later is performed.

[0571] In step SB**27**, CPU **31** erases all input images that have been generated and drawn by now. Thus, the user can start again an operation for drawing an input image by touching all erase image **258**. Subsequent to step SB**27**, processing in step SB**28** is performed.

[0572] In step SB**28**, CPU **31** determines whether an instruction to change setting relating to the operation for generating an input image has been given or not. Specifically, CPU **31** determines whether an input to touch an area where each of button images **253** to **257** above is displayed has been provided or not. When a result of determination in step SB**28** indicates Yes, processing in step SB**29** is performed. On the other hand, when the result of determination in step SB**28** indicates No, the processing in step SB**28** is skipped and CPU **31** ends the input image generation processing.

[0573] In step SB**29**, CPU **31** changes the setting in accordance with the provided instruction. In other words, when a touch input to any of mode images **253** to **255** is provided, CPU **31** changes the edition mode to a mode corresponding to a mode image indicated by the touch input. When a touch input to thickness change image **256** is made, CPU **31** changes setting of a thickness of a line (trail) generated in the pen mode. Specifically, CPU **31** displays a plurality of images of lines different in thickness, causes the user to select a line of a desired thickness from among the plurality of lines different in thickness, and changes the setting of a thickness of a line to the selected thickness. When a touch input to color change image **257** is made, CPU **31** changes a color of a line (trail) generated in the pen mode. Specifically, CPU **31** displays a plurality of images of a plurality of colors, causes the user to select a desired color from among the plurality of colors, and changes the setting of a color of a line to the selected color. After the end of step SB**29**, CPU **31** ends the input image generation processing.

[0574] As a result of step SB**5** above, addition to the real-time image (the live image) based on an input to the touch panel is made. In other words, the user can input an image over the picked-up image displayed on lower LCD **12** (in a manner superimposed on the picked-up image). In the present embodiment, though the processing for adding an image drawn by the user or a seal image prepared in advance to the picked-up image has been described by way of example, in an alternative embodiment, CPU **31** should only perform processing for modifying a real-time image, and it may perform processing for distorting the picked-up image, processing for altering expression of a face (processing for detecting a feature point of the face through image recognition processing and changing a position of the feature point) when a face of a person is included in the picked-up image, processing for converting a picked-up image into an image symmetrical about a line, and the like.

[0575] Referring back to the description of step SB**20**, in step SB**6** subsequent to step SB**5**, CPU **31** performs the display processing for displaying a prescribed image on LCDs **12** and **22**. Specifically, an image such as image **252** shown in FIG. **37** for explaining a manner of operation to the user is displayed on upper LCD **22**. The picked-up image obtained in step SB**1** and button images **253** to **261** are displayed on lower LCD **12** (see FIG. **37**). Further, when an input image is generated and drawn in the input image generation processing, the input image is displayed over the picked-up image (see FIG. **39**). In the present embodiment, since the processing in steps SB**1** to SB**6** is repeatedly performed, the picked-up image is different each time. Therefore, the user can add an input image onto an image picked up by camera **23** or **25** in real time. Subsequent to step SB**6**, processing in step SB**7** is performed.

[0576] In step SB**7**, CPU **31** determines whether a photographing instruction has been given or not. In the present embodiment, the photographing instruction is given by pressing a prescribed button (for example, button **14**I or button **14**J) or by providing to touch panel **13**, an input to touch an area where photographing instruction image **260** is displayed. It is noted that photographing may automatically be performed at prescribed timing by program processing. Therefore, in the determination processing in step SB**7**, CPU **31** determines whether or not the prescribed button above has been pressed or whether or not the input to touch the area where photographing instruction image **260** is displayed has been provided. Determination in step SB**7** can be made by referring to the operation data and the touch position data stored in main memory **32** in step SB**2**. When a result of determination in step SB**7** indicates Yes, processing in step SB**8** is performed. On the other hand, when the result of determination in step SB**7** indicates No, processing in step SB**11** which will be described later is performed.

[0577] In step SB**8**, CPU **31** holds (freezes) a display content (the picked-up image and the input image) currently displayed on lower LCD **12**. In other words, display on lower LCD **12** of a still image (the picked-up image and the input image displayed in step SB**5**) which is a live image at the time

when a photographing instruction was given is continued. A period for which the still image is displayed may be a predetermined prescribed period or a period until display processing in step SB**6** is performed next time. In an alternative embodiment, the processing in step SB**8** may not be performed. In other words, a moving image of a live image may always be displayed on lower LCD **12**, instead of display of a still image on lower LCD **12** in accordance with an image pick-up instruction. Subsequent to step SB**8**, processing in step SB**9** is performed.

[0578] In step SB**9**, CPU **31** causes storage of a picked-up image currently displayed on lower LCD **12** and the input image. In other words, data of the picked-up image and the input image displayed in step SB**5** is stored, for example, in data memory **34** for storage. Thus, the user can store the picked-up image and the input image added onto the picked-up image. It is noted that CPU **31** may cause storage of data of an image obtained by combining the picked-up image and the input image, or may cause separate storage but in association with each other, of image data of the picked-up image and image data of the input image. Subsequent to step SB**9**, processing in step SB **10** is performed.

[0579] In step SB**10**, CPU **31** causes upper LCD **22** to display the image stored in step SB**9**. It is noted that the image displayed on upper LCD **22** is continuously displayed until another photographing instruction is given (Yes in step SB**7** again) and another stored image is displayed in step SB **10**. In a variation, the image displayed on upper LCD **22** may be displayed for a predetermined prescribed period, or may be displayed until display processing in step SB**6** is performed next time. Further, after display of the stored image ends, an image for explaining a manner of operation to the user (an operation guidance image as described previously with reference to FIG. **37**) may be displayed on upper LCD **22**. Though the display processing is performed in step SB **10** following the storage processing in step SB**9** in the present embodiment, any of the storage processing and the display processing may be performed first. Specifically, in response to a photographing instruction, CPU **31** may cause upper LCD **22** to display an image stored in response to the photographing instruction. CPU **31** may not only display an image stored in response to a photographing instruction but also may display an image which is to be stored in response to a photographing instruction. Subsequent to step SB**10**, processing in step SB**11** is performed.

[0580] FIG. **40** is a diagram showing an example of an image displayed on LCDs **12** and **22** when step SB**10** is performed. As shown in FIG. **40**, in the present embodiment, in accordance with a photographing instruction (a photographing operation), an image **263** stored in response to the photographing instruction is displayed on upper LCD **22** (step SB **10**). Thus, an image representing a result of photographing can be displayed on upper LCD **22** having a display screen that faces in a display direction corresponding to the photographing direction of camera **23** or **25** (in a direction the same as the photographing direction or in a direction opposite to the photographing direction). By displaying the image representing the result of photographing on upper LCD **22**, the image representing the result of photographing can be presented to the user in a manner easy for the user to recognize the photographing direction. In the present embodiment, since a real-time image picked-up by camera **23** or **25** is displayed on lower LCD **12** of which display direction does not correspond to the photographing direction of camera **23** or **25**, it is particularly effective to present the image representing the result of photographing to the user in a manner easy for the user to recognize the photographing direction.

[0581] In the present embodiment, an edition result obtained before a photographing instruction is given is maintained also after the photographing instruction was given (after an image is stored). Namely, as shown in FIG. **40**, input image **262** input prior to a photographing instruction is displayed on lower LCD **12** in a manner superimposed on a live image even after the photographing instruction was given. In an alternative embodiment, an edition result obtained before a photographing instruction is given may be erased in accordance with the photographing instruction, and only a live image may be displayed on lower LCD **12** after the photographing instruction was given.

[0582] In an alternative embodiment, an image representing a result of photographing (a stored image) may be displayed on upper LCD **22** at any timing, without limited to the timing in accordance with a photographing instruction. For example, CPU **31** may cause upper LCD **22** to display an image representing a result of photographing in accordance with a user's instruction to view an image (the number of images may be one or more) or may always display an image representing a result of photographing on upper LCD **22** instead of the image for explaining a manner of operation.

[0583] In step SB**11**, CPU **31** determines whether or not to end the edition processing. Determination is made based on whether or not an instruction to end the edition processing has been given by the user. Specifically, determination in step SB**11** is made based on whether a touch input to an area of end image **259** displayed on lower LCD **12** has been provided or not. When a result of determination in step SB**11** indicates No, CPU **31** performs the processing in step SB**1** again. Thereafter, the processing loop of steps SB**1** to SB**11** is repeatedly performed until determination to end the photographing processing is made in step SB**11**. On the other hand, when the result of determination in step SB**11** indicates Yes, CPU **31** ends the photographing processing shown in FIG. **36**.

[0584] Through the photographing processing described above, the user can store an image picked-up by the camera in accordance with the photographing instruction. Here, in the present embodiment, two display devices are included, an image being currently taken is displayed on one of the display devices, and a picture for explaining an operation is displayed on the other display device. Thus, since the user can perform the photographing operation while looking at the picture for explaining the operation in addition to the currently picked-up image, user-friendly game device **10** can be provided. Further, in the present embodiment, by providing touch panel **13** in lower LCD **12**, an operation can more easily be performed.

[0585] Further, in the present embodiment, the user can provide the photographing instruction by pressing button **14**I or button **14**J. By using button **14**I or button **14**J as the shutter button, the user can press the shutter button while holding lower housing **11** with both hands. Thus, the photographing operation can more easily be performed. In an alternative embodiment, some of buttons **14**B to **14**E may be used as the shutter button. In this case as well, the user can press the shutter button while holding lower housing **11** with both hands as in the present embodiment. Alternatively, some buttons of direction input button A (for example, one direction input; for example, a left input) and one of buttons **14**B to E (for example, button **14**D) may both have a function of the

shutter button. By doing so, either a left-handed user or a right-handed user can easily operate the shutter button.

Second Example

Processing Procedure

[0586] In the processing procedure above, in the photographing processing, the case where the user adds an input image to an image obtained in real time has been described by way of example, however, in the photographing processing, the user may add an input image to an image (a still image) picked-up by game device **10**. A second example of the photographing processing will be described hereinafter with reference to FIGS. **41** to **45**.

[0587] FIG. **41** is a flowchart showing a flow of photographing processing (No. 2) in the multifunctional photographing application in game device **10**. When power of game device **10** is turned on by pressing of power button **14**F, CPU **31** of game device **10** initializes main memory **32** and the like, and then starts execution of a program for performing the photographing processing shown in FIG. **41**. It is noted that a processing loop of steps SB**31** to SB**44** shown in FIG. **41** is performed once in a prescribed time period (for example, 1/60 sec.) except for a period when edition processing (step SB**43**) is performed.

[0588] In step SB**31** shown in FIG. **41**, CPU **31** obtains data of an image picked-up by inner camera **23** or outer camera **25**. In the present second example, an image is picked-up by only any one of cameras **23** and **25**. In step SB**31**, CPU **31** obtains image data only from one camera. In the present variation, at the time of start of the photographing processing, a camera for image pick-up is set to outer camera **25**. Subsequent to step SB**31**, processing in step SB**32** is performed.

[0589] In step SB**32**, CPU **31** performs display processing for displaying prescribed images on LCDs **12** and **22**. FIG. **42** is a diagram showing an example of an image displayed on LCDs **12** and **22** in step SB**32**. As shown in FIG. **42**, CPU **31** causes upper LCD **22** to display a real-time image (a picked-up image) **51** taken by camera **23** or **25**. In other words, CPU **31** outputs the image data obtained in step SB**31** to upper LCD **22**. Further, in the present variation, an image **272** showing a current date is displayed on upper LCD **22** in a manner superimposed on picked-up image **271**.

[0590] In the present variation, magnification data indicative of a magnification of the picked-up image displayed on upper LCD **22** is stored in main memory **32**. In step SB**32**, the picked-up image is displayed on upper LCD **22** at a magnification indicated by the magnification data. In other words, CPU **31** determines an area in the picked-up image to be displayed in accordance with the magnification above, zooms in an image of the determined area to have a size of upper LCD **22** as necessary, and causes upper LCD **22** to display that image. It is noted that, at the time of start of the photographing processing, the magnification data is set so as to indicate a predetermined prescribed magnification (for example, a magnification with which an entirety of the picked-up image is displayed on upper LCD **22** (one time)). Content of the magnification data is changed when a zoom change instruction which will be described later is given. Therefore, when the picked-up image is zoomed in and displayed on upper LCD **22**, not the entirety but only a part of the picked-up image may be displayed.

[0591] On the other hand, CPU **31** causes lower LCD **12** to display an operation screen for operating game device **10**. As shown in FIG. **42**, the operation screen displayed in step SB**32** includes stored images **273**A to **273**D and instruction images **274** to **278** for giving various instructions to game device **10** using touch panel **13**.

[0592] Stored images **273**A to **273**D are images previously taken by game device **10** and stored in game device **10** (or alternatively in memory card **28**) (referred to as stored images). In the present variation, among the stored images, a prescribed number of images (four in FIG. **42**) are displayed on lower LCD **12**. It is noted that, in main memory **32**, data indicative of stored images to be displayed on lower LCD **12** (displayed stored images) is stored as displayed stored image data. The displayed stored image data is, for example, data indicative of an ID assigned to a stored image. In FIG. **42**, stored images **273**A to **273**D are aligned and displayed in order of date (time and date) of photographing. Here, leftmost stored image **273**A is an image taken at the earliest time, and the time of photographing is earlier in order of stored image **273**B which is second from the left, stored image **273**C which is second from the right, and rightmost stored image **273**D. In the present variation, an instruction to perform edition processing for editing a stored image (an edition instruction) can be given by providing a touch input to displayed stored images **273**A to **273**D through touch panel **13**.

[0593] Further, as the instruction images above, a photographing instruction image **274**, a camera change image **275**, a zoom bar **276**, a zoom cursor **277**, and display change images **278**A and **278**B are displayed on lower LCD **12**. Photographing instruction image **274** is an image for giving a photographing instruction using touch panel **13**. The photographing instruction is an instruction for causing camera **23** or **25** of game device **10** to perform photographing. Camera change image **275** is an image for giving a camera change instruction using touch panel **13**. The camera change instruction is an instruction to change the camera for image pick-up between inner camera **23** and outer camera **25**. Zoom bar **276** and zoom cursor **277** are images for giving a zoom change instruction using touch panel **13**. The zoom change instruction is an instruction to zoom in/out the picked-up image displayed on upper LCD **22**. Display change images **278**A and **278**B are images for giving a display change instruction. The display change instruction is an instruction for changing stored images to be displayed as stored images **273**A to **273**D on lower LCD **12** among the stored images stored in game device **10**. A manner of giving each of these instructions and processing performed by game device **10** in accordance with each of the instructions will be described later.

[0594] Referring back to the description in connection with FIG. **41**, subsequent to step SB**32**, processing in step SB**33** is performed. In step SB**33**, CPU **31** accepts an input to each input device. In other words, CPU **31** obtains operation data from operation button group **14** and obtains touch position data from touch panel **13**. The obtained operation data and touch position data are stored in main memory **32**. Subsequent to step SB**33**, processing in step SB**34** is performed.

[0595] In step SB**34**, CPU **31** determines whether the photographing instruction has been given or not. In the present variation, the photographing instruction is given by pressing a prescribed button (for example, button **14**I or button **14**J) or by providing to touch panel **13**, an input to touch an area where photographing instruction image **274** is displayed. Therefore, in the determination processing in step SB**34**, CPU **31** determines whether or not the prescribed button above has been pressed or whether or not the input to touch

the area where photographing instruction image **274** is displayed has been provided. Determination in step SB**34** can be made by referring to the operation data and the touch position data stored in main memory **32** in step SB**33**. When a result of determination in step SB**34** indicates Yes, processing in step SB**35** is performed. On the other hand, when the result of determination in step SB**34** indicates No, processing in step SB**36** which will be described later is performed.

[0596] In step SB**35**, CPU **31** performs the photographing processing. In other words, CPU **31** causes data memory **34** for storage to store (save) the image data obtained from the camera in step SB**31**. In an alternative embodiment, CPU **31** may cause any of LCDs **12** and **22** to display the image data obtained from the camera in step SB**31**, and inquire of the user whether or not to store the image data. Only when the user provides an instruction to store the image data, CPU **31** may cause data memory **34** for storage to store (save) the image data. Further, in an alternative embodiment, CPU **31** may cause memory card **28** to store data of the picked-up image, or may cause the user to indicate whether the image data should be stored in a device main body (data memory **34** for storage) or in memory card **28**. Subsequent to step SB**35**, processing in step SB**42** which will be described later is performed.

[0597] On the other hand, in step SB**36**, CPU **31** determines whether the camera change instruction has been given or not. In the present variation, the camera change instruction is given by pressing a prescribed button (for example, button **14**B, button **14**C, button **14**D, or button **14**E) or by providing to touch panel **13**, an input to touch an area where camera change image **275** is displayed. Thus, in the determination processing in step SB**36**, CPU **31** determines whether or not the prescribed button above has been pressed or whether or not the input to touch the area where camera change image **275** is displayed has been provided. Determination in step SB**36** can be made by referring to the operation data and the touch position data stored in main memory **32** in step SB**33**. When a result of determination in step SB**36** indicates Yes, processing in step SB**37** is performed. On the other hand, when the result of determination in step SB**36** indicates No, processing in step SB**38** which will be described later is performed.

[0598] In step SB**37**, CPU **31** changes the camera for image pick-up. In other words, when the camera for image pick-up is set to inner camera **23**, CPU **31** changes the camera for image pick-up to outer camera **25**. When the camera for image pick-up is set to outer camera **25**, CPU **31** changes the camera for image pick-up to inner camera **23**. Specifically, CPU **31** gives an instruction to stop an operation to one of cameras **23** and **25** picking up an image and gives an instruction to perform image pick-up (an image pick-up execution instruction) to the other camera. If the processing in step SB**37** above is performed, in step SB**31** that will subsequently be performed, data of an image picked-up by the camera after the change is obtained by CPU **31**, and in subsequent step SB**32**, the image picked-up by the camera after the change is displayed on upper LCD **22**. Subsequent to step SB**37**, processing in step SB**42** which will be described later is performed.

[0599] On the other hand, in step SB**38**, CPU **31** determines whether the zoom change instruction has been given or not. In the present variation, the zoom change instruction is given by moving zoom cursor **277** on zoom bar **276** upward or downward by using a prescribed button (for example, an up button or a down button of direction input button **14**A) or by providing an input to touch panel **13**. Specifically, zoom cursor **277** is moved upward by a prescribed distance in accordance with pressing of the up button of direction input button **14**A and moved downward by a prescribed distance in accordance with pressing of the down button of direction input button **14**A. In addition, the user can move zoom cursor **277** upward or downward by initially touching a screen area where zoom cursor **277** is displayed and performing an operation with respect to touch panel **13** to slide a touch position upward or downward while touching the screen area. Therefore, in the determination processing in step SB**38**, CPU **31** determines whether or not the prescribed button above has been pressed or whether or not the operation with respect to touch panel **13** for moving zoom cursor **277** has been performed. Determination in step SB**38** can be made by referring to the operation data and the touch position data stored in main memory **32** in step SB**33**. When a result of determination in step SB**38** indicates Yes, processing in step SB**39** is performed. On the other hand, when the result of determination in step SB**38** indicates No, processing in step SB**40** which will be described later is performed.

[0600] In step SB**39**, CPU **31** zooms in/out the picked-up image displayed on upper LCD **22** in accordance with the zoom change instruction. In other words, when an instruction for moving zoom cursor **277** upward is given, CPU **31** changes the content of the magnification data stored in main memory **32** such that the magnification is lowered. Thus, in step SB**32** that will subsequently be performed, a picked-up image is displayed with the image being zoomed out as compared to preceding step SB**32**. On the other hand, when an instruction for moving zoom cursor **277** downward is given, CPU **31** changes the content of the magnification data stored in main memory **32** such the magnification is increased. Thus, in step SB**32** that will subsequently be performed, a picked-up image is displayed with the image being zoomed in as compared to preceding step SB**32**. Subsequent to step SB**39**, processing in step SB**42** which will be described later is performed.

[0601] On the other hand, in step SB**40**, CPU **31** determines whether the display change instruction has been given or not. In the present variation, the display change instruction is given by pressing a prescribed button (for example, a left button or a right button of direction input button **14**A) or by providing to touch panel **13**, an input to touch an area where display change image **278**A is displayed or an area where display change image **278**B is displayed. Therefore, in the determination processing in step SB**40**, CPU **31** determines whether or not the prescribed button above has been pressed or whether or not the input to touch the area where display change image **278**A is displayed or the area where display change image **278**B is displayed has been provided. Determination in step SB**40** can be made by referring to the operation data and the touch position data stored in main memory **32** in step SB**33**. When a result of determination in step SB**40** indicates Yes, processing in step SB**41** is performed. On the other hand, when the result of determination in step SB**40** indicates No, processing in step SB**42** which will be described later is performed.

[0602] In step SB**41**, CPU **31** changes stored images to be displayed on lower LCD **12** (displayed stored images) among the stored images. Specifically, when the right button of direction input button **14**A is pressed or when display change image **278**B is touched, the displayed stored images are shifted by one image toward recent images. In other words,

among the four currently displayed stored images, the image taken at the earliest time is removed from the displayed stored images. In addition, a stored image taken subsequent to the image taken most recently among the four currently displayed stored images is added as a new displayed stored image. On the other hand, when the left button of direction input button **14**A is pressed or when display change image **278**A is touched, the displayed stored images are shifted by one image toward old images. In other words, among the four currently displayed stored images, the image taken most recently is removed from the displayed stored images. In addition, a stored image taken immediately before the image taken at the earliest time among the four currently displayed stored images is added as a new displayed stored image. In main memory **32**, data indicative of the displayed stored images after the change in step SB**40** is stored as new displayed stored image data. Subsequent to step SB**41**, processing in step SB**42** which will be described later is performed.

[0603] In step SB**42**, CPU **31** determines whether an edition instruction has been given or not. In the present variation, the edition instruction is given by providing through touch panel **13**, a touch input to a display area of a stored image of which edition is desired among displayed stored images **273**A to **273**D. Thus, in the determination processing in step SB**42**, CPU **31** determines whether the input to touch any of the areas where stored images **273**A to **273**D are displayed respectively has been provided or not. Determination in step SB**42** can be made by referring to the operation data and the touch position data stored in main memory **32** in step SB**33**. When a result of determination in step SB**42** indicates Yes, processing in step SB**43** is performed. On the other hand, when the result of determination in step SB**42** indicates No, processing in step SB**44** which will be described later is performed.

[0604] In step SB**43**, CPU **31** performs the edition processing. The edition processing is processing for editing a stored image. Hereinafter, a stored image to be edited is referred to as an edited image. The edition processing will be described hereinafter in detail with reference to FIGS. **43** to **45**.

[0605] FIG. **43** is a flowchart showing a flow of the edition processing (step SB**43**) shown in FIG. **41**. In the edition processing, initially in step SB**51**, CPU **31** determines whether or not the current edition mode is set to the pen mode. Here, in the present variation, in the edition processing, three modes of the pen mode, the seal mode and the eraser mode are prepared in advance. In the pen mode, an image of an input trail input through touch panel **13** can be added to an edited image. In the seal mode, a seal image prepared in advance can be added to an edited image. In the eraser mode, an image added in the pen mode or the seal mode can be erased. In the present variation, it is assumed that the edition mode has been set to the pen mode at the time of start of the edition processing. When a result of determination in step SB**51** indicates Yes, processing in step SB**52** is performed. On the other hand, when the result of determination in step SB**51** indicates No, processing in step SB**58** which will be described later is performed.

[0606] In steps SB**52** to SB**57**, processing in the pen mode is performed. FIG. **44** is a diagram showing an example of an image displayed on LCDs **12** and **22** in the pen mode in the edition processing. As shown in FIG. **44**, during the edition processing, an operation screen for edition (an edition screen) is displayed on lower LCD **12**. Specifically, a part or an entirety of an edited image **281** is displayed on lower LCD **12**. Edited image **281** is a stored image to be edited, that is, a stored image designated with a touch input from among stored images **273**A to **273**D shown in FIG. **42**. Further, images **284** to **290** for performing various operations are displayed on lower LCD **12**. Operations using these images **284** to **290** will be described in detail later. On the other hand, during the edition processing, as shown in FIG. **44**, entire edited image **281** is displayed on upper LCD **22**. It is noted that a dotted-line area **282** shown in FIG. **44** shows an area in edited image **281** being displayed on lower LCD **12**. An image of such a dotted-line area **282** may or may not be displayed on upper LCD **22**. Since a real-time image picked-up by camera **23** or **25** is not displayed during the edition processing, CPU **31** may give an instruction not to perform an image pick-up operation to each of cameras **23** and **25**. The processing in the pen mode (the steps SB**52** to SB**57**) will be described hereinafter in detail with reference to FIG. **44**.

[0607] In step SB**52**, CPU **31** accepts an input to touch panel **13**. In other words, CPU **31** obtains touch position data from touch panel **13**. The obtained touch position data is stored in main memory **32**. Subsequent to step SB**52**, processing in step SB**53** is performed.

[0608] In step SB**53**, CPU **31** has an image of an input trail **283** displayed in accordance with an input to touch panel **13**. In other words, when a touch input through touch panel **13** to an area of edited image **281** is provided, the image of input trail **283** is displayed. Input trail **283** is an image showing a trail of positions of touch input to touch panel **13**. Specifically, when the touch position data obtained in step SB**52** indicates a position in an area where edited image **281** is displayed, CPU **31** adds the image of input trail **283** at the position in edited image **281**. Edited image **281** to which the image has been added is displayed on LCDs **12** and **22**. Since a processing loop of steps SB**51** to SB**56** is repeated once in a prescribed time period (one frame time (1/60 sec.)) during the pen mode, the processing in steps SB**52** and SB**53** is repeated during the pen mode. Therefore, when the user continuously provides input to touch panel **13** to draw a trail, the image of input trail **283** is generated and displayed in a manner showing the trail. It is noted that generation and display processing of input trail **283** in step SB**53** is performed only when a touch input to the area of edited image **281** is provided, and it is not performed when a touch input is not provided or when a touch input to an area other than the area of edited image **281** is provided. Subsequent to step SB**53**, processing in step SB**54** is performed.

[0609] In step SB**54**, CPU **31** performs zoom in/out processing of edited image **281** displayed on lower LCD **12**. The zoom in/out processing is performed when a magnification change instruction is given, that is, when an input to an area of a magnification change instruction image **289** displayed on lower LCD **12** is provided through touch panel **13**. Magnification change instruction image **289** is an image for giving an instruction to zoom in or out edited image **281** displayed on lower LCD **12**. In step SB**54**, CPU **31** changes a magnification for displaying edited image **281** displayed on lower LCD **12** when the touch position data obtained in step SB**52** indicates a position in the area where magnification change instruction image **289** is displayed. In the present variation, the magnification for displaying edited image **281** has, for example, three levels, and CPU **31** changes the magnification in order of a low magnification, an intermediate magnification, and a high magnification each time the magnification change instruction is given. When the magnification change

instruction is given in the case of high magnification, CPU **31** changes the magnification to the low magnification. Thus, when the magnification change instruction is given by the user, the magnification for edited image **281** displayed on lower LCD **12** is changed. It is noted that the magnification change processing in step SB**54** is performed only when a touch input to the area of magnification change instruction image **289** is provided, and it is not performed when an input to touch panel **13** is not provided or when a touch input to an area other than the area of magnification change instruction image **289** is provided. Subsequent to step SB**54**, processing in step SB**55** is performed.

[0610] In step SB**55**, CPU **31** performs movement processing of edited image **281** displayed on lower LCD **12**. The movement processing is performed when a movement instruction is given, that is, when a touch input to an area of a movement instruction image **290** displayed on lower LCD **12** is provided. Movement instruction image **290** is an image for giving an instruction to move (scroll) edited image **281** displayed on lower LCD **12**. In step SB**55**, CPU **31** scrolls for display, edited image **281** displayed on lower LCD **12** when the touch position data obtained in step SB**52** indicates a position in the area where movement instruction image **290** is displayed. In the present variation, as shown in FIG. **44**, movement instruction image **290** includes images indicating four directions of an upward direction, a downward direction, a left direction, and a right direction (triangle images in FIG. **44**). When a touch input to any of areas of these images is provided, CPU **31** scrolls edited image **281** in a direction corresponding to the image to which the touch input was provided. It is noted that the movement processing in step SB**55** is performed only when a touch input to the area of movement instruction image **290** is provided, and it is not performed when an input to touch panel **13** is not provided or when a touch input to an area other than the area of movement instruction image **290** is provided. Subsequent to step SB**55**, processing in step SB**56** is performed.

[0611] In step SB**56**, CPU **31** determines whether or not to change the edition mode. Determination is made based on whether or not a mode change instruction has been given by the user. Specifically, determination in step SB**56** is made by determining whether a touch input to any of areas of a pen mode image **284**, an eraser mode image **285**, and a seal mode image **286** displayed on lower LCD **12** has been provided or not. Pen mode image **284** is an image for giving an instruction to change the edition mode to the pen mode. Eraser mode image **285** is an image for giving an instruction to change the edition mode to the eraser mode. Seal mode image **286** is an image for giving an instruction to change the edition mode to the seal mode. In step SB**56**, when the position indicated by the touch position data obtained in step SB**52** is within the area where any of pen mode image **284**, eraser mode image **285**, and seal mode image **286** is displayed, CPU **31** determines that a determination result indicates Yes. Then, CPU **31** changes the edition mode to a mode corresponding to the image to which input was provided. On the other hand, when the position indicated by the touch position data is not within the area where any of pen mode image **284**, eraser mode image **285**, and seal mode image **286** is displayed, CPU **31** determines that the determination result indicates No. In this case, the edition mode is not changed. When the result of determination in step SB**56** indicates Yes, the processing in step SB**51** is performed again. On the other hand, when the result of determination in step SB**56** indicates No, processing in step SB**57** is performed.

[0612] In step SB**57**, CPU **31** determines whether or not to end the edition processing. Determination is made based on whether an instruction to end the edition processing has been given by the user or not. Specifically, determination in step SB**57** is made based on whether a touch input to any of areas of a stop instruction image **287** and a completion instruction image **288** displayed on lower LCD **12** has been provided or not. Stop instruction image **287** is an image for giving an instruction to stop the edition processing. Completion instruction image **288** is an image for giving an instruction to complete the edition processing. In step SB**57**, when the position indicated by the touch position data obtained in step SB**52** is within the area where any of stop instruction image **287** and completion instruction image **288** is displayed, CPU **31** determines that a determination result indicates Yes. On the other hand, when the position indicated by the touch position data obtained in step SB**52** is not within the area where any of stop instruction image **287** and completion instruction image **288** is displayed, CPU **31** determines that the determination result indicates No. When the result of determination in step SB**57** indicates Yes, processing in step SB**72** which will be described later is performed. On the other hand, when the result of determination in step SB**57** indicates No, the processing in step SB**52** is performed again.

[0613] As described above, the processing in the pen mode (steps SB**52** and SB**57**) is repeated until the result of determination in step SB**56** indicates Yes or until the result of determination in step SB**57** indicates No. Further, when the user inputs a trail to touch panel **13** in the pen mode, the image of input trail **283** is added to the edited image (see FIG. **44**).

[0614] On the other hand, in step SB**58**, CPU **31** determines whether the current edition mode is set to the seal mode or not. When a result of determination in step SB**58** indicates Yes (that is, when the current edition mode is set to the seal mode), processing in step SB**59** is performed. On the other hand, when the result of determination in step SB**58** indicates No (that is, when the current edition mode is set to the eraser mode), processing in step SB**66** which will be described later is performed.

[0615] In steps SB**59** to SB**65**, processing in the seal mode is performed. FIG. **45** is a diagram showing an example of an image displayed on LCDs **12** and **22** in the seal mode of the edition processing. As shown in FIG. **45**, in the seal mode as well, as in the pen mode, edited image **281** is displayed on LCDs **12** and **22**, and images **264** to **270** for performing various operations are displayed on lower LCD **12**. The processing in the seal mode (steps SB**59** to SB**65**) will be described hereinafter in detail with reference to FIG. **45**.

[0616] In step SB**59**, CPU **31** selects a seal image to be added to edited image **281**. Selection of the seal image is made by user's designation of a desired seal image from among seal images stored in advance in main memory **32**, data memory **34** for storage, or memory card **28**. When a seal image is selected in step SB**59**, the selected seal image is added at a prescribed position (for example, at a center position) in edited image **281**. Thus, a seal image **291** is added to edited image **281** and displayed on LCDs **12** and **22** (FIG. **45**). Subsequent to step SB**59** above, processing in step SB**60** is performed.

[0617] In step SB**60**, CPU **31** accepts an input to touch panel **13**. The processing in step SB**60** is the same as in step

SB52 above. In the following step SB61, CPU 31 moves seal image 291 on edited image 281 in accordance with the input to touch panel 13. An operation for moving seal image 291 is performed by performing the same operation as that for the aforementioned zoom change instruction (step SB38). In other words, the user can move seal image 291 by initially touching an area where seal image 291 is displayed and performing an operation to slide a touch position on touch panel 13 while touching the area. CPU 31 can detect the operation for moving seal image 291 by referring to touch position data stored in main memory 32 in step SB60. It is noted that the processing for moving seal image 291 in step SB61 is performed only when the operation for moving seal image 291 above is performed, and it is not performed when an input to touch panel 13 is not provided or when an operation other than such an operation is performed. Subsequent to step SB61, processing in step SB62 is performed.

[0618] In step SB62, CPU 31 performs processing for zoom-in/out of edited image 281 displayed on lower LCD 12. The processing in step SB62 is the same as in step SB54 above. In the seal mode, when the magnification for edited image 281 displayed on lower LCD 12 is changed, seal image 291 is also zoomed in or out in accordance with zoom in or out of edited image 281, and a ratio between a size of edited image 281 and a size of seal image 291 is not changed. In the following step SB63, CPU 31 performs processing for moving edited image 281 displayed on lower LCD 12. The processing in step SB63 is the same as in step SB55 above. Subsequent to step SB63, processing in step SB64 is performed.

[0619] In step SB64, CPU 31 determines whether or not to change the edition mode. The processing in step SB64 is the same as in step SB56 above. When a result of determination in step SB64 indicates Yes, the processing in step SB51 is performed again. On the other hand, when the result in step SB64 indicates No, processing in step SB65 is performed.

[0620] In step SB65, CPU 31 determines whether or not to end the edition processing. The processing in step SB65 is the same as in step SB57 above. When a result of determination in step SB65 indicates Yes, processing in step SB72 which will be described later is performed. On the other hand, when the result of determination in step SB65 indicates No, the processing in step SB60 is performed again.

[0621] As described above, the processing in the seal mode (steps SB60 to SB65) is repeated until the result of determination in step SB64 indicates Yes or until the result of determination in step SB65 indicates No. Seal image 291 is added to edited image 281 in the seal mode, and the user can arrange a seal image at a desired position by providing an input to touch panel 13.

[0622] On the other hand, when the result of determination in step SB58 indicates No, that is, when the current edition mode is set to the eraser mode, processing in steps SB66 to SB71 is performed. In the eraser mode as well, as in the pen mode and the seal mode, edited image 281 is displayed on LCDs 12 and 22, and images 264 to 270 for performing various operations are displayed on lower LCD 12. Further, in the eraser mode, input trail 283 and seal image 291 added during a period from the time of start of the edition processing to the time of transition to the eraser mode are displayed together with edited image 281 on LCDs 12 and 22.

[0623] In step SB66, CPU 31 accepts an input to touch panel 13. The processing in step SB66 is the same as in step SB52 above. In the following step SB67, CPU 31 erases the image of input trail 283 or seal image 291 on edited image 281 in accordance with the input to touch panel 13. Specifically, when touch position data obtained in step SB66 indicates a position in an area where input trail 283 or seal image 291 added to edited image 281 is displayed, CPU 31 erases the image added at the position in edited image 281. Then, CPU 31 causes LCDs 12 and 22 to display edited image 281 from which the image has been erased. It is noted that the processing for erasing an image in step SB67 is performed only when a touch input to the area of input trail 283 or the area of seal image 291 is provided, and it is not performed when an input to touch panel 13 is not performed or when a touch input to an area other than the area of input trail 283 and seal image 291 is provided. Subsequent to step SB67, processing in step SB68 is performed.

[0624] In step SB68, CPU 31 performs processing for zooming in/out edited image 281 displayed on lower LCD 12. In step SB69, CPU 31 performs processing for moving edited image 281. The processing in steps SB68 and SB69 is the same as in steps SB54 and SB55 above, respectively.

[0625] In the following step SB70, CPU 31 determines whether or not to change the edition mode. The processing in step SB70 is the same as in step SB56 above. When a result of determination in step SB70 indicates Yes, the processing in step SB51 is performed again. On the other hand, when the result of determination in step SB70 indicates No, processing in step SB71 is performed.

[0626] In step SB71, CPU 31 determines whether or not to end the edition processing. The processing in step SB71 is the same as in step SB57 above. When a result of determination in step SB71 indicates Yes, processing in step SB72 is performed. On the other hand, when the result of determination in step SB71 indicates No, the processing in step SB66 is performed again.

[0627] As described above, the processing in the eraser mode (steps SB66 to SB71) is repeated until the result of determination in step SB640 indicates Yes or until the result of determination in step SB71 indicates No. In the eraser mode, the image of input trail 283 and seal image 291 is erased in accordance with an input to touch panel 13.

[0628] When end of the edition processing is determined in step SB57, SB65, or SB71 above, the processing in step SB72 is performed. In step SB72, CPU 31 determines whether or not to store edited image 281 edited in the edition processing. Determination is made by determining whether a touch input to any of stop instruction image 287 and completion instruction image 288 has been provided or not based on the touch position data obtained in step SB52, SB60 or SB66. In other words, when a touch input to the area of stop instruction image 287 has been provided, CPU 31 stops the edition processing, that is, determines not to store the edited image. On the other hand, when a touch input to the area of completion instruction image 288 has been provided, CPU 31 completes the edition processing, that is, determines to store the edited image. When a result of determination in step SB72 indicates Yes, processing in step SB73 is performed. On the other hand, when the result of determination in step SB72 indicates No, CPU 31 skips the processing in step SB73 and ends the edition processing shown in FIG. 43.

[0629] In step SB73, CPU 31 stores (saves) edited image 281 in data memory 34 for storage. It is noted that edited image 281 may be written over the stored image before the edition processing or stored separately from the stored image before the edition processing, or the user may be caused to

select between writing of edited image **281** over the stored image before the edition processing or storage of edited image **281** separately therefrom. Further, edited image **281** may be stored in memory card **28** instead of in data memory **34** for storage. Subsequent to step SB**73**, CPU **31** ends the edition processing shown in FIG. **43**.

[0630] According to the edition processing described above, the user can add a character and a drawing to an edited image by providing an input to draw a trail on touch panel **13**. Further, the user can add a seal image at a desired position on the edited image.

[0631] Referring back to the description in connection with FIG. **41**, subsequent to the edition processing (step SB**43**) above, processing in step SB**44** is performed. In step SB**44**, CPU **31** determines whether or not to end the photographing processing. Specifically, CPU **31** determines whether power button **14**F has been pressed or not. When a result of determination in step SB**44** indicates No, CPU **31** performs the processing in step SB**31** again. Thereafter, the processing loop of steps SB**31** to SB**44** is repeatedly performed until end of the photographing processing is determined in step SB**44**. On the other hand, when the result of determination in step SB**44** is affirmative, CPU **31** ends the photographing processing shown in FIG. **41**.

[0632] Through the photographing processing described above, the user can store the image picked-up by the camera in accordance with the photographing instruction. In the present variation, two display devices are included, a currently picked-up image is displayed on one of the display devices, and an operation screen and a previously taken image are displayed on the other display device. Thus, as the user can perform a photographing operation while looking at the currently taken image displayed on upper LCD **22** as well as the operation screen and the previously taken image, user-friendly game device **10** can be provided. Further, in the present variation, by providing touch panel **13** on lower LCD **12**, an operation is more easily performed.

[0633] <Calendar Function>

[0634] A calendar function launched when a touch input of calendar button **106** is made in the image displayed in the multifunctional photographing processing shown in FIG. **31** will now be described with reference to FIG. **46**.

[0635] FIG. **46** is a diagram showing an image displayed in calendar processing according to the present embodiment. It is noted that the image shown in FIG. **46** is displayed on upper LCD **22** while the image displayed in the multifunctional photographing processing shown in FIG. **31** is displayed on lower LCD **12**. When a touch input of calendar button **106** is then made, the image shown in FIG. **46** is now displayed on lower LCD **12** with a display effect as if the image moved from upper LCD **22** to lower LCD **12**.

[0636] As shown in FIG. **46**, various buttons **302**, **303**, **304**, and **305** in addition to a calendar image **306** of one month are displayed on lower LCD **12**. When a touch input of any date included in calendar image **306** is made and if a picked-up image taken on the date indicated with the touch input, a memo input on that date or the like has been stored in any of main memory **32**, data memory **34** for storage, and memory card **28**, a corresponding picked-up image and/or memo is read and the content thereof is displayed on upper LCD **22**.

[0637] Scroll buttons **304** and **305** are button images for selecting displayed calendar image **306**. Namely, when a touch input of scroll button **304** or **305** is made, month and year displayed as calendar image **306** is successively changed.

[0638] A memo button **303** is a button image for performing an operation to store a memo input by the user in data memory **34** for storage or the like in correspondence with the designated date. Namely, when a touch input of memo button **303** is made, switching to a not-shown memo content accepting screen is made so that the user can input any character or graphic by using touch pen **27** etc. on the memo content accepting screen.

[0639] An end button **302** is a button image for performing an operation to end the calendar processing. Namely, when a touch input of end button **302** is made, the calendar processing ends and the image shown in FIG. **46** is displayed on upper LCD **22** with a display effect as if the image moved from lower LCD **12** to upper LCD **22**, and substantially at the same time, the image shown in FIG. **46** is again displayed on lower LCD **12**.

8. IMAGE COMMUNICATION FUNCTION

[0640] <Overview>

[0641] Processing provided by an image communication program executed as a result of launch of communication application program **55** will now be described with reference to FIGS. **47** to **55**. Prior to description of a specific processing operation, an exemplary display manner on lower LCD **12** and/or upper LCD **22** through execution of the image communication processing, exemplary connection to another device, and the like will initially be described.

[0642] FIG. **47** is a diagram illustrating an exemplary image communication system in which a plurality of game devices **10** are connected to each other. FIGS. **48** and **49** are diagrams showing exemplary screen display provided on lower LCD **12** and upper LCD **22** of game device **10** before determination as to whether game device **10** should serve as a transmission-end device or a reception-end device. FIGS. **50** to **54** are diagrams showing exemplary screen display provided in the first stage to the fifth stage of a communication application program respectively, on lower LCD **12** and upper LCD **22** of each of transmission-end game device **10***t***1** and reception-end game devices **10***r***1** to **10***r***3**. FIG. **55** is a diagram showing exemplary screen display provided on lower LCD **12** and upper LCD **22** of each of transmission-end game device **10***t***1** and reception-end game devices **10***r***1** to **10***r***3** when communication is disconnected.

[0643] In FIG. **47**, a plurality of game devices **10** transmit and receive image data such as a photograph (picked-up image) and the like through wireless communication. As described above, game device **10** can establish wireless communication with another game device **10** through wireless communication module **38** or local communication module **39**, however, an example in which game device **10** establishes wireless communication to game devices of the same type through local communication module **39** based on a prescribed communication scheme will be described here. In order to make the description specific, it is assumed that each of game devices **10***t***1** to **10***t***3** shown in FIG. **47** is a transmission-end game device **10***t* serving to transmit image data and each of game devices **10***r***1** to **10***r***3** is a reception-end game device **10***r* serving to receive image data.

[0644] In the present embodiment, a user is allowed to select whether his/her game device is to serve to transmit image data or to serve to receive image data when the image

communication program is executed. Namely, whether game device **10** serves as a transmission-end game device or a reception-end game device is determined based on user's selection. It is noted, however, that a transmission-end device for executing only a transmission-end program may be different from a reception-end device for executing only a reception-end program.

[0645] Transmission-end game device **10***t* includes game device **10***t***1** used by a user "Ichiro", game device **10***t***2** used by a user "Taro", and game device **10***t***3** used by a user "Hanako". On the other hand, reception-end game device **10***r* includes game device **10***r***1** used by a user "Jiro", game device **10***r***2** used by a user "Saburo", and game device **10***r***3** used by a user "Shiro". Here, transmission-end game devices **10***t***1** to **10***t***3** perform broadcast transmission of signals (transmitter data) indicating that transmission-end game devices **10***t***1** to **10***t***3** are transmitters of image data. An example in which the users "Jiro", "Saburo" and "Shiro" receive image data from game device **10***t***1** serving as a transmitter used by the user "Ichiro" among transmission-end game devices **10***t* will be described. "Ichiro", "Taro" and the like represent a user name stored in a main body of game device **10**, and a user may set any user name. The user name is stored in preset data memory **35**, data memory **34** for storage or the like in the main body of game device **10**.

[0646] Initially, for example on lower LCD **12** of each game device **10**, information for inquiring of a user whether a storage memory in the main body (for example, data memory **34** for storage) or a memory card (for example, memory card **28**) is to be used is displayed (FIG. **48**). The user of game device **10** can select a storage medium to be used by performing a touch operation for selection from among options displayed on lower LCD **12** through touch panel **13**.

[0647] Next, for example on lower LCD **12** of each game device **10**, information for inquiring of a user whether a photograph is to be transmitted to another game device or to be received from another game device is displayed (FIG. **49**). When the user of game device **10** performs a touch operation for selection from among options displayed on lower LCD **12** through touch panel **13**, the user can determine whether his/her game device is to serve as a transmitter (for example, transmission-end game device **10***t***1**, **10***t***2** or **10***t***3**) or as a receiver (for example, reception-end game device **10***rl*, **10***r***2** or **10***r***3**).

[0648] For example on lower LCD **12** of reception-end game devices **10***r***1** to **10***r***3**, a message that it is searching for game device **10***t* to serve as a transmitter (for example, character information indicating that "searching for transmitter from which you receive photograph") is displayed until the transmitter data is received from transmission-end game device **10***t* (the right drawing in FIG. **50**). On the other hand, for example on lower LCD **12** of transmission-end game device **10***t***1**, a message that it is searching for game device **10***r* to serve as a receiver (for example, character information indicating that "searching for receiver to which you transmit photograph") is displayed while it invites a request for image data reception from reception-end game device **10** by transmitting the transmitter data above (the left drawing in FIG. **50**).

[0649] Next, when reception-end game devices **10***r***1** to **10***r***3** receive the transmitter data from transmission-end game devices **10***t***1** to **10***t***3**, for example on lower LCD **12** of reception-end game devices **10***r***1** to **10***r***3**, information indicating a user name of transmitter game device **10***t* from which the transmitter data has been received is displayed. For example, user names Nt**1** to Nt**3** of respective transmission-end game devices **10***t***1** to **10***t***3** are displayed on lower LCD **12** of reception-end game devices **10***r***1** to **10***r***3** in an example in the right drawing in FIG. **51**. A user of each of reception-end game devices **10***r***1** to **10***r***3** performs through touch panel **13**, a touch operation to touch one of user names Nt**1** to Nt**3** displayed on lower LCD **12**, so that the user can select one of transmission-end game devices **10***t***1** to **10***t***3** as a transmitter. When the user of each of reception-end game devices **10***r***1** to **10***r***3** performs the operation to select a transmitter, reception-end game devices **10***r***1** to **10***r***3** transmit receiver data representing a reception request to any selected transmission-end game devices **10***t***1** to **10***t***3**.

[0650] On the other hand, when transmission-end game device **10***t***1** receives the receiver data from reception-end game devices **10***r***1** to **10***r***3**, information indicating a user name of game device **10***r* serving as a receiver from which the receiver data has been received is displayed, for example on lower LCD **12**. In the example shown in the left drawing in FIG. **51**, on lower LCD **12** of transmission-end game device **10***t***1**, user names Nr**1** to Nr**3** of respective reception-end game devices **10***r***1** to **10***r***3** that have issued a reception request are displayed. In the present embodiment, transmission-end game device **10***t***1** has no right to select a reception-end device from among a plurality of displayed reception-end game devices **10***r***1** to **10***r***3** and it is only allowed to determine whether to transmit image data to all displayed reception-end game devices **10***r***1** to **10***r***3** or to stop transmission. For example, when a user of transmission-end game device **10***t***1** performs through touch panel **13**, a touch operation to touch an operation button icon Bs representing "start" displayed on lower LCD **12**, transition to image transmission processing can be made.

[0651] Next, transmission-end game device **10***t***1** performs processing for selecting an image to be transmitted, from among images stored in a memory (for example, data memory **34** for storage) in the main body of game device **10***t***1** or in a memory card (for example, memory card **28**). Though an image taken by game device **10***t***1** is typically transmitted, another image (for example, an image received from another device or a stored image other than a taken image) may be transmitted. For example, in an example shown in the left drawing in FIG. **52**, thumbnail images of images stored in data memory **34** for storage of game device **10***t***1** or memory card **28** are displayed in a thumbnail display area At on lower LCD **12**. Further, the thumbnail images displayed in thumbnail display area At are scrolled to the right or left by performing a touch operation to touch a scroll button icon B**1** or Br through touch panel **13** for display. A user of transmission-end game device **10***t***1** can select a thumbnail image surrounded by a cursor C displayed on lower LCD **12** as an image to be transmitted. Here, a thumbnail image IM (that is, an image to be transmitted) surrounded by cursor C is displayed on upper LCD **22**. When the user of transmission-end game device **10***t***1** performs through touch panel **13**, a touch operation to touch an operation button icon Bt representing "transmit" displayed on lower LCD **12**, image data of image IM currently selected as an image to be transmitted can be transmitted. When the user of transmission-end game device **10***t***1** performs a touch operation through touch panel **13** to touch an operation button icon Bf representing "end" displayed on lower LCD **12**, the image transmission processing itself can end.

[0652] On the other hand, for example on lower LCD **12** of reception-end game devices **10***r***1** to **10***r***3**, a message that a user of transmission-end game device **10***t***1** is selecting an image (for example, character information indicating that "waiting for selection of photograph by transmitter") is displayed while the user of transmission-end game device **10***t***1** is selecting an image to be transmitted (the right drawing in FIG. **52**).

[0653] Next, transmission-end game device **10***t***1** outputs to each of reception-end game devices **10***r***1** to **10***r***3**, image data of image IM selected as an image to be transmitted from among images stored in the memory in the main body of game device **10***t***1** or in the memory card. Here, on lower LCD **12** and/or upper LCD **22** of transmission-end game device **10***t***1**, a message that selected image IM is being transmitted from game device **10***t***1** to reception-end game devices **10***r***1** to **10***r***3** is displayed. For example, as shown in the left drawing in FIG. **53**, image IM being transmitted is displayed on upper LCD **22** and character information indicating that "transmitting photograph" is displayed on lower LCD **12**.

[0654] On the other hand, for example on lower LCD **12** of reception-end game devices **10***r***1** to **10***r***3**, a message indicating that the image data is being received from transmission-end game device **10***t***1** (for example, character information indicating that "receiving photograph") is displayed while the image data is being transmitted from transmission-end game device **10***t***1** (the right drawing in FIG. **53**).

[0655] Next, when reception of the image data transmitted from transmission-end game device **10***t***1** ends, for example on upper LCD **22** of reception-end game devices **10***r***1** to **10***r***3**, image IM represented by the image data received from transmitter game device **10***t***1** is displayed, and a user is urged to determine whether or not to further receive image data from game device **10***t***1**. For example, as shown in the right drawing in FIG. **54**, received image IM is displayed on upper LCD **22** and character information indicating that "photograph has been received. Do you want more?" is displayed on lower LCD **12**. When a user of each of reception-end game devices **10***r***1** to **10***r***3** performs through touch panel **13**, a touch operation to touch an operation button icon By of "YES" displayed on lower LCD **12**, the user can request further reception of image data from transmitter game device **10***t***1**. Here, the screen described in connection with the right drawing in FIG. **52** is displayed on reception-end game devices **10***r***1** to **10***r***3**, and reception-end game devices **10***r***1** to **10***r***3** wait until a user of transmission-end game device **10***t***1** selects again an image to be transmitted. Further, when the user of each of reception-end game devices **10***r***1** to **10***r***3** performs through touch panel **13**, a touch operation to touch an operation button icon Bn of "NO" displayed on lower LCD **12**, subsequent reception of image data can be stopped to disconnect communication with transmission-end game device **10***t***1**.

[0656] On the other hand, when transmission of the image data to reception-end game devices **10***r***1** to **10***r***3** ends, transmitted image IM is displayed, for example, on upper LCD **22** of transmission-end game device **10***t***1** and a message that reception-end game devices **10***r***1** to **10***r***3** are determining whether or not to further receive image data is displayed. For example, as shown in the left drawing in FIG. **54**, transmitted image IM is displayed on upper LCD **22** and character information indicating that "receiver is still thinking whether or not to receive more" is displayed on lower LCD **12**. When information indicating whether or not to further receive image data is obtained from all reception-end game devices **10***r***1** to **10***r***3** and a reception request for requesting further reception of image data is received from at least one of reception-end game devices **10***r***1** to **10***r***3**, the screen described in connection with the left drawing in FIG. **52** is displayed and the user of transmission-end game device **10***t***1** selects again an image to be transmitted.

[0657] When users of transmission-end game device **10***t***1** and/or reception-end game devices **10***r***1** to **10***r***3** perform an operation for ending the image transmission processing, information inquiring of a user whether or not a photograph is to be transmitted to another game device or to be received from another game device as shown in FIG. **49** is displayed, for example on lower LCD **12** of each game device **10**, and the process described above is repeated. When all reception-end game devices **10***r***1** to **10***r***3** end reception from transmission-end game device **10***t***1** or when transmission-end game device **10***t***1** ends transmission to reception-end game devices **10***r***1** to **10***r***3**, a message that communication was disconnected is displayed. For example, as shown in the left drawing and the right drawing in FIG. **55**, when communication is disconnected, character information indicating that "communication was disconnected" is displayed, for example, on lower LCD **12** of each of transmission-end game device **10***t***1** and reception-end game devices **10***r***1** to **10***r***3**. When the user of each of transmission-end game device **10***t***1** and reception-end game devices **10***r***1** to **10***r***3** performs through touch panel **13**, a touch operation to touch operation button icon By of "YES" displayed on lower LCD **12**, the process returns to an initial stage of the image transmission processing and new image transmission processing is started.

[0658] <Data Structure>

[0659] Next, various data to be used for executing the image communication application program will now be described with reference to FIG. **56**. FIG. **56** is a diagram illustrating an example of various data stored in main memory **32** in accordance with execution of the image communication application program.

[0660] In FIG. **56**, main memory **32** stores programs read from memory cards **28** and **29** and data memory **34** for storage and temporary data generated in processing. In FIG. **56**, operation data Da, identification data Db, user data Dc, transmitter data Dd, receiver data De, image data Df, and the like are stored in a data storage area of main memory **32**. Further, various programs Pa including the image communication application program and the like are stored in a program storage area of main memory **32**.

[0661] Operation data Da includes data of a touch coordinate representing a touch position TP in a screen coordinate system of touch panel **13** touched by a player (touch coordinate point data) and data representing a state of operation of operation button group **14** by a player (operation button data). For example, the touch coordinate data and the operation button data are acquired every unit time (for example, 1/60 sec.) in which game device **10** performs game processing, and they are updated and stored as operation data Da when acquired.

[0662] Identification data Db includes data representing a unique identification number for identifying game device **10**. For example, data representing an own device ID set in advance in preset data memory **35** or the like of game device **10** is stored as identification data Db. The own device ID may

be stored as a unique serial number assigned in a manufacturing plant or as identification information generated at random in game device **10**.

[0663] User data Dc includes data representing a user name set in advance by a user of game device **10**. For example, in preset data memory **35** or the like of game device **10**, a user name input by a user is described and data representing the user name is stored therein as user data Dc.

[0664] Transmitter data Dd includes data representing the identification number and the user name of game device **10** serving as a transmitter when image data is transmitted and received. Receiver data De includes data representing the identification number and the user name of game device **10** serving as a receiver when image data is transmitted and received.

[0665] Image data Df includes transmitted image data Df**1**, received image data Df**2**, operation image data Df**3**, and the like. As transmitted image data Df**1**, image data of an image to be transmitted to another game device **10** is temporarily stored. As received image data Df**2**, image data of an image received from another game device **10** is temporarily stored. Operation image data Df**3** is image data representing operation buttons for operating game device **10** and information of which the user is to be informed.

[0666] <Processing Procedure>

[0667] A specific processing operation based on the image communication application program executed by game device **10** will now be descried with reference to FIGS. **57** to **60**. FIG. **57** is a flowchart showing an example in which game device **10** performs image communication processing by executing the image communication application program. FIG. **58** illustrates sub routine showing in detail an operation in image transmission processing performed in step SC**52** in FIG. **57**. FIG. **59** illustrates sub routine showing in detail an operation in image reception processing performed in step SC**53** in FIG. **57**. FIG. **60** is a diagram showing exemplary signals transmitted and received between game device **10***t* serving as a transmitter and game device **10***r* serving as a receiver. A program for performing the processing is included in a program stored in data memory **34** for storage, and when power of game device **10** is turned on, the program is read from data memory **34** for storage into main memory **32** through memory control circuit **33** and executed by CPU **31**. Though the image communication application program is stored in advance in data memory **34** for storage in the present embodiment, the program may be downloaded to game device **10** through the Internet or the like. Further, the program stored in memory card **28** or memory card **29** may be read and executed.

[0668] Initially, when power of game device **10** (power button **14**F) is turned on, CPU **31** executes a boot program (not shown) so that a launcher program stored in data memory **34** for storage for selectively executing a plurality of application programs is loaded to main memory **32** and executed by CPU **31**. Thereafter, an image communication application is selected and executed on the launcher program, so that the image communication application program is loaded to main memory **32**. The loaded image communication application program is executed by CPU **31**.

[0669] The image communication application program in the present embodiment includes not only an image communication function but also a photographing function and a taken image display function to display a taken image. A user can selectively perform a function through an operation of the touch panel and the buttons. When the photographing function is selected here, a video image picked-up by the camera currently selected from inner camera **23** and outer camera **25** is displayed on lower LCD **12** in real time. When L button **14**I or R button **14**J is operated in this state, the photographing processing is performed to store the taken image in a storage medium selected from the storage memory in the main body (for example, data memory **34** for storage) and a memory card (for example, memory card **28**). The taken image may be displayed on lower LCD **12** immediately after photographing. Further, when the taken image display function is selected, images desired by a user from among the taken images stored in the storage medium selected from the storage memory in the main body and the memory card may be displayed one by one or in a list. Further, before selection of each function, a user selects whether the storage memory in the main body or the memory card is to be used, so that storage means selected here serves to store the taken image in the photographing function and serves as a source of reading of an image to be displayed in the taken image display function. An image to be transmitted from the transmission-end device in the image communication function is read from this selected storage means, and an image received by the reception-end device is also stored in this selected storage means. When a user selects and performs the image communication function, processing in step SC**51** and subsequent steps shown in FIG. **57** is performed.

[0670] In FIG. **57**, CPU **31** determines whether a memory in the main body (for example, data memory **34** for storage) or a memory card (for example, memory card **28**) is to be used in subsequent processing based on operation data Da (step SC**50**). For example, an indication urging a user to select whether to use the storage memory in the main body or the memory card is provided on lower LCD **12** and/or upper LCD **22** of game device **10** (see FIG. **48**). CPU **31** then determines which storage medium is to be used in accordance with the user's operation for selection from among the options. When the memory card is to be used, the process proceeds to next step SC**57**. On the other hand, when the storage memory in the main body is to be used, the process proceeds to next step SC**51**.

[0671] In step SC**57**, CPU **31** determines whether the memory card (for example, memory card **28**) for storing an image in game device **10** is attached to a connector of game device **10** or not. When the memory card above is attached to the connector of game device **10**, the process proceeds to step SC**51**. On the other hand, when the memory card above is not attached to the connector of game device **10**, CPU **31** causes lower LCD **12** and/or upper LCD **22** to display notification for urging a user to attach the memory card (step SC**58**), and the process returns to step SC**50** and the processing is repeated.

[0672] In step SC**51**, CPU **31** determines whether an image is to be transmitted to another game device **10***r* or received from another game device **10***t* in subsequent processing based on operation data Da. For example, an indication urging a user to select whether or not a photograph is to be transmitted to another game device **10***r* or to be received from another game device **10***t* is provided on lower LCD **12** and/or upper LCD **22** of game device **10** (see FIG. **49**). CPU **31** then determines whether an image is to be transmitted to another game device **10***r* or to be received from another game device **10***t* in accordance with the user's operation for selection from among the options. When an image is to be transmitted to another game device **10***r*, the process proceeds to next step SC**52**. On the

other hand, when an image is to be received from another game device **10***t*, the process proceeds to next step SC**53**.

[0673] In step SC**52**, CPU **31** performs image transmission processing and the process proceeds to next step SC**54**. Detailed operation in the image transmission processing performed in step SC**52** above will be described hereinafter with reference to FIG. **58**.

[0674] In FIG. **58**, CPU **31** performs broadcast transmission of transmitter data indicating that the own device is a transmitter of image data, for example through local communication module **39** (step SC**63**), and the process proceeds to next step SC. For example, CPU **31** generates the transmitter data by using data representing the identification number and the user name stored as identification data Db and user data Dc respectively, and has the generated data stored as transmitter data Dd. Then, broadcast transmission of the transmitter data stored as transmitter data Dd is performed, so that another game device **10***r* that can receive the transmitter data is informed of presence of game device **10** to serve as a transmitter (see FIG. **60**).

[0675] Next, CPU **31** searches for another game device **10***r* to serve as a receiver (step SC**64**) and the process to a next step. As will be clarified in the description below, another game device **10***r* to serve as the receiver selects game device **10***t* to serve as a transmitter from which reception is desired, based on the received transmitter data. The receiver data indicating that another game device **10***r* serves as the receiver of image data is transmitted to selected game device **10***t* serving as the transmitter (see FIG. **60**). In step SC**64** above, CPU **31** waits until the receiver data is received, for example through local communication module **39**. When the receiver data is received, CPU **31** then describes the identification number and the user name of another game device **10***r* to serve as the receiver, that are represented by the receiver data, as receiver data De. While another game device **10***r* to serve as the receiver is being searched for, CPU **31** causes, for example, lower LCD **12** to display notification that game device **10***r* to serve as the receiver is currently being searched for (see the left drawing in FIG. **50**). Further, when the receiver data is received from another game device **10***r* serving as the receiver, CPU **31** causes, for example, lower LCD **12** to display information indicating the user name of another game device **10***r* serving as the receiver that is represented by the receiver data (see user names Nr**1** to Nr**3** in the left drawing in FIG. **51**).

[0676] Next, CPU **31** determines whether or not to start processing for transmitting an image to another game device **10***r* serving as the receiver as a result of search based on operation data Da (step SC**65**). For example, CPU **31** provides an indication (operation button icon Bs) on lower LCD **12** and/or upper LCD **22** urging a user to perform an operation for starting the image transmission processing. In response to the user's operation for starting the image transmission processing, it is determined that the processing is to be started, and the process proceeds to next step SC**66**. On the other hand, when the processing for transmitting an image is not to be started, the process returns to step SC**64** above, and search for another game device **10***r* to serve as the receiver is continued.

[0677] In a period from determination of start of the image transmission processing to determination of an image to be transmitted, game device **10***t* serving as the transmitter transmits transmission ready data indicating that transmission to game device **10***r* serving as the receiver is ready. On the other hand, when game device **10***r* serving as the receiver is ready to receive image data, game device **10***r* serving as the receiver transmits reception ready data indicating that reception of image data is ready to game device **10***t* serving as the transmitter, in response to reception of the transmission ready data (see FIG. **60**).

[0678] In step SC**66**, CPU **31** determines, based on operation data Da, whether an image to be transmitted to another game device **10***r* has been selected or not. For example, CPU **31** causes lower LCD **12** and/or upper LCD **22** to display a screen for allowing a user to select an image to be transmitted to another game device **10***r* (see the left drawing in FIG. **52**), so as to urge the user to select an image to be transmitted. Then, the process proceeds to next step SC**69** in response to the user's operation to determine an image to be transmitted (for example, an operation to touch operation button icon Bt). On the other hand, when the user does not perform the operation to determine an image to be transmitted (No in step SC**66**), the process proceeds to next step SC**67**.

[0679] In step SC**69**, CPU **31** transmits image data representing a transmitted image selected in step SC**66** above to another game device **10***r* serving as the receiver, and the process proceeds to a next step. For example, CPU **31** extracts the image data corresponding to the transmitted image selected in step SC**66** from the storage medium selected in step SC**50** above, and has the extracted image data stored as transmitted image data Df**1**. CPU **31** then identifies another game device **10***r* currently serving as the receiver by referring to receiver data De, and transmits the image data stored as transmitted image data Df**1** to identified another game device **10***r*, for example, through local communication module **39** (see FIG. **60**). While the image data is transmitted to another game device **10***r* serving as the receiver, CPU **31** provides an indication, for example on lower LCD **12**, that the image data is being transmitted to game device **10***r* currently serving as the receiver (see the left drawing in FIG. **53**).

[0680] Next, CPU **31** waits for a receiver response transmitted from each game device **10***r* serving as the receiver (step SC**70**). The receiver response includes a response indicating further reception of image data (reception request) or a response indicating end of reception (end of reception). After receiving the image data, each game device **10***r* serving as the receiver transmits any response to game device **10***t* serving as the transmitter (see FIG. **60**). CPU **31** waits for a response from all game devices **10***r* currently serving as the receiver. When the reception request is received from at least one game device **10***r* serving as the receiver (Yes in step SC**71**), the process returns to step SC**66** above and the processing is repeated. On the other hand, when CPU **31** waits for a response from all game devices **10***r* currently serving as the receiver and the end of reception is received from all game devices **10***r* serving as the receiver (No in step SC**71**), CPU **31** ends the processing in the sub routine. When CPU **31** receives the end of reception from game device **10***r* serving as the receiver, CPU **31** erases data of game device **10***r* serving as the receiver from receiver data De. Further, while CPU **31** waits for the response from another game device **10***r* serving as the receiver, CPU **31** provides an indication, for example on lower LCD **12**, that the response from game device **10***r* currently serving as the receiver is awaited (see the left drawing in FIG. **54**).

[0681] On the other hand, when the user has not yet performed the operation to determine a transmitted image in step SC**66** above, CPU **31** determines whether or not to end the

processing for transmitting an image based on operation data Da (step SC**67**). For example, CPU **31** determines whether or not to end the processing for transmitting an image in accordance with a user's operation (for example, an operation to touch operation button icon Bf). When the processing for transmitting an image should end, CPU **31** transmits data indicating that transmission should end (end of transmission; see FIG. **60**) to each game device **10***r* currently serving as the receiver (step SC**68**), and the processing in the sub routine ends. On the other hand, when the processing for transmitting an image should not end, the process returns to step SC**66** above and the processing is repeated.

[0682] Referring back to FIG. **57**, following the image transmission processing in step SC**52** above, CPU **31** determines whether or not a receiver is absent (step SC**54**). For example, when determination in step SC**71** above indicates No (that is, end of reception is received from all game devices **10***r* serving as the receiver), CPU **31** determines that no receiver exists. When no receiver exists, the process proceeds to next step SC**56**. On the other hand, when determination in step SC**67** above indicates Yes (that is, when the user selects end of transmission), CPU **31** disconnects communication with game device **10***r* serving as the receiver. The process returns to step SC**51** above and the processing is repeated.

[0683] CPU **31** performs the image reception processing in step SC**53** and the process proceeds to next step SC**55**. Detailed operation in the image reception processing performed in step SC**53** above will be described hereinafter with reference to FIG. **59**.

[0684] In FIG. **59**, CPU **31** receives the transmitter data indicating a transmitter of image data (step SC**84**) and the process proceeds to a next step. Here, as described above, game device **10***t* serving as a transmitter performs broadcast transmission of the transmitter data indicating that game device **10***t* is a transmitter of image data, for example, through local communication module **39** (see FIG. **60**). In step SC**84** above, when CPU **31** receives the transmitter data transmitted through broadcast transmission, CPU **31** can know presence of another game device **10***t* serving as a transmitter. When CPU **31** receives the transmitter data, CPU **31** acquires the identification number and the user name of game device **10***t* serving as the transmitter that are represented by the transmitter data and describes the identification number and the user name as transmitter data Dd.

[0685] While another game device **10***t* serving as a transmitter is being searched for, CPU **31** provides an indication, for example on lower LCD **12**, that game device **10***t* serving as a transmitter is currently being searched for (see the right drawing in FIG. **50**). Further, when the transmitter data is received from another game device **10***t* serving as the transmitter, CPU **31** causes, for example, lower LCD **12** to display information indicating the user name of another game device **10***t* serving as the transmitter, that is represented by the transmitter data (see the right drawing in FIG. **51**).

[0686] Next, CPU **31** determines, based on operation data Da, whether or not a transmitter has been determined from among game devices **10***t* serving as the transmitter that have been searched for (step SC**85**). For example, CPU **31** provides an indication urging selection from information indicating the user name of another game device **10***t* serving as the transmitter, on lower LCD **12** and/or upper LCD **22** (see user names Nt**1** to Nt**3** in the right drawing in FIG. **51**). In accordance with a user's operation to select any of the user names, the selected user is determined as a transmitter from which an image is to be received, and the process proceeds to next step SC**86**. On the other hand, when a transmitter from which an image is to be received is not determined, the process returns to step SC**84** above, and search for another game device **10***t* serving as the transmitter is continued.

[0687] In step SC**86**, CPU **31** transmits receiver data indicating that the own device is a receiver of image data to another game device **10***t* to serve as the transmitter, for example, through local communication module **39**, and the process proceeds to a next step. For example, CPU **31** generates the receiver data by using the identification number and the user name stored as identification data Db and user data Dc respectively, and has the generated data stored as receiver data De. When the receiver data stored as receiver data De is transmitted to another game device **10***t* serving as the transmitter, another game device **10***t* serving as the transmitter that has received the receiver data is informed of presence and the user name of game device **10** serving as a receiver (see FIG. **60**).

[0688] In a period from determination of start of the image transmission processing to determination of an image to be transmitted in another game device **10***t* serving as the transmitter, transmission ready data indicating that transmission to game device **10***r* serving as the receiver is ready is transmitted. Here, when game device **10***r* serving as the receiver is ready to receive image data, game device **10***r* serving as the receiver transmits reception ready data indicating that reception of the image data is ready to another game device **10***t* serving as the transmitter, in response to reception of the transmission ready data (see FIG. **60**).

[0689] Next, CPU **31** determines whether or not data indicating end of transmission has been received from another game device **10***t* serving as the transmitter (step SC**87**), determines whether or not the user has performed an operation to end reception (step SC**88**) based on operation data Da, and determines whether or not the image data has been received from another game device **10***t* serving as the transmitter (step SC**89**). For example, when another game device **10***t* serving as the transmitter is selecting an image to be transmitted, CPU **31** causes lower LCD **12** and/or upper LCD **22** to display a screen indicating that the receiver is waiting for selection of a photograph by the transmitter (see the right drawing in FIG. **52**) and informs a user of a current state. In accordance with the user's operation to stop reception of an image (for example, an operation to touch operation button icon Bf), CPU **31** determines that a user has performed an operation to cancel reception (Yes in step SC**88**) and the process proceeds to next step SC**93**. Further, when end of transmission is received from another game device **10***t* serving as the transmitter (see step SC**68** in FIG. **58**, and FIG. **60**) (Yes in step SC**87**), CPU **31** ends the processing in the sub routine. Further, when reception of image data from another game device **10***t* serving as the transmitter is started (see step SC**69** in FIG. **58**, and FIG. **60**) (Yes in step SC**89**), the process proceeds to next step SC**90**. On the other hand, when each determination indicates No (that is, when determination in each of steps SC**87** to SC**89** indicates No), CPU **31** repeats determination in steps SC**87** to SC**89**.

[0690] In step SC**90**, CPU **31** has the image data received from another game device **10***t* (see FIG. **60**) stored as received image data Df**2**. CPU **31** then causes the storage medium selected in step SC**50** above to store the image data stored as received image data Df**2**, and the process proceeds to a next step. Here, when reception of the image data from another

game device **10***t* is started, CPU **31** causes, for example, lower LCD **12** to display a message that the image data is currently being received from game device **10***t* serving as the transmitter while the image data is received (see the right drawing in FIG. **53**).

[0691] Next, CPU **31** determines whether or not to further receive an image from another game device **10***t* serving as the transmitter based on operation data Da. For example, CPU **31** causes lower LCD **12** and/or upper LCD **22** to display a screen for having a user determine whether or not to further receive an image from another game device **10***t* serving as the transmitter (see the right drawing in FIG. **54**) and urges the user to make selection. The process proceeds to next step SC**92** in accordance with the user's operation to request further reception of an image (for example, an operation to touch operation button icon By). On the other hand, the process proceeds to next step SC**93** in accordance with the user's operation to end reception of an image (for example, an operation to touch operation button icon Bn).

[0692] In step SC**92**, CPU **31** transmits to another game device **10***t* serving as the transmitter, data indicating further reception of image data (reception request; see FIG. **60**), and the process returns to step SC**87** and the processing is repeated.

[0693] On the other hand, in step SC**93**, CPU **31** transmits to another game device **10***t* serving as the transmitter, data indicating that reception should end (end of reception: see FIG. **60**), and the processing in the sub routine ends. In determination in step SC**88**, reception may automatically be canceled regardless of a user's operation. For example, a remaining storage capacity of the storage medium selected in step SC**50** above is monitored, and when the remaining capacity indicates an amount equal to or lower than a prescribed amount, a user may be informed that storage capacity for 0 image is available, and the processing in step SC**93** may be performed.

[0694] Referring back to FIG. **57**, after the image reception processing in step SC**53**, CPU **31** determines whether or not end of transmission has been received (step SC**55**). For example, when determination in step SC**87** above indicates Yes (that is, when end of transmission is received from game device **10***t* serving as the transmitter), the process proceeds to next step SC**56**. On the other hand, when determination in step SC**91** above indicates No (that is, when the user selects end of reception), communication with game device **10***t* serving as the transmitter is disconnected, and the process returns to step SC**51** and the processing is repeated.

[0695] In step SC**56**, CPU **31** performs communication disconnection processing, and the processing in the flowchart ends. For example, CPU **31** ends (disconnects) communication with another game device **10** with which communication is currently established, and causes lower LCD **12** and/or upper LCD **22** to display a screen indicating that communication was disconnected (see the left drawing or the right drawing in FIG. **55**), so as to inform a user of a current state.

[0696] Thus, when game device **10** according to the present embodiment serves as a receiver of image data, game device **10** serving as the receiver can select a transmitter from which the image data is to be received. Therefore, when images are transmitted and received among devices, game device **10** can select a transmission-end device desired by a user to receive an image from the transmission-end device.

[0697] In the description above, though game device **10***r* serving as a receiver that receives image data has the right to select game device **10***t* serving as a transmitter that transmits the image data, game device **10***t* serving as the transmitter may also have the right to select game device **10***r* serving as the receiver that receives image data. For example, in the processing in step SC**65** above for determining start of transmission, when the user determines start of transmission after the user selects game device **10***r* to serve as a receiver, the transmitter can also select the receiver. For example, when game device **10***r* serving as a receiver selects a user to serve as a transmitter, a check box is provided (for example, next to each of user names Nr**1** to Nr**3**) for each user name serving as the receiver displayed on a display screen of game device **10***t* serving as the transmitter. When a user of game device **10***t* serving as the transmitter checks the user name by performing an operation to touch the check box provided for the user name of the receiver, image data is transmitted only to the checked user to serve as the receiver.

[0698] In the processing operation described above, game device **10***r* serving as a receiver can leave a group in which images are transmitted and received at the time desired by a user. Further, even when game device **10***r* serving as the receiver leaves the group, so long as at least one game device **10***r* serving as the receiver remains, game device **10***t* serving as a transmitter can continue transmission of image data. Thus, even when game device **10***r* serving as the receiver leaves the group due to lack of the remaining storage capacity, game device **10***t* serving as the transmitter and other game devices **10***r* serving as the receiver are not affected. On the other hand, transmission of image data may be continued only when all game devices **10***r* serving as the receiver request to continue image communication, and when at least one of game devices **10***r* serving as the receiver leaves the group, any communication in the group above may end.

[0699] Further, in the processing operation described above, though game device **10***t* to initially serve as a transmitter transmits the transmitter data through broadcast transmission in which data is transmitted to an unspecified large number of receivers, communication may be started in another manner. For example, game device **10***r* to initially serve as a receiver may transmit the receiver data to an unspecified large number of transmitters, and game device **10***t* to serve as the transmitter that has received the receiver data may send back the transmitter data. Here, it is not necessary to describe as the receiver data to initially be transmitted, the user name of game device **10***r* that transmits the receiver data.

[0700] Further, in the processing procedure described above, game device **10***r* to serve as a receiver that communicates with game device **10***t* serving as a transmitter is determined first, and thereafter an image to be transmitted from game device **10***t* to game device **10***r* is selected. Thus, game device **10***t* serving as the transmitter can sequentially transmit selected transmitted images to determined game device **10***r* serving as the receiver, so that various images can readily be transmitted. When such an effect is not expected, however, an image to be transmitted may be determined in another procedure. For example, game device **10***t* serving as a transmitter determines an image to be transmitted to another game device **10**, and thereafter determines game device **10***r* to serve as a receiver. In this case, when game device **10***t* to initially serve as the transmitter transmits the transmitter data to an unspecified large number of receivers, and such data is transmitted together with data representing the image determined as an image to be transmitted. Thus, a user of game device **10***r*

serving as the receiver can select a transmitter from which the image data is to be received after reviewing the user name of the transmitter and an image to be transmitted, so that information for selection is increased and the transmitter that better matches expectations can be selected.

[0701] Further, in the processing procedure described above, when an operation to touch button Bt is performed, a thumbnail image surrounded by cursor C is selected as an image to be transmitted, that is, the image is selected and transmitted one by one. On the other hand, a plurality of images may be selected and transmitted. For example, in the left drawing in FIG. **52**, in a selection operation for selecting a thumbnail image displayed in thumbnail display area At (for example, an operation to directly touch a thumbnail image), the thumbnail image is highlighted and an image corresponding to the thumbnail image is selected. Further, the selection operation is performed multiple times, so that a plurality of images are in the selected state. The operation to touch button Bt may be performed in this state, so that the plurality of images in the selected state are transmitted.

[0702] In the former case, as an image is selected and transmitted one by one, the number of images transmitted at a time is accordingly limited to one. On the other hand, in the latter case, by limiting the number of selectable images, the number of images transmitted at a time is limited to the number of selectable images. Specifically, in the latter case, a prescribed number of images or more may not be selected at a time, or further selection of images at a time may be prohibited when the total capacity of selected images is equal to or greater than a prescribed capacity. Further alternatively, the number of images transmitted at a time may be limited separately from the number of selectable images. In this case, the number of selectable images may be greater than the number of images transmitted at a time. Here, for a single image selection operation, the image transmission processing for transmitting the limited number of images is repeated multiple times for completing the processing for transmitting the selected images. In any image selection manner/image transmission limitation manner, a user of reception-end game device **10** can cancel further reception of an image while an image is being received, and can determine whether or not to continue reception based on the number of received images.

[0703] Further, when game device **10***t* to initially serve as a transmitter transmits the transmitter data to an unspecified large number of receivers, the transmitter data may be transmitted together with additional information to game device **10***r* to serve as a receiver. For example, information indicating a title of an image or the number of images to be transmitted from game device **10***t* serving as the transmitter may be included in the transmitter data above and transmitted. Thus, game device **10***r* serving as the receiver can display information representing a title of an image and the number of images included in the received transmitter data together with the user name of the transmitter, so that information for helping a user of the receiver select a transmitter is increased and selection of a transmitter that better matches expectations can be made. A user of game device **10***t* serving as the transmitter may select a title of an image to be included in the transmitter data from among predetermined typical titles, or the user may freely input a title thereof. Further, the number of images to be transmitted by a user of game device **10***t* serving as the transmitter may be input as the number of images to be included in the transmitter data, or the number of photographs stored in game device **10***t* may be included as the number of images to be included in the transmitter data.

[0704] Further, screen display as described above is only by way of example, and another screen display may naturally be employed. For example, though notification that image data is being transmitted or received is displayed in the exemplary screen display shown in FIG. **53**, notification may not be displayed when a time period for transmitting or receiving the image data is extremely short.

[0705] Though a still image taken by game device **10** or the like is transmitted and received among game devices **10** in the description above, a moving image may be transmitted and received. In this case, a moving image to be transmitted may be a moving image taken by game device **10**, a moving image received from another device, or a stored moving image other than a taken moving image.

[0706] In addition, in the present embodiment described above, the process returns to step SC**51** when a user himself/herself selects end of transmission or end of reception. Specifically, though an exemplary operation in which the process returns to processing for urging a user to determine whether an image is to be transmitted to another game device **10***r* or to be received from another game device **10***t* is described, the process may not return to that processing. For example, even when a user himself/herself selects end of transmission or end of reception, the processing in step SC**56** may be performed. That is, communication with another game device **10** with which communication has been established may be disconnected and a screen indicating that communication was disconnected may be displayed (see the left drawing or the right drawing in FIG. **55**) and the processing in the flowchart may end.

[0707] Further, in the present embodiment described above, lower LCD **12** and upper LCD **22** physically separated from each other and disposed vertically are described by way of example of a liquid crystal display portion having two screens (two screens of an upper screen and a lower screen), however, the display screen including two screens may differently be structured. For example, lower LCD **12** and upper LCD **22** may be arranged side-by-side on one main surface of lower housing **11**. Alternatively, a vertically long LCD having a width equal to lower LCD **12** and a length twice as large as lower LCD **12** (that is, a physically single LCD having a vertical length equivalent to two display screens) may be disposed on one main surface of lower housing **11** and two images may vertically be displayed (that is, two images are displayed vertically adjacent to each other, with no boundary portion being interposed therebetween). Alternatively, a horizontally long LCD having a length equal to lower LCD **12** and having a width twice as large as lower LCD **12** may be disposed on one main surface of lower housing **11** and two game images may horizontally be displayed side-by-side (that is, two game images may be displayed horizontally adjacent to each other, with no boundary portion being interposed therebetween). That is, a physically single screen may be divided in two parts to display two images respectively. For any form of images, the present invention can similarly be implemented by disposing touch panel **13** on the screen for displaying a display image displayed on lower LCD **12** described above. Further, in a case where a physically single screen is divided into two parts to display two images above, touch panel **13** may be disposed over the entire screen.

[0708] In addition, in the present embodiment described above, touch panel **13** is integrally provided in game device

10, however, the present invention can also be implemented in such a manner that the game device and the touch panel are separately provided. Further, touch panel **13** may be provided on the upper surface of upper LCD **22** to display thereon a display image that has been displayed on lower LCD **12** described above. Furthermore, though two display screens (lower LCD **12** and upper LCD **22**) are provided in the present embodiment, a single display screen may be provided. That is, in the present embodiment, only lower LCD **12** may serve as a display screen and touch panel **13** may be provided thereon without providing upper LCD **22**. In addition, in the present embodiment, touch panel **13** may be provided on the upper surface of upper LCD **22** without providing lower LCD **12**, and a display image that has been displayed on lower LCD **12** described above may be displayed on upper LCD **22**.

[0709] In addition, in the present embodiment, though touch panel **13** is used as input means in game device **10** for providing a coordinate input, another pointing device may be used. Here, the pointing device is an input device for designating an input position or a coordinate on a screen. For example, the present invention can similarly be implemented by employing a mouse, a track pad, a track ball, or the like as input means and by using positional information based on a screen coordinate system calculated from an output value output from the input means.

[0710] Furthermore, in such a stationary game device that a player enjoys a game while holding a game controller, another type of a pointing device may also be employed. For example, a camera securely fixed to a housing of a game controller may be used as the pointing device. In this case, an image picked-up by the camera varies depending on variation of a position indicated by the housing of the game controller. Therefore, by analyzing the picked-up image, a coordinate on a display screen indicated by the housing above can be calculated. The present invention can naturally be implemented even though game device **10** does not include a pointing device itself such as touch panel **13**.

[0711] Moreover, in the present embodiment described above, though portable game device **10** or a stationary game device is described by way of example, an information processing device such as a general personal computer may execute the image communication application program of the present invention so as to implement the present invention.

[0712] The shape of game device **10** described above as well as a shape, the number, a setting position, or the like of operation button **14** group and touch panel **13** provided in game device **10** are only by way of example, and the present invention can naturally be implemented even though the shape, the number, and the setting position thereof may be different. An order of performing the steps, a screen display example, or the like used in the image communication processing described above is only by way of example, and the present invention can naturally be implemented even though the order of performing the steps or screen display may be different.

9. SOUND FUNCTION

[0713] Processing provided by the sound program executed as a result of launch of sound application program **57** will now be described with reference to FIGS. **61** to **101**.

[0714] <Exemplary Usage of Game Device>

[0715] FIG. **61** is a diagram showing an exemplary sound selection screen **400** in a sound function in game device **10** according to the present embodiment.

[0716] Referring to FIG. **61**, game device **10** according to the present embodiment includes a plurality of functions including a function for reproduction of a recording data file freely recorded by the user through the microphone in the main body or reproduction of a music file which is music data stored in an SD card, and the user can arbitrarily select a desired function on sound selection screen **400** shown in FIG. **61**.

[0717] In the example shown in FIG. **61**, a plurality of icons **402** and **404** corresponding to respective functions incorporated in game device **10** are displayed on the screen of lower LCD **12**.

[0718] Here, when a "play with sound recorded through microphone" icon **402** is selected, transition to a microphone recording and reproduction mode of a function allowing the user to create a recording data file by freely recording sound through the microphone in the main body or to reproduce the created recording data file or to edit the created recording data file is made.

[0719] On the other hand, when a "play with music in SD card" icon **404** is selected, transition to a music reproduction mode of a function to reproduce a music file which is music data stored in the SD card is made. In the present embodiment, for example, the music file is stored in the SD card as appropriate through a personal computer or the like, however, wireless communication module **38** described above may be used to transmit and receive data to and from a server storing music files through the Internet, and a downloaded music file may be stored in the SD card.

[0720] Alternatively, when the user selects a "setting" icon **408** here, the user can freely select a function relating to setting processing.

[0721] Alternatively, when a "quit" icon **406** is selected, a sound function ends and the screen returns to a not-shown menu screen.

[0722] In addition, in FIG. **61**, an object **410** in a bird shape is displayed in a lower portion of the screen of lower LCD **12**. While object **410** in a bird shape is being displayed, it is assumed that an automatic recording and reproduction function which will be described later is being performed.

[0723] The music reproduction mode, which is a function to perform processing or the like for reproducing a music file which is music data stored in the SD card, will initially be described hereinafter.

[0724] Specifically, when "play with music in SD card" icon **404** is selected, transition to the music reproduction mode is made and a music reproduction folder list selection screen **500** is displayed.

[0725] FIG. **62** is a diagram illustrating music reproduction folder list selection screen **500** according to the present embodiment.

[0726] FIG. **62**(*a*) shows a case where music reproduction folder list selection screen **500** is displayed on the screen of lower LCD **12**.

[0727] In addition, in FIG. **62**(*b*), a list screen **500**# of music files included in a currently selected folder is displayed on the screen of upper LCD **22**.

[0728] Referring to FIG. **62**(*a*), the user can select any folder in a folder list display range **530** in music reproduction folder list selection screen **500** by touching the screen of lower LCD **12** with touch pen **27** etc. For example, a case in which folders are diagonally displayed along the circumference of a disc in folder list display range **530** is shown.

[0729] For example, it is assumed that a cursor **520** selects the folder displayed at the top of folder list display range **530**. Processing for scroll display of the folder list in accordance with a trail of movement of the touch pen is performed by touching a position where another folder is displayed in folder list display range **530** on the screen of lower LCD **12** with touch pen **27** etc. or by touching the screen and moving touch pen **27** etc. while maintaining the touched state. In the present example, for example, it is assumed that the position of cursor **520** is not changed and a folder at the top in the folder list currently displayed in folder list display range **530** is set to a selected state. Therefore, processing for scroll display of the folder list is performed such that the disc turns in accordance with the trail of movement of the touch pen.

[0730] In the present example, though the description is given by way of example, assuming that the position of cursor **520** is not changed, the position of cursor **520** may be moved to a position in accordance with a touch position which is a position touched with touch pen **27**. Specifically, when the screen is touched and thereafter an operation to reset the touched state without changing the touch position from the originally touched position is performed (off the screen), only cursor **520** moves in accordance with the touch position. Here, the processing for scroll display of the folder list is not performed. Specifically, when a "random" folder is touched in FIG. **62**(*a*), only cursor **520** moves to the position of the "random" folder.

[0731] Meanwhile, when an operation to touch the screen and move touch pen **27** etc. while maintaining the touched state, that is, an operation to change the touch position from the originally touched position while maintaining the touched state (drag operation), is performed, the processing for scroll display of the folder list is performed in accordance with the trail of movement (travel distance) of the touch pen. Here, cursor **520** can be maintained at the position of cursor **520** before scroll display processing or the folder at the top of the folder list can be set in a selected state.

[0732] In addition, when the position of cursor **520** is varied and the selected folder is changed, FIG. **62**(*b*) is updated to list screen **500**# of music files included in the folder selected by cursor **520**. Specifically, when a favorite folder which will be described later is touched, a list of music files registered in the favorite folder is displayed. Alternatively, when the random folder is touched, random reproduction as will be described later is carried out and a list of music files to be reproduced in random reproduction is displayed. In random reproduction, a file name of an already reproduced music file may be displayed, but a file name of a music file which has not yet been reproduced may be displayed with its name being replaced with a different symbol or the like. Through this processing, in random reproduction, the user cannot know a music file to be reproduced next until this music file is reproduced. Thus, the user can have expectation and enjoy reproduction of music data.

[0733] Even when the position of cursor **520** is not varied, the folder selected by cursor **520** is changed in accordance with the processing for scroll display of the folder list. Therefore, in list screen **500**# displayed on the screen of upper LCD **22**, update to the list of music files in the selected folder is made.

[0734] In addition, the user can move a slider **518** on a folder list scroll bar **510** displayed on the screen of lower LCD **12**, by using touch pen **27** etc.

[0735] By moving slider **518** on folder list scroll bar **510**, the folder list displayed in folder list display range **530** is updated and a folder list in accordance with the cursor position is displayed.

[0736] Moreover, the user can set a volume at which output from the speaker or the like is provided, by designating a volume setting icon **550** with touch pen **27** etc.

[0737] Further, the user can return to sound selection screen **400**, which is a preceding screen, by selecting a "back" icon **512**.

[0738] In addition, by selecting an "open" icon **514**, a music file selection screen is displayed.

[0739] Moreover, by selecting a selection function icon **516** in FIG. **62**(*a*), the user can perform the function corresponding to the selection function icon. It is assumed that display and setting of the selection function icon are switched in correspondence with the folder currently selected by cursor **520**. Here, for example, a case where a "best 10" folder which is one of the favorite folder is selected is shown, and selection function icon **516** of "all erase" is provided in correspondence with this folder. When selection function icon **516** of "all erase" is selected, processing for erasing all music files registered in the best 10 folder is performed. The favorite folder which will be described later may be displayed when a music file is registered in the folder but it may not be displayed when no music file is registered.

[0740] The "random" folder is displayed as a folder next to the "best 10" folder. It is assumed that, when this "random" folder is selected and executed, reproduction of all music files is started such that the order of reproduction from the first file to the last file is randomly designated. It is then assumed that, when reproduction of the last designated music file ends, reproduction is continued in such a manner that the order of reproduction is again randomly designated. When the "random" folder is selected, random reproduction is carried out but the order of reproduction is designated. Therefore, reproduction can be repeated from a music file that was once reproduced. In addition, in an example where reproduction of the last designated music file ends and then the order of next reproduction is randomly designated, in case that the last designated music file happens to be the same as the first music file in subsequent reproduction, processing for setting the order of reproduction again is performed. As a result of this processing, successive reproduction of the same music piece can be suppressed and stress imposed on the user can be suppressed. In addition, it is assumed that, when the "random" folder is selected, reproduction processing is automatically started and hence a reproduction operation selection screen **503** which will be described later is displayed.

[0741] Here, for example, subsequent to "best 10", the "random" folder, a "memories" folder and a "collection" folder that are other favorite folders are sequentially displayed, however, the order of display is not particularly limited as such and a manner of display can freely be set. For example, the "random" folder and "best 10" may be displayed with their positions being interchanged. For example, when an initial position of cursor **520** is on the "random" folder, the reproduction processing above is automatically started. Therefore, music data can be reproduced without any selection by the user.

[0742] FIG. **63** is a diagram illustrating another music reproduction folder list selection screen **501** according to the present embodiment.

[0743] FIG. **63**(*a*) shows a case where music reproduction folder list selection screen **501** is displayed on lower LCD **12**.

[0744] In addition, in FIG. **63**(*b*), a list screen **501**# of music files included in the currently selected folder is displayed on the screen of lower LCD **12**.

[0745] For example, a case where the user uses touch pen **27** etc. to attain scroll display of the folder list in folder list display range **530** in FIG. **62**(*a*) is shown.

[0746] Specifically, for example, the touch pen is moved while it keeps touching the screen in folder list display range **530** (slide operation), so that the folder list is updated in accordance with the trail of movement.

[0747] Therefore, FIG. **63**(*a*) shows a case where the position of cursor **518**# on folder list scroll bar **510** has moved from the initial position.

[0748] In addition, list screen **501**# in FIG. **63**(*b*) shows that a music folder FA is selected with cursor **520** and a plurality of music files are stored in this music folder FA. As other features are as described in connection with FIG. **62**, detailed description thereof will not be repeated.

[0749] As the favorite folder such as "best 10", the "random" folder and the like and the music folders are displayed in parallel in the same folder list display range **230**, a folder to be designated can be grasped at a glance and user's operability in selection from the folder list is improved.

[0750] FIG. **62**(*a*) shows by way of example a case that "best 10", "memories" and "collection" are provided as the favorite folders. In addition to the folders above, though not shown, a "practice" folder and a folder that can be displayed in a special manner in accordance with user's preference can also be provided. For example, such a "secret" folder that only first several characters of a music file included in the folder are displayed and remaining characters are not shown (hidden) may be provided. Registration of this folder will be described later.

[0751] FIG. **64** is a diagram illustrating a music file selection screen **502** according to the present embodiment.

[0752] Referring to FIG. **64**(*a*), a music file list **540** is displayed on the screen of lower LCD **12**.

[0753] When "open" icon **514** is selected in the preceding music reproduction folder list selection screen, the list of music files included in the selected music folder is displayed.

[0754] In addition, the user can move a slider **518**# on a file list scroll bar **510**# on the screen of lower LCD **12**, by using touch pen **27** etc.

[0755] By moving the slider on file list scroll bar **510**#, the file list displayed in the file list selection screen is scrolled and the list of music files in accordance with the cursor position is displayed.

[0756] Moreover, by selecting the selection function icon in FIG. **64**(*a*), the user can perform the function corresponding to the selection function icon. It is assumed that display and setting of the selection function icon are switched in correspondence with the folder currently selected by cursor **520**. Here, a selection function icon **515** of "favorite" is provided. When selection function icon **515** of "favorite" is selected, a favorite folder selection screen is displayed.

[0757] FIG. **102** is a diagram illustrating a favorite folder selection screen **509** according to the present embodiment.

[0758] Referring to FIG. **102**, a case where a "best 10" registration icon **700**, a "memories" registration icon **702**, a "collection" registration icon **704**, a "practice" registration icon **706**, and a "secret" registration icon **708** that are favorite folders are provided on the screen of lower LCD **12** is shown.

[0759] The user selects any of the registration icons above in favorite folder selection screen **509**, so that a music file selected with a cursor **520**# in FIG. **64**(*a*) above is registered in the selected folder and displayed.

[0760] When a "back" icon **710** is selected, music file selection screen **502** which is the preceding screen is displayed.

[0761] Referring again to FIG. **64**(*a*), a reproduction mode switching icon **517** is provided in music file selection screen **502**.

[0762] In addition, the user can make switching among reproduction modes in the folder based on selection of reproduction mode switching icon **517**. Specifically, switching among a reproduction mode in which a music file being reproduced is repeatedly reproduced, a reproduction mode in which music files are sequentially reproduced and reproduction is repeated from the beginning when reproduction is completed, a reproduction mode in which music files are sequentially reproduced and reproduction is stopped when reproduction is completed, a reproduction mode in which random reproduction is performed, and a reproduction mode in which only a set section is repeatedly reproduced can sequentially be made for execution.

[0763] In addition, information on the selected music folder is displayed on upper LCD **22** in FIG. **64**(*b*).

[0764] In FIG. **64**(*a*), the user selects a "start" icon **516** to perform the operation of reproducing the music file selected with cursor **520**#, and the reproduction operation selection screen is displayed.

[0765] FIG. **65** is a diagram illustrating reproduction operation selection screen **503** according to the present embodiment.

[0766] FIG. **65**(*a*) shows a case where reproduction operation selection screen **503** for allowing an operation with music being modified in the reproduction operation or the like is displayed on lower LCD **12**.

[0767] Specifically, for example, the user can switch between sound effects output from a speaker or the like by operating R button **14**J and L button **14**I after selection of a sound effect selection icon **532**, **534** with the touch pen etc.

[0768] In addition, the user can perform the function to vary a reproduction speed or a key of a reproduction signal by selecting a speed and key adjustment icon **541**.

[0769] Moreover, the user can perform the function of change to another tone by modulating a frequency of the reproduction signal or performing filtering processing or the like, by selecting a tone adjustment icon **542**.

[0770] Further, the user can perform the function to output as sound effect from the speaker, a recording data file created by recording voice and sound which will be described later, by selecting a recording data selection icon **544**.

[0771] In addition, it is assumed that a slider **519** moves in accordance with a reproduction position in a total duration of the music file within the display range of a reproduction time bar **511**. When the user touches a position within the display range of reproduction time bar **511** with touch pen **27** etc., processing for reproducing the music file can be started from the time corresponding to the touch position. Here, it is assumed that slider **519** moves to the position where the reproduction processing is started. By selecting slider **519** with touch pen **27** etc. and performing the slide operation, the reproduction processing may be started from the position resulting from the slide operation.

[0772] In addition, the user can cause the music file being reproduced to pause, by selecting a pause command icon **522**.

Moreover, the user can select a next music file included in the folder to perform the reproduction operation thereof, by selecting a next music selection command icon **524**. Further, the user can select a previous music file included in the folder to perform the reproduction operation thereof, by selecting a previous music selection command icon **520**.

[0773] In addition, the user can perform visualizer processing which will be described later, by pressing a visualizer switching icon **531**.

[0774] In addition, the user can make switching among reproduction modes in the folder by pressing reproduction mode switching icon **517**. Specifically, switching among the reproduction mode in which a music file being reproduced is repeatedly reproduced, the reproduction mode in which music files are sequentially reproduced and reproduction is repeated from the beginning when reproduction is completed, the reproduction mode in which music files are sequentially reproduced and reproduction is stopped when reproduction is completed, the reproduction mode in which random reproduction is performed, and the reproduction mode in which only a set section is repeatedly reproduced can sequentially be made for execution.

[0775] In addition, by pressing "favorite" icon **515**, the user can have favorite folder selection screen **509** as described in connection with FIG. **102** displayed. As described above, by selecting any of the registration icons in favorite folder selection screen **509**, the currently reproduced music file can be registered in the selected folder and displayed.

[0776] FIG. **65**(*b*) shows a case where music file list **540** displayed on the screen of lower LCD **12** in FIG. **64**(*a*) is displayed on the screen of upper LCD **22** as a music file selection list screen **503**#. A music file included in the same folder where the music file being reproduced is included can be selected by operating direction input button **14**A. Specifically, after the music file is selected with the touch pen etc. on the screen of lower LCD **12** in FIG. **64**(*a*) (start is pressed), on the screen of lower LCD **12** in FIG. **65**(*a*), processing relating to the operation for reproducing the music file selected with the touch pen etc. is selected in the reproduction operation selection screen with the touch pen etc., and on the screen of upper LCD **22**, a music file can be selected with direction input button **14**A.

[0777] For example, by using direction input button **14**A to select the music file and pressing any of operation buttons **14**B to **14**E, the music file being reproduced is switched to the selected music file and the reproduction operation thereof can be performed.

[0778] Therefore, the processing in reproduction operation selection screen **503** on lower LCD **12** and the processing in music file selection list screen **503**# on upper LCD **22** can be performed in parallel, which contributes to convenience of the user.

[0779] Detailed processing of the sound function according to the present embodiment will be described hereinafter.

[0780] A processing procedure relating to the "sound function" according to the present embodiment described above will be described with reference to the following flow. It is noted that each step is implemented representatively by reading of a program or the like stored in memory card **29** to main memory **32** and execution thereof by CPU **31**.

[0781] <Function Selection Processing>

[0782] FIG. **66** is a flowchart illustrating processing relating to function selection in game device **10** according to the present embodiment. It is noted that the flow shown in FIG. **66** illustrates the processing in sound selection screen **400** in FIG. **61**.

[0783] Referring to FIG. **66**, when the power of game device **10** is turned on or the start button is pressed and thereafter the user selects a prescribed icon in a not-shown menu screen, the sound function is performed.

[0784] In step SD**1**, CPU **31** causes lower LCD **12** to display sound selection screen **400** as shown in FIG. **61**.

[0785] Thereafter, CPU **31** starts automatic recording and reproduction processing (step SD**2**). The automatic recording and reproduction processing will be described later. It is noted that the processing in steps SD**1** and SD**2** may be interchanged.

[0786] Thereafter, CPU **31** determines whether data of the touch position has been input from touch panel **13** or not (step SD**3**). CPU **31** determines whether or not the touch position data has been input from touch panel **13** through I/F circuit **42**. Namely, CPU **31** determines whether a touch operation with touch pen **27** etc. by the user has been performed or not. When the touch position data has not been input (NO in step SD**3**), the processing in step SD**3** is repeated.

[0787] On the other hand, when the touch position data has been input (YES in step SD**3**), the process proceeds to step SD**4**.

[0788] In step SD**4**, CPU **31** determines whether the coordinate value indicated by the touch position data is within a display range of the function selection icon or not. Specifically, CPU **31** determines which of "play with sound recorded through microphone" icon **402** or "play with music in SD card" icon **404** has been selected.

[0789] Then, when the coordinate value indicated by the touch position data is within the display range of "play with sound recorded through microphone" icon **402** or "play with music in SD card" icon **404** (YES in step SD**4**), the process proceeds to step SD**8**.

[0790] On the other hand, when the coordinate value indicated by the touch position data is out of the display range of "play with sound recorded through microphone" icon **402** or "play with music in SD card" icon **404** (NO in step SD**4**), the process proceeds to step SD**5**.

[0791] When CPU **31** determines in step SD**4** that the coordinate value indicated by the touch position is within the display range of the function selection icon, the processing for automatic recording and reproduction processing ends in step SD**8** (step SD**8**).

[0792] Then, CPU **31** performs processing for transition to a next selected function mode (step SD**9**). The processing for transition to the selected function mode will be described later.

[0793] On the other hand, when CPU **31** determines in step SD**4** that the coordinate value indicated by the touch position is not within the display range of the function selection icon, CPU **31** then determines whether the coordinate value indicated by the touch position is within the display range of "setting" icon **408** or not (step SD**5**).

[0794] When CPU **31** determines in step SD**5** that the coordinate value indicated by the touch position is within the display range of "setting" icon **408**, the automatic recording and reproduction processing ends (step SD**10**).

[0795] Thereafter, CPU **31** performs the setting processing (step SD**11**). The setting processing will be described later.

[0796] On the other hand, when CPU **31** determines in step SD**5** that the coordinate value indicated by the touch position

is not within the display range of "setting" icon **408**, CPU **31** then determines whether the coordinate value indicated by the touch position is within the display range of "end" icon **406** or not (step SD**6**).

[0797] When CPU **31** determines in step SD**6** that the coordinate value indicated by the touch position is within the display range of "end" icon **408**, the automatic recording and reproduction processing ends and the function selection processing ends (end). Namely, the screen thus returns to the not-shown menu screen.

[0798] On the other hand, when the coordinate value indicated by the touch position is not within the display range of "end" icon **408** in step SD**6**, the process returns to step SD**3**.

[0799] FIG. **67** is a flowchart illustrating sub routine processing of the processing for transition to a selection function mode in FIG. **66**.

[0800] Referring to FIG. **67**, CPU **31** determines whether the coordinate value indicated by the touch position is within the display range of "play with music in SD card" icon **404** or "play with sound recorded through microphone" icon **402** (step SD_2O).

[0801] When the coordinate value indicated by the touch position is within the display range of "play with music in SD card" icon **404**, the process proceeds to step SD**21**.

[0802] Then, CPU **31** determines whether the SD card has been inserted or not (step SD**21**). When CPU **31** determines that the SD card has been inserted, transition to the music reproduction mode is then made (step SD**22**). The music reproduction mode will be described later. When the music reproduction mode ends, the screen again returns to the sound selection screen in step SD**1** in FIG. **1** (return).

[0803] On the other hand, when CPU **31** determines in step SD**21** that the SD card has not been inserted, CPU **31** performs error indication processing (step SD**23**). The error indication processing is processing for performing processing for indicating, for example, that an "SD card is not inserted" or the like and urging the user to insert the SD card. Then, the process again returns to step SD**1** (return).

[0804] On the other hand, when CPU **31** determines in step SD**20** that the coordinate value indicated by the touch position is within the display range of "play with sound recorded through microphone" icon **402**, transition to the microphone recording and reproduction mode is made (step SD**24**). The microphone recording and reproduction mode will be described later. When the microphone recording and reproduction mode ends, the screen again returns to the sound selection screen in step SD**1** in FIG. **1** (return).

[0805] <Music Reproduction Mode>

[0806] The music reproduction mode will now be described.

[0807] FIG. **68** is a flowchart illustrating sub routine processing in the music reproduction mode.

[0808] Referring to FIG. **68**, initially, CPU **31** performs processing for search of a folder in an SD card (step SD**30**).

[0809] Then, CPU **31** generates the folder list (step SD**31**).

[0810] Then, CPU **31** has the music reproduction folder list selection screen displayed (step SD**32**). FIGS. **62** and **63** above show examples of display of music reproduction folder list selection screen **500**.

[0811] The processing for search of a folder in an SD card will be described here.

[0812] FIG. **69** is a flowchart illustrating sub routine processing of the processing for search of a folder in an SD card.

[0813] Referring to FIG. **69**, CPU **31** sets a search initial path to be first searched, among paths associated with the folders stored in the SD card (step SD**50**). Thereafter, CPU **31** performs processing for searching for a music file in accordance with the search initial path (step SD**51**).

[0814] Then, CPU **31** determines whether or not a music file is present in the folder through the processing for search for the music file in accordance with the search initial path (step SD**52**).

[0815] When CPU **31** determines in step SD**52** that the music file is present, the music folder including the music file is extracted (step SD**53**).

[0816] Whether the music file is present or not can be determined, for example, by referring to an extension for identifying a file. Here, determination may also be made by referring to identification information stored in a header or the like of a file, without limited to determination based on the extension, and a determination method is not limited.

[0817] Thereafter, CPU **31** determines whether search of all paths has been completed or not (step SD**54**).

[0818] When CPU **31** determines in step SD**54** that search of all paths has not been completed, CPU **31** sets a next search path to be searched next (step SD**25**).

[0819] Then, the process returns to step SD**51** and the processing for searching for the music file which is the processing described above is performed.

[0820] The processing in steps SD**51** to SD**54** described above is repeated until search of all paths is completed. When CPU **31** determines in step SD**54** that search of all paths has been completed, the process ends (return).

[0821] Thus, all folders in which a music file is present can be extracted from the attached SD card.

[0822] FIG. **70** is a flowchart illustrating sub routine processing for generating a folder list.

[0823] Referring to FIG. **70**, initially, CPU **31** performs processing for determining a folder name (step SD**60**). Thereafter, CPU **31** performs folder arrangement processing (step SD**61**).

[0824] FIG. **71** is a flowchart illustrating sub routine processing of the processing for determining a folder name.

[0825] Referring to FIG. **71**, CPU **31** selects a first folder extracted in the processing for search of the folder in FIG. **69** (step SD**65**). Then, CPU **31** determines whether there is an identical folder name or not (step SD**66**).

[0826] When CPU **31** determines in step SD**66** that there is an identical folder name, CPU **31** merges the folders (step SD**67**).

[0827] On the other hand, when CPU **31** determines in step SD**66** that there is no identical folder, the process proceeds to step SD**68**. CPU **31** determines in step SD**68** whether or not determination has been completed for all folders extracted in the processing for search of the folder in FIG. **69**.

[0828] When CPU **31** determines in step SD**68** that determination has not been completed for all folders, CPU **31** selects a next folder extracted in the processing for search of the folder in FIG. **69** (step SD**69**). Then, the process returns to step SD**66** and the processing in steps SD**66** to SD**69** described above is repeated.

[0829] When CPU **31** determines in step SD**68** that determination has been completed for all folders, the process then proceeds to the folder arrangement processing (step SD**61**) in FIG. **70**.

[0830] Referring again to FIG. **70**, in the folder arrangement processing (step SD**61**), the folders or the like merged in

the folder name determination processing (step SD**60**) are arranged in accordance with a prescribed order of arrangement based on a name, a symbol, or the like.

[0831] Then, the process again returns to FIG. **68** (return).

[0832] Referring to FIG. **68**, in step SD**32**, in accordance with the order of folders arranged in the folder arrangement processing (step SD**61**), the folder list is then displayed on the music reproduction folder list selection screen (step SD**32**).

[0833] FIG. **72** is a diagram illustrating a specific example illustrating the folder search processing.

[0834] Here, for example, a list structure of music files and folders stored in one SD card is shown.

[0835] Referring to FIG. **72**, specifically, for example, a case where a folder FD**1** and a folder FD**2** are provided and music folder FA and music folder FB are provided in folder FD**1** is shown.

[0836] Then, a case where a music file MAA, a music file MBB, . . . are included in music folder FA is shown.

[0837] In addition, a case where a music file . . . are included in music folder FB is shown.

[0838] A case where music folder FA and a music folder FC are provided in folder FD**2** is shown.

[0839] Then, a case where music files MX, MY are included in music folder FA is shown.

[0840] In addition, a case where a music file . . . are included in music folder FC is shown.

[0841] In a case where folders having such a tree structure are stored in the SD card, four music folders of music folders FA, FB, FA, FC storing music files are extracted in the processing in accordance with the flow described in connection with FIG. **69**.

[0842] In the processing in accordance with the flow described in connection with FIG. **71**, as music folder FA stored in folder FD**1** and music folder FA stored in folder FD**2** have the same folder name, music files stored in respective music folders FA are merged. As a result of such merging, in the example described above, music file MAA, music file MBB, . . . , music file MX, music file MY, . . . are displayed in a list as music files belonging to music folder FA, in music file list screen **501**# as illustrated in FIG. **63**(*b*) or music file selection list screen **503**# as illustrated in FIG. **70**(*b*).

[0843] In this processing, merging is carried out based on the same folder name, whereby the folder list is displayed on the folder list selection screen. Thus, if folders having the same name are present in the attached memory card (SD card), display in a list as belonging to the same group is provided. Therefore, no disadvantageous condition in folder extraction processing due to a folder configuration in the SD card, such as presence of a plurality of identical folder names, is caused and convenience can be improved.

[0844] In the present embodiment, in order to group music files within the attached memory card (SD card), folder information in the memory card is utilized as it is, without utilizing attribute information of music files (music files present in the same folder are handled as belonging to the same group). In addition, regardless of levels where folders are present, all folders are displayed in parallel (in one level) in music reproduction folder list selection screen **500** or the like. Specifically, in the example of FIG. **72** where music files are present in both of folder FD**1** and folder FD**2**, folder FD**1**, folder FD**2**, music folder FA, music folder FB, and music folder FC are displayed in a list in parallel on music reproduction folder list selection screen **500**. Thus, in spite of a complicated level configuration in the memory card, for example, even a child or the like representative of the user can readily find a desired music file.

[0845] In addition, since the folder name registered in the memory card is directly utilized on music reproduction folder list selection screen **500** or the like as the name of the folder handled as belonging to the same group, the user can readily locate a desired music file and convenience is improved.

[0846] In addition, as described previously, in music reproduction folder list selection screen **500**, since the name of each folder extracted from the memory card (which also serves as a touch button for display in a list of music files belonging to each folder) and the favorite folder (which also serves as a touch button for display in a list of music files registered as favorite) are displayed in parallel (in one level), an operation to select a folder is facilitated and convenience is further improved. In addition, as the "random" folder is displayed in parallel in such a list, convenience is further improved.

[0847] Referring again to FIG. **68**, after the music reproduction folder list selection screen is displayed in step SD**32**, CPU **31** then determines whether the touch position data has been input from touch panel **13** or not (step SD**33**). CPU **31** determines whether or not the touch position data has been input from touch panel **13** through I/F circuit **42**. Namely, CPU **31** determines whether a touch operation with touch pen **27** by the user has been performed or not. In other words, CPU **31** determines whether the coordinate value input through the user's operation of touch panel **13** is detected or not. When the touch position data has not been input (NO in step SD**33**), the processing in step SD**33** is repeated.

[0848] On the other hand, when the touch position data has been input (YES in step SD**33**), the process proceeds to step SD**34**.

[0849] Then, CPU **31** determines whether the coordinate value indicating the touch position data is within the display range of the folder list or not (step SD**34**).

[0850] When CPU **31** determines in step SD**34** that the coordinate value indicated by the touch position data is within the display range of the folder list, CPU **31** performs the processing for scroll display of the folder list in accordance with the trail of movement from the touch position or the touch position with the touch pen (step SD**35**).

[0851] Thereafter, CPU **31** performs the processing for moving the slider position on folder list scroll bar **510** in accordance with the position of the selected folder in the folder list (step SD**35**#). Then, the process again returns to step SD**33**. It is noted that the processing in steps SD**35** and SD**35**# may be interchanged, which is also applicable hereinafter.

[0852] In the present example, as the description is given by way of example assuming that the position of cursor **520** is not changed, only the processing for scroll display of the folder list is described. As described above, however, display processing can also be performed such that the position of cursor **520** is moved to a position in accordance with a touch position which is a position touched with touch pen **27**.

[0853] In this case, when the screen is touched and thereafter an operation to reset the touched state without changing the touch position from the originally touched position is performed (off the screen), only cursor **520** moves in accordance with the touch position. Here, the processing for scroll display of the folder list and the processing for moving the slider position on the folder list scroll bar are not performed.

[0854] Meanwhile, when an operation to touch the screen and move touch pen **27** etc. while maintaining the touched state, that is, an operation to change the touch position from the originally touched position while maintaining the touched state (drag operation), is performed, the processing for scroll display of the folder list is performed in accordance with the trail of movement (travel distance) of the touch pen. Here, the processing for moving also the slider position on the folder list scroll bar is performed.

[0855] On the other hand, when CPU **31** determines in step SD**34** that the coordinate value indicated by the touch position data is not within the display range of the folder list, CPU **31** determines whether the coordinate value indicated by the touch position data is within the display range of volume setting icon **550** or not (step SD**36**).

[0856] When CPU **31** determines in step SD**36** that the coordinate value indicated by the touch position data is within the display range of volume setting icon **550**, CPU **31** then performs the volume setting processing (step SD**37**). Then, the process again returns to step SD**33**. The volume setting processing will be described later.

[0857] When CPU **31** determines in step SD**36** that the coordinate value indicated by the touch position data is not within the display range of volume setting icon **550**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of "open" icon **514** or not (step SD**38**).

[0858] When CPU **31** determines in step SD**36** that the coordinate value indicated by the touch position data is within the display range of "open" icon **514**, CPU **31** then performs music file selection processing (step SD**39**). The music file selection processing will be described later.

[0859] On the other hand, when CPU **31** determines in step SD**38** that the coordinate value indicated by the touch position data is not within the display range of "open" icon **514**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of folder list scroll bar **510** or not (step SD**40**).

[0860] When CPU **31** determines in step SD**40** that the coordinate value indicated by the touch position data is within the display range of folder list scroll bar **510**, CPU **31** performs the processing for scroll display of the folder list in accordance with the touch position (step SD**41**).

[0861] Thereafter, the processing for moving the slider position on folder list scroll bar **510** in accordance with the position of the selected folder in the folder list is performed (step SD**42**). Then, the process again returns to step SD**33**.

[0862] On the other hand, when CPU **31** determines in step SD**40** that the coordinate indicated by the touch position data is not within the display range of folder list scroll bar **510**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of the selection function icon or not (step SD**43**).

[0863] When CPU **31** determines in step SD**43** that the coordinate value indicated by the touch position data is within the display range of the selection function icon, CPU **31** performs the function corresponding to the selection function icon (step SD**44**).

[0864] On the other hand, when CPU **31** determines in step SD**43** that the coordinate value indicated by the touch position data is not within the display range of the selection function icon, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of "back" icon **512** or not (step SD**45**).

[0865] When CPU **31** determines in step SD**45** that the coordinate value indicated by the touch position data is within the display range of "back" icon **512**, the processing in the music reproduction mode ends and the sound selection screen in step SD**1** in FIG. **66** is displayed.

[0866] On the other hand, when CPU **31** determines in step SD**45** that the coordinate value indicated by the touch position data is not within the display range of "back" icon **512**, the process returns to step SD**33**.

[0867] FIG. **73** is a flowchart illustrating sub routine processing of the processing for selecting a music file.

[0868] Referring to FIG. **73**, CPU **31** initially has music file selection screen **502** as described in connection with FIG. **64** displayed (step SD**70**).

[0869] CPU **31** then determines whether the touch position data has been input from touch panel **13** or not (step SD**70**#). CPU **31** determines whether or not the touch position data has been input from touch panel **13** through I/F circuit **42**. Namely, CPU **31** determines whether a touch operation with touch pen **27** by the user has been performed or not. In other words, CPU **31** determines whether the coordinate value input through the user's operation of touch panel **13** is detected or not. When the touch position data has not been input (NO in step SD**70**#), the processing in step SD**70**# is repeated.

[0870] On the other hand, when the touch position data has been input (YES in step SD**70**#), the process proceeds to step SD**71**.

[0871] Then, CPU **31** determines whether the coordinate value indicated by the touch position data is within the display range of music file list **540** or not (step SD**71**).

[0872] When CPU **31** determines in step SD**71** that the coordinate value indicated by the touch position data is within the display range of music file list **540**, CPU **31** performs the processing for scroll display of music file list **540** in accordance with the touch position (step SD**72**).

[0873] Thereafter, CPU **31** performs the processing for moving the slider position on music file list scroll bar **510**# in accordance with the position of the selected music file in the music file list (step SD**73**). Then, the process again returns to step SD**70**#.

[0874] On the other hand, when CPU **31** determines in step SD**71** that the coordinate value indicated by the touch position data is not within the display range of music file list **540**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of volume setting icon **550** or not (step SD**74**). When CPU **31** determines in step SD**74** that the coordinate value indicated by the touch position data is within the display range of volume setting icon **550**, CPU **31** performs the volume setting processing (step SD**75**). Then, the process again returns to step SD**70**#. The volume setting processing will be described later.

[0875] When CPU **31** determines in step SD**74** that the coordinate value indicated by the touch position data is not within the display range of volume setting icon **550**, CPU **31** determines whether the coordinate value indicated by the touch position data is within the display range of a "start" icon **526** (step SD**76**).

[0876] When CPU **31** determines in step SD**76** that the coordinate value indicated by the touch position data is within the display range of "start" icon **526**, CPU **31** performs the music file reproduction processing (step SD**76**#). The music file reproduction processing will be described later.

[0877] On the other hand, when CPU **31** determines in step SD**76** that the coordinate value indicated by the touch position data is not within the display range of "start" icon **526**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of music file list scroll bar **510**# or not (step SD**77**).

[0878] When CPU **31** determines in step SD**77** that the coordinate value indicated by the touch position data is within the display range of music file list scroll bar **510**#, CPU **31** performs the processing for scroll display of music file list **540** in accordance with the touch position data (step SD**78**).

[0879] Thereafter, CPU **31** performs the processing for moving the slider position on music file list scroll bar **510**# in accordance with the position of the selected music file in the music file list (step SD**79**). Then, the process again returns to step SD**70**#.

[0880] On the other hand, when CPU **31** determines in step SD**77** that the coordinate value indicated by the touch position data is not within the display range of music file list scroll bar **510**#, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of the selection function icon or not (step SD**80**).

[0881] When CPU **31** determines in step SD**80** that the coordinate value indicated by the touch position data is within the display range of the selection function icon, CPU **31** performs the function corresponding to the selection function icon (step SD**81**). Then, the process again returns to step SD**70**#. For example, when determination that the coordinate value is within the display range of selection function icon **515** of "favorite" is made, favorite folder selection screen **509** described in connection with FIG. **102** above is displayed. By selecting any of the registration icons, processing for registering the music file in the selected folder is performed.

[0882] On the other hand, when CPU **31** determines in step SD**80** that the coordinate value indicated by the touch position data is not within the display range of the selection function icon, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of a "back" icon **512**# or not.

[0883] When it is determined in step SD**82** that the coordinate value indicated by the touch position data is within the display range of "back" icon **512**#, the process proceeds to "A" and the music reproduction folder list selection screen in step SD**32** in FIG. **68** is displayed.

[0884] FIG. **74** is a diagram illustrating sub routine processing of the processing for reproducing a music file.

[0885] Referring to FIG. **74**, CPU **31** starts reproduction of the selected music file (step SD**90**).

[0886] As described above, in response to an instruction from CPU **31**, audio output control circuit **42***c* provides output to the headphone through headphone amplifier **48** when headphone **18** is connected, and it provides output to right speaker **45**, **47** through amplifier **44**, **46** when the headphone is not connected.

[0887] Thereafter, the music file selection screen is displayed on upper LCD **22** and the reproduction operation selection screen is displayed on lower LCD **12** (step SD**91**).

[0888] Thereafter, CPU **31** determines whether the touch position data has been input from touch panel **13** or not (step SD**92**).

[0889] When CPU **31** determines in step SD**92** that the touch position data has not been input from touch panel **13**, CPU **31** then determines whether the operation of direction input button **14**A has been performed or not (step SD**93**).

[0890] When CPU **31** determines in step SD**93** that the operation of direction input button **14**A has been performed, CPU **31** performs the processing for scroll display of the music file list selected by the cursor position on the music file selection screen in accordance with the operation of direction input button **14**A (step SD**94**).

[0891] On the other hand, when CPU **31** determines in step SD**93** that the operation of direction input button **14**A has not been performed, the process again returns to step SD**92**.

[0892] Then, CPU **31** determines whether a prescribed button has been pressed or not (step SD**94**#).

[0893] When the prescribed button has been pressed in step SD**94**#, CPU **31** starts reproduction of the music file selected by the cursor position (step SD**90**).

[0894] On the other hand, when the prescribed button has not pressed in step SD**94**#, the process again returns to step SD**92**. Here, it is assumed that any of operation buttons **14**B to **14**E is set as the prescribed button.

[0895] When the touch position data has been input from touch panel **13** in step SD**92**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of reproduction time bar **511** or not (step SD**95**).

[0896] When CPU **31** determines in step SD**95** that indication by the touch position data is within the display range of reproduction time bar **511**, CPU **31** performs the processing for reproducing the music file from the time corresponding to the touch position (step SD**96**).

[0897] Then, CPU **31** performs the processing for moving the slider position indicating the reproduction position in the total duration of the music file on reproduction time bar **511** in accordance with the touch position (step SD**97**). Then, the process again returns to step SD**92**.

[0898] When CPU **31** determines in step SD**95** that the coordinate value indicated by the touch position data is not within the display range of reproduction time bar **511**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of volume setting icon **550** or not (step SD**98**).

[0899] When CPU **31** determines in step SD**98** that the coordinate value indicated by the touch position data is within the display range of volume setting icon **550**, CPU **31** performs the volume setting processing (step SD**99**). Then, the process again returns to step SD**92**. The volume setting processing will be described later.

[0900] On the other hand, when CPU **31** determines in step SD**98** that the coordinate value indicated by the touch position data is not within the display range of volume setting icon **550**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the range of visualizer switching icon **531** or not (step SD**100**).

[0901] When CPU **31** determines in step SD**100** that the coordinate value indicated by the touch position data is within the display range of visualizer switching icon **531**, CPU **31** then performs the visualizer display processing (step SD**101**). Then, the process again returns to step SD**92**. The visualizer display processing will be described later.

[0902] When CPU **31** determines in step SD**100** that the coordinate value indicated by the touch position data is not within the display range of visualizer switching icon **531**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of a reproduction operation command icon or not (step SD**402**). Here, pause command icon **522**, next music selection com-

mand icon **524** and previous music selection command icon **520** are provided by way of example of the reproduction operation command icon.

[0903] When CPU **31** determines in step SD**402** that the coordinate value indicated by the touch position data is within the display range of the reproduction operation command icon, CPU **31** performs the function corresponding to the reproduction operation command (step SD**103**). Then, the process again returns to step SD**92**.

[0904] Specifically, when it is determined that the coordinate value indicated by the touch position data is within the display range of pause command icon **522**, CPU **31** causes the reproduction operation to pause. Alternatively, when it is determined that the coordinate value indicated by the touch position data is within the display range of next music selection command icon **524**, CPU **31** starts reproduction of the next selected music file. On the other hand, when it is determined that the coordinate value indicated by the touch position data is within the display range of previous music selection command icon **521**, CPU **31** starts reproduction of the previously selected music file.

[0905] When CPU **31** determines in step SD**402** that the coordinate value indicated by the touch position data is not within the display range of the reproduction operation command icon, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of the selection function icon or not.

[0906] When CPU **31** determines in step SD**104** that the coordinate value indicated by the touch position data is within the display range of the selection function icon, CPU **31** then performs the function corresponding to the selection function icon (step SD**105**). Then, the process again returns to step SD**92**. For example, in the present example, "favorite" icon **515**, reproduction mode switching icon **517**, speed and key adjustment icon **541**, tone adjustment icon **542**, and recording data selection icon **544** are displayed as the selection function icon.

[0907] Specifically, as described above, when CPU **31** determines that the coordinate value indicated by the touch position data is within the display range of "favorite" icon **515**, CPU **31** performs the processing for moving the currently selected music file to the favorite folder.

[0908] Alternatively, when CPU **31** determines that the coordinate value indicated by the touch position data is within the display range of reproduction mode switching icon **517**, CPU **31** switches the setting of the reproduction mode for display.

[0909] Alternatively, when CPU **31** determines that the coordinate value indicated by the touch position data is within the display range of speed and key adjustment icon **541**, CPU **31** performs the function to change a reproduction speed or a key which will be described later.

[0910] Alternatively, when CPU **31** determines that the coordinate value indicated by the touch position data is within the display range of tone adjustment icon **542**, CPU **31** performs the function for change to another tone by performing filtering processing for modulating a frequency which will be described later.

[0911] Alternatively, when CPU **31** determines that the coordinate value indicated by the touch position data is within the display range of recording data selection icon **544**, CPU **31** performs the function to output an audio data file in which sound is recorded from the speaker as sound effect, as will be described later.

[0912] When CPU **31** determines in step SD**104** that the coordinate value indicated by the touch position data is not within the display range of the selection function icon, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of a "back" icon **512***a* or not (step SD**106**).

[0913] When CPU **31** determines in step SD**106** that the coordinate value indicated by the touch position data is not within the display range of "back" icon **512***a*, the process returns to step SD**92**.

[0914] On the other hand, when CPU **31** determines in step SD**106** that the coordinate value indicated by the touch position data is within the display range of "back" icon **512***a*, the process proceeds to "B" and the music file selection screen is displayed in step SD**70** in FIG. **73**.

[0915] <Volume Setting Processing>

[0916] The volume setting processing will now be described.

[0917] FIG. **75** is an enlarged view of volume setting icon **550**.

[0918] Referring to FIG. **75**(*a*), volume setting icon **550** is provided with a slider **552**, for example, of which position on the horizontal axis from left toward right indicates a greater volume.

[0919] Slider **552** is displayed at a position in accordance with a current value within a volume level parameter setting range.

[0920] Here, a region in a direction of lower volume relative to a position corresponding to the current value, at which slider **552** is displayed, is identified as a volume low region **554**, and a region in a direction of higher volume relative to the position corresponding to the current value, at which slider **552** is displayed, is identified as a volume high region **555**.

[0921] In the embodiment of the present invention, in a case where slider **552** is selected with the touch pen etc., the slider can continuously be operated to move (what is called a drag operation) in any direction toward volume low region **554** and volume high region **555** from the position corresponding to the current value, in accordance with a subsequent touch-and-slide operation (an operation to change the touch position with a touch-on state being maintained).

[0922] The case where slider **552** is selected with the touch pen etc. includes (i) a case where slider **552** is touched and (ii) a case where the touch position enters slider **552** during the touch operation. Here, the drag operation of slider **552** may be performed only in the case (i), the drag operation may be performed only in the case (ii), or the drag operation may be performed in either of the case (i) or (ii).

[0923] Referring to FIG. **75**(*b*), in a case where volume low region **554** other than slider **552** is touched with the touch pen etc., slider **552** can instantaneously be operated to move to the touch-on position. Thus, change to a volume lower than a current volume value can instantaneously be made. On the other hand, when volume high region **555** other than slider **552** is touched with the touch pen etc., slider **552** is not instantaneously operated to move to the touch-on position. Thus, change to a volume higher than the current volume value cannot instantaneously be made.

[0924] The case where volume low region **554** is touched includes (i) a case where somewhere within volume low region **554** is touched and (ii) a case where the touch position enters volume low region **554** during the touch operation. Here, slider **552** may instantaneously be moved to the touch-

on position only in the case (i), slider **552** may instantaneously be moved to the touch position only in the case (ii), or slider **552** may instantaneously be moved in either of the case (i) or (ii).

[0925] In addition, when volume low region **554** is touched, slider **552** is instantaneously moved to the touch position, and when the slide operation follows, the drag operation as described above can be performed.

[0926] FIG. **76** is a flowchart illustrating sub routine processing of the volume setting processing according to the present embodiment.

[0927] Referring to FIG. **76**, when CPU **31** determines that the coordinate value indicated by the touch position data is within the display range of volume setting icon **550**, CPU **31** determines whether the coordinate value indicated by the touch position data is within the display range of slider **552** or not (step SD**110**).

[0928] When CPU **31** determines in step SD**110** that the coordinate value indicated by the touch position data is within the display range of the slider, slider **552** is moved to and displayed at the most recent touch position in accordance with the trail of movement of the touch pen that keeps touching the screen (slide operation) (step SD**114**). Namely, a continuous operation of movement of slider **552** from the current position to a desired position within the volume level parameter setting range is accepted.

[0929] Then, CPU **31** sets the volume in accordance with the position of slider **552** (step SD**115**). Namely, the volume level parameter is updated to a value in accordance with the position of slider **552** resulting from movement in accordance with a moving operation. In this regard, as slider **552** continuously moves from the current position to the desired position, the volume level parameter is gradually adjusted along with movement.

[0930] On the other hand, when CPU **31** determines in step SD**110** that the coordinate value indicated by the touch position data is not within the display range of slider **552**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of acceptable volume input or not (step SD**111**).

[0931] When CPU **31** determines in step SD**111** that the coordinate value indicated by the touch position data is within the display range of acceptable volume input, slider **552** is moved to and displayed at the position input with the touch pen (step SD**112**). Then, the volume in accordance with the position of slider **552** within the parameter setting range is set (step SD**115**).

[0932] On the other hand, when CPU **31** determines in step SD**111** that the coordinate value indicated by the touch position data is not within the display range of acceptable volume input, CPU **31** performs invalid input determination processing (step SD**113**). Namely, processing for determining the input as invalid is performed. Then, the process ends.

[0933] In the present embodiment, it is assumed that the volume low region is set as inside of the display range of acceptable volume input. Volume high region **555** is not set as inside of the display range of acceptable volume input. Specifically, in a case where the slider is moved in a direction of decrease from the current value of the parameter, in the present example, the input indicating the operation of moving the slider to the desired position in the volume low region is accepted. In a case where the slider is moved in a direction of increase from the current value of the parameter, in the present example, the input indicating the operation of moving the slider to the desired position in the volume high region is not accepted.

[0934] Therefore, slider **552** is immediately moved to the touch position in the volume low region and the volume in accordance with the slider position is set. On the other hand, touching the volume high region results in the invalid input determination processing, so that the slider is not moved and the volume in accordance with the slider position is not set.

[0935] As a result of such processing, abrupt increase in the volume caused by a user's erroneous operation while the volume setting processing is performed with the touch pen is avoided. Specifically, the position of the slider is varied with the touch pen in a direction of decrease in the volume and the volume setting processing in accordance with the slider position can be performed. In the direction of increase in the volume, however, the position of the slider is not varied with the touch pen and the volume is not increased.

[0936] In particular, in performing the setting processing using the touch pen, the user can freely designate any position on the touch panel but a display range of volume setting icon **550** cannot be great owing to layout restrictions. Accordingly, in performing the volume setting processing, though attention should be paid in designating a position in accordance with a desired volume level within the display range of volume setting icon **550**, it is very likely that the user erroneously designates the direction of increase in the volume with the touch pen. Therefore, as a result of this processing, such stress imposed on the user that he/she operates game device **10** while being anxious about the possibility of abrupt increase in the volume caused by his/her erroneous operation can be suppressed.

[0937] In the above, regarding the operation of moving the slider to the desired position, a case where the slider is immediately moved to the position in the volume low region so that the volume in accordance with the slider position is set has been described, however, as in the continuous operation of moving the slider, such setting that the volume level parameter is gradually adjusted can also be made.

[0938] FIG. **77** is a diagram illustrating another example of the volume setting icon.

[0939] Referring to FIG. **77**(*a*), a volume setting region for setting a volume at which output is provided from the right speaker and the left speaker is shown here.

[0940] Specifically, the ordinate (R) represents a volume level of the right speaker and the abscissa (L) represents a volume level of the left speaker. Namely, a coordinate value (position) at any point is associated with the volume level of the right speaker and the left speaker. Here, a point **552**# indicating a position corresponding to the current volume level of the right speaker and the left speaker is displayed.

[0941] By touching point **552**# with the touch pen, point **552**# is selected. By moving the touch pen while the screen is being touched (performing the slide operation), the pointer is moved and displayed in accordance with the trail of movement. On the other hand, when a position other than point **552**# is touched with the touch pen and this touched position is within the display range of acceptable audio input, point **552**# is moved and displayed at the position of input with the touch pen.

[0942] Though a case where setting of two types of parameters, that is, the volume level of the right speaker and the left speaker, is associated with the coordinate value (position) on the abscissa and the ordinate has been described here, the

setting may be associated with more types of parameters, without limited to two types of parameters. Regarding display of a parameter setting range, when a single parameter is set, for example, a position of the parameter may be displayed one-dimensionally, that is, on the abscissa. On the other hand, for example, when two parameters are set, a position of the parameters may be displayed two-dimensionally, that is, on the ordinate and the abscissa. Further, when a plurality of types of parameters are set, a position of the parameters may be displayed multi-dimensionally, in accordance with the number of types thereof.

[0943] Referring to FIG. **77**(*b*), the case where a position within the display range of acceptable volume input is touched with the touch pen and the volume level in accordance with this position is immediately set is shown here. Namely, for example, a direction of decrease in the volume of at least any one of the right speaker and the left speaker with the use of the touch pen is set as inside of the display range of acceptable volume input, however, other regions are not set as inside of the display range of acceptable volume input.

[0944] Therefore, when a position other than point **552**# is touched, pointer **552**# is not moved in a direction of increase in the volume, which is outside of the display range of acceptable audio input, in spite of touch with the touch pen. Thus, the volume is prevented from becoming excessively high and having the user feel uncomfortable can be suppressed.

[0945] In the present example, a case where the display range of volume setting icon **550** is divided into the display range of acceptable audio input and otherwise has been described. Such division, however, is not limited to division relating to volume setting, and for example, the reproduction time bar described in connection with FIG. **65** can also be divided into a display range of acceptable input and otherwise. For example, an already-reproduced position is defined as inside of the display range of acceptable input, and a position where reproduction has not yet been carried out is defined as outside of the display range of acceptable input so that only a continuous operation of moving slider **519** is allowed. As a result of such processing, start of reproduction in response to touching with the touch pen from a position where reproduction has not yet been carried out is prevented and having the user feel uncomfortable can be suppressed.

[0946] <Speed and Key Adjustment Processing>

[0947] FIG. **78** is a diagram illustrating a function to change a reproduction speed or a key by selecting speed and key adjustment icon **541**.

[0948] Referring to FIG. **78**, a speed and key adjustment screen displayed on the screen of lower LCD **12** by pressing speed and key adjustment icon **541** is shown here.

[0949] Here, the user uses the touch pen etc. to select and move a slider **553**, so that adjustment to a reproduction speed and a key corresponding to a moved position can be made. Specifically, by moving the slider toward the right from a current position of slider **553**, the reproduction speed can be made faster. In contrast, by moving the slider toward the left, the reproduction speed can be made slower. In addition, by moving slider **553** upward from the current position of slider **553**, the key can be made higher. In contrast, by moving slider **553** downward, the key can be lowered.

[0950] By performing this function, the reproduced and output audio signal can be varied as the user desires.

[0951] <Tone Adjustment Processing>

[0952] FIG. **79** is a diagram illustrating a function for change to another tone by modulating a frequency of a reproduction signal or performing filtering processing or the like based on selection of tone adjustment icon **542**.

[0953] Referring to FIG. **79**, a tone adjustment icon selection screen displayed on the screen of lower LCD **12** by pressing tone adjustment icon **542** is shown here.

[0954] Four tone adjustment selection icons are provided here. Specifically, a "radio" icon **542***a* for adjusting sound to such a tone as heard on a radio by modulating a frequency, a "karaoke" icon **542***b* suppressing vocals based on subtraction of left and right sound from a stereophonic sound source, an "echo" icon **542***c* for making sound echo through filtering processing, and an "electronic sound" icon **542***d* for varying sound to an electronic tone by modulating a frequency are provided. When the user selects any of these four tone adjustment selection icons by using the touch pen etc., the function of the selected icon is performed.

[0955] Though a case where four tone adjustment selection icons are provided and sound can be adjusted to four types of tones has been described here, any number of icons may be provided, without particularly limited to four. By providing a plurality of tone adjustment selection patterns, adjustment to a tone as desired by the user can be made.

[0956] Here, regarding the function of "karaoke" icon **542***b*, a case of suppression of vocals based on subtraction of left and right sound from the stereophonic sound source is described. This processing is performed generally because vocal sound or the like is localized in the center of a sound field of the stereophonic sound source and ambient sound or the like is localized on the left and right except for the center. Vocals can also be suppressed with other methods without particularly limited to this method.

[0957] <Sound Effect Selection Processing>

[0958] FIG. **80** is a diagram illustrating a case where sound effect output from a speaker or the like is changed in response to a user's operation of R button **14**J and L button **14**I for selecting sound effect selection icon **532**, **534**. In the present embodiment, by operating R button **14**J and L button **14**I, sound effect can additionally be produced for fun during reproduction of music based on a music file.

[0959] Referring to FIG. **80**, the sound effect can be changed by selecting sound effect selection icon **532**, **534** shown in FIG. **65**. Specifically, in an initial state, a "no sound effect" state is set (step SD**120**). Thereafter, sound effect selection icon **532** is selected once, to set the sound effect of "drum" (step SD**121**). Thereafter, by selecting sound effect selection icon **532**, the sound effect of "cymbal" is set (step SD**122**). Thereafter, by selecting sound effect selection icon **532**, the sound effect of "trumpet" is set (step SD**123**). By selecting sound effect icon **532** again, the "no sound effect" state is set (step SD**120**). Namely, switching between the sound effects output from the speaker or the like can be made in accordance with the number of times of selection of the sound effect selection icon. In the present example, by selecting sound effect selection icons **532**, **534** with R button **14**J and L button **14**I respectively, sound effect in accordance with the button operation can be set.

[0960] Here, a case where switching in the order of "no sound effect", "drum", "cymbal", and "trumpet" is made is described, however, the order is not particularly limited as such and any order can be set. In addition, such setting as switching to a plurality of sound effects can also naturally be made. Moreover, such setting that types of sound effects are different between R button **14**J and L button **14**I respectively can also be made.

[0961] <Visualizer Display Processing>

[0962] FIG. **81** is a diagram illustrating visualizer display processing according to the present embodiment.

[0963] When CPU **31** determines in step SD**100** in FIG. **74** that the coordinate value indicated by the touch position data is within a range of visualizer switching icon **531**, CPU **31** performs the visualizer display processing.

[0964] FIG. **81**(*a*) shows the reproduction operation selection screen on lower LCD **12**. As the screen is the same as described in connection with FIG. **65**, detailed description thereof will not be repeated.

[0965] FIG. **81**(*b*) shows the visualizer display screen on upper LCD **22**.

[0966] FIG. **82** is a flowchart illustrating sub routine processing of the visualizer display processing.

[0967] Referring to FIG. **82**, initially, an audio output level is sensed (step SD**130**). Specifically, output level sensing circuit **42***d* senses the output level of the audio signal output from audio output control circuit **42***c* to amplifiers **44**, **46** and outputs the result to CPU **31**.

[0968] Thereafter, CPU **31** generates an object in accordance with the output level sensed by output level sensing circuit **42***d* (step SD**131**).

[0969] Thereafter, scroll display of the object is provided (step SD**132**). The process again returns to step SD**130** and the processing above is repeated.

[0970] Specifically, in FIG. **81**(*b*), as the output level of the audio signal being reproduced is successively sensed, new objects are successively generated at positions in accordance with the output level, and scroll display of these objects is provided. In the present embodiment, an object **801** (specifically, a ground object) is sequentially generated at a height in accordance with the output level at the right end of a visualizer display area and scroll display of the entire picture toward the left is provided. In addition, on the ground object thus generated, another object (in the present example, objects **802** and **803**, for example) in automatically controlled operation is provided (that is, moves horizontally along the ground on the screen or jumps).

[0971] In the present example, the height of the ground object is determined by the total output level of the audio signal being reproduced from right and left speakers **45** and **47**, or alternatively the controlled operation of a first object (in the present embodiment, object **802** in a motorcycle form) (speed, acceleration, height of jump, etc.) is determined by the output level of right speaker **45** and the controlled operation of a second object (in the present embodiment, object **803** in a motorcycle form) is determined by the output level of left speaker **47**.

[0972] Without limited to the above, in yet another example, the height of the ground object for the first object (in the present embodiment, object **802**) or the controlled operation (speed, acceleration, height of jump, etc.) of the first object may be determined by the output level of a signal for right speaker **45** of the audio signal, and the height of the ground object for the second object (in the present embodiment, object **803**) or the controlled operation of the second object may be determined by the output level of a signal for left speaker **47** of the audio signal.

[0973] The user can visually recognize variation of the output level based on the height of a geographic feature in accordance with the output level of the audio signal. In addition, as two objects **802** and **803** in a motorcycle form jump in accordance with the height of the geographic feature, the user can visually recognize variation of the output level of the audio signal also based on variation of objects **802** and **803**.

[0974] In addition, relative positional relation between two objects **802** and **803** in a motorcycle form may be varied, depending on a difference in the volume level between the audio signal output from right speaker **45** and the audio signal output from left speaker **47**.

[0975] If the processing for reproducing the selected music file pauses, there is no variation of the geographic feature in accordance with the output level above and hence scroll display of a flat geographic feature object is provided. Here, for example, when the user operates L button **14**I and R button **14**J described above, the sound effect is output from the speaker or the like. Therefore, the output level of the audio signal of the sound effect is sensed, the geographic object in accordance with the output level of the audio signal is generated, and scroll display thereof is provided. The visualizer display screen hereinafter is also processed in accordance with a similar scheme.

[0976] FIG. **83** is a diagram illustrating another visualizer display screen.

[0977] Referring to FIGS. **83** (*a*) and (*b*), a visualizer for generation and scroll display on upper LCD **22** of an object **301***a* in a snowball shape having a size in accordance with the sensed output level of the audio signal is shown here. Scroll display of a geographic feature showing a slope is provided behind object **301***a* in a snowball shape and such scroll display as object **301***a* in a snowball shape rolling down the slope is provided.

[0978] Comparing FIG. **83**(*a*) with FIG. **83**(*b*), a case that object **301***a* in a snowball shape in FIG. **83**(*a*) is greater than object **301***a* in a snowball shape in FIG. **83**(*b*) in accordance with the sensed output level of the audio signal is shown here.

[0979] As a size of object **301***a* in a snowball shape varies, the user can visually recognize variation of the output level of the audio signal in accordance with the size of object **301***a* in a snowball shape.

[0980] In addition, as object **301***a* in a snowball shape bounds at prescribed timing during scroll display of the geographic feature showing the slope, the size of object **301***a* in a snowball shape can further visually be recognized.

[0981] FIG. **84** is a diagram illustrating yet another visualizer display screen.

[0982] Referring to FIG. **84**, a visualizer for generation and scroll display on upper LCD **22** of an object **301**# in a prescribed character shape at a height in accordance with the sensed output level of the audio signal is shown here. In addition, setting is made such that scroll display of a background region of the screen from a right end of the screen to a left end of the screen is provided, and objects **606** in a coin shape are continuously arranged at prescribed intervals from the position of object **301**# in a prescribed character shape and scroll display thereof from the right end of the screen to the left end of the screen is provided.

[0983] In addition, setting is made such that an object **605** in another prescribed character shape is displayed, and for example, the object can jump in the screen in response to a user's operation. Moreover, setting is made such that, when object **605** in a prescribed character shape is superimposed on object **606** in a coin shape, object **605** in a coin shape disappears and the number of times of superposition on object **605** in a coin shape is displayed in the upper left field of the screen.

[0984] Therefore, the user can visually recognize variation of the output level of the audio signal based on variation of the

height of object **301**#. In addition, as objects **606** in a coin shape are also continuously arranged in accordance with the height of object **301**#, the user can visually recognize variation of the output level of the audio signal also based on the height of object **606** in a coin shape.

[0985] Namely, a display position of a third object (in the present embodiment, object **806** in a coin shape) is determined by the output level of the audio signal. Specifically, the third object is displayed at the height in accordance with the output level, at an end portion of a display area of a virtual space and thereafter scroll display of the third object in a direction toward an opposite end portion is provided. Then, in response to the user's operation, movement of a fourth object (in the present embodiment, object **805** in a prescribed character shape) is controlled. Prescribed game processing is then performed in accordance with positional relation between the third object and the fourth object. Thus, the output level can be checked during reproduction of music and the user can have fun based on his/her operation.

[0986] Further, as the user can operate object **605** in a prescribed character shape by providing an operation input. As object **606** in a coin shape disappears when object **605** is superimposed on object **606** in a coin shape, the user can recognize variation of the output level of the audio signal also based on his/her own operation input (pressing of a button).

[0987] In the present example, visualizer display processing in three patterns has been described, however, the pattern is not limited to three. A single pattern may be provided, or a function of visualizer display processing in a further greater number of patterns may also be provided.

[0988] For example, such setting that switching among three patterns of visualizer display processing is successively made in accordance with the number of times of touch with the touch pen of a position within a display range of visualizer switching icon **531** on the reproduction operation selection screen on lower LCD **12** shown in FIG. **81**(*a*) can be made. For example, setting can be such that, by touching the position within the display range of visualizer switching icon **531** with the touch pen four times, the visualizer display processing ends and the screen in FIG. **65**(*b*) is shown.

[0989] As described previously, in the present embodiment, the user can have fun by additionally producing the sound effect by performing the prescribed operation during reproduction of music based on the music files. In detection of the output level of the audio signal described above, not only the output of reproduction of music based on the music files but also the output of sound effect based on the user's operation are considered. Namely, the total output level of both of the audio signal based on the music files and the audio signal of the sound effect based on the user's operation is sensed as the output level of the audio signal described above. Thus, display contents on the visualizer are indirectly varied in response to the user's operation, and more specifically, a display position or an operation content of the object is varied.

[0990] <Headphone Output Processing>

[0991] FIG. **85** is a diagram illustrating a flow in a case where the headphone is sensed according to the present embodiment. It is noted that headphone output processing is performed independently of other processing while the sound function is being performed.

[0992] Referring to FIG. **85**, initially, whether the headphone is sensed or not is determined (step SD**140**). Specifically, ° F. circuit **42** senses insertion of the plug of the headphone into the jack by sensing turn-on of a mechanical switch, for example, resulting from insertion of the plug of the headphone into jack **62** described in connection with FIG. **2** or an electrically conducting state resulting from insertion of the plug of the headphone into jack **62**. Thereafter, I/F circuit **42** outputs the result of sensing to CPU **31**, and CPU **31** determines attachment of the headphone upon receiving a signal indicating the result of sensing from I/F circuit **42**.

[0993] When the headphone is sensed, CPU **31** then performs equalizer adjustment processing (step SD**141**).

[0994] The process then ends (end).

[0995] Comparing a case where the user wears the headphone to listen to the reproduced audio signal with a case where the user listens to the reproduced audio signal output from the speaker, wearing the headphone means covering of earholes. Accordingly, acoustic characteristics are significantly different from a case not wearing the headphone and hence the user may feel discomfort.

[0996] Therefore, in the present embodiment, when the headphone is sensed, equalization adjustment processing for adjusting a prescribed frequency band of audio data is performed so as not to produce an audio signal disagreeable to the user due to variation of acoustic characteristics.

[0997] Thus, even when the user listens to music data through the headphone, the audio signal agreeable to the user can be output. In addition, the volume of sound effect output in response to the user's operation of L button **14**I and R button **14**J can also be adjusted, or a type of sound effect described in connection with FIG. **80** can also be varied in accordance with sensing of the headphone.

[0998] Here, though a case where the equalization adjustment processing for adjusting a prescribed frequency band when the headphone is sensed is performed has been described, the processing is not particularly limited as such. When the headphone is sensed, the audio signal itself to be reproduced may be made different from the audio signal for reproduction from the speaker. For example, sound of high key that gives no uncomfortable feeling in reproduction from the speaker but sounds too high in listening through the headphone may be replaced with different sound of lower key, or sound accompanying noise in listening through the headphone may be replaced with different sound.

[0999] Alternatively, when the headphone is sensed, instead of changing the audio signal itself to be reproduced, the volume of the audio signal to be reproduced may be made different from the volume thereof in reproduction from the speaker. For example, an audio signal reproduced in balance without giving uncomfortable feeling in reproduction from the speaker but reproduced in poor volume balance in listening through the headphone may be adjusted by increasing or decreasing the volume thereof to attain balance.

[1000] <Sleep Processing>

[1001] FIG. **86** is a flowchart illustrating sleep processing in a case where game device **10** is folded to a folded position.

[1002] Referring to FIG. **86**, CPU **31** determines whether a folded position has been detected or not (step SD**150**). Specifically, whether a determination signal indicating the closed state has been input from folded position detection sensor **50** or not is determined. When it is determined that the determination signal indicating the closed state has been input from folded position detection sensor **50**, that is, when the folded position is detected, CPU **31** then determines whether the music reproduction operation is being performed or not (step SD**151**). Specifically, CPU **31** determines whether or not the

"start" icon is selected and the processing for reproducing the selected music file is being performed as described above.

[1003] Receiving the input of the determination signal indicating the closed state output from folded position detection sensor **50**, for example, if game device **10** is operating, CPU **31** stops the operation and sets what is called a sleep state in which data of that state of operation is stored. On the other hand, receiving input of the determination signal indicating the opened state output from folded position detection sensor **50** after game device **10** enters the sleep state, CPU **31** performs processing for recovering from the sleep state to the original state based on the stored data of the state of operation.

[1004] When CPU **31** determines in step SD**151** that the music reproduction operation is not being performed, CPU **31** performs sleep processing (step SD**154**). Namely, when other function is operated, the operation is stopped and the data of that state of operation is stored. Thus, when music is being reproduced through the speaker, music reproduction is stopped by folding game device **10** from the unfolded state to the folded state.

[1005] On the other hand, when CPU **31** determines in step SD**151** that the music reproduction operation is being performed, CPU **31** then determines whether the headphone is sensed or not (step SD**152**). Specifically, CPU **31** determines whether a signal indicating a result of sensing involved with attachment of the headphone from I/F circuit **42** has been received or not as described above. On the other hand, as will be described later, when music is being reproduced through the headphone, reproduction of music is continued also after game device **10** is folded from the unfolded state to the folded state.

[1006] When CPU **31** determines in step SD**152** that the headphone is not sensed, CPU **31** performs sleep processing (step SD**154**). Namely, when the music reproduction operation is being performed but the headphone is not sensed, CPU **31** stops the operation as in the case of other active functions and has the data of the state of operation stored.

[1007] On the other hand, when CPU **31** determines in step SD**152** that the headphone is sensed, transition to a sleep music reproduction mode is made (step SD**153**).

[1008] FIG. **87** is a flowchart illustrating sub routine processing in the sleep music reproduction mode.

[1009] Referring to FIG. **87**, CPU **31** continues only the music reproduction function and performs the sleep processing for other functions (step SD**160**). For example, display processing or the like is set to the sleep state.

[1010] Thereafter, CPU **31** determines whether a continuous reproduction operation has been set or not (step SD**161**). Specifically, it is determined whether the reproduction mode is set to the reproduction mode in which data being reproduced is repeatedly reproduced, to the reproduction mode in which data is sequentially reproduced and reproduction is repeated from the beginning when reproduction is completed, or to the reproduction mode in which only a set section is repeatedly reproduced, or whether or not the "random" folder is selected and executed.

[1011] When CPU **31** determines in step SD**161** that the continuous reproduction operation has been set, CPU **31** continues the music reproduction operation (step SD**162**).

[1012] On the other hand, when CPU **31** determines in step SD**161** that the continuous reproduction operation has not been set, the reproduction operation ends with the current music file (step SD**163**). Then, the sleep processing described above is performed (step SD**164**).

[1013] According to this method, when the user folds game device **10** and does not operate game device **10**, the sleep processing is performed except for a case where the music reproduction operation is being performed. Therefore, this processing allows extension of a service life of a power supply of game device **10**. In addition, when the user folds game device **10** during performance of the music reproduction function and when the headphone is sensed and the continuous reproduction operation is set, the music reproduction operation is continued.

[1014] In general, it is highly likely that the user carries game device **10** in the folded state in a bag or in a pocket or the like of clothing. Therefore, as it is less likely that the user operates game device **10** in such a folded state, the sleep processing is normally performed.

[1015] On the other hand, it would be convenient for the user if the function of the music reproduction operation can be performed while carrying game device **10** in the folded state although not operating game device **10**.

[1016] Therefore, in spite of game device **10** being in the folded state, if the music reproduction operation is being performed, the headphone is sensed and the continuous reproduction operation is set, the music reproduction operation is continued, to thereby contribute to convenience of the user. In addition, when the continuous reproduction operation is not set, it can be determined that the user does not desire to continue the music reproduction operation. Therefore, after the reproduction operation of the current music file ends, normal sleep processing is performed, to thereby contribute to convenience of the user. In particular, as the normal sleep processing is performed after the reproduction operation of the current music file ends, the reproduction operation can end without giving uncomfortable feeling to the user who enjoys the music reproduction operation.

[1017] <Automatic Recording and Reproduction Processing>

[1018] In the automatic recording and reproduction processing, processing of two functions of an automatic recording mode and an automatic reproduction mode is performed independently of each other. As described in step SD**2** in FIG. **66**, the automatic recording and reproduction processing is started after sound selection screen **400** is displayed.

[1019] FIG. **88** is a flowchart illustrating the automatic recording mode according to the present embodiment.

[1020] Referring to FIG. **88**, whether the volume of input from microphone **43** is equal to or greater than a threshold value is determined (step SD**170**). Specifically, audio input control circuit **42***b* senses whether the volume of input from microphone **43** is equal to or greater than the threshold value. When the sensed volume of input from microphone **43** is equal to or greater than the threshold value, audio input control circuit **42***b* outputs the result of sensing to CPU **31**.

[1021] When CPU **31** determines in step SD**170** that the volume of input from microphone **43** is equal to or greater than the threshold value, CPU **31** performs the recording processing (step SD**171**). Specifically, CPU **31** performs the recording processing, upon receiving the input of the result of sensing from audio input control circuit **42***b* that the volume of input from microphone **43** is equal to or greater than the threshold value.

[1022] FIG. **89** is a flowchart illustrating sub routine processing of the recording processing according to the present embodiment.

[1023] Referring to FIG. **89**, initially, CPU **31** determines whether audio input is present or not (step SD**180**). When CPU **31** determines that audio input is present, CPU **31** temporarily has the recording data input from audio input control circuit **42***b* stored (step SD**181**). Specifically, CPU **31** causes the main memory to temporarily store the recording data.

[1024] Thereafter, CPU **31** determines whether a capacity of the recording data has reached a capacity limit of a slot or not (step SD**182**). Here, the slot refers to a recording data storage area in memory **34** for storage, in which the recording data is stored as a recording data file. In the present example, it is assumed that a plurality of slots used for recording processing are provided in advance in memory **34** for storage. In the present example, for example, it is assumed that recording data of 10 seconds can be stored in one slot.

[1025] When CPU **31** determines in step SD**182** that the capacity of the recording data has not reached the capacity limit of the slot, the processing in step SD**180** and step SD**181** is repeated and the recording data is temporarily stored.

[1026] When CPU **31** determines in step SD**182** that the capacity of the recording data has reached the capacity limit of the slot, the process proceeds to step SD**184** and the recording ends. Then, referring back to FIG. **88**, the process proceeds to step SD**172**.

[1027] On the other hand, when CPU **31** determines in step SD**180** that audio input is not present, the process then proceeds to step SD**183**.

[1028] In step SD**183**, CPU **31** determines whether or not audio input is absent for a prescribed period. For example, the prescribed period for determining absence of sound can be set to three seconds. This period is merely by way of example, and an appropriate period may be set.

[1029] When CPU **31** determines in step SD**183** that audio input is absent for the prescribed period, recording ends (step SD**184**). Then, referring back to FIG. **88**, the process proceeds to step SD**172**.

[1030] On the other hand, when it is not determined in step SD**183** that audio input is absent for the prescribed period, that is, when the audio input is made again, the process again returns to step SD**180** and proceeds to step SD**181**.

[1031] According to this recording processing, when audio input is present, the recording data is automatically stored until the capacity limit of the slot is reached, and when there is no longer audio input, the recording processing automatically ends.

[1032] Through a series of processing as above (SD**180** to SD**183**), voice and sound is automatically recorded while sound selection screen **400** is displayed. Speech of the user while sound selection screen **400** is displayed (including unconscious utterance) is automatically recorded in the slot as the recording data so long as the capacity of the slot is available.

[1033] Referring again to FIG. **88**, thereafter, CPU **31** determines whether the capacity of the recording data is equal to or greater than a prescribed capacity or not (step SD**172**). Specifically, CPU **31** determines whether the capacity of the recording data temporarily stored in the main memory is equal to or greater than the prescribed capacity or not. For example, the prescribed capacity can be set to a capacity not less than a minimum period of time that can be recognized by the user as the audio signal in reproduction. In other words, a capacity less than the prescribed capacity means a capacity to such an extent that the recording data cannot be recognized as the audio signal when the user reproduces the recording data.

[1034] When CPU **31** determines in step SD**172** that the recording data of the prescribed capacity or greater is stored in the main memory, CPU **31** performs the processing for storing the recording data (step SD**173**). On the other hand, when CPU **31** determines in step SD**172** that the recording data of the prescribed capacity or greater is not stored, the temporarily stored recording data is erased (step SD**174**), because an amount of stored data is too small as the recording data and such data is not recognizable. Here, the prescribed capacity is assumed as being smaller than the capacity limit of the slot. Therefore, the recording data of such a length that the user cannot recognize as the audio signal is automatically erased.

[1035] FIG. **90** is a flowchart illustrating sub routine processing of the processing for storing the recording data.

[1036] Referring to FIG. **90**, initially, CPU **31** checks an empty slot (step SD**190**). Specifically, CPU **31** checks whether there is a slot not including the recording data, among a plurality of slots provided in advance in memory **34** for storage and serving as a plurality of recording data storage areas.

[1037] Then, CPU **31** determines whether there is an empty slot or not (step SD**191**).

[1038] When CPU **31** determines in step SD**191** that there is an empty slot, the processing for storing the recording data in the empty slot as the recording data file is performed (step SD**192**). Specifically, CPU **31** causes memory **34** for storage to store the temporarily stored recording data as the recording data file through memory control circuit **33**. Then, the process returns to the flow in FIG. **88** (return).

[1039] On the other hand, when CPU **31** determines in step SD**191** that there is no empty slot, one slot is determined from among the plurality of slots through processing using a random number, and processing for overwriting the slot determined by using a random number with the recording data as the recording data file (step SD**193**). Then, the process returns to the flow in FIG. **30** (return).

[1040] As a result of this processing, one recording data file is stored in the slot.

[1041] On the other hand, when CPU **31** determines in step SD**191** that the capacity of the recording data is not lower than a capacity limit, erasing processing for erasing an old recording data file is performed (step SD**193**). Then, the process again returns to step SD**191**, where it is determined whether the capacity of the recording data is lower than the capacity limit or not. The processing in step SD**193** is repeated until it is determined that the capacity of the recording data is lower than the capacity limit. When the capacity of the recording data is lower than the capacity limit, processing for storage as the recording data file described above is performed. Therefore, the old recording data file is automatically updated to a new recording data file.

[1042] The automatic reproduction mode will now be described.

[1043] FIG. **91** is a flowchart of the automatic reproduction mode according to the present embodiment.

[1044] Referring to FIG. **91**, CPU **31** determines whether there is a slot in which a recording data file is stored or not (step SD**200**). Specifically, CPU **31** determines whether or not the recording data files are present in a plurality of slots provided in advance in memory **34** for storage through memory control circuit **33**.

[1045] When there is no recording data file in a slot in step SD**200**, CPU **31** repeats the processing in step SD**200**.

[1046] On the other hand, when CPU **31** determines in step SD**200** that there is a recording data file in a slot, CPU **31** performs the processing for reproducing the recording data file (step SD**201**). Thereafter, CPU **31** performs stand-by processing (step SD**202**). Specifically, CPU **31** is in a stand-by state for a prescribed period of time and the process again returns to step SD**200**. The stand-by processing may be processing of being in a stand-by state for a certain prescribed period of time or for a random period of time.

[1047] Therefore, when there is a recording data file in a slot, CPU **31** repeats execution of the reproduction processing for a certain period of time or for a random period of time.

[1048] In addition, when it is determined that the recording data files are present in the plurality of slots in memory **34** for storage respectively, the processing for reproducing the recording data file stored in each slot is sequentially performed. In addition, during the reproduction processing, object **410** in a bird shape in FIG. **61** can be displayed in an animated manner. As a result of such display processing, the user can visually recognize execution of the reproduction processing based on the operation of object **410** in a bird shape.

[1049] As a result of this processing, when the user speaks loud enough for the volume of input from the microphone to exceed the threshold value while the sound selection screen in FIG. **61** is displayed, the audio signal representing the speech is stored in the slot as the recording data file based on the automatic recording mode. Based on the automatic reproduction mode, the audio signal stored in the slot as the recording data file is then automatically reproduced and the reproduction processing is repeated.

[1050] This function allows the user to create his/her own audio signal as the recording data file and to enjoy reproduction thereof.

[1051] The method of performing the recording processing or the recording and storing processing based on determination as to whether the capacity of the recording data has reached a prescribed capacity or not has been described above, however, such determination can be made, for example, based on a recording period of time without limited to the capacity, or such determination may be made based on another parameter.

[1052] <Setting Processing>

[1053] FIG. **92** is a flowchart illustrating sub routine processing of the setting processing according to the present embodiment.

[1054] Referring to FIG. **92**, when CPU **31** determines that the coordinate value indicated by the touch position is within the display range of "setting" icon **408** in FIG. **61**, CPU **31** has the setting screen displayed (step SD**210**).

[1055] FIG. **93** is a diagram illustrating a setting screen **508** according to the present embodiment.

[1056] Referring to FIG. **93**, here, a "headphone" setting item **560**, a "touch sound" setting item **562**, and a "backlight" setting item **564** are provided. In addition, as "headphone" setting item **560**, a selection function icon **561** for selecting and setting "stereophonic" or "monaural" is provided. Moreover, as "touch sound" setting item **562**, a selection function icon **563** for selecting and setting "sound on" or "sound off" is provided. Further, as "backlight" setting item **564**, a selection function icon **565** for selecting and setting "always on" or "automatically turned off" is provided. In addition, a "saved data initialization" icon **566** is provided, and by selecting this "saved data initialization" icon **566**, the content in the recording data file in the automatic recording and reproduction processing, the content in the recording data file created in the microphone recording and reproduction mode which will be described later, or the music file content registered in "favorite" is erased. In addition, by selecting a "back" icon **512***b*, the screen returns to immediately preceding sound selection screen **400**.

[1057] Referring again to FIG. **92**, CPU **31** determines whether the touch position data has been input from touch panel **13** or not (step SD**211**).

[1058] When CPU **31** determines in step SD**211** that the touch position data has been input from touch panel **13**, CPU **31** determines whether the coordinate value indicated by the touch position data is within the display range of the function selection icon of "headphone" or not (step SD**212**).

[1059] When CPU **31** determines in step SD**212** that the coordinate value indicated by the touch position data is within the display range of the function selection icon of "headphone", CPU **31** determines whether the current setting is "stereophonic" or not (step SD**213**).

[1060] When the current setting is "stereophonic" in step SD**213**, CPU **31** makes switching to monaural setting (step SD**214**).

[1061] On the other hand, when CPU **31** determines in step SD**213** that the current setting is not "stereophonic", CPU **31** makes switching to stereophonic setting (step SD**215**).

[1062] In the "stereophonic" setting, while the headphone is connected, stereophonic audio output is provided. Namely, output for the right and output for the left are separately provided. On the other hand, in the "monaural" setting, while the headphone is connected, monaural audio output is provided, but while the headphone is not connected, stereophonic audio output is provided, regardless of this setting.

[1063] When CPU **31** determines in step SD**212** that the coordinate value indicated by the touch position data is not within the display range of the function selection icon of "headphone", CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of the function selection icon of "touch sound" or not (step SD**216**).

[1064] When CPU **31** determines in step SD**216** that the coordinate value indicated by the touch position data is within the display range of the function selection icon of "touch sound", CPU **31** determines whether the current setting is "sound on" or not (step SD**217**).

[1065] When CPU **31** determines in step SD**217** that the current setting is "sound on", CPU **31** makes switching to touch sound off setting (step SD**218**).

[1066] The process again returns to step SD**211**.

[1067] When CPU **31** determines in step SD**217** that the current setting is not "sound on", CPU **31** makes switching to touch sound on setting (step SD**219**).

[1068] When CPU **31** determines in step SD**216** that the coordinate value indicated by the touch position data is not within the display range of the function selection icon of "touch sound", CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of the function selection icon of the "backlight function" or not (step SD**220**).

[1069] When CPU **31** determines in step SD**220** that the coordinate value indicated by the touch position data is within the display range of the function selection icon of "backlight", CPU **31** determines whether the current setting is "always on" or not (step SD**221**).

[1070] When CPU **31** determines in step SD**221** that the current setting is "always on", CPU **31** makes switching to automatic off setting (step SD**222**). As a result of switching to the automatic off setting, when it is determined that game device **10** is not operated for a certain period of time, the processing for automatically turning off the backlight is performed.

[1071] On the other hand, when CPU **31** determines in step SD**221** that the current setting is not "always on", CPU **31** makes switching to always on setting (step SD**223**). Then, the process returns to step SD**211**.

[1072] On the other hand, when CPU **31** determines in step SD**220** that the coordinate value indicated by the touch position data is not within the display range of the function selection icon of "backlight", CPU **31** determines whether the coordinate value indicated by the touch position data is within the display range of the function selection icon of "saved data initialization" or not (step SD**224**).

[1073] When CPU **31** determines in step SD**224** that the coordinate value indicated by the touch position data is within the display range of the function selection icon of "saved data initialization", CPU **31** performs processing for erasing the recording data file and the contents registered in "favorite" (step SD**225**). Namely, the processing or the like for erasing the recording data file stored in data memory **34** for storage is performed.

[1074] When CPU **31** determines in step SD**224** that the coordinate value indicated by the touch position data is not within the display range of the function selection icon of "saved data initialization," CPU **31** determines whether the coordinate value indicated by the touch position data is within the display range of the function selection icon of "back" or not.

[1075] When CPU **31** determines in step SD**226** that the coordinate value indicated by the touch position data is within the display range of the function selection icon of "back", the screen returns to immediately preceding sound selection screen **400**.

[1076] As a result of this setting processing, for example with regard to the reproduction processing when the headphone for one ear is attached, the stereophonic setting can be switched to the monaural setting as desired by the user. As a result of such switching setting, appropriate reproduction processing can be selected in accordance with the type of the headphone. Naturally, in the case of the headphone for both ears, switching to the monaural setting can also be made.

[1077] <Microphone Recording and Reproduction Mode>

[1078] The microphone recording and reproduction mode will now be described.

[1079] FIG. **94** is a flowchart illustrating sub routine processing in the microphone recording and reproduction mode.

[1080] Referring to FIG. **94**, when transition to the microphone recording and reproduction mode is made, initially, CPU **31** has a recording data file list selection screen for play with sound recorded through the microphone displayed (step SD**230**).

[1081] FIG. **95** is a diagram illustrating a recording data file list selection screen **600** according to the present embodiment.

[1082] Referring to FIG. **95**, a case where recording data file list selection screen **600** is displayed on the screen of lower LCD **12** is shown.

[1083] The user can select any recording data file from a recording data file list by touching the screen on lower LCD **12** with touch pen **27** etc. As will be described later, it is assumed that the recording data file is set to a display color selectively designated by the user. Here, each recording data file in the recording data file list corresponds to each one of the plurality of slots provided in advance in memory **34** for storage for use in the recording processing.

[1084] For example, it is assumed that a cursor **590** selects a recording data file displayed at the top left in a recording data file list **610** on recording data file list selection screen **600**. For example, by touching a recording data file included in recording data file list **610** with touch pen **27** etc., cursor **590** moves to the touched recording data file and the recording data file designated with cursor **590** is in a selected state.

[1085] In addition, it is assumed that, by touching any recording data file on the screen and moving this recording data file to a position of any other recording data file while maintaining the touched state, that is, maintaining the selected state of the recording data file designated with cursor **590** (performing slide operation), positions of these recording data files are interchanged.

[1086] Here, for example, a recording data file **615** is assumed as a file storing no recording data, which is also applicable to other files. On the other hand, recording data files other than aforementioned are assumed as files storing recording data. In the present example, for example, it is assumed that one file can record an audio signal for approximately 10 seconds.

[1087] In addition, the user can set the volume at which output is provided from the speaker or the like by designating volume setting icon **550** with touch pen **27** etc. Since this processing is as described above, detailed description thereof will not be repeated.

[1088] Moreover, the user can return to sound selection screen **400** which is the preceding screen, by selecting a "back" icon **620**.

[1089] Further, by selecting a recording data file in recording data file list selection screen **600** and selecting a "play" icon **570**, the reproduction processing is started and a recording data reproduction operation selection screen **301** is displayed.

[1090] On the other hand, it is assumed that, if a file in which no recording data is stored is selected from recording data file list selection screen **600**, "play" icon **570** is changed to a "record" icon **570**#. Then, by selecting this "record" icon **570**#, a recording start screen **602** which will be described later is displayed.

[1091] In addition, by selecting an "erase" icon **571** with touch pen **27** etc., the currently selected recording data file can be erased and a file in which no recording data is stored can be set.

[1092] In addition, regarding a manner of display of the recording data file, a data amount of the recording data included in each file relative to the total capacity is displayed as a water level. Based on such a manner of display, the user can sensuously recognize the amount of data of the recording data file. In addition, in recording data file list **610**, a recording data file different in shape is shown. For example, when a modification and edition function by using tone adjustment icon **542** or the like which will be described later is performed and "overwrite" is selected, that is, when change to different recording data is made, display processing is performed such that the shape of the recording data file is changed in accordance with modification and edition.

[1093] As a result of this manner of display, the user can intuitively recognize that a recording data file is a modified and edited file, which contributes to convenience of the user.

[1094] FIG. **96** is a diagram illustrating recording data reproduction operation selection screen **601** according to the embodiment of the present invention.

[1095] FIG. **96**(*a*) shows a case that recording data reproduction operation selection screen **601** is displayed on lower LCD **12**.

[1096] Specifically, the user can perform the function of the operation with music being modified, in the reproduction operation or the like of the recording data based on selection with the touch pen etc.

[1097] Here, a case where speed and key adjustment icon **541**, tone adjustment icon **542**, reproduction mode switching icon **517**, and an "overwrite" icon **586** are provided as the selection function icon is shown.

[1098] The user can perform the function to change the reproduction speed or the key by selecting speed and key adjustment icon **541** described above.

[1099] In addition, the user can perform the function for modification and edition to another tone by modulating a frequency of the reproduction signal or by performing filtering processing or the like based on selection of tone adjustment icon **542**. Specifically, the tone adjustment icon described in connection with FIG. **79** may be provided or another tone adjustment icon may be provided.

[1100] In addition, the user can cause the recording data file being reproduced to pause, by pressing a pause command icon **580** serving as the reproduction operation command icon. Here, display of pause command icon **580** is changed to display of a play command icon **582**#. Moreover, a reverse play command icon **580** is also provided as the reproduction operation command icon. When reverse play command icon **580** is selected, reverse reproduction processing is performed. Here, display of reverse play command icon **580** is changed to display of a pause command icon **580**#. Two icons of the play command and the reverse play command are displayed as such command icons, and the selected icon is switched to the pause command icon. Therefore, the user can switch between the reproduction operation and the reverse reproduction operation with one action by using touch pen **27** etc.

[1101] Specifically, in a reproduction interface for music data (here, music data will be described by way of example, however, a video data may be applicable), two command icon areas are provided (a first command icon area and a second command icon area), any of the reverse play command icon and the pause command icon is displayed in a switched manner in the first command icon area, and any of the play command icon and the pause command icon is displayed in a switched manner in the second command icon area.

[1102] More specifically, the manner of display is as follows.

[1103] In stop state: The reverse play command icon is displayed in the first command icon area and the play command icon is displayed in the second command icon area.

[1104] In play state: The reverse play command icon is displayed in the first command icon area and the pause command icon is displayed in the second command icon area.

[1105] In reverse play state: The pause command icon is displayed in the first command icon area and the play command icon is displayed in the second command icon area.

[1106] Play command icon: When touched, forward play of audio data is started.

[1107] Reverse play command icon: When touched, reverse play of audio data is started.

[1108] Pause command icon: When touched, reproduction of audio data is caused to pause.

[1109] Though the pause command icon indicating pause has been described in the present example, a stop command icon indicating stop instead of pause may be employed.

[1110] Thus, transition to any of play, reverse play and stop can be made by using two command icon areas in any state of stop, play and reverse play.

[1111] Speaking more generally, in an information processing device that can take three states (a first state, a second state, and a third state), two button areas are provided, and when the information processing device is currently in the first state, a button for transition to the second state and a button for transition to the third state are displayed (i). When the button for transition from the (i) state to the second state is operated to make transition to the second state, the button for transition to the second state is changed to a button for transition to the first state, and the button for transition to the first state and the button for transition to the third state are displayed (ii). In addition, when the button for transition from the (i) state to the third state is operated to make transition to the third state, the button for transition to the third state is changed to the button for transition to the first state, and the button for transition to the second state and the button for transition to the first state are displayed (iii). Moreover, when the button for transition from the (ii) state to the first state is operated to make transition to the first state, the state returns to the (i) state. Further, when the button for transition from the (iii) state to the first state is operated to make transition to the first state, the state returns to the (i) state. In addition, when the button for transition from the (ii) state to the third state is operated to make transition to the third state, the button for transition to the first state is changed to the button for transition to the second state, the button for transition to the third state is changed to the button for transition to the first state, and the button for transition to the second state and the button for transition to the first state are displayed. In addition, when the button for transition from the (iii) state to the second state is operated to make transition to the second state, the button for transition to the second state is changed to the button for transition to the first state, and the button for transition to the first state is changed to the button for transition to the third state.

[1112] Thus, two button areas can be used to efficiently make transition to any of the three states.

[1113] Further, the user can make switching among the reproduction modes in the recording data file list by pressing reproduction mode switching icon **517**. Specifically, the reproduction mode in which data being reproduced is repeatedly reproduced, the reproduction mode in which data is sequentially reproduced and reproduction is repeated from the beginning when reproduction is completed, the reproduction mode in which data is sequentially reproduced and reproduction is stopped when reproduction is completed, the reproduction mode in which random reproduction is performed, and the reproduction mode in which only a set section is repeatedly reproduced can sequentially be switched and executed.

[1114] In addition, by pressing "overwrite" icon **586**, for example, the user can overwrite for storage, the recording

data file with a recording data file modified and edited through filtering processing or the like based on selection of a tone adjustment icon **588**.

[1115] In addition, FIG. **96**(*b*) shows a case where recording data file list **610** displayed on the screen of lower LCD **12** in FIG. **95** is now displayed on the screen of upper LCD **22** as a recording data file selection list screen **601**#. The recording data file displayed on recording data file list **610**# can then be selected by operating direction input button **14**A. Namely, after the recording data file is selected with the touch pen etc. (by pressing play) on the screen of lower LCD **12** in FIG. **95**, on the screen of lower LCD **12** in FIG. **96**(*a*), the processing for the reproduction operation of the recording data file selected with the touch pen etc. is selected on the recording data reproduction operation selection screen with the touch pen etc. and on the screen of upper LCD **22**, the recording data file can be selected with direction input button **14**A.

[1116] For example, by using direction input button **14**A to select the recording data file and pressing any of operation buttons **14**B to **14**E, the recording data file being reproduced is switched to the selected recording data file and the reproduction operation thereof can be performed.

[1117] Therefore, the processing in reproduction operation selection screen **601** on lower LCD **12** and the processing in recording data file selection list screen **601**# on upper LCD **22** can be performed in parallel, which contributes to convenience of the user.

[1118] In addition, by pressing "overwrite" icon **586**, for example, the user can overwrite for storage, the recording data file with a recording data file modified and edited through filtering processing or the like based on selection of a tone adjustment icon **588**.

[1119] Specifically, in an information processing device having two screens (or two display areas), contact detection means (in the present embodiment, a touch panel) is provided for at least one screen (in the present embodiment, lower LCD **12**). Then, an icon group (a first icon group; in the embodiment, a group of icons **615** showing respective recording data files) showing a plurality of choices is displayed on one screen, and selection of any icon is permitted through the contact detection means. After any icon is selected from among the plurality of icons by using the contact detection means, display of the first icon group is moved to the other screen (in the present embodiment, upper LCD **22**) and another icon group (a second icon group; in the embodiment, **541** and **542**) is displayed on one screen and selection of any icon from this second icon group is permitted through the contact detection means. Even after the first icon group has moved to the other screen, one icon can be selected from the first icon group by using a key switch (which is a direction key, and in the embodiment, a cross-shaped key **14**A). Thus, selection from the first icon group and selection from the second icon group can be made in parallel. For example, first selection may be made with the use of the first icon group and selection relating to the icon selected in the first selection may be made with the use of the second icon group (in the present embodiment, data to be processed is selected in the first selection and processing content for the selected data is selected in the second selection). Here, even after transition to a condition for the second selection is made after the first selection from the first icon group, selection from the first icon group can be changed by operating the key switch and hence the first selection can be redone in parallel after transition to the condition for the second selection, which contributes to improved convenience.

[1120] Referring again to FIG. **94**, CPU **31** determines whether the touch position data has been input from touch panel **13** or not (step SD**231**).

[1121] When CPU **31** determines in step SD**231** that the touch position data has been input from touch panel **13**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of recording data file list **610** or not (step SD**232**).

[1122] When CPU **31** determines in step SD**232** that the coordinate value indicated by the touch position data is within the display range of recording data file list **610**, the recording data file is selected and displayed in accordance with the touch position (step SD**233**).

[1123] Then, CPU **31** changes a function icon button in accordance with the recording data file and has the resultant function icon button displayed (step SD**234**). The process then again returns to step SD**231**. Specifically, when the cursor selects and indicates a recording data file, "play" icon **570** is displayed. When the cursor selects and indicates a file in which nothing is recorded, "record" icon **570**# is displayed.

[1124] When CPU **31** determines in step SD**232** that the coordinate value indicated by the touch position data is not within the display range of recording file list **610**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of volume setting icon **550** or not (step SD**235**).

[1125] When CPU **31** determines in step SD**235** that the coordinate value indicated by the touch position data is within the display range of volume setting icon **550**, CPU **31** performs the volume setting processing (step SD**236**). As the volume setting processing has been described above, detailed description thereof will not be repeated.

[1126] On the other hand, when CPU **31** determines in step SD**235** that the coordinate value indicated by the touch position data is not within the display range of volume setting icon **550**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of "play" icon **570** or not (step SD**237**).

[1127] When CPU **31** determines in step SD**237** that the coordinate value indicated by the touch position data is within the display range of "play" icon **570**, CPU **31** performs the processing for reproducing a recording data file (step SD**237**#). The processing for reproducing the recording data file will be described later.

[1128] On the other hand, when CPU **31** determines in step SD**237** that the coordinate value indicated by the touch position data is not within the display range of "play" icon **570**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of "erase" icon **571** or not (step SD**238**).

[1129] When CPU **31** determines in step SD**238** that the coordinate value indicated by the touch position data is within the display range of "erase" icon **571**, CPU **31** performs the processing for erasing the recording data file (step SD**239**).

[1130] When CPU **31** determines in step SD**238** that the coordinate value indicated by the touch position data is not within the display range of "erase" icon **571**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of "record" icon **570**# or not (step SD**240**).

[1131] When CPU **31** determines in step SD**240** that the coordinate value indicated by the touch position data is within

the display range of "record" icon **570**#, CPU **31** performs processing for creating the recording data file (step SD**241**). The processing for creating the recording data file will be described later.

[1132] When CPU **31** determines in step SD**240** that the coordinate value indicated by the touch position data is not within the display range of "record" icon **570**#, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of "back" icon **620** or not (step SD**242**).

[1133] When CPU **31** determines in step SD**242** that the coordinate value indicated by the touch position data is not within the display range of "back" icon **620**, the process again proceeds to step SD**231**.

[1134] On the other hand, when CPU **31** determines in step SD**242** that the coordinate value indicated by the touch position data is within the display range of "back" icon **620**, sound selection screen **400** shown in FIG. **61** is displayed.

[1135] FIG. **97** is a diagram illustrating sub routine processing of the processing for reproducing the recording data file.

[1136] Referring to FIG. **97**, when CPU **31** determines in step SD**237** that the coordinate value indicated by the touch position data is within the display range of the "play" icon, CPU **31** then starts the processing for reproducing the selected recording data file (step SD**250**).

[1137] Thereafter, CPU **31** causes upper LCD **22** to display recording data file selection list screen **601**# and lower LCD **12** to display reproduction operation selection screen **601** (step SD**251**).

[1138] Thereafter, CPU **31** determines whether the touch position data has been input from touch panel **13** or not (step SD**252**).

[1139] When CPU **31** determines in step SD**252** that the touch position data has been input from touch panel **13**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of a reproduction time bar **551** or not (step SD**253**).

[1140] When CPU **31** determines in step SD**252** that the touch position data has not been input from touch panel **13**, CPU **31** then determines whether the operation of direction input button **14**A has been performed or not (step SD**264**).

[1141] When CPU **31** determines in step SD**264** that the operation of direction input button **14**A has been performed, CPU **31** performs the processing for scroll display of the cursor position indicating the selected recording data file in recording data file selection list screen **601**# in accordance with the operation of direction input button **14**A (step SD**265**).

[1142] On the other hand, when CPU **31** determines in step SD**264** that the operation of direction input button **14**A has not been performed, the process again returns to step SD**252**.

[1143] Then, CPU **31** determines whether a prescribed button has been pressed or not (step SD**266**).

[1144] When the prescribed button has been pressed in step SD**266**, CPU **31** starts reproduction of the recording data file selected by the cursor position (step SD**250**).

[1145] On the other hand, when the prescribed button has not been pressed in step SD**266**, the process again returns to step SD**252**. Here, it is assumed that the prescribed button is set to any of operation buttons **14**B to **14**E.

[1146] On the other hand, when CPU **31** determines in step S**252** that the touch position data has been input from touch panel **13**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of reproduction time bar **551** or not (step SD**253**).

[1147] When CPU **31** determines in step SD**253** that the coordinate value indicated by the touch position data is within the display range of reproduction time bar **251**, CPU **31** performs the processing for reproducing the recording data file from the time corresponding to the touch position (step SD**254**).

[1148] In step SD**254**, CPU **31** then performs the processing for moving the slider position on reproduction time bar **251** in accordance with the touch position (step SD**255**).

[1149] When CPU **31** determines in step SD**253** that the coordinate value indicated by the touch position data is not within the display range of reproduction time bar **251**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of volume setting icon **550** or not (step SD**256**).

[1150] When CPU **31** determines in step SD**256** that the coordinate value indicated by the touch position data is within the display range of volume setting icon **550**, CPU **31** performs the volume setting processing (step SD**257**). As the volume setting processing has been described above, detailed description thereof will not be repeated.

[1151] When CPU **31** determines in step SD**256** that the coordinate value indicated by the touch position data is not within the display range of volume setting icon **550**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of the reproduction operation command icon or not (step SD**258**).

[1152] When CPU **31** determines in step SD**258** that the coordinate value indicated by the touch position data is within the display range of the reproduction operation command icon, CPU **31** performs the function corresponding to the reproduction operation command (step SD**259**).

[1153] Thereafter, display of the reproduction operation command is switched (step SD**260**).

[1154] Then, the process again returns to step SD**252**.

[1155] When CPU **31** determines in step SD**258** that the coordinate value indicated by the touch position data is not within the display range of the reproduction operation command icon, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of the selection function icon or not (step SD**261**).

[1156] When CPU **31** determines in step SD**261** that the coordinate value indicated by the touch position data is within the display range of the selection function icon, CPU **31** performs the function corresponding to the selection function icon (step SD**262**).

[1157] When CPU **31** determines in step SD**261** that the coordinate value indicated by the touch position data is not within the display range of the selection function icon, CPU **31** determines whether the coordinate value indicated by the touch position is within the display range of "back" icon **513**.

[1158] When CPU **31** determines in step SD**263** that the coordinate value indicated by the touch position data is within the display range of "back" icon **513**, recording data file list selection screen **600** which is the preceding screen is displayed (step SD**230**).

[1159] On the other hand, when CPU **31** determines in step SD**263** that the coordinate value indicated by the touch position is not within the display range of "back" icon **513**, the process returns to step SD**252**.

[1160] FIGS. **98** and **100** are flowcharts illustrating sub routine processing of the processing for creating a recording data file.

[1161] As described above, it is assumed that a plurality of slots used for processing for recording in memory **34** for storage are provided in advance in the present embodiment.

[1162] Referring to FIG. **98**, initially, CPU **31** has recording start screen **602** displayed.

[1163] FIG. **99** is a diagram illustrating recording start screen **602** according to the present embodiment (step SD**270**).

[1164] Referring to FIG. **99**, a recording command icon **610** is provided in recording start screen **602**. In addition, a "quit" icon **615** is provided. By pressing recording command icon **610**, recording is started. In addition, it is assumed that, after recording is started, display of recording command icon **610** is changed to display of a stop command icon **610**#. By pressing stop command icon **610**#, recording is stopped. In addition, by pressing "quit" icon **615**, it is assumed that the screen returns to recording data file list selection screen **600** which is the preceding screen.

[1165] Referring again to FIG. **98**, CPU **31** determines whether the touch position data has been input from touch panel **13** or not (step SD**270**#).

[1166] Thereafter, when CPU **31** determines that the touch position data has been input from touch panel **13**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of the recording command icon or not (step SD**271**).

[1167] When CPU **31** determines in step SD**271** that the coordinate value indicated by the touch position data is within the display range of recording command icon **610**, CPU **31** then determines whether the volume of input from the microphone is equal to or greater than the threshold value or not (step SD**272**).

[1168] When it is determined that the volume of input from the microphone is equal to or greater than the threshold value, CPU **31** then starts the recording processing (step SD**273**).

[1169] Thereafter, CPU **31** makes switching of display of the recording command (step SD**274**). Specifically, stop command icon **610**# is displayed.

[1170] Thereafter, CPU **31** determines whether the touch position data has been input from touch panel **13** or not (step SD**275**).

[1171] When CPU **31** determines that the touch position data has been input from touch panel **13**, CPU **31** determines whether the coordinate value indicated by the touch position data is within the display range of stop command icon **610**# or not (step SD**276**).

[1172] When CPU **31** determines in step SD**276** that the coordinate value indicated by the touch position data is within the display range of stop command icon **610**#, the recording processing ends (step SD**277**) and the process proceeds to "D".

[1173] Referring to FIG. **100**, when the recording processing ends in step SD**277**, CPU **31** then stores the recording data file (step SD**290**). Specifically, CPU **31** causes data memory **34** for storage to store the recording data file through memory control circuit **33**.

[1174] Thereafter, CPU **31** has a recording data file color designation screen displayed (step SD**291**).

[1175] FIG. **101** is a diagram illustrating a recording data file color designation screen **603** according to the present embodiment.

[1176] Referring to FIG. **101**, a case where a message "Recording is completed. You can play with this sound." is displayed on recording data file color designation screen **603** according to the present embodiment is shown. A color designation area **620** is provided and color designation selection icons **621** to **626** indicating red, orange, yellow, green, blue, and navy, respectively are provided. The user can designate any color designation icon by touching the icon with touch pen **27** etc. A display color of the recording data file corresponding to the designated slot is registered in this designated color. In addition, by pressing a "cancel" icon **630**, the recording data file is erased and the screen returns to recording data file list selection screen **600**.

[1177] Referring again to FIG. **100**, CPU **31** determines whether the touch position data has been input from touch panel **13** or not (step SD**292**).

[1178] When CPU **31** determines in step SD**292** that the touch position data has been input from touch panel **13**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the color designation area or not (step SD**293**).

[1179] When CPU **31** determines in step SD**293** that the coordinate value indicated by the touch position data is within the color designation area, the designated display color is registered (step SD**294**). Then, CPU **31** has recording data file list selection screen **600** displayed. Here, the selected recording data file is displayed in the designated display color.

[1180] On the other hand, when CPU **31** determines in step SD**293** that the coordinate value indicated by the touch position data is not within the color designation area, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of "cancel" icon **630** or not (step SD**295**).

[1181] When CPU **31** determines in step SD**295** that the coordinate value indicated by the touch position data is not within the display range of "cancel" icon **630**, the process returns to step SD**292**.

[1182] On the other hand, when CPU **31** determines in step SD**295** that the coordinate value indicated by the touch position data is within the display range of "cancel" icon **630**, the recording data file corresponding to the designated slot is erased (step SD**296**).

[1183] Then, CPU **31** has recording data file list selection screen **600** displayed. Here, the selected file is displayed as a file in which no recording data is stored.

[1184] Referring again to FIG. **98**, when CPU **31** determines in step SD**276** that the coordinate value indicated by the touch position data is not within the display range of stop command icon **610**#, the process returns to step SD**275**.

[1185] When the touch position data has not been input from touch panel **13** in step SD**275**, CPU **31** determines whether the capacity of the recording data has reached the capacity limit of the slot or not (step SD**278**).

[1186] When CPU **31** determines in step SD**278** that the capacity of the recording data has not reached the capacity limit of the slot, the process again returns to step SD**275**.

[1187] When CPU **31** determines in step SD**278** that the capacity of the recording data has not reached the capacity limit of the slot, the process again returns to step SD**275**.

[1188] Then, when CPU **31** determines in step SD**278** that the capacity of the recording data has reached the capacity limit of the slot, the recording processing ends (step SD**279**). Then, the process proceeds to step SD**290** in FIG. **100**. The subsequent processing is as described above.

[1189] On the other hand, when CPU **31** determines in step SD**271** that the coordinate value indicated by the touch position data is not within the display range of recording command icon **610**, CPU **31** then determines whether the coordinate value indicated by the touch position data is within the display range of "quit" icon **615** or not.

[1190] When CPU **31** determines in step SD**280** that the coordinate value indicated by the touch position data is within the display range of "quit" icon **615**, CPU **31** has recording data file list selection screen **600** as described in connection with FIG. **95** displayed.

[1191] On the other hand, when CPU **31** determines in step SD**280** that the coordinate value indicated by the touch position data is not within the display range of "quit" icon **615**, the process proceeds to step SD**270**#.

[1192] As a result of this processing, the user can create a recording data file freely recorded by the user through the microphone in the main body and reproduce the created recording data file. In addition, the function to display the created recording data file by selecting recording data selection icon **544** described in connection with FIG. **65** and to output the recording data file recorded in a similar manner as sound effect from the speaker can also be performed.

[1193] In the present embodiment described above, for example, a case where the slot storing the recording data file is provided in memory **34** for storage embedded in game device **10** has been described. Storage of the recording data file, however, is not limited to storage in memory **34** for storage, and for example, the recording data file may be stored in a memory card such as an SD card in accordance with a user's operation instruction.

10. STORAGE MEDIUM STORING PROGRAM

[1194] Description above has been provided on the premise that various application programs to be executed are stored in any of at least data memory **34** for storage, memory card **28**, and memory card **29**. A more preferred embodiment of an application program stored in each storage medium will be exemplified hereinafter.

[1195] FIG. **103** is a diagram for illustrating a storage medium that can be used with game device **10** according to the present embodiment.

[1196] Referring to FIG. **103**, data memory **34** for storage embedded in game device **10** is provided with a program area and a data area separately for each other. Typically, a first photographing function program **901** (for example, photographing function program **52** or photographing application program **53** described previously), a first recording function program **902** (for example, sound application program **57** described previously), a second photographing function program **903** (which is a program that has not yet been described so far, for example, a program similar to photographing application program **53** described previously that allows storage of taken images also in a memory in an attached card complying with dedicated specifications in a photographing mode and allows display of taken images stored in the memory in the attached card complying with dedicated specifications), a second recording function program **904** (which is a program that has not yet been described so far, for example, a program similar to sound application program **57** described previously that allows storage of audio data also in a memory in an attached card complying with dedicated specifications and allows utilization of audio data stored in the memory in the attached card complying with dedicated specifications), a first photograph utilization program **905** (which is a program that has not yet been described so far, for example, a program having an edition function (only the edition function in the photographing mode described previously) and a photograph viewing function (the photograph display mode described previously) in photographing application program **53** described previously), a first audio utilization program **906** (which is a program that has not yet been described so far, for example, a program having functions of sound application program **57** described previously with the recording function being deleted therefrom), a second photograph utilization program **907** (which is a program that has not yet been described so far, for example, a program that has only the photograph display mode of photographing application program **53** described previously and in addition allows display of taken images stored in a memory in an attached card complying with dedicated specifications), and a second audio utilization program **907** (which is a program that has not yet been described so far, for example, a program having functions of sound application program **57** described previously with the recording function being deleted therefrom, that allows reproduction or edition of the audio data stored in the memory in the attached card complying with dedicated specifications) can be stored in the program area.

[1197] It is assumed that first photographing function program **901**, first recording function program **902**, first photograph utilization program **905**, and first audio utilization program **906** among these programs are stored in advance (preinstalled) in data memory **34** for storage of game device **10**.

[1198] In contrast, second photographing function program **903**, second recording function program **904**, second photograph utilization program **907**, and second audio utilization program **907** are downloaded from a not-shown distribution server through wireless communication module **38**, local communication module **39**, or other communication means.

[1199] In addition, a data area **909** can store in a non-volatile manner, image pick-up data obtained by first or second photographing function program **901** or **903** and/or audio data obtained by first or second recording function program **902** or **904** or the like. It is noted that image pick-up data obtained by the first photographing function program and image pick-up data obtained by the second photographing function program may be stored in the same area without distinction, so that both of them can be utilized. Alternatively, the audio data obtained by the first recording function program and the audio data obtained by the second recording function program may be stored in the same area without distinction, so that both of them can be utilized.

[1200] For better understanding, FIG. **103** shows an "embedded NAND" representing a NAND-type flash memory typically implementing data memory **34** for storage. Naturally, memory **34** for storage may be implemented by a non-volatile memory other than the NAND-type flash memory.

[1201] In addition, memory card **28** (typically an SD card) implemented by a universal specifications card complying with universal specifications can be attached to game device **10** according to the present embodiment through memory card interface **36** (FIG. **18**). Memory card **28** can store various types of data in a non-volatile manner. Namely, memory card **28** is provided with a data area **910**.

[1202] Moreover, any of various memory cards **29-1** to **29-4** implemented by a dedicated specifications card complying with dedicated specifications can selectively be attached

to game device **10** according to the present embodiment through memory card interface **37** (FIG. **18**). Each of memory cards **29-1** to **29-4** is provided with a program area and a data area separately from each other.

[1203] More specifically, it is assumed that memory card **28-1** stores a photographing function program **921** (a program having a function similar to that of photographing function program **2** described previously, but different in specific contents thereof) and a photograph utilization program **922** (a program having a function similar to that of the second photograph utilization program described previously, but different in specific contents thereof). In addition, memory card **29-1** is provided with a data area **923** where image pick-up data and/or audio data can be stored in a non-volatile manner.

[1204] Similarly, it is assumed that memory card **29-2** stores a photographing function program **931** (a program having a function similar to that of photographing function program **2** described previously, but different in specific contents thereof; storage destination of taken images being limited to a non-volatile memory **933** in the card itself) and a photograph utilization program **932** (a program having a function similar to that of photograph utilization program **2** described previously, but different in specific contents thereof; photographs that can be utilized being limited to taken images stored in non-volatile memory **933** in the card itself). In addition, memory card **28-2** is provided with a data area **933** where image pick-up data and/or audio data can be stored in a non-volatile manner.

[1205] In addition, it is assumed that memory card **29-3** stores a recording function program **941** (a program having a function similar to that of recording function program **2** described previously, but different in specific contents thereof) and an audio utilization program **942** (a program having a function similar to that of audio utilization program **2** described previously, but different in specific contents thereof). Moreover, memory card **28-3** is provided with a data area **943** where image pick-up data and/or audio data can be stored in a non-volatile manner.

[1206] Similarly, it is assumed that memory card **28-4** stores a recording function program **951** (a program having a function similar to that of recording function program **2** described previously, but different in specific contents thereof; storage destination of recorded audio data being limited to a non-volatile memory **953** in the card itself) and an audio utilization program **952** (a program having a function similar to that of audio utilization program **2** described previously, but different in specific contents thereof; audio data that can be utilized being limited to audio data stored in non-volatile memory **933** in the card itself). Moreover, memory card **28-4** is provided with a data area **953** where image pick-up data and/or audio data can be stored in a non-volatile manner.

[1207] Programs stored in respective storage media are different from each other in a provided function in a part or in its entirety, for example, even though a program is a photographing function program providing the same photographing function.

[1208] For example, first photographing function program **901** pre-installed in the main body of game device **10** and second photographing function program **903** stored in game device **10** as a result of downloading are different from each other in a variety of choices of storage destination of image data obtained in photographing. Namely, according to first photographing function program **901**, the obtained image pick-up data can selectively be stored in any of embedded data memory **34** for storage (data area **909**, embedded NAND) and memory card **28** (SD card). On the other hand, according to second photographing function program **903**, the obtained image pick-up data can selectively be stored in any of embedded data memory **34** for storage (data area **909**, embedded NAND), memory card **28** (SD card), and memory card **29** attached to game device **10** (card complying with dedicated specifications). Namely, second photographing function program **903** provides more sophisticated processing than first photographing function program **901**, in terms of a variety of choices of storage destination of image pick-up data.

[1209] The processing as shown in FIG. **30** above is performed as a result of execution of any photographing function program by CPU **31**. Difference in a function between similar photographing function programs leads to the different number of button images for selecting a storage destination shown in FIG. **31**.

[1210] Similarly, according to first recording function program **902**, the obtained audio data can selectively be stored in any of embedded data memory **34** for storage (data area **909**, embedded NAND) and memory card **28** (SD card). On the other hand, according to second recording function program **904**, the obtained audio data can selectively be stored in any of embedded data memory **34** for storage (data area **909**, embedded NAND), memory card **28** (SD card), and memory card **29** attached to game device **10** (card complying with dedicated specifications). Namely, second photographing recording program **904** provides more sophisticated processing than first recording function program **902**, in terms of a variety of choices of storage destination of image pick-up data. It is noted that the processing as shown in FIG. **30** above is implemented as a result of execution of the recording function program by CPU **31**.

[1211] It is noted that the processing as shown in FIG. **98** above is implemented as a result of execution of any recording function program by CPU **31**. Difference in a function between similar recording function programs leads to difference in a variety of choices of a storage destination of a recording data file, as shown in step SD**290** in FIG. **100**.

[1212] In addition, according to first photograph utilization program **905**, image pick-up data stored in any of embedded data memory **34** for storage (data area **909**, embedded NAND) and memory card **28** (SD card) can selectively be utilized. On the other hand, according to second photograph utilization program **907**, image pick-up data stored in any of embedded data memory **34** for storage (data area **909**, embedded NAND), memory card **28** (SD card), and memory card **29** attached to game device **10** (card complying with dedicated specifications) can selectively be utilized. Namely, second photograph utilization program **907** provides more sophisticated processing than first photograph utilization program **905**, in terms of a variety of choices of a storage medium from which image pick-up data can be read and utilized.

[1213] It is noted that the processing as shown in FIG. **32** above is implemented as a result of execution of any photograph utilization program by CPU **31**. Namely, image pick-up data that has already been obtained can be viewed (displayed) or the image pick-up data can be subjected to various types of edition. Difference in a function between similar photograph utilization programs leads to the different number of button images for allowing selection of a source of reading shown in FIG. **31**.

[1214] Similarly, according to first audio utilization program **906**, audio data stored in any of embedded data memory **34** for storage (data area **909**, embedded NAND) and memory card **28** (SD card) can selectively be utilized. On the other hand, according to second audio utilizing program **908**, audio data stored in any of embedded data memory **34** for storage (data area **909**, embedded NAND), memory card **28** (SD card), and memory card **29** attached to game device **10** (card complying with dedicated specifications) can selectively be utilized. Namely, second audio utilization program **908** provides more sophisticated processing than first audio utilization program **906**, in terms of a variety of choices of a storage medium from which audio data can be read and utilized.

[1215] It is noted that the processing as shown in FIG. **97** above is implemented as a result of execution of any audio utilization program by CPU **31**. Difference in a function between similar audio utilization programs leads to difference in a variety of choices of a source from which audio data to be reproduced is read.

[1216] Photographing function program **921** stored in memory card **29-1** provides a function similar to that of second photographing function program **903** stored in data memory **34** for storage. Namely, according to photographing function program **921**, obtained image pick-up data can selectively be stored in any of data memory **34** for storage embedded in the main body of game device **10** (data area **909**, embedded NAND), memory card **28** (SD card), and memory card **29-1** itself (data area **923**). Namely, photographing function program **921** provides more sophisticated processing than first photographing function program **901** stored in data memory **34** for storage embedded in the main body of game device **10**, in terms of a variety of choices of a storage destination of image pick-up data.

[1217] In contrast, photographing function program **931** stored in memory card **29-2** is restricted in a function that it can provide, as compared with photographing function program **921**. Namely, according to photographing function program **931**, obtained image pick-up data can be stored only in memory card **29-2** itself (data area **933**).

[1218] In addition, photograph utilization program **922** stored in memory card **29-1** provides a function similar to that of second photograph utilization program **907** stored in data memory **34** for storage. Namely, according to photograph utilization program **922**, image pick-up data stored in any of data memory **34** for storage embedded in the main body of game device **10** (data area **909**, embedded NAND), memory card **28** (SD card), and memory card **29-1** itself (data area **923**) can selectively be utilized. Namely, photograph utilization program **922** provides more sophisticated processing than first photograph utilization program **905** stored in data memory **34** for storage embedded in the main body of game device **10**, in terms of a variety of choices of a storage medium from which image pick-up data can be read and utilized.

[1219] In contrast, photograph utilization program **932** stored in memory card **29-2** is restricted in a function that it can provide, as compared with photograph utilization program **922**. Namely, according to photograph utilization program **932**, image pick-up data stored in memory card **29-2** itself (data area **933**) can only be utilized.

[1220] Similarly, recording function program **941** stored in memory card **29-3** provides a function similar to that of second recording function program **904** stored in data memory **34** for storage. Namely, according to recording function program **941**, obtained audio data can selectively be stored in any of data memory **34** for storage embedded in the main body of game device **10** (data area **909**, embedded NAND), memory card **28** (SD card), and memory card **29-3** itself (data area **943**). Namely, recording function program **941** provides more sophisticated processing than first recording function program **902** stored in data memory **34** for storage embedded in the main body of game device **10**, in terms of a variety of choices of a storage destination of audio data.

[1221] In contrast, recording function program **951** stored in memory card **29-4** is restricted in a function that it can provide, as compared with recording function program **941**. Namely, according to recording function program **951**, obtained audio data can be stored only in memory card **29-4** itself (data area **953**).

[1222] In addition, audio utilization program **942** stored in memory card **29-3** provides a function similar to that of second audio utilization program **908** stored in data memory **34** for storage. Namely, according to audio utilization program **942**, image pick-up data stored in any of data memory **34** for storage embedded in the main body of game device **10** (data area **909**, embedded NAND), memory card **28** (SD card), and memory card **29-3** itself (data area **943**) can selectively be utilized. Namely, audio utilization program **942** provides more sophisticated processing than first audio utilization program **906** stored in data memory **34** for storage embedded in the main body of game device **10**, in terms of a variety of choices of a storage medium from which audio data can be read and utilized.

[1223] In contrast, audio utilization program **952** stored in memory card **29-4** is restricted in a function that it can provide, as compared with audio utilization program **942**. Namely, according to audio utilization program **942**, audio data stored in memory card **29-4** itself (data area **953**) can only be utilized.

[1224] In game device **100** according to the present embodiment, reading and execution of an application stored in memory cards **29-1** to **29-4** that are memory cards complying with dedicated specifications is permitted, however, reading and execution of an application stored in memory card **28** which is a memory card complying with universal specifications is prohibited.

[1225] Thus, game device **100** according to the present embodiment can execute various applications stored in various types of storage media. Therefore, a degree of freedom of a method of marketing or distributing an application program can be enhanced. For example, an application program capable of executing only a basic function may be pre-installed in data memory **34** for storage embedded in game device **10** and an application program may be marketed in such a manner that an application program capable of executing a more sophisticated function is downloaded or provided in a form of a card complying with dedicated specifications.

11. FUNCTION AND EFFECT OF PRESENT EMBODIMENT AND OTHER FEATURES

[1226] The present invention is implemented as embodiments as described above, however, the present invention essentially includes the following aspects. In the description below, for better understanding of the present invention, correspondence with the embodiments described above is shown, however, reference numerals, supplemental explanation and the like in parentheses are not intended to limit the present invention in any manner.

[1227] <First Aspect>

[1228] According to the first aspect of the present invention, a portable image pick-up device (**10**) including a first housing (lower housing **11**), a second housing (upper housing **21**), a first image pick-up portion (outer camera **25**), a first display portion (lower LCD **12**), touch coordinate detection means (touch panel **13**), first display control means (CPU **31** performing step SB**6**), and change means (CPU **31** performing step SB**5**) is provided. The second housing is foldably connected to the first housing. The first image pick-up portion is provided in an outer surface of the second housing when folded. The first display portion has a display screen in an inner surface of the first housing when folded. The touch coordinate detection means detects touch coordinates on the display screen of the first display portion. The first display control means causes the first display portion to display a live image currently picked-up by the first image pick-up portion. The change means changes the live image based on an input to the touch coordinate detection means.

[1229] It is noted that the above phrase "changes the live image based on an input to the touch coordinate detection means" typically includes the following examples, but not limited thereto, and includes combining a prescribed image with a live image by providing a touch input to the live image (typically, at a position based on a touch input) or performing prescribed image conversion processing on a live image (typically, performing image conversion processing on a position or an area based on a touch input).

[1230] Drawing an image handwritten by a touch input on a live image

[1231] Combining a stamp image at a touched position with a live image

[1232] Performing image processing for distorting an image at a touched position or in a touched area on a live image

[1233] Performing processing for changing color at a touched position or in a touched area on a live image

[1234] According to this aspect, the following first problem can be solved.

[1235] (First Problem)

[1236] In the portable phone described in Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1), an image being picked-up by the camera (a live image; an image which is a picked-up image output from the camera and displayed as a moving image in real-time) is displayed on a display screen provided in a housing on which the camera is mounted. This is because, since a photographing direction of the camera is opposite to a direction in which the live image is displayed, the live image is displayed such that a user can view the live image in the same direction as a direction of viewing a real view, and thus it is easy for the user to recognize where the user is photographing in the real view. In the portable phone described in Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1), however, it is impossible to perform an edition operation on the live image.

[1237] Here, the edition operation on the live image is an operation for modifying the live image, such as superimposing on the live image an image prepared in advance and referred to as a stamp image or a seal image and an image handwritten by a user, and the like. Examples of devices capable of such an edition operation include those in Japanese Patent Laying-Open No. 04-156791 (Patent Document 5), Japanese Patent Laying-Open No. 06-276478 (Patent Document 6), Japanese Patent Laying-Open No. 01-297986 (Patent Document 7), Japanese Patent Laying-Open No. 2002-125176 (Patent Document 8), and Japanese Patent Laying-Open No. 2004-320091 (Patent Document 9).

[1238] For example, in the image pick-up device described in Japanese Patent Laying-Open No. 04-156791 (Patent Document 5), an input to a still image or a live image can be made through a touch panel. In this image pick-up device, however, since a screen for displaying a live image is located on a back side of a camera lens (see FIG. 1 of Japanese Patent Laying-Open No. 04-156791), it is difficult to place the image pick-up device with the touch panel facing upward, and a user cannot perform an edition operation (a touch input operation to the touch panel) in a stable manner.

[1239] Further, in an audio and image recording/displaying device described in Japanese Patent Laying-Open No. 06-276478 (Patent Document 6), a mouse is used as an input device for adding a handwritten image to a live image displayed on a display portion. Thus, it is impossible to perform an intuitive edition operation to directly touch a live image. In addition, when the audio and image recording/displaying device above is placed, a photographing direction of a camera cannot be changed in an up-down direction, and hence a degree of freedom of photographing is limited when the audio and video recording/displaying device is placed.

[1240] Further, according to a device described in Japanese Patent Laying-Open No. 01-297986 (Patent Document 7), an image created by a user with a digitizer can be superimposed on a picked-up image. In the device above, however, the user merely creates in advance an image with the digitizer and superimposes the created image on a picked-up image, and the user cannot perform an edition operation on a live image. In addition, the digitizer is provided separately from a camera (see FIG. 1 of Japanese Patent Laying-Open No. 01-297986) or integrally with the camera (see FIGS. 5 and 6 of Japanese Patent Laying-Open No. 01-297986). Thus, when the digitizer is provided separately from the camera, the device is suitable for use in a placed state. On the other hand, in using the device while holding the same, both of two devices (the camera and the digitizer) should be held, which leads to difficulty in operating the device. When the digitizer is provided integrally with the camera, since a display screen is arranged perpendicular to a surface on which the device is placed as in Japanese Patent Laying-Open No. 04-156791 (Patent Document 5) and Japanese Patent Laying-Open No. 06-276478 (Patent Document 6) above, an operation of the digitizer is difficult.

[1241] Devices disclosed in Japanese Patent Laying-Open No. 2002-125176 (Patent Document 8) and Japanese Patent Laying-Open No. 2004-320091 (Patent Document 9) are stationary devices, and two manners of use including holding the device and placing the device are not taken into consideration.

[1242] (Function and Effect According to First Aspect)

[1243] According to the first aspect, in order to address the first problem above, a portable image pick-up device with which it is easy to perform an edition operation on a live image can be provided.

[1244] Namely, according to the first aspect, a camera is provided in an upper housing (the second housing) of a foldable portable image pick-up device, and a live image being picked-up by the camera is displayed on a screen provided in a lower housing (the first housing). By using a touch panel provided on the screen, a user can perform an edition operation directly on the live image. According to the feature above, since a photographing direction of the camera can be

changed independently of a surface on which an edition operation on a live image is performed (a surface of the touch panel), the touch panel can be arranged at such an angle as facilitating the user's operation in either holding or placing the image pick-up device for use. Namely, an edition operation on a live image is facilitated. In other words, even when the touch panel is arranged at such an angle as facilitating the user's operation, the photographing direction of the camera can freely be adjusted and hence photographing can easily be performed.

[1245] According to a more preferred aspect of the first aspect, the portable image pick-up device may further include a second display portion (upper LCD **22**), storage means (data memory **34** for storage), storing means (CPU **31** performing step SB**9**), and second display control means (CPU **31** performing step SB**10**). The second display portion has a display screen in an inner surface of the second housing when folded. The storing means causes the storage means to store the live image that has been changed by the change means as a stored image in accordance with a prescribed operation. The second display control means causes the second display portion to display the stored image.

[1246] According to this aspect, by displaying a picked-up image on a display screen facing in a direction opposite to the photographing direction of the camera, a stored image that has already been taken can be presented to the user together with a live image.

[1247] According to a more preferred aspect of the first aspect, in the third invention, the second display control means may cause the second display portion to display a stored image stored in response to the prescribed operation, in accordance with the prescribed operation being performed.

[1248] According to this aspect, when the user performs a photographing operation, an image obtained by the photographing operation is displayed on the second display portion immediately after the photographing operation. Therefore, (though the photographing direction does not correspond to a direction in which a live image is displayed) by causing the photographing direction of the camera to correspond to a direction in which a taken image is displayed, the picked-up image can be presented to the user so that the user easily recognizes the photographing direction.

[1249] According to a more preferred aspect of the first aspect, the first image pick-up portion may be arranged in an area of the outer surface of the second housing corresponding to non-screen areas of the inner surface of the second housing provided on both right and left sides of the second display portion, on a side more distant from a lower side of the second housing than a center thereof in an up-down direction.

[1250] According to this aspect, by arranging the first image pick-up portion on an upper side of the upper housing (the second housing), when the portable image pick-up device is held for use, an image of a hand of the user holding the lower housing can be prevented from being picked-up. In addition, when the portable image pick-up device is placed for use, since a distance from a surface on which the portable image pick-up device is placed to the first image pick-up portion is increased, an image of the surface on which the portable image pick-up device is placed can be prevented from being picked-up. Further, by arranging the camera in a non-screen area of the upper housing, a space of the non-screen area is effectively used and the device can be reduced in size.

[1251] According to a more preferred aspect of the first aspect, a prescribed image for performing the photographing operation may be displayed on the first display portion. Here, the portable image pick-up device further includes storage means (data memory **34** for storage) and storing means (CPU **31** performing step SB**9**). The storing means causes the storage means to store the live image that has been changed by the change means as a stored image, in accordance with an operation to designate the prescribed image through coordinate input means.

[1252] According to this aspect, a photographing operation can be performed by operating the touch panel. In other words, since an edition operation and a photographing operation can both be performed through the touch panel, it becomes extremely easy for the user to perform the photographing operation after the edition operation.

[1253] According to a more preferred aspect of the first aspect, the portable image pick-up device may further include an operation button (button **14**I and/or **14**J), storage means (data memory **34** for storage) and storing means (CPU **31** performing step SB**9**). The operation button is provided at least at one of right and left ends of an upper side of the first housing. The storing means causes the storage means to store the live image that has been changed by the change means as a stored image in accordance with an operation of the operation button.

[1254] According to this aspect, the user can perform a photographing operation by pressing the operation button with a hand holding the portable image pick-up device. In other words, since the user can perform a photographing operation while holding the portable image pick-up device, the user can easily perform a photographing operation.

[1255] According to a more preferred aspect of the first aspect, the operation button may be provided at a left end of the upper side of the first housing as viewed from the inner surface of the first housing.

[1256] According to this aspect, while holding the portable image pick-up device with a left hand and performing an edition operation on a live image with a right hand, the user can perform a photographing operation by pressing the operation button with the left hand. Therefore, the user can quickly perform a photographing operation with the left hand while performing an edition operation with the right hand when holding the portable image pick-up device, and hence the user can easily perform an edition operation and a photographing operation.

[1257] According to a more preferred aspect of the first aspect, the operation button may be provided at each of the right and left ends of the upper side of the first housing.

[1258] According to this aspect, either a right-handed user or a left-handed user can easily perform an edition operation and a photographing operation.

[1259] According to a more preferred aspect of the first aspect, the portable image pick-up device may further include a second image pick-up portion (inner camera **23**) provided in an inner surface of the second housing. Here, the first display control means causes the first display portion to display a live image currently picked-up by the first image pick-up portion or the second image pick-up portion.

[1260] According to this aspect, by providing the image pick-up means also in the inner surface of the second housing, photographing can be performed also in a direction opposite to a photographing direction of the first image pick-up portion.

[1261] According to a more preferred aspect of the first aspect, the portable image pick-up device may further include an operation button (button **14**I and/or **14**J), storage means (data memory **34** for storage) and storing means (CPU **31** performing step SB**9**). The operation button is provided at at least one of right and left ends of an upper side of the first housing. The storing means causes the storage means to store the live image that has been changed by the change means as a stored image in accordance with an operation of the operation button. The first housing has a first shaft portion (**11**A) provided to project from the inner surface of the first housing in a direction perpendicular thereto. The second housing has a second shaft portion (**21**A) pivotably connected to the first shaft portion. The second image pick-up portion is arranged in the second shaft portion.

[1262] According to this aspect, by providing the second image pick-up portion in the shaft portion (the second shaft portion), a space for the device is saved. Further, since the second shaft portion is located on the inner surface of the first housing, when the two housings are folded, the second image pick-up portion faces the first housing. Thus, when the portable image pick-up device is closed, the second image pick-up portion is covered with the inner surface of the first housing and not exposed to the outside, thereby protecting the second image pick-up portion.

[1263] According to an alternative aspect of the first aspect, a program executed by a computer of a portable image pick-up device for achieving the functions in the invention described above may also be provided. The program provides a program executed by a computer of a portable image pick-up device including the first housing above, the second housing above, the first image pick-up portion above, the first display portion above, and the touch coordinate detection means above, and causes the computer to execute a first display control step (SB**6**) and a change step (SB**5**). In the first display control step, the computer causes the first display portion to display a live image currently picked-up by the first image pick-up portion. In the change step, the computer changes the live image based on an input to the touch coordinate detection means.

[1264] <Second Aspect>

[1265] According to the second aspect of the present invention, an image pick-up device including a first housing (lower housing **11**), a second housing (upper housing **21**), a first display portion (lower LCD **12**), a first image pick-up portion (outer camera **25**), a plurality of operation buttons (buttons **14**A to **14**E), and a touch panel (**13**) is provided. The first housing has a horizontally long shape. The second housing has a horizontally long shape, and a long side thereof is connected to an upper long side of the first housing such that the first and second housings are foldable. The first display portion has a display screen provided in an inner surface thereof, which is a surface located inside when the first and second housings are folded. The first image pick-up portion is provided in an outer surface of the second housing which is a surface located outside when the first and second housings are folded, and arranged at an end portion opposite to a connection portion where the second housing is connected to the first housing. The plurality of operation buttons are provided on the inner surface of the first housing, on opposing sides of the display screen in a longitudinal direction of the first housing. The touch panel is provided on the display screen.

[1266] According to this aspect, the following second problem can be solved.

[1267] (Second Problem)

[1268] In the image pick-up device disclosed in Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1), the vertically long housings are arranged lengthwise and connected to each other. Thus, a width of the image pick-up device is too small for a user to firmly hold the image pick-up device with both hands. Further, since the display screen is provided across the entire surface of each housing, when the user holds the image pick-up device either lengthwise or sideways, fingers are located on the screen, thereby deteriorating visibility of the screen and operability of the touch panel. On the other hand, when the user holds the image pick-up device such that the fingers are not located on the screen, the user has to hold the image pick-up device at back surfaces and side surfaces of the housings, and hence cannot firmly hold the image pick-up device. Further, since the information equipment disclosed in Japanese Patent Laying-Open No. 2001-142564 (Patent Document 4) is a notebook personal computer, it is assumed that the notebook personal computer is used in a placed state in image pick-up, and the notebook personal computer cannot be held with hands for use in image pick-up.

[1269] As described above, the image pick-up devices disclosed in Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1) and Japanese Patent Laying-Open No. 2001-142564 (Patent Document 4) respectively cannot firmly be held by the user while maintaining visibility of the screen and operability of the touch panel in image pick-up. Thus, there is a problem that hand movement is highly likely in image pick-up. Further, since the image pick-up device cannot firmly be held in image pick-up, an operation in image pick-up has been difficult.

[1270] (Function and Effect According to Second Aspect)

[1271] According to the second aspect, in order to address the second problem above, an image pick-up device that can firmly be held by the user while maintaining visibility of the display screen and operability of the touch panel in image pick-up can be provided.

[1272] Namely, according to the second aspect, when the user holds the image pick-up device sideways, the user can firmly hold the image pick-up device by holding portions of the first housing on opposing sides of the display screen (portions on which the operation buttons are provided). Here, hands of the user are located on the operation buttons, not on the display screen. Thus, the display screen is not covered with hands and hidden, and visibility of the display screen can be maintained. In other words, an image pick-up device that can firmly be held by the user while maintaining visibility of the display screen in image pick-up can be achieved.

[1273] In addition, according to the second aspect, the display portion and the touch panel are provided in the first housing held by the user. Therefore, even when the image pick-up device is held for use or even when the image pick-up device is placed on a desk or the like for use, an operation of the touch panel is easy (as compared to the case where the touch panel is provided in the second housing).

[1274] According to a more preferred aspect of the second aspect, the image pick-up device may further include a second display portion (upper LCD **22**) of which display screen is provided in an inner surface of the second housing located inside when the first and second housings are folded. Here, non-display-screen areas (B**1** and B**2**) having a width as large as that of areas (A**1** and A**2**) on the inner surface of the first housing on which the plurality of operation buttons are pro-

vided are provided on the inner surface of the second housing, on opposing sides of the second display portion.

[1275] According to a more preferred aspect of the second aspect, the second housing may have a width as large as that of the first housing. In this case, the display screen of the first display portion and a display screen of the second display portion have the same width, and they are provided in the same position with regard to the longitudinal direction.

[1276] According to a more preferred aspect of the second aspect, the image pick-up device may further include a speaker provided inside the non-display-screen area of the second housing.

[1277] According to each aspect above, since the image pick-up device includes two display screens, more information can be displayed. Further, according to the configuration in which non-display-screen areas are provided on opposing sides of the display screen on the second housing ((**1**-**2**) above), even when the user rotates the image pick-up device by 90° from a state where the image pick-up device is held sideways to hold the image pick-up device lengthwise, the user can firmly hold the image pick-up device. In other words, when the user holds the image pick-up device lengthwise, the user can support the areas of the first housing on which the operation buttons are provided and the non-display-screen areas with thumbs and can support a back surface of each housing in which the display screen is provided with index fingers to little fingers. Thus, while the user can firmly hold the image pick-up device, the thumbs are not located on the display screen, and visibility of the display screen does not deteriorate. Further, according to the feature of (**4**) above, by arranging the speaker inside the non-display-screen area of the second housing, the inside space of the second housing can effectively be used and the image pick-up device can be made smaller in size.

[1278] According to a more preferred aspect of the second aspect, the second display portion may display an image picked-up by the first image pick-up portion in real time. Here, the first display portion displays an operation screen for performing an operation to the image pick-up device (see FIG. **42**).

[1279] According to this aspect, the display screen on which the picked-up real-time image is displayed and the first image pick-up portion for picking up an image are both provided in the second housing. Thus, if the image pick-up direction of the first image pick-up portion is changed, an orientation of the display screen is changed accordingly. Thus, the user can intuitively and easily grasp the image pick-up direction.

[1280] In addition, according to this aspect, since the operation screen is displayed on the display screen provided in the first housing held by the user, the operation screen is displayed on the display screen in the vicinity of input means (the touch panel and the operation buttons). Therefore, the user can easily perform an operation while looking at the operation screen.

[1281] According to a more preferred aspect of the second aspect, when a real-time image picked-up by the first image pick-up portion is displayed on the second display portion, the first display portion may display an image for providing an input to the touch panel as the operation screen. Thus, an operation to the image pick-up device can easily be performed through the touch panel.

[1282] According to a more preferred aspect of the second aspect, the first display portion may display an image for editing a picked-up image. Thus, the user can easily perform edition processing through the touch panel.

[1283] According to a more preferred aspect of the second aspect, the image pick-up device may further include a second image pick-up portion (inner camera **23**) provided in an inner surface of the second housing located inside when the first and second housings are folded, and provided on a side closer to a coupling portion of the first and second housings than a screen of the second display portion. Thus, the user can pick up images in two different directions without changing a manner of holding the image pick-up device. Further, when photographing is performed using the second image pick-up portion, as in the case of the first image pick-up portion, the image pick-up direction can easily be changed by adjusting an angle of the second housing, and the image pick-up direction of the image pick-up portion can easily be changed without providing a special mechanism. Further, since the second image pick-up portion is not exposed to the outside when the housings are folded, the second image pick-up portion can be protected by folding the housings.

[1284] According to a more preferred aspect of the second aspect, the image pick-up device may further include an image pick-up instruction button (button **14**J) arranged at a right end of the upper long side of the first housing for giving an instruction to store a picked-up image. Thus, while holding the first housing, the user can easily press the photographing instruction button with an index finger.

[1285] According to a more preferred aspect of the second aspect, the image pick-up device may further include two image pick-up instruction buttons (buttons **14**J and **14**I) arranged at opposing ends of the upper long side of the first housing respectively, for giving an instruction to store a picked-up image. Thus, while holding the first housing, either a right-handed user or a left-handed user can easily press the photographing instruction button with an index finger.

[1286] According to a more preferred aspect of the second aspect, weight of the first housing and parts provided in the first housing may be greater than that of the second housing and parts provided in the second housing.

[1287] According to a more preferred aspect of the second aspect, at least a battery, a circuit board on which electronic parts are mounted, and a connector for removable connection of a storage medium may be provided in the first housing.

[1288] According to the two aspects above, when the image pick-up device is placed on a desk or the like, the image pick-up device is less likely to fall down. Further, by making the first housing held by the user heavier than the second housing, stability when the image pick-up device is held can be increased and hand movement in image pick-up can be prevented.

[1289] According to a more preferred aspect of the second aspect, the second housing can be fixed at an angle smaller than 180° with respect to the first housing. Thus, by setting the angle between the housings to be slightly smaller than 180°, the outer surfaces of the housings fit to a shape of a hand, and hence it becomes easier to hold the image pick-up device.

[1290] <Third Aspect>

[1291] According to the third aspect of the present invention, a foldable image pick-up device including a first image pick-up portion (camera **23** or **25**), a first housing (lower housing **11**), a second housing (upper housing **21**), and a coupling portion (shaft portions **11**A and **21**A) is provided. The coupling portion foldably couples the first housing and the second housing to each other. Further, the image pick-up

device includes at least one photographing button (buttons **14**J and **14**I) for giving an instruction to record an image picked-up by the first image pick-up portion. At least one photographing button is provided on a side surface of the first housing, assuming an inner surface of the first housing when folded as a front surface, on a side where the second housing is located when the first housing and the second housing are opened.

[1292] According to this aspect, the following third problem can be solved.

[1293] (Third Problem)

[1294] In the portable phone disclosed in Japanese Patent Laying-Open No. 2003-333149 (Patent Document 10), when a user performs photographing, a manner of operation in which the user presses a first shutter button with a thumb while holding the lower second housing with one hand is assumed. In other words, the user presses the first shutter button with the thumb while touching the inner surface of the second housing with a thumb and an outer surface of the second housing with other fingers (so as to sandwich the second housing between the thumb and other fingers). In such a manner of operation, since the thumb should be released from the second housing when pressing the first shutter button, the second housing cannot firmly be held. Thus, it is difficult to press the first shutter button, and hand movement may occur when the first shutter button is pressed. Thus, the conventional foldable image pick-up device suffers from a problem that it is difficult to perform a photographing operation by pressing the shutter button.

[1295] (Function and Effect According to Third Aspect)

[1296] According to the third aspect, in order to address the third problem above, operability in the photographing operation can be improved.

[1297] Namely, according to the third aspect, by providing the photographing button on the side surface of the first housing on a side where the first housing is coupled to the second housing, the user can press the photographing button with an index finger while holding the first housing by touching the inner surface of the first housing with a thumb and an outer surface of the first housing with a middle finger or the like (see FIGS. **9** and **10**). Thus, since the user can press the photographing button while firmly holding the first housing, the button is easily pressed in a photographing operation, and hand movement is less likely. Thus, according to the feature of (**2-1**) above, operability in the photographing operation in the foldable image pick-up device can be improved.

[1298] In addition, according to the third aspect, since the photographing button is provided on the side surface of the first housing, the photographing operation can be performed even in a state where the image pick-up device is placed with its outer surface of the first housing facing downward. As the image pick-up portion is provided in the second housing, the user can freely change a photographing direction even in a state where the image pick-up device is placed.

[1299] According to a more preferred aspect of the third aspect, the first image pick-up portion may be provided in an outer surface of the second housing when folded.

[1300] According to this aspect, since the first image pick-up portion is provided in the second housing, the image pick-up direction can readily be changed by changing an angle of the second housing with respect to the first housing. Further, since the first image pick-up portion is provided in the outer surface of the second housing, photographing in a direction the same as the line-of-sight of the user can be carried out.

[1301] According to a more preferred aspect of the third aspect, the first image pick-up portion may be arranged in the outer surface of the second housing, on a side more distant from the coupling portion than a center thereof in an up-down direction. Here, the first housing and the second housing are vertically coupled to each other, and a direction in which the first housing and the second housing are coupled to each other is defined as the up-down direction. Further, a direction of a shaft by which the first housing and the second housing are coupled to each other is defined as a left-right direction. For example, when the first housing has a horizontally long shape, a longitudinal direction of the first housing may be defined as a left-right direction.

[1302] Since the user presses the photographing button provided on the side surface of the first housing with an index finger as described above, the index finger may be located within an image pick-up range of the first image pick-up portion, depending on a position of the first image pick-up portion. In contrast, according to the feature of (**2-3**) above, since the first image pick-up portion is located on a side distant from the connection portion with the first housing, the index finger can be prevented from being located within the image pick-up range of the first image pick-up portion.

[1303] According to a more preferred aspect of the third aspect, in the image pick-up device, first and second buttons may be provided on left and right ends of the side surface respectively, as at least one photographing button.

[1304] According to this aspect, since the photographing buttons are provided on the left and right ends of the side surface of the first housing respectively, the user can easily press the photographing button even when the user holds the image pick-up device with either a right hand or a left hand. Thus, according to the feature of (**2-4**) above, the user can easily perform the photographing operation regardless of handedness.

[1305] According to a more preferred aspect of the third aspect, the image pick-up device may further include a second image pick-up portion (inner camera **23**). The second image pick-up portion is provided substantially at a center in a left-right direction of a device main surface (the operation surface) formed by the inner surface of the first housing and an inner surface of the second housing when the image pick-up device is opened.

[1306] According to this aspect, since the second image pick-up portion is provided on the device main surface, image pick-up in a direction toward the user by the second image pick-up portion can be carried out. Further, since the second image pick-up portion is provided substantially at the center of the device main surface in the left-right direction, the user can easily adjust the image pick-up device to an appropriate position in the left-right direction, for example, in photographing the user himself/herself.

[1307] According to a more preferred aspect of the third aspect, the image pick-up device may further include a plurality of operation buttons (buttons **14**A to **14**F). The plurality of operation buttons are provided on the inner surface of the first housing, on a right side and a left side of the second image pick-up portion.

[1308] According to this aspect, by providing the operation buttons on the inner surface of the first housing, the user can hold the image pick-up device while touching the operation

buttons with thumbs. Since the operation buttons are provided on the outer side of the second image pick-up portion (in the left-right direction), the thumbs of the user come in contact at positions on the outer side of the second image pick-up portion. Thus, according to the feature of (**2-6**) above, a possibility that the thumbs are located within an image pick-up range of the second image pick-up portion can be lowered (naturally, without particularly making the user aware of such a fact).

[1309] According to a more preferred aspect of the third aspect, the image pick-up device may further include a display portion (lower LCD **12**) and a plurality of operation buttons (buttons **14**A to **14**F). The display portion has a display screen substantially at a center of the inner surface of the first housing in a left-right direction. The plurality of operation buttons are provided on the inner surface of the first housing, on a left side and a right side of the display screen.

[1310] According to this aspect, by providing the operation buttons on the inner surface of the first housing, the user can hold the image pick-up device while touching the operation buttons with thumbs. Here, since the operation buttons are provided on the left and right sides of the display portion, the thumbs of the user come in contact at positions on the outer side of the display portion. Thus, according to the feature of (**2-7**) above, the thumbs are prevented from entering the display screen of the display portion and disturbing display (naturally, without particularly making the user aware of such a fact).

[1311] According to a more preferred aspect of the third aspect, the image pick-up device may further include a display portion (lower LCD **12**), a coordinate input portion (touch panel **13**), and a control unit (CPU **31**). The display portion has a display screen provided in the inner surface of the first housing. The coordinate input portion is an input device through which coordinates on the display screen can be input. The control unit has a prescribed image displayed on the display screen, and causes recording of an image picked-up by the first image pick-up portion when an input in an area of the prescribed image is provided through coordinate input means.

[1312] According to this aspect, the user can perform a photographing operation through the coordinate input portion provided on the inner surface of the first housing. Thus, the user can easily perform a photographing operation even when the image pick-up device is placed, with the outer surface of the first housing facing downward. Thus, as a photographing operation using the coordinate input portion can be performed, it is unnecessary to operate the photographing button with an index finger and the photographing operation can easily be performed in various holding manners (for example, in a holding manner in which the second housing is located on a lower side).

[1313] According to a more preferred aspect of the third aspect, the control unit may have the prescribed image displayed substantially at a center of the first housing in a left-right direction.

[1314] According to this aspect, since the prescribed image to be touched when the user performs a photographing operation is displayed substantially at the center of the first housing, the user can easily perform an operation in operating the touch panel with either a right hand or a left hand. Thus, according to this aspect, even in performing a photographing operation in a state where the image pick-up device is placed with the outer surface of the first housing facing downward, the user can easily perform the photographing operation regardless of handedness.

[1315] According to a more preferred aspect of the third aspect, the first housing may have a length in a left-right direction not smaller than 100 mm and not larger than 150 mm and a length in an up-down direction not smaller than 60 mm and not larger than 90 mm.

[1316] According to this aspect, by setting a length of the first housing to an appropriate length, that is, by setting the length of the first housing in the left-right direction not smaller than 100 mm and not larger than 150 mm and the length of the first housing in the up-down direction not smaller than 60 mm and not larger than 90 mm, the image pick-up device can easily be held when it is held with either one hand or both hands. In other words, according to this aspect, difficulty in holding the image pick-up device with one hand because of its too long a length in the left-right direction or with both hands because of its too short a length in the left-right direction is not likely. Further, since the first housing has such a length in the up-down direction that the first housing fits into a palm, it is easy for the user to hold the image pick-up device in holding the image pick-up device with either one hand or both hands.

[1317] <Fourth Aspect>

[1318] According to the fourth aspect of the present invention, an image pick-up device including a first housing (lower housing **11**), a second housing (upper housing **21**), a first display portion (lower LCD **12**), a second display portion (upper LCD **22**), an image pick-up portion (inner camera **23**), and an audio input portion (microphone **42**) is provided. The second housing has a lower side connected to an upper side of the first housing such that the first and second housings are foldable. The first display portion has a display screen provided in an inner surface of the first housing when folded. The second display portion has a display screen provided in an inner surface of the second housing when folded. The image pick-up portion is provided in the inner surface of the second housing, between the display screen of the first display portion and the display screen of the second display portion. The audio input portion is provided in the inner surface of the second housing, between the display screen of the first display portion and the display screen of the second display portion.

[1319] According to this aspect, the following fourth problem can be solved.

[1320] (Fourth Problem)

[1321] As in the portable instruments described in Japanese Patent Laying-Open No. 2004-274304 (Patent Document 2), Japanese Patent Laying-Open No. 2005-184060 (Patent Document 11), and Japanese Patent Laying-Open No. 2007-201727 (Patent Document 12) above, in the structure in which a screen is provided in each of the inner surface and the outer surface of the housing, the user can look at only one screen at a time. Accordingly, an amount of information that can be presented to the user at a time is less. As a result, the user cannot obtain (view) sufficient information in image pick-up and audio input.

[1322] Meanwhile, in the telephones of Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1) and Japanese Patent Laying-Open No. 09-247634 (Patent Document 13) above, as a user can look at two screens at a time, an amount of information that can be presented to the user at a time is large. In these telephones, however, since positions of

the camera and the microphone are inappropriate, it is difficult to carry out image pick-up and audio input for the following reasons.

[1323] In the telephones of Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1) and Japanese Patent Laying-Open No. 09-247634 (Patent Document 13) above, the camera and the microphone are provided in different housings and arranged at end portions of the telephone, respectively. Specifically, the camera is arranged at an end portion of one housing and the microphone is arranged at an end portion of the other housing. Accordingly, in the case where a folded angle is not 180°, an image pick-up direction of the camera and a direction in which the microphone collects sound are different from each other. Further, here, the direction in which the microphone collects sound and a direction in which a "screen of a housing provided with the camera" faces are different from each other. A foldable device is meaningfully used, for example, in such a manner that it is placed on a desk with a folding angle thereof being set to a desired angle. Here, the device is easily operated if setting is made such that a screen of an upper housing faces the user. In these prior telephones, however, in such a situation, the direction in which the microphone collects sound is different from a direction of a mouth of the user.

[1324] Further, in the telephones of Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1) and Japanese Patent Laying-Open No. 09-247634 (Patent Document 13) above, the camera is provided at the end portion of the housing, and two screens are both present under the camera. Thus, in order to look at information displayed on each screen from a state where the line-of-sight is directed toward the camera, the line-of-sight should inevitably be moved downward, and particularly, an amount of movement of user's line-of-sight is great when information on a lower screen is viewed. Further, in order for the user to equally look at information displayed on two screens, user's line-of-sight is desirably moved with reference to a center between the two screens. In the telephone of Japanese Patent Laying-Open No. 2006-311224 (Patent Document 1) or Japanese Patent Laying-Open No. 09-247634 (Patent Document 13) above, however, such a line-of-sight direction and the photographing direction of the camera are different from each other.

[1325] (Function and Effect According to Fourth Aspect)

[1326] According to the fourth aspect, in order to address the fourth problem above, an image pick-up device with which it is easy for a user to carry out image pick-up and audio input can be provided.

[1327] Namely, according to the fourth aspect, since the image pick-up portion and the audio input portion are provided between the two screens, if the user faces the two screens in image pick-up and audio input, the camera and the microphone are located in front of the user. Therefore, the user can successfully achieve image pick-up and audio input while facing the two screens (without changing an orientation of user's face). Further, for example, in picking up an image of the user himself/herself with the camera, the user performs an image pick-up operation looking at the camera while looking at the screen. According to the feature of (**3-1**) above, since the camera is arranged between the two screens, the user can minimize a distance of movement of his or her line-of-sight between the camera and the screen in the image pick-up operation, and the image pick-up operation while looking at the two screens is facilitated. Further, according to the feature of (**3-1**) above, since the camera and the microphone are arranged substantially at the same position in the second housing, the user naturally turns his or her face to the microphone if the user faces the camera in image pick-up. Thus, user's voice can easily be collected by the audio input portion and sensed accurately.

[1328] According to a more preferred aspect of the fourth aspect, the image pick-up device may further include an operation button (buttons **14**A to **14**F) provided in the first housing.

[1329] According to this aspect, since the operation button and the microphone are provided in different housings, collection by the microphone of operation sound (noise) generated when the operation button is operated is less likely, and desired voice and sound can accurately be detected by the microphone. Further, according to the feature of (**3-2**) above, since the operation button is provided in the first housing, it is considered that the user holds the first housing in image pick-up. Thus, the user can easily change an image pick-up direction to a desired direction by turning the second housing to the desired direction without changing his or her position for holding the image pick-up device (without moving the first housing).

[1330] According to a more preferred aspect of the fourth aspect, the second housing may have, in its lower side, a shaft portion (**21**A) pivotably coupled to the upper side of the first housing. Here, the image pick-up portion and the audio input portion are arranged in the shaft portion.

[1331] According to this aspect, by arranging the image pick-up portion and the audio input portion in the shaft portion for achieving a foldable structure, a distance between the two screens can be shorter than in the case where the image pick-up portion and the audio input portion are arranged between the screen of the second display portion and the shaft portion. Thus, the two screens can be arranged closer to each other, and it becomes easier for the user to look at the two screens.

[1332] According to a more preferred aspect of the fourth aspect, may be provided substantially at a center of the second housing in a left-right direction.

[1333] According to a more preferred aspect of the fourth aspect, since the image pick-up portion and the audio input portion are arranged substantially at the center also in the left-right direction, it becomes easier for the user to achieve image pick-up and audio input.

[1334] According to a more preferred aspect of the fourth aspect, may be arranged substantially at a center in a left-right direction. Here, the audio input portion is arranged at a position displaced from a position of the image pick-up portion in the left-right direction.

[1335] According to a more preferred aspect of the fourth aspect, by arranging the image pick-up portion at the center in the left-right direction, for example, it becomes easier for the user to pick up an image of the user himself/herself such that he/she is located at a center of an image pick-up region. In addition, even if the audio input portion is arranged at a position slightly displaced from the center, it does not have a significant effect on detection accuracy. Further, according to this aspect, since the image pick-up portion and the audio input portion can be juxtaposed to each other in the left-right direction, a distance between the two screens can be shorter than in the case where the image pick-up portion and the audio input portion are juxtaposed to each other in an up-down direction. Thus, according to this aspect, the image pick-up portion and the audio input portion can be arranged

such that it becomes easier to look at the two screens while ease of image pick-up and audio input is maintained.

[1336] According to a more preferred aspect of the fourth aspect, the image pick-up device may further include audio output portions (speakers) provided in the inner surface of the second housing, on opposing sides of the display screen of the second display portion in a left-right direction, respectively.

[1337] According to this aspect, when the user holds the image pick-up device so as to face the two screens, the audio output portions are arranged in positions corresponding to left and right ears (in positions on both left and right sides of user's face), respectively. Thus, a stereo effect can effectively be obtained.

[1338] According to a more preferred aspect of the fourth aspect, a first housing (lower housing **11**), a second housing (upper housing **21**), a first display portion (lower LCD **12**), a second display portion (upper LCD **22**), an image pick-up portion (inner camera **23**), and an audio output portion (speaker) are provided. The second housing has a lower side connected to an upper side of the first housing such that the first and second housings are foldable. The first display portion has a display screen provided in an inner surface of the first housing when folded. The second display portion has a display screen provided in an inner surface of the second housing when folded. The image pick-up portion is provided in the inner surface of the second housing, between the screen of the first display portion and the screen of the second display portion. The audio output portions are provided in the inner surface of the second housing, on opposing sides of the display screen of the second display portion in a left-right direction, respectively.

[1339] According to this aspect, as in the preceding aspect, when the user holds the image pick-up device so as to face the two screens, a stereo effect can effectively be obtained. Further, as in the first invention, when the user faces the two screens, the camera is located in front of the user. Thus, the user can successfully pick up an image while facing the two screens (without changing an orientation of user's face).

[1340] According to a more preferred aspect of the fourth aspect, a first housing (lower housing **11**), a second housing (upper housing **21**), a first display portion (lower LCD **12**), a second display portion (upper LCD **22**), and an image pick-up portion (inner camera **23**) are included. The second housing has a lower side connected to an upper side of the first housing such that the first and second housings are foldable. The first display portion has a display screen provided in an inner surface of the first housing when folded. The second display portion has a display screen provided in an inner surface of the second housing when folded. The image pick-up portion is provided in a central portion in the left-right direction, and between the display screen of the first display portion and the display screen of the second display portion when the first housing and the second housing are opened. According to this aspect, by providing the camera at the center between the two screens, movement of the user's line-of-sight from a state where the user looks at the camera, for obtaining information displayed on the upper screen and information displayed on the lower screen, can be minimized Further, even when the user looks at the information on any of the upper screen and the lower screen, a difference between the photographing direction of the camera and the user's line-of-sight is small, and an image of the user facing the camera can be taken.

[1341] According to a more preferred aspect of the fourth aspect, an audio input portion (microphone **42**) provided in the central portion in the left-right direction and between the display screen of the first display portion and the display screen of the second display portion when the first housing and the second housing are opened may further be included.

[1342] According to this aspect, since the camera and the microphone are arranged substantially at the same position in the second housing, the user naturally turns his or her face to the microphone if the user faces the camera in image pick-up. Thus, user's voice can easily be collected by the audio input portion and sensed accurately.

[1343] According to a more preferred aspect of the fourth aspect, may be provided at a center in the left-right direction and between the display screen of the first display portion and the display screen of the second display portion when the first housing and the second housing are opened. Here, the audio input portion is provided in proximity to the image pick-up portion.

[1344] According to this aspect, the image pick-up portion and the audio input portion can be arranged such that it becomes easier to look at the two screens while ease of image pick-up and audio input is maintained.

[1345] According to an aspect similar to the fourth aspect of the present invention, an image pick-up device is structured to be capable of transformation between a first form in which a first housing and a second housing are stacked on each other and a second form in which the first housing and the second housing are opened. The image pick-up device includes at least one photographing button provided on a side surface of the first housing with an inner surface thereof in the first form being assumed as a front surface, on a side where the second housing is located in the second form, for giving an instruction to record an image picked-up by an image pick-up portion.

[1346] According to a more preferred aspect of the fourth aspect, a second image pick-up portion may be provided substantially at a center in a left-right direction of a device main surface in the second form. Here, the image pick-up device further includes a plurality of operation buttons provided on an inner surface of the first housing in the first form, on the left side and the right side relative to the second image pick-up portion.

[1347] According to a more preferred aspect of the fourth aspect, a display screen may be provided substantially at a center in the left-right direction of the inner surface of the first housing in the first form. Here, the image pick-up device further includes operation buttons provided on the inner surface of the first housing, on the left side and the right side of the display screen.

[1348] <Fifth Aspect>

[1349] According to the fifth aspect of the present invention, a launch program (**61**) executed by a computer (CPU **31**) of an information processing device (**10**) including image pick-up means (cameras **23** and **25**), capable of storing a plurality of application programs (**53** to **56**), and storing in advance a prescribed photographing application program (**53**) for performing photographing with the image pick-up means as the application program, is provided. The launch program is a program for selectively launching an application program desired by a user from among the plurality of application programs above. The launch program causes the computer to function as: first launch operation acceptance means (CPU **31** performing steps SA**6** and SA**11**; hereinafter, steps are indicated only with step numbers); first launch means (SA**12**); photographing processing means (SA**10**); photo-

graphing enabling operation acceptance means (SA**6**, SA**9**); photographing operation acceptance means (SA**24**, SA**25**); second launch operation acceptance means (SA**24**, SA**28**); and second launch means (SA**30**). The first launch operation acceptance means accepts a first launch operation for selectively launching the plurality of application programs. The first launch means launches an application program selected in the first launch operation from among the plurality of application programs when the first launch operation is performed. The photographing processing means performs photographing processing for storing an image picked-up by the image pick-up means in storage means in the information processing device in accordance with a prescribed photographing operation. The photographing enabling operation acceptance means accepts a photographing enabling operation for causing a photographing enabled state in which the photographing processing by the photographing processing means can be performed in accordance with the photographing operation in a launch acceptance state of accepting the first launch operation. The photographing operation acceptance means accepts the photographing operation when the photographing enabling operation is performed. The second launch operation acceptance means accepts a second launch operation for launching the photographing application program in the photographing enabled state. The second launch means launches the photographing application program when the second launch operation is performed.

[1350] According to this aspect, the fifth problem below can be solved.

[1351] (Fifth Problem)

[1352] The first and second application programs above executable in the information processing device described in "'Chotto Shot Camera Instruction Manual' published by Sony Computer Entertainment Inc. on Nov. 2, 2006" (Non-Patent Document 1) above have different functions (although having also common functions). Therefore, in a state where the user performs photographing by executing any one of the application programs, a case where a user desires (or needs) to use a function attained only by the other application program is assumed. Here, in order to use the desired function, the user has to perform a troublesome operation of ending execution of one of the application programs above, thereafter selecting the other application program in a menu screen or the like, and launching the other application program.

[1353] (Function and Effect According to Fifth Aspect)

[1354] According to the fifth aspect, in order to address the fifth problem above, a user-friendly information processing device capable of performing a plurality of types of photographing functions with a simple operation can be provided.

[1355] According to the fifth aspect, in the launch acceptance state, the user can launch a selected application program by performing the first launch operation, and can perform the photographing processing by the photographing processing means by performing the photographing enabling operation. Therefore, even in the launch acceptance state for launching the application program, the user can easily and quickly activate a function of the photographing processing means. In addition, in the photographing enabled state, the photographing application program can be launched by performing the second launch operation. Therefore, even during the photographing processing by the photographing processing means, the user can easily and quickly launch the photographing application program by performing the second launch operation. In other words, according to the present embodiment, when the user desires to use a function (of the photographing application program) not provided by the photographing processing means during use of a photographing function of the photographing processing means, the user can easily and quickly use the function by performing the second launch operation. As described above, according to the first invention, both a photographing function of the photographing processing means and a photographing function of the photographing application program can be performed with a simple operation, and a user-friendly information processing device can be provided.

[1356] Further, according to the fifth aspect, during performance of the photographing function by the photographing processing means, the photographing application program can directly be launched. In other words, since the other photographing function (the photographing function attained by the photographing application program) can easily be activated from one photographing function (the photographing function attained by the photographing processing means), the user can be led to use the other function through use of one function.

[1357] According to a more preferred aspect of the fifth aspect, a manner of operation of the photographing enabling operation may be different from that of the first launch operation.

[1358] According to this aspect, the photographing function attained by the photographing processing means can easily be performed by an operation different from the first launch operation for launching the selected application program.

[1359] According to a more preferred aspect of the fifth aspect, the photographing processing means may have only a part of a photographing function enabled as a result of execution of the photographing application program.

[1360] According to this aspect, the photographing function of the photographing processing means which is a relatively simple function can quickly be activated from the launch acceptance state, and the photographing application program having more functions can immediately be launched during performance of the photographing function of the photographing processing means. Here, the user can be caused to use the information processing device in such an order that the information processing device is initially operated based on the photographing function of the photographing processing means which is the simple function and then various photographing functions are utilized based on the photographing application program having more functions. By using the information processing device in such an order, the user can use the information processing device in a manner gradually getting used to the operation of the information processing device.

[1361] According to a more preferred aspect of the fifth aspect, the launch program above may further cause the computer to function as image display means (SA**5**) for causing display means of the information processing device to display the picked-up image (stored image) stored in the storage means in the launch acceptance state (FIG. **23**).

[1362] According to this aspect, an image taken in the past is displayed in the launch acceptance state. Therefore, by taking a picture of which display is desired, the user can customize a screen (menu screen) in the launch acceptance state for each user (for each information processing device). Further, a user who touches (uses) the information processing

device for the first time can be made aware that the information processing device has the photographing function.

[1363] According to a more preferred aspect of the fifth aspect, the image display means may automatically change at prescribed timing, a picked-up image to be displayed on the display means among a plurality of picked-up images stored in the storage means.

[1364] According to this aspect, by changing content of a displayed image at prescribed timing, variation in the menu screen is produced and the user can be prevented from getting bored.

[1365] In a more preferred aspect of the fifth aspect, the image display means may change a picked-up image to be displayed on the display means, at timing of launch of the information processing device.

[1366] According to this aspect, an image displayed in the launch acceptance state is changed each time the information processing device is started up. Thus, the user has things to look forward to (about "which image will be displayed") at the time of start-up. Further, from the viewpoint of the supplier of the information processing device, by giving the user such things to look forward to, the user can be prompted to start up the information processing device (that is, to use the information processing device).

[1367] According to a more preferred aspect of the fifth aspect, the image display means may cause the display means of the information processing device to display in the launch acceptance state a picked-up image last stored in an immediately preceding photographing enabled state.

[1368] According to this aspect, an image taken in the photographing enabled state is displayed in the launch acceptance state immediately after the end of that photographing enabled state. Therefore, in the launch acceptance state, the user can check an image last taken in the photographing enabled state.

[1369] According to a more preferred aspect of the fifth aspect, the launch program above further causes the computer to function as first transition means (SA**21**) and second transition means (SA**4**). The first transition means ends the launch acceptance state and causes transition to the photographing enabled state in accordance with the photographing enabling operation. The second transition means ends the photographing enabled state and causes transition to the launch acceptance state in accordance with a prescribed operation in the photographing enabled state.

[1370] According to this aspect, since the photographing operation is not accepted in the launch acceptance state, the user does not accidentally perform the photographing operation in the launch acceptance state. Further, since the launch acceptance state has ended in the photographing enabled state, display for causing the user to perform the first launch operation (for example, display of an image indicating an application program) is unnecessary. Therefore, a display area can effectively be used, for example, by displaying a picked-up image on the screen of the display device. Further, by not allowing acceptance of the first launch operation in the photographing enabled state, an operation in the photographing enabled state can be simplified and an operation is easier for the user.

[1371] According to a more preferred aspect of the fifth aspect, in the second transition means, the prescribed operation above may be the photographing operation.

[1372] According to this aspect, when the photographing operation is performed in the photographing enabled state, the photographing enabled state ends (after the photographing processing is performed). In other words, once the user performs the photographing operation in the photographing enabled state, the state of the information processing device returns to the launch acceptance state. Accordingly, even a novice user who has not read an instruction manual or the like can naturally return to the launch acceptance state by performing the photographing operation. Therefore, a state where "the user does not know how to return from the photographing enabled state to the launch acceptance state" can be prevented and a user-friendly information processing device can be provided.

[1373] According to this aspect, since the state of the information processing device makes transition from the photographing enabled state to the launch acceptance state after the photographing operation, an image representing a result of photographing cannot be displayed in the photographing enabled state. Here, when the invention according to the previous aspect and the invention according to the present aspect are combined, the image representing the result of photographing that could not be displayed in the photographing enabled state can be shown to the user in the launch acceptance state immediately after the photographing enabled state, which is particularly effective.

[1374] According to a more preferred aspect of the fifth aspect, the photographing enabling operation may be performed by performing an operation the same as the photographing operation.

[1375] According to this aspect, since the photographing enabling operation and the photographing operation are performed by performing the same operation, a series of operations for making transition to the photographing enabled state and further performing photographing can be performed by performing one type of operation, and thus the series of operations can easily be performed. Further, when the invention according to the previous aspect and the invention according to the present aspect are combined, transition from the launch acceptance state to the photographing enabled state and transition from the photographing enabled state to the launch acceptance state can be made by performing the same operation. Therefore, even if the user accidentally performs the photographing enabling operation or performs the photographing enabling operation without fully understanding a manner of operation to cause transition to the photographing enabled state, the user can return to the original state (the launch acceptance state) by performing the same operation again. Thus, a state where "the user does not know how to return from the photographing enabled state to the launch acceptance state" can be prevented and a user-friendly information processing device can be provided.

[1376] According to a more preferred aspect of the fifth aspect, the photographing enabling operation and the photographing operation may be an operation to press a prescribed button.

[1377] According to this aspect, the user can perform the photographing enabling operation and the photographing operation with a simple operation. Therefore, the photographing function of the photographing processing means can be activated with the simple operation and a picked-up image can be stored with the simple operation.

[1378] According to a more preferred aspect of the fifth aspect, the information processing device may include coordinate input means (touch panel **13**) through which a coordinate position on a screen of a display device (lower LCD **12**)

can be input. Here, the first launch operation acceptance means causes display on the screen of at least a plurality of images (icon images **71***a* to **71***c*) among images corresponding to the plurality of application programs respectively, changes a displayed image in accordance with an operation to scroll the screen, and accepts as the first launch operation, an input to a position of the displayed image through the coordinate input means. The first launch means launches an application program corresponding to an icon image indicated by the input accepted by the first launch operation acceptance means. The second launch operation acceptance means causes display of an image (**72**) indicating the photographing application program at a prescribed position on the screen, and accepts as the second launch operation, an input to the prescribed position through the coordinate input means. The second launch means launches the photographing application program in accordance with the input accepted by the second launch operation acceptance means.

[1379] According to this aspect, in the launch acceptance state, by performing an operation to select a position of one image from among a plurality of images indicating respective application programs through the coordinate input means, the application program can be launched. In the photographing enabled state, by performing an operation to designate a prescribed position at which an image indicating a photographing application is displayed through the coordinate input means, the photographing application program can be launched. Further, in the launch acceptance state, for facilitating selection from images indicating the plurality of application programs respectively, a displayed image (an application program) is changed by performing a scroll operation. Thus, for launching a desired application program in the launch acceptance state, the user may have to perform an operation to scroll the screen and an operation to designate an image. On the other hand, in the photographing enabled state, since an image indicating the photographing application program is always displayed at a prescribed position, the user can always easily launch the photographing application program by performing only an operation to designate the image.

[1380] According to a more preferred aspect of the fifth aspect, when the second launch operation is performed, the second launch means may cause the computer to execute the photographing application program, using at least a part of information set in the photographing processing by the photographing processing means as an argument to be passed to the photographing application program.

[1381] According to this aspect, setting in the photographing processing by the photographing processing means is reflected also in processing based on the photographing application program. Thus, when transition from the photographing processing by the photographing processing means to the processing based on the photographing application program is made, the user can similarly perform an operation and there is no need to change the setting. Thus, according to the thirteenth invention, a further user-friendly information processing device can be provided.

[1382] According to a more preferred aspect of the fifth aspect, the program above may further cause the computer to function as first-time start-up determination means (SA**1**) and photographing leading means (SA**2**). The first-time start-up determination means determines whether the information processing device is started up for the first time or not before acceptance of the first launch operation after start-up of the information processing device. When it is determined that the information processing device is started up for the first time, the photographing leading means sets a state of the information processing device to the photographing enabled state or provides display allowing the user to select whether or not to set the photographing enabled state.

[1383] According to this aspect, when the information processing device is started up for the first time, the user can initially be caused to actually experience the photographing operation, so that a novice user can get used to the photographing operation. Further, when the invention according to the previous aspect and the invention according to the present aspect are combined, it is the photographing processing by the photographing processing means having a relatively simple function that is performed when the information processing device is started up for the first time. Therefore, since the user performs the photographing operation only with a simple function when the information processing device is started up for the first time, the user can relatively easily perform the photographing operation even when he/she operates the information processing device for the first time.

[1384] According to a more preferred aspect of the fifth aspect, the photographing application program may have a function to perform processing for storing the picked-up image in the storage means and a function to view a picked-up image stored as a result of the photographing processing of the photographing processing means or of the processing based on the photographing application program.

[1385] According to this aspect, by using the photographing application program, the user can view an image taken based on any of the photographing function of the photographing processing means and the photographing application program.

[1386] According to a more preferred aspect of the fifth aspect, the photographing processing means and the photographing application program may be capable of performing a function common to a function of the photographing processing means and a function enabled as a result of execution of the photographing application program, in response to the same operation by the user.

[1387] According to this aspect, since the user can perform the same operation for the same function even when a program executed for photographing is changed, a user-friendly operation system can be provided.

[1388] According to a more preferred aspect of the fifth aspect, the launch program may include a launch function program (**51**) for launching the application program and a photographing function program (**52**) for causing the computer to function as the photographing processing means. Here, the photographing function program has a data size smaller than that of the photographing application program.

[1389] According to this aspect, by setting the photographing function program having a smaller data size as a program that can be launched in the launch acceptance state, a program for photographing can quickly be launched in the launch acceptance state.

[1390] According to a more preferred aspect of the fifth aspect, the launch program may include a launch function program (**51**) for launching the application program and a photographing function program (**52**) for causing the computer to function as the photographing processing means. Here, the launch program above may further cause the computer to function as read means (SA**4**) for reading, at timing of execution of the launch function program, the photographing function program along with the launch function program in

prescribed storage means for storing a program executed by the computer, after start-up of the information processing device.

[1391] According to this aspect, by reading the launch function program and the photographing function program together, the photographing function program can quickly be launched in the launch acceptance state.

[1392] According to an alternative aspect of the fifth aspect of the present invention, an information processing device including each means in the aspects above may be provided.

[1393] <Sixth Aspect>

[1394] According to the sixth aspect of the present invention, an image communication system including a plurality of image communication devices (**1**) each having image storage means (**28**, **32**, **34**) for storing prescribed images, and allowing transmission and reception of the prescribed images among the plurality of image communication devices is provided. An image communication device (**10***t*) serving to transmit an image among the plurality of image communication devices further includes transmitter information transmission control means (CPU **31** performing step SC**63**; hereinafter steps are indicated only with step numbers). The transmitter information transmission control means transmits as transmitter information (transmitter data) indicating a transmitter, its own identification information to other unspecified image communication devices. An image communication device (**10***r*) serving to receive an image among the plurality of image communication devices further includes transmitter information reception means (SC**84**), selection means (SC**85**), and destination information transmission control means (SC**86**, SC**92**). The transmitter information reception means receives the transmitter information. The selection means provides display indicating the transmitter (Nt**1** to Nt**3**) on display means (**12**) based on the received transmitter information, and allows a user to select whether or not to receive an image from the image communication device that has transmitted the transmitter information. The destination information transmission control means transmits as destination information (receiver data) indicating a destination, its own identification information to the image communication device selected by the selection means as the transmitter from which an image is to be received. The image communication device serving to transmit an image further includes destination information reception control means (SC**64**), destination determination means (SC**64**, SC**65**), and image transmission means (SC**69**). The destination information reception control means receives the destination information. The destination determination means determines the image communication device to serve as the destination based on the received destination information. The image transmission means transmits at least one of images stored in the image storage means to the destination determined by the destination determination means. The image communication device serving to receive an image further includes image reception means (SC**90**) and image storage control means (SC**90**). The image reception means receives an image transmitted by the image transmission means. The image storage control means causes the image storage means to store the image received by the image reception means. Transmission of the transmitter information from the transmitter information transmission control means to other unspecified image communication devices includes, for example, transmission of the transmitter information without specifying a destination and transmission of the transmitter information to an unidentified image communication device in accordance with a request therefrom.

[1395] According to this aspect, the following sixth problem can be solved.

[1396] (Sixth Problem)

[1397] The electronic camera disclosed in Japanese Patent Laying-Open No. 10-341388 (Patent Document 14) communicates through infrared, and therefore the transmission-end electronic camera and the reception-end electronic camera should be arranged to face each other. Further, when a plurality of transmission-end electronic cameras are present in a communication range of the reception-end electronic camera, the reception-end electronic camera is not allowed to select a camera from among the plurality of transmission-end electronic cameras.

[1398] (Function and Effect According to Sixth Aspect)

[1399] According to the sixth aspect, in order to address the sixth problem above, an image communication system, an image communication device, and an image communication program allowing a user to receive an image from a desired transmission-end device when images are transmitted and received among devices are provided.

[1400] According to the sixth aspect of the present invention, the image communication device serving to receive an image is allowed to select whether or not to receive an image depending on a transmitter, thereby preventing reception of an image from an unintended transmitter. On the other hand, the image communication device serving to transmit an image can invite receivers to which an image is to be distributed, without specifying in advance a device to receive an image, and distribute the image.

[1401] According to a more preferred aspect of the sixth aspect, the transmitter information reception means is capable of receiving a plurality of pieces of transmitter information transmitted to the unspecified image communication devices. The selection means provides display of each piece of transmitter information in accordance with each piece of received transmitter information on the display means, and causes a user to select any transmitter information.

[1402] According to this aspect, the image communication device serving to receive an image is allowed to select a transmitter from which image data is to be received from among a plurality of transmitters. For example, when a plurality of image communication devices serving as transmitters are present, the image communication device serving to receive an image is allowed to select an image communication device desired by a user from among the plurality of image communication devices, and to receive an image.

[1403] According to a more preferred aspect of the sixth aspect, the image communication device serving to transmit an image further includes transmitter display control means (SC**65**, FIG. **51**). The transmitter display control means causes display means (**12**) of the image communication device serving to transmit an image to provide indication indicating the image communication device (Nr**1** to Nr**3**) requesting image transmission, based on the destination information received from the image communication device serving to receive an image.

[1404] According to this aspect, a user of the image communication device serving to transmit an image can know the destination image communication device to which an image is to be transmitted.

[1405] According to a more preferred aspect of the sixth aspect, the transmitter information includes transmitter user information (Dc) that can be set by a user of the image communication device serving to transmit an image. The selection means causes the display means of the image communication device serving to receive an image to display the transmitter user information included in the transmitter information as information indicating the image communication device transmitting the transmitter information.

[1406] According to this aspect, a user of the image communication device serving to transmit an image can express its characteristic, and the image communication device serving to receive the image also can easily identify the image communication device serving to transmit the image.

[1407] According to a more preferred aspect of the sixth aspect, the destination information includes destination user information (Dc) that can be set by a user of the image communication device serving to receive an image, and the transmitter display control means causes the display means of the image communication device serving to transmit an image to display the transmitter user information included in the destination information as notification indicating the image communication device requesting image transmission.

[1408] According to this aspect, a user of the image communication device serving to receive an image can express its characteristic, and the image communication device serving to transmit an image also can easily identify the image communication device serving to receive an image.

[1409] According to a more preferred aspect of the sixth aspect, the image communication device serving to transmit an image further includes image selection means (SC**66**) for selecting an image to be transmitted to the image communication device that has transmitted the destination information, in accordance with a user's operation, after reception of the destination information. The image transmission means transmits the image selected by the image selection means to the image communication device that has transmitted the destination information.

[1410] According to this aspect, an image desired by a user of the image communication device serving to transmit an image can be selected and transmitted. Further, after the image communication device serving to receive an image and the image communication device serving to transmit an image are determined, an image to be transmitted from the image communication device serving to transmit an image to the image communication device is selected, so that the image communication device serving to transmit the image can change a type and the number of images to be transmitted to the image communication device serving to receive an image.

[1411] According to a more preferred aspect, the image selection means includes image-to-be-transmitted display control means (FIG. **52**). The image-to-be-transmitted display control means urges a user to select an image to be transmitted to the image communication device serving to receive an image, from among images stored in the image storage means, as images to be transmitted to the image communication device serving to receive an image, by displaying these images on the display means of the image communication device serving to transmit an image.

[1412] According to this aspect, the display means displays images stored as images to be transmitted, so that selection of an image by a user of the image communication device serving to transmit an image is facilitated.

[1413] According to a more preferred aspect, the image storage means of the image communication device serving to transmit an image includes embedded storage means (**34**) and removable storage means (**28**). The embedded storage means is embedded in a main body of the image communication device. The removable storage means is removably attached to the main body of the image communication device. The image selection means includes storage destination selection means (SC**50**). The storage destination selection means selects any one of the embedded storage means and the removable storage means. The image selection means selects an image to be transmitted to the image communication device serving to receive an image from among images stored in the storage means selected by the storage destination selection means, in accordance with a user's operation.

[1414] According to this aspect, an image to be transmitted can be limited to an image stored in predetermined storage means.

[1415] According to a more preferred aspect of the sixth aspect, the image communication device serving to receive an image further includes determination means and image transmission continuation request transmission means. The determination means determines, after the image reception means receives an image transmitted from the image communication device serving to transmit an image, whether or not to further receive an image from the image communication device serving to transmit an image. The image transmission continuation request transmission means transmits an image transmission continuation request to the image communication device serving to transmit an image that has been selected by the selection means, when the determination means determines further reception of an image. Receiving the image transmission continuation request, the image transmission means transmits an image to the image communication device that has transmitted the image transmission continuation request.

[1416] According to this aspect, the image communication device serving to transmit an image can transmit images in a stepwise fashion to the image communication device serving to receive an image.

[1417] According to a more preferred aspect of the sixth aspect, the image communication device serving to transmit an image further includes image selection means. After receiving the image transmission continuation request, the image selection means selects an image to be transmitted to the image communication device that has transmitted the image transmission continuation request, in accordance with a user's operation. Receiving the image transmission continuation request, the image transmission means transmits the image selected by the image selection means to the image communication device that has transmitted the image transmission continuation request.

[1418] According to this aspect, an image to be transmitted can be selected and transmitted each time a request is issued from the reception end.

[1419] According to a more preferred aspect of the sixth aspect, the image communication device serving to transmit an image further includes limitation means. The limitation means limits the number of images to be transmitted at a time by the image transmission means.

[1420] According to this aspect, as images in number not larger than a prescribed number are transmitted at a time from the image communication device serving as a transmitter, the reception-end device can receive images while confirming

the number of received images and determine whether or not to continue reception based on the number of received images.

[1421] According to a more preferred aspect, the determination means determines whether or not to further receive an image from the image communication device serving to transmit an image, in accordance with a user's operation. The image communication device serving to receive an image further includes reception end notification means. The reception end notification means transmits reception end notification to the image communication device selected by the selection means when the determination means determines not to receive an image. The image transmission means transmits, each time the image transmission continuation request is received, an image only to the image communication device that has transmitted the image transmission continuation request, except for the image communication device that has transmitted the reception end notification.

[1422] According to this aspect, each image communication device serving to receive an image can leave a group of devices to which the image communication device serving to transmit an image transmits an image, at timing desired by a user.

[1423] According to a more preferred aspect, the image communication device serving to receive an image further includes remaining capacity monitoring means. The remaining capacity monitoring means monitors a remaining storage capacity of the image storage means for additionally storing the image. The reception end notification means transmits the reception end notification to the image communication device selected by the selection means when the remaining storage capacity is equal to or smaller than a prescribed capacity.

[1424] According to this aspect, the image communication device serving to receive an image can automatically leave a group of devices to which the image communication device serving to transmit an image transmits an image, based on a capacity for storing image data.

[1425] According to a more preferred aspect of the sixth aspect, the image storage means of the image communication device serving to receive an image further includes embedded storage means and removable storage means. The embedded storage means is embedded in a main body of the image communication device. The removable storage means is removably attached to the main body of the image communication device. The image communication device serving to receive an image further includes storage means determination means (SC**50**). The storage means determination means determines in advance any one of the embedded storage means and the removable storage means as storage means for storing the received image. The image storage control means causes the storage means determined by the storage means determination means to store an image transmitted from the image communication device serving to transmit an image.

[1426] According to this aspect, received image data can be stored only in a predetermined storage means.

[1427] According to a more preferred aspect of the sixth aspect, the image communication device further includes image pick-up means and photographing means. The photographing means causes the image storage means to store an image picked-up by the image pick-up means, in accordance with a user's prescribed operation. The image transmission means transmits the image stored in the image storage means by means of the photographing means.

[1428] According to this aspect, an image picked-up by the image communication device can be transmitted and received.

[1429] According to a more preferred aspect of the sixth aspect, an image communication device (**10***r*) for receiving an image from another image communication device is provided. The image communication device includes: storage means; transmitter information reception means; selection means; destination information transmission control means; image reception means; and image storage control means. The transmitter information reception means receives from another image communication device, identification information of another image communication device as transmitter information indicating a transmitter. The selection means causes display means to provide display indicating the transmitter based on the received transmitter information, and allows a user to select whether or not to receive an image from the image communication device that has transmitted the transmitter information. The destination information transmission control means transmits as destination information indicating a destination, its own identification information to the image communication device selected by the selection means as the transmitter from which an image is to be received. The image reception means receives an image transmitted by the image communication device to which the destination information has been transmitted. The image storage control means causes the storage means to store the image received by the image reception means.

[1430] According to a more preferred aspect of the sixth aspect, an image communication device (**10***t*) for transmitting an image to another image communication device is provided. The image communication device includes: image storage means; transmitter information transmission control means; destination information reception control means; destination determination means; and image transmission means. The image storage means stores a prescribed image. The transmitter information transmission control means transmits as transmitter information indicating a transmitter, its own identification information to other unspecified image communication devices. The destination information reception control means receives as destination information indicating a destination, identification information of another image communication device from another image communication device. The destination determination means determines an image communication device to serve as the destination based on the received destination information. The image transmission means transmits at least one of images stored in the image storage means to the destination determined by the destination determination means.

[1431] According to a more preferred aspect of the sixth aspect, an image communication device (**1**) for receiving an image from another image communication device or transmitting an image to another image communication device is provided. The image communication device includes image storage means; and transmission/reception selection means (SC**51**). The image storage means stores a prescribed image. The transmission/reception selection means selects any of reception of an image from another image communication device and transmission of an image to another image communication device. When the transmission/reception selection means selects reception of an image from another image communication device, the image communication device further includes: transmitter information reception means; selection means; destination information transmission control

means; image reception means; and image storage control means. The transmitter information reception means receives identification information of another image communication device from another image communication device as transmitter information indicating a transmitter. The selection means causes display means to provide display indicating the transmitter based on the received transmitter information, and allows a user to select whether or not to receive an image from the image communication device that has transmitted the transmitter information. The destination information transmission control means transmits as destination information indicating a destination, its own identification information to the image communication device selected by the selection means as the transmitter from which an image is to be received. The image reception means receives an image transmitted from the image communication device to which the destination information has been transmitted. The image storage control means causes the image storage means to store the image received by the image reception means. When the transmission/reception selection means selects transmission of an image to another image communication device, the image communication device further includes: transmitter information transmission control means; destination information reception control means; destination determination means; and image transmission means. The transmitter information transmission control means transmits as transmitter information indicating a transmitter, its own identification information to other unspecified image communication devices. The destination information reception control means receives identification information of another image communication device from another image communication device as the destination information indicating the destination. The destination determination means determines an image communication device to serve as the destination, based on the received destination information. The image transmission means transmits at least one of images stored in the image storage means to the destination determined by the destination determination means.

[1432] According to a more preferred aspect of the sixth aspect, an image communication program executed by a computer (**31**) of a device for receiving an image from another image communication device is provided. The image communication program causes the computer to function as: transmitter information reception means; selection means; destination information transmission control means; image reception means; and image storage control means. The transmitter information reception means receives identification information of another image communication device from another image communication device as transmitter information indicating a transmitter. The selection means causes display means to provide display indicating the transmitter based on the received transmitter information, and allows a user to select whether or not to receive an image from the image communication device that has transmitted the transmitter information. The destination information transmission control means transmits as destination information indicating a destination, its own identification information to the image communication device selected by the selection means as the transmitter from which an image is to be received. The image reception means receives an image transmitted by the image communication device to which the destination information has been transmitted. The image storage control means causes a storage device to store the image received by the image reception means.

[1433] According to a more preferred aspect of the sixth aspect, an image communication program executed by a computer of a device for receiving an image from another image communication device or transmitting an image to another image communication device is provided. A prescribed image is stored in a storage device of the device. The image communication program causes the computer to function as transmission/reception selection means. The transmission/reception selection means selects any of reception of an image from another image communication device and transmission of an image to another image communication device. When the transmission/reception selection means selects reception of an image from another image communication device, the image communication program causes the computer to further function as: transmitter information reception means; selection means; destination information transmission control means; image reception means; and image storage control means. The transmitter information reception means receives identification information of another image communication device from another image communication device as transmitter information indicating a transmitter. The selection means causes display means to provide display indicating the transmitter based on the received transmitter information, and allows a user to select whether or not to receive an image from the image communication device that has transmitted the transmitter information. The destination information transmission control means transmits as destination information indicating a destination, its own identification information to the image communication device selected by the selection means as the transmitter from which an image is to be received. The image reception means receives an image transmitted from the image communication device to which the destination information has been transmitted. The image storage control means causes the image storage means to store the image received by the image reception means. When the transmission/reception selection means selects transmission of an image to another image communication device, the image communication program causes the computer to further function as: transmitter information transmission control means; destination information reception control means; destination determination means; and image transmission means. The transmitter information transmission control means transmits as the transmitter information indicating the transmitter, its own identification information to other unspecified image communication devices. The destination information reception control means receives identification information of another image communication device from another image communication device as the destination information indicating the destination. The destination determination means determines the image communication device to serve as the destination, based on the received destination information. The image transmission means transmits at least one of images stored in the image storage means to the destination determined by the destination determination means.

[1434] In addition, according to the image communication device and the image communication program according to an aspect similar to the sixth aspect of the present invention, the same effect as in the image communication system described above can be achieved.

[1435] <Seventh Aspect>

[1436] According to the seventh aspect of the present invention, an information processing program executed in a computer (**1**) setting a value of at least one parameter based on an input from an input device (**13**) is provided. The informa-

tion processing program causes the computer (**1**) to function as: first change operation accepting means (SD **110**) for accepting an operation of change from a position in accordance with a current value of the parameter within a prescribed display area (**250**) in a prescribed screen (**500**, **501**, **502**, **503**); first update means (SD**114**, SD**115**) for gradually updating the parameter from the current value based on the operation of change accepted by the first change operation accepting means; second change operation accepting means (SD**111**) for accepting an operation of change to a position in accordance with a desired value of the parameter within the prescribed display area; and second update means (SD**112**, SD**115**) for updating the parameter from the current value to the desired value based on the operation of change accepted by the second change operation accepting means. In addition, the second update means updates the parameter from the current value to the desired value (SD**115**) when the desired value is smaller than the current value of the parameter (SD**111**, SD**112**) and the second update means does not update the parameter from the current value to the desired value (SD**113**) when the desired value is greater than the current value of the parameter (SD**111**, SD**113**).

[1437] According to this aspect, the following seventh problem can be solved.

[1438] (Seventh Problem)

[1439] In a general media player, the user cannot know only from appearance, the highest volume in a volume adjustment portion and association between the volume adjustment portion and the volume. Further, even when the volume is the same, how sound is heard varies depending on variation in an ambient environment, and it is difficult to immediately change the volume to a user's desired volume.

[1440] In this regard, if the volume cannot immediately be changed to the user's desired volume, in particular, if the volume is higher than the user's desired volume, the user and a person around the user may feel uncomfortable, that is, stress may be imposed.

[1441] (Function and Effect According to Seventh Aspect)

[1442] According to the seventh aspect, in order to address the seventh problem above, an information processing program and an information processing device implementing a user interface suitable for a user's operation in an operation to change setting of a parameter are provided.

[1443] According to the seventh aspect of the present invention, when a slider operation which is an operation of change from the position in accordance with the current value is accepted through the input device (**13**), the parameter is gradually updated in accordance with a slider position. On the other hand, when the operation of change to the position in accordance with the desired value is accepted through the input device (**13**), the parameter is updated from the current value to the desired value if the desired value is smaller than the current value of the parameter, and the parameter is not updated from the current value to the desired value if the desired value is greater than the current value of the parameter.

[1444] Therefore, the user can change the parameter through a series of operations of the input device (**13**). Specifically, the parameter can gradually be changed from the current value to a greater value or a smaller value. On the other hand, a change operation input for abruptly increasing the parameter from the current value to a greater value is prohibited. Thus, by prohibiting the change operation for abruptly increasing the parameter value to a greater value in the operation to change setting of the parameter, stress imposed on a user or the like due to abrupt change in the parameter caused by an erroneous operation is suppressed and the user interface suitable for a user's operation can be implemented.

[1445] In addition, according to an aspect similar to the seventh aspect of the present invention, an information processing program executed in a computer setting a value of at least one parameter based on an input from an input device (**13**) is provided. The information processing program causes the computer (**10**) to function as: slider display means (SD**32**, SD**70**, SD**91**) for displaying a slider (**252**) indicating a current value of the parameter within a prescribed display area (**550**) in a prescribed screen (**500**, **501**, **502**, **503**); first movement operation accepting means (SD**110**, SD**114**) for accepting a continuous operation of movement from a position of the slider (**552**) in accordance with the current value of the parameter; second movement operation accepting means (SD**110**, SD**111**) for accepting an operation of movement to a position of the slider (**552**) in accordance with a desired value of the parameter within the prescribed display area; and update means (SD**115**) for updating the parameter to a value in accordance with a position of the slider (**552**) resulting from movement in accordance with the accepted operation of movement. The second movement operation accepting means accepts the operation of movement to a desired position of the slider (**552**) (SD**112**) when the slider moves in a direction of decrease from the current value of the parameter and the second movement operation accepting means does not accept the operation of movement to the desired position of the slider (SD**113**) when the slider moves in a direction of increase from the current value of the parameter.

[1446] According to this similar aspect, when the continuous operation of movement from the position of the slider (**552**) in accordance with the current value or an operation of movement to the position of the slider in accordance with the desired value is accepted through the input device (**13**), the parameter is updated to the value in accordance with the position of the slider (**552**) resulting from movement. When the operation to move the slider (**552**) through the input device (**13**) is such that the slider moves in a direction of decrease from the current value, the operation of movement to the desired position is accepted, whereas when the operation to move the slider (**552**) through the input device (**13**) is such that the slider moves in a direction of increase from the current value, the operation of movement to the desired position is not accepted.

[1447] Therefore, the user can change the parameter through a series of operations of the input device (**13**). Specifically, by continuously moving the slider, the parameter can gradually be changed from the current value to a greater value or a smaller value. On the other hand, when the slider is operated to move to the position in accordance with the desired value, an operation of movement in a direction of increase from the current value of the parameter is prohibited. Thus, by prohibiting the operation of movement to abruptly increase the parameter value to a greater value in the operation to change setting of the parameter, stress imposed on the user or the like due to abrupt change in the parameter caused by an erroneous operation is suppressed and the user interface suitable for a user's operation can be implemented.

[1448] According to a more preferred aspect of the seventh aspect, the input device is a pointing device (**27**). According to

this aspect, as the user provides input to an arbitrary position on a touch panel by using a touch pen (**27**), user's operability in selection is improved.

[1449] According to a more preferred aspect of the seventh aspect, means for updating the parameter from the current value to the desired value based on the operation of change to a position corresponding to the desired information processing value gradually updates the parameter from the current value. According to this aspect, when the parameter is updated from the current value to the desired value as well, the parameter is gradually updated, so that variation of the parameter can be smooth and hence natural.

[1450] According to a more preferred aspect of the seventh aspect, the computer sets values of a plurality of types of parameters based on the input from the input device (**13**). The values of the plurality of types of parameters are associated with arbitrary positions within the prescribed display area, respectively.

[1451] According to this aspect, as association with the plurality of types of parameters is established, setting of the parameter through the input device can be made in a simplified manner.

[1452] In particular, the prescribed display area is a multi-dimensional area in accordance with the number of types of parameters set by the computer. Thus, as the parameter is displayed in a dimension in accordance with the number of types of parameters, the position of each parameter can readily be recognized.

[1453] According to a more preferred aspect of the seventh aspect, the parameter corresponds to a volume level of sound output from an output device of the computer. According to this aspect, abrupt increase in volume from the current volume, which leads to uncomfortable feeling, that is, stress imposed on the user and a person around the user, can be suppressed.

[1454] According to a more preferred aspect of the seventh aspect, the parameter corresponds to duration of a file reproduced in the computer. According to this aspect, start of reproduction from a position where reproduction has not yet been carried out is avoided and having the user feel uncomfortable can be suppressed.

[1455] According to another aspect similar to the seventh aspect of the present invention, an information processing device (**10**) setting a value of at least one parameter based on an input from an input device (**13**) is provided. The information processing device (**10**) includes: first change operation accepting means (**552**, SD**110**, SD**114**) for accepting an operation of change from a position in accordance with a current value of the parameter, within a prescribed display area (**550**) in a prescribed screen (**500**, **501**, **502**, **503**); first update means (SD**114**, SD**115**) for gradually updating the parameter from the current value based on the operation of change accepted by the first change operation accepting means; second change operation accepting means (**554**, **555**) for accepting an operation of change to a position in accordance with a desired value of the parameter within the prescribed display area; and second update means (SD**111**, SD**112**, SD**115**) for updating the parameter from the current value to the desired value based on the operation of change accepted by the second change operation accepting means. The second update means updates the parameter from the current value to the desired value when the desired value is smaller than the current value of the parameter (**554**) and the second update means does not update the parameter from the current value to the desired value when the desired value is greater than the current value of the parameter (**555**) (SD**113**).

[1456] According to yet another aspect similar to the seventh aspect of the present invention, an information processing device setting a value of at least one parameter based on an input from an input device (**13**) is provided. The information processing device (**10**) includes: slider display means (SD**32**, SD**70**, SD**91**) for displaying a slider (**552**) indicating a current value of the parameter within a prescribed display area (**550**) in a prescribed screen (**500**, **501**, **502**, **503**); first movement operation accepting means (SD**110**, SD**114**) for accepting a continuous operation of movement from a position of the slider (**552**) in accordance with the current value of the parameter; second movement operation accepting means (SD**110**, SD**111**) for accepting an operation of movement to a position of the slider (**552**) in accordance with a desired value of the parameter within the prescribed display area; and update means (SD**115**) for updating the parameter to a value in accordance with a position of the slider (**552**) resulting from movement in accordance with the accepted operation of movement. The second movement operation accepting means accepts the operation of movement to a desired position of the slider (**552**) when the slider moves in a direction of decrease from the current value of the parameter (**554**, SD**112**) and the second movement operation accepting means does not accept the operation of movement to the desired position of the slider when the slider moves in a direction of increase from the current value of the parameter (**555**, SD**113**).

[1457] <Eighth Aspect>

[1458] According to the eighth aspect of the present invention, an information processing program executed in a computer representing an information processing device (**10**) capable of reproducing music data in which an upper member (**21**) and a lower member (**11**) are coupled to each other to allow opening and closing is provided. The information processing program causes the computer to function as music reproduction means (SD**90**) for reproducing music data, opening and closing detection means (SD**150**) for detecting an opened or closed state of the upper member and the lower member, and sleep means (SD**153**, SD**154**) for continuing reproduction of the music data by the music reproduction means when transition from the opened state to the closed state of the upper member and the lower member is detected by the opening and closing detection means and connection with prescribed external output equipment is detected while the music data is being reproduced by the music reproduction means, continuing reproduction of the music data by the music reproduction means when connection with prescribed external output equipment is detected, and stopping reproduction of the music data by the music reproduction means when connection with prescribed external output equipment is not detected.

[1459] According to this aspect, the following eighth problem can be solved.

[1460] (Eighth Problem)

[1461] Japanese Patent Laying-Open No. 2003-216289 (Patent Document 1) shows a computer device implemented as a notebook PC which is a portable terminal device, in which when the notebook PC is closed (in a closed state), sleep processing is performed to set a sleep state where operation such as display is stopped. On the other hand, this docu-

ment shows the feature that setting from a sleep state to an active state is made when the notebook PC is again opened (in an opened state).

[1462] In addition, this document discloses such a technique that, even in performing the sleep processing, when the notebook PC is connected to a reproduction device performing reproduction processing of music data through a USB cable, an active state is partially set in order to transmit necessary data from the notebook PC to the reproduction device through the USB cable.

[1463] Therefore, even when the sleep processing is performed, the sleep processing is not performed for a partial function relating to reproduction processing of the music data.

[1464] In an information terminal device in Japanese Patent Laying-Open No. 2003-216289 (Patent Document 1), however, reproduction processing of the music data in the information processing device has not been considered and it has not been possible to perform reproduction processing convenient for a user.

[1465] (Function and Effect According to Eighth Aspect)

[1466] According to the eighth aspect, in order to address the eighth problem above, an information processing program and an information processing device performing processing convenient for a user in reproduction of music data are provided.

[1467] According to the eighth aspect of the present invention, when the user closes the upper member and the lower member of the information processing device coupled to allow opening and closing, transition from the opened state to the closed state of the upper member and the lower member is detected. When connection with prescribed external output equipment is detected, reproduction of the music data is continued. When connection with prescribed external output equipment is not detected, reproduction is stopped.

[1468] As shown in a typical embodiment, when the user closes the upper member and the lower member from the opened state and connection of prescribed external output equipment (typically, a headphone) is detected, a reproduction function is continued and hence an audio signal is output from the headphone. Therefore, as the audio signal is not output from a speaker or the like of the device, the user and a person around the user do not feel uncomfortable. In addition, the reproduction function is continued while connection with the headphone is detected, and otherwise, i.e., when connection with the headphone is not detected, the sleep state where the reproduction function is stopped is set, which is convenient for the user who has been expecting transition to the sleep state where reproduction is stopped by closing the device.

[1469] According to a more preferred aspect of the eighth aspect, this information program further causes the computer to function as continuous reproduction accepting means (**517**, SD**161**) for accepting a setting instruction indicating continuous reproduction of music data. When the opening and closing detection means detects transition from the opened state to the closed state of the upper member and the lower member and the setting instruction is accepted, the music reproduction means carries out continuous reproduction of the music data (SD**162**), and when the setting instruction is not accepted, the music reproduction means stops reproduction of the music data (SD**163**) at the timing of end of reproduction of the music data that is currently being carried out.

[1470] According to this aspect, when the user provides input of the setting instruction indicating continuous reproduction of the music data and transition from the opened state to the closed state of the upper member and the lower member is detected, reproduction of the music data is continuously carried out. When input of the setting instruction is not provided, reproduction of the music data is stopped at the timing of end of reproduction of the music data that is currently being carried out.

[1471] As shown in a typical embodiment, when the user selects "reproduction mode" switching icon **517** to select a reproduction mode of repeated reproduction, that is, the reproduction mode in which reproduction of the music data is continuously carried out, reproduction of the music data is continued. When the user selects a reproduction mode other than that, reproduction is stopped at the timing of end of reproduction of the music data that is currently being carried out. Thus, as whether to continue reproduction or not is determined based on the setting instruction indicating continuous reproduction provided by the user, reproduction as intended by the user can be carried out. In addition, as reproduction is stopped at the timing of end of reproduction of the music data that is currently being carried out, reproduction can end without having the user feel uncomfortable.

[1472] According to a more preferred aspect of the eighth aspect, this information processing program further causes the computer to function as reproduction setting accepting means (**561**, SD**212**, SD**213**) for accepting a setting instruction to switch between stereophonic reproduction and monaural reproduction in reproduction of music data by the music reproduction means. When the setting instruction is accepted and connection with prescribed external output equipment is detected, the music reproduction means carries out reproduction in accordance with the setting instruction, and when connection with prescribed external output equipment is not detected, the music reproduction means carries out stereophonic reproduction (SD**214**, SD**215**).

[1473] According to this aspect, the reproduction setting means for accepting a setting instruction to switch between stereophonic reproduction and monaural reproduction in reproduction of the music data functions, and when connection with prescribed external output equipment is detected, stereophonic reproduction or monaural reproduction is carried out in accordance with the setting instruction.

[1474] As shown in a typical embodiment, when the user selects function selection icon **561** of "headphone" in reproduction through external output equipment (typically, a headphone) and switches to the headphone, reproduction processing appropriate for a type of the headphone can be selected.

[1475] According to a more preferred aspect of the eighth aspect, this information processing program further causes the computer to function as adjustment means (SD**141**) for adjusting a prescribed frequency band of music data to be reproduced by the music reproduction means when connection with prescribed external output equipment is detected (SD**140**).

[1476] According to this aspect, when connection with external output equipment (typically, a headphone) is detected, the adjustment means for adjusting a prescribed frequency band of music data to be reproduced functions.

[1477] As shown in a typical embodiment, equalization processing is performed when the user attaches external output equipment (typically, a headphone), so that reproduction can be carried out without having the user feel uncomfortable

by adjusting a prescribed frequency band even when acoustic characteristics are significantly changed owing to attachment of the headphone.

[1478] According to a more preferred aspect of the eighth aspect, this information processing program further causes the computer to function as adjustment means for adjusting a prescribed tone of music data to be reproduced by the music reproduction means when connection with prescribed external output equipment is detected.

[1479] According to this aspect, when connection with external output equipment (typically, a headphone) is detected, the adjustment means for adjusting a prescribed tone of music data to be reproduced functions.

[1480] As shown in a typical embodiment, when the user attaches external output equipment (typically, a headphone), reproduction can be carried out without having the user feel uncomfortable, for example, in such a manner that sound of high key that gives no uncomfortable feeling in reproduction from the speaker but sounds too high in listening through the headphone is replaced with different sound of lower key, or sound accompanying noise in listening through the headphone is replaced with different sound.

[1481] According to a more preferred aspect of the eighth aspect, this information processing program further causes the computer to function as adjustment means for adjusting a volume of music data to be reproduced by the music reproduction means when connection with prescribed external output equipment is detected.

[1482] According to this aspect, when connection with external output equipment (typically, a headphone) is detected, the adjustment means for adjusting a volume of music data to be reproduced functions.

[1483] As shown in a typical embodiment, when the user attaches external output equipment (typically, a headphone), reproduction can be carried out without having the user feel uncomfortable, for example, in such a manner that an audio signal reproduced in balance without giving uncomfortable feeling in reproduction from the speaker but reproduced in poor volume balance in listening through the headphone is adjusted by increasing or decreasing the volume thereof to attain balance.

[1484] According to a more preferred aspect of the eighth aspect, sleep means stops at least a part of a display function when the opening and closing detection means detects transition from the opened state to the closed state of the upper member and the lower member.

[1485] According to this aspect, when transition from the opened state to the closed state of the upper member and the lower member is detected, at least a part of the display function is stopped.

[1486] As shown in a typical embodiment, when the user sets the upper member and the lower member from the opened state to the closed state, a sleep state where an unnecessary function is stopped by stopping at least a part of the display function is set and hence power consumption can be lowered.

[1487] According to another aspect of the eighth aspect, an information processing program executed in a computer representing an information processing device capable of reproducing music data causes a computer to function as music reproduction means for reproducing music data and reproduction setting accepting means for accepting a setting instruction to switch between stereophonic reproduction and monaural reproduction in reproduction of music data by the music reproduction means. When the setting instruction is accepted and connection with prescribed external output equipment is detected, the music reproduction means carries out reproduction in accordance with the setting instruction, and when connection with prescribed external output equipment is not detected, the music reproduction means carries out stereophonic reproduction.

[1488] According to this aspect, reproduction setting means for accepting a setting instruction to switch between stereophonic reproduction and monaural reproduction in reproduction of the music data functions, and when connection with prescribed external output equipment is detected, stereophonic reproduction or monaural reproduction is carried out in accordance with the setting instruction.

[1489] As shown in a typical embodiment, when the user selects function selection icon **561** of "headphone" in reproduction through external output equipment (typically, a headphone) and switches to the headphone, reproduction processing appropriate for a type of the headphone can be selected.

[1490] According to yet another aspect of the eighth aspect, an information processing device (**10**) capable of reproducing music data in which an upper member (**21**) and a lower member (**11**) are coupled to each other to allow opening and closing includes music reproduction means (SD**90**) for reproducing music data, opening and closing detection means (SD**150**) for detecting an opened or closed state of the upper member and the lower member, and sleep means (SD**153**, SD**154**) for continuing reproduction of the music data by the music reproduction means when transition from the opened state to the closed state of the upper member and the lower member is detected by the opening and closing detection means and connection with prescribed external output equipment is detected while the music data is being reproduced by the music reproduction means, continuing reproduction of the music data by the music reproduction means when connection with prescribed external output equipment is detected, and stopping reproduction of the music data by the music reproduction means when connection with prescribed external output equipment is not detected.

[1491] According to this yet another aspect, an information processing device capable of reproducing music data includes music reproduction means for reproducing music data and reproduction setting accepting means (SD**261**, SD**212**, SD**213**) for accepting a setting instruction to switch between stereophonic reproduction and monaural reproduction in reproduction of music data by the music reproduction means. When the setting instruction is accepted and connection with prescribed external output equipment is detected, the music reproduction means carries out reproduction in accordance with the setting instruction, and when connection with prescribed external output equipment is not detected, the music reproduction means carries out stereophonic reproduction (SD**214**, SD**215**).

[1492] It should be understood that the embodiments disclosed herein are illustrative and non-restrictive in every respect. The scope of the present invention is defined by the terms of the claims, rather than the description above, and is intended to include any modifications within the scope and meaning equivalent to the terms of the claims.

We claim:

1: A device, comprising:

at least one camera;

a touchscreen; and

a display controller configured to concurrently display on the touchscreen (i) a first button operable for taking a picture using the camera, and (ii) a real time image captured by the camera, wherein the first button overlaps the real time image.

2: The device according to claim **1**, wherein the real time image is displayed over the entirety of the touchscreen.

3: The device according to claim **1**, wherein the display controller is further configured to display on the touchscreen a second button concurrently with the first button, wherein the second button overlaps the real time image.

4: The device according to claim **3**, wherein the first button and the second button are located adjacent a same edge of the touchscreen.

5: The device according to claim **4**, wherein the first button and the second button are displayed spaced apart from each other so that a portion of the real time image is displayed in the space between the first and second buttons.

6: The device according to claim **3**, wherein the first button is located adjacent one edge of the touchscreen and the second button is located adjacent another edge of the touchscreen.

7: The device according to claim **3**, wherein the at least one camera comprises first and second oppositely facing cameras, and the second button is operable for selecting between the first and second cameras.

8: The device according to claim **3**, wherein the second button is operable for launching a picture-related application.

9: The device according to claim **3**, wherein the second button is operable for launching by a shortcut a picture-related application which is different from a currently-activated application.

10: The device according to claim **1**, wherein the first button is located adjacent an edge of the touchscreen.

11: The device according to claim **10**, wherein the second button is located adjacent an edge of the touchscreen.

12: The device according to claim **1**, wherein the first button is horizontally centered.

13: The device according to claim **1**, further comprising:
a microphone.

14: The device according to claim **1**, further comprising:
wireless communication circuitry.

15: The device according to claim **14**, wherein the wireless communication circuitry includes first and second wireless modules.

16: The device according to claim **1**, further comprising:
a memory card connector for connecting to a memory card for storing pictures.

17: The device according to claim **1**, further comprising a mechanical button operable for taking a picture using the camera.

18: The device according to claim **17**, the mechanical button is located on a side surface of the device.

19: A non-transitory computer readable medium storing a program which, when executed by a processing system of a device including at least one camera and a touchscreen, cause the device to perform operations comprising:
displaying on the touchscreen a first button operable for taking a picture using the camera; and
displaying on the touchscreen, concurrently with the first button, a real time image captured by the camera, wherein the first button overlaps the real time image.

20: The non-transitory computer readable medium according to claim **19**, wherein the real time image is displayed over the entirety of the touchscreen.

21: The non-transitory computer readable medium according to claim **19**, wherein the operations further comprising:
displaying, on the touchscreen, a second button concurrently with the first button, wherein the second button overlaps the real time image.

22: The non-transitory computer readable medium according to claim **21**, wherein the first button and the second button are located adjacent a same edge of the touchscreen.

23: The non-transitory computer readable medium according to claim **22**, wherein the first button and the second button are displayed spaced apart from each other so that a portion of the real time image is displayed in the space between the first and second buttons.

24: The non-transitory computer readable medium according to claim **22**, wherein the first button is located adjacent one edge of the touchscreen and the second button is located adjacent another edge of the touchscreen.

25: A device, comprising:
first and second cameras;
a touchscreen; and
a display controller configured to concurrently display on the touchscreen (i) first, second and third buttons, the first button being operable for taking a picture using one of the cameras, the second button being operable for selecting between the first and second cameras, and the third button being operable for launching a picture-related application, and (ii) a real time image captured by the camera, wherein the first, second and third buttons overlap the real time image,
wherein one of the buttons is located adjacent one of the edges of the touchscreen and the other buttons are located adjacent another of the edge of the touchscreen, and
wherein the other buttons are spaced apart from each other so that part of the real time image is seen in the space.

26: A non-transitory computer readable medium storing a program which, when executed by a processing system of a device including first and second cameras and a touchscreen, cause the device to perform operations comprising:
displaying on the touchscreen first, second and third buttons, the first button being operable for taking a picture using one of the cameras, the second button being operable for selecting between the first and second cameras, and the third button being operable for launching a picture-related application; and
displaying on the touchscreen, concurrently with the first, second and third buttons, a real time image captured by the camera,
wherein the first, second and third buttons overlap the real time image,
wherein one of the buttons is located adjacent one of the edges of the touchscreen and the other buttons are located adjacent another of the edge of the touchscreen, and
wherein the other buttons are spaced apart from each other so that part of the real time image is seen in the space.

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