US 20220337739A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2022/0337739 A1**

YOROZU (43) **Pub. Date: Oct. 20, 2022**

(54) **IMAGING APPARATUS, IMAGING METHOD, AND PROGRAM**

(71) Applicant: **SONY GROUP CORPORATION**, TOKYO (JP)

(72) Inventor: **Shutaro YOROZU**, Kanagawa (JP)

(21) Appl. No.: **17/661,797**

(22) Filed: **May 3, 2022**

Related U.S. Application Data

(63) Continuation of application No. 16/336,648, filed on Mar. 26, 2019, now Pat. No. 11,350,027, filed as application No. PCT/JP2017/036455 on Oct. 6, 2017.

(30) **Foreign Application Priority Data**

Oct. 21, 2016 (JP) 2016-207107

Publication Classification

(51) **Int. Cl.**

H04N 5/232	(2006.01)
H04N 5/225	(2006.01)
H04N 5/765	(2006.01)

(52) **U.S. Cl.**

CPC ***H04N 5/23216*** (2013.01); ***H04N 5/22525*** (2018.08); ***H04N 5/23203*** (2013.01); ***H04N 5/765*** (2013.01)

(57) **ABSTRACT**

The present disclosure relates to an imaging apparatus, an imaging method, and a program that enable operation in which a display unit is brought into a turn-off state when a predetermined time elapses after start of capturing a moving image, a command from a remote commander is accepted and executed, and the captured moving image is output to an external apparatus. In a case where a manipulation unit that outputs a command depending on content of a user manipulation is manipulated and a command causing a moving image to be recorded on a recording medium is output, recording of the moving image is started and the display unit is controlled to a turn-off state in which an image is not displayed. The present disclosure can be applied to an imaging apparatus.

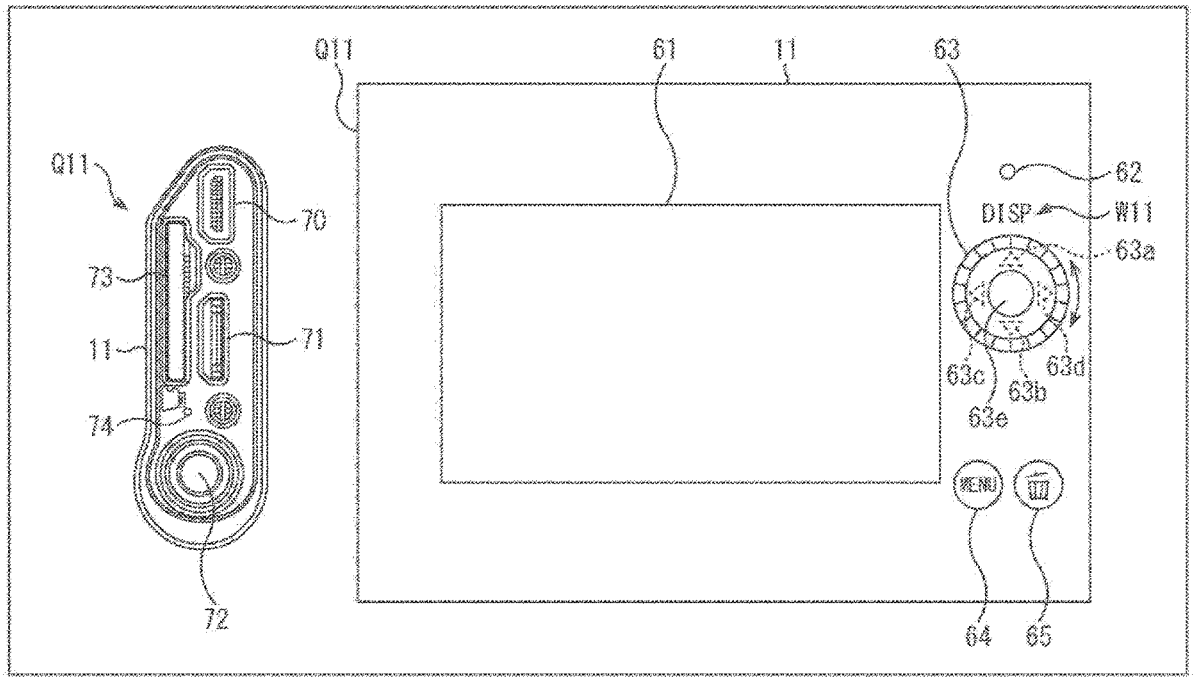


FIG. 1

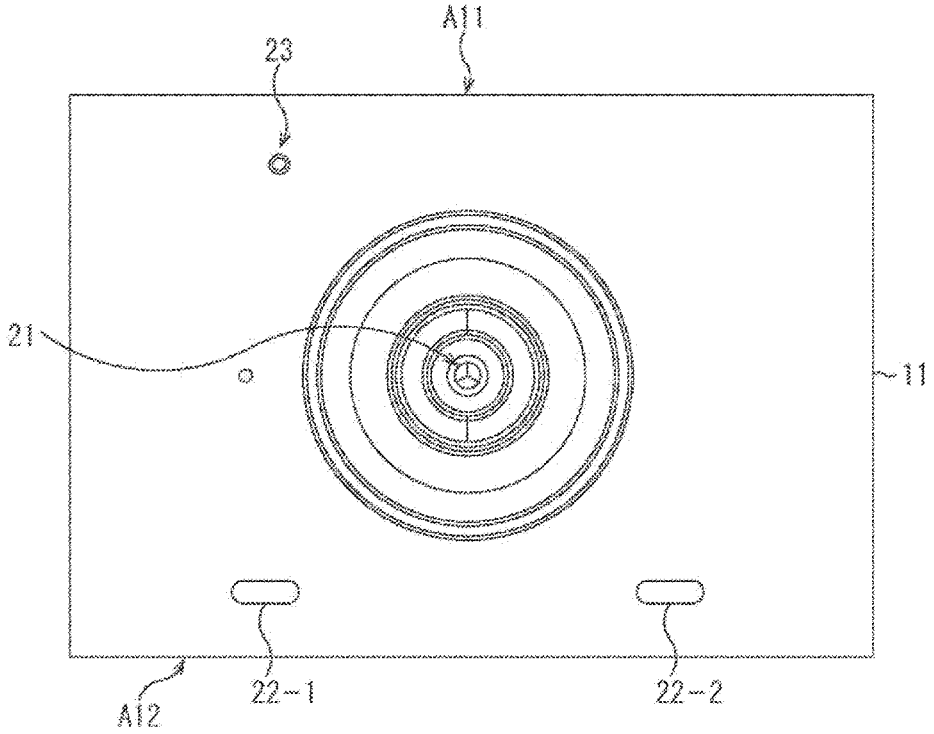


FIG. 2

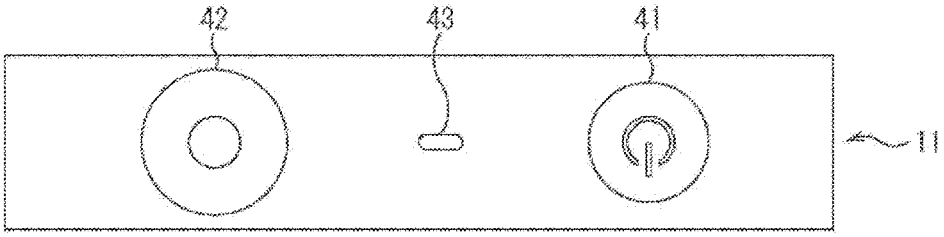


FIG. 3

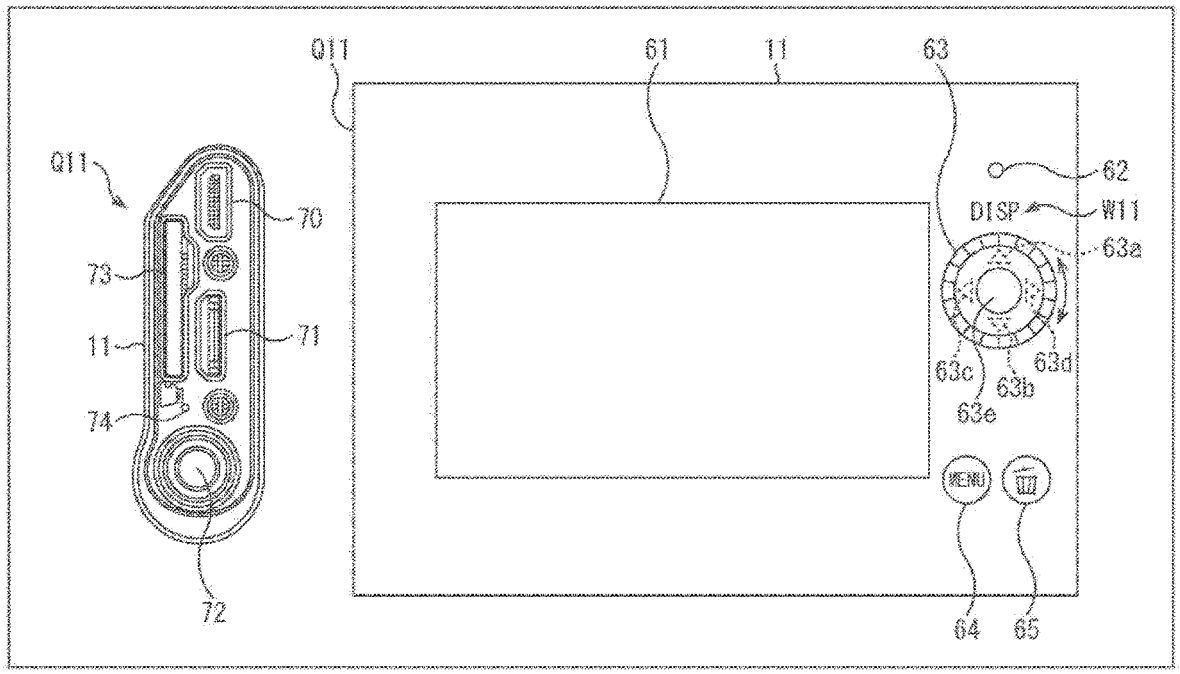

Q11
61
11
63
Q11
62
DISP
W11
63a
70
73
11
71
74
63c
63d
63b
63e
MENU
72
64
65

FIG. 4

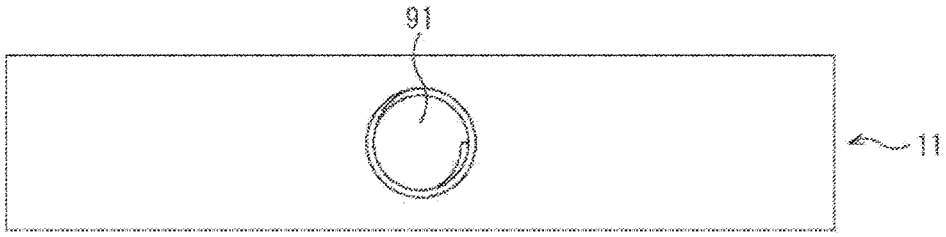


FIG. 5

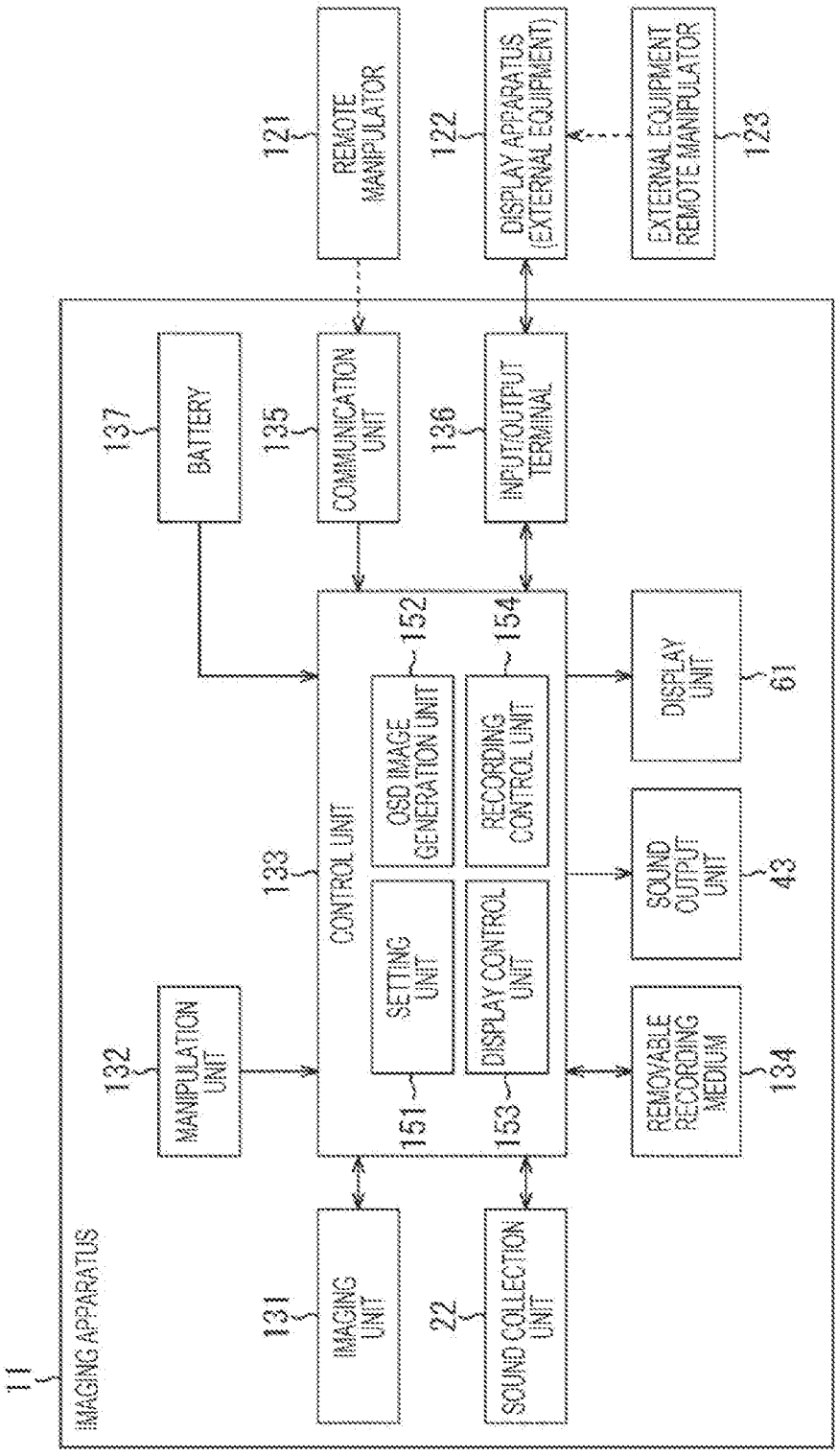

11
IMAGING APPARATUS
131
IMAGING UNIT
22
SOUND COLLECTION UNIT
132
MANIPULATION UNIT
133
CONTROL UNIT
151
SETTING UNIT
152
OSD IMAGE GENERATION UNIT
153
DISPLAY CONTROL UNIT
154
RECORDING CONTROL UNIT
134
REMOVABLE RECORDING MEDIUM
43
SOUND OUTPUT UNIT
61
DISPLAY UNIT
137
BATTERY
135
COMMUNICATION UNIT
136
INPUT/OUTPUT TERMINAL
121
REMOTE MANIPULATOR
122
DISPLAY APPARATUS (EXTERNAL EQUIPMENT)
123
EXTERNAL EQUIPMENT REMOTE MANIPULATOR

FIG. 6

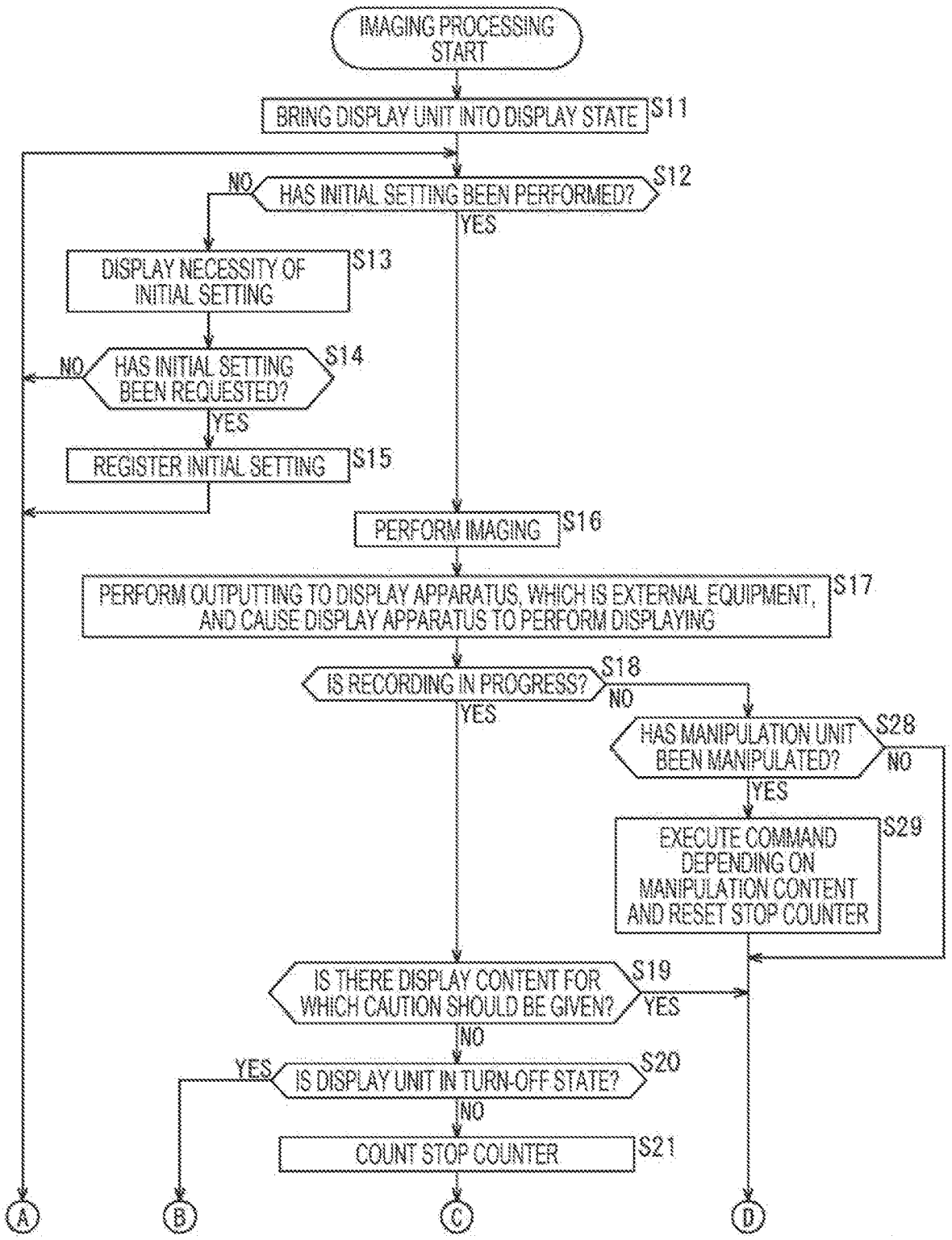

IMAGING PROCESSING START
BRING DISPLAY UNIT INTO DISPLAY STATE
S11
HAS INITIAL SETTING BEEN PERFORMED?
S12
NO
YES
DISPLAY NECESSITY OF INITIAL SETTING
S13
HAS INITIAL SETTING BEEN REQUESTED?
S14
NO
YES
REGISTER INITIAL SETTING
S15
PERFORM IMAGING
S16
PERFORM OUTPUTTING TO DISPLAY APPARATUS, WHICH IS EXTERNAL EQUIPMENT, AND CAUSE DISPLAY APPARATUS TO PERFORM DISPLAYING
S17
IS RECORDING IN PROGRESS?
S18
NO
YES
HAS MANIPULATION UNIT BEEN MANIPULATED?
S28
NO
YES
EXECUTE COMMAND DEPENDING ON MANIPULATION CONTENT AND RESET STOP COUNTER
S29
IS THERE DISPLAY CONTENT FOR WHICH CAUTION SHOULD BE GIVEN?
S19
YES
NO
IS DISPLAY UNIT IN TURN-OFF STATE?
S20
YES
NO
COUNT STOP COUNTER
S21
A
B
C
D

FIG. 7

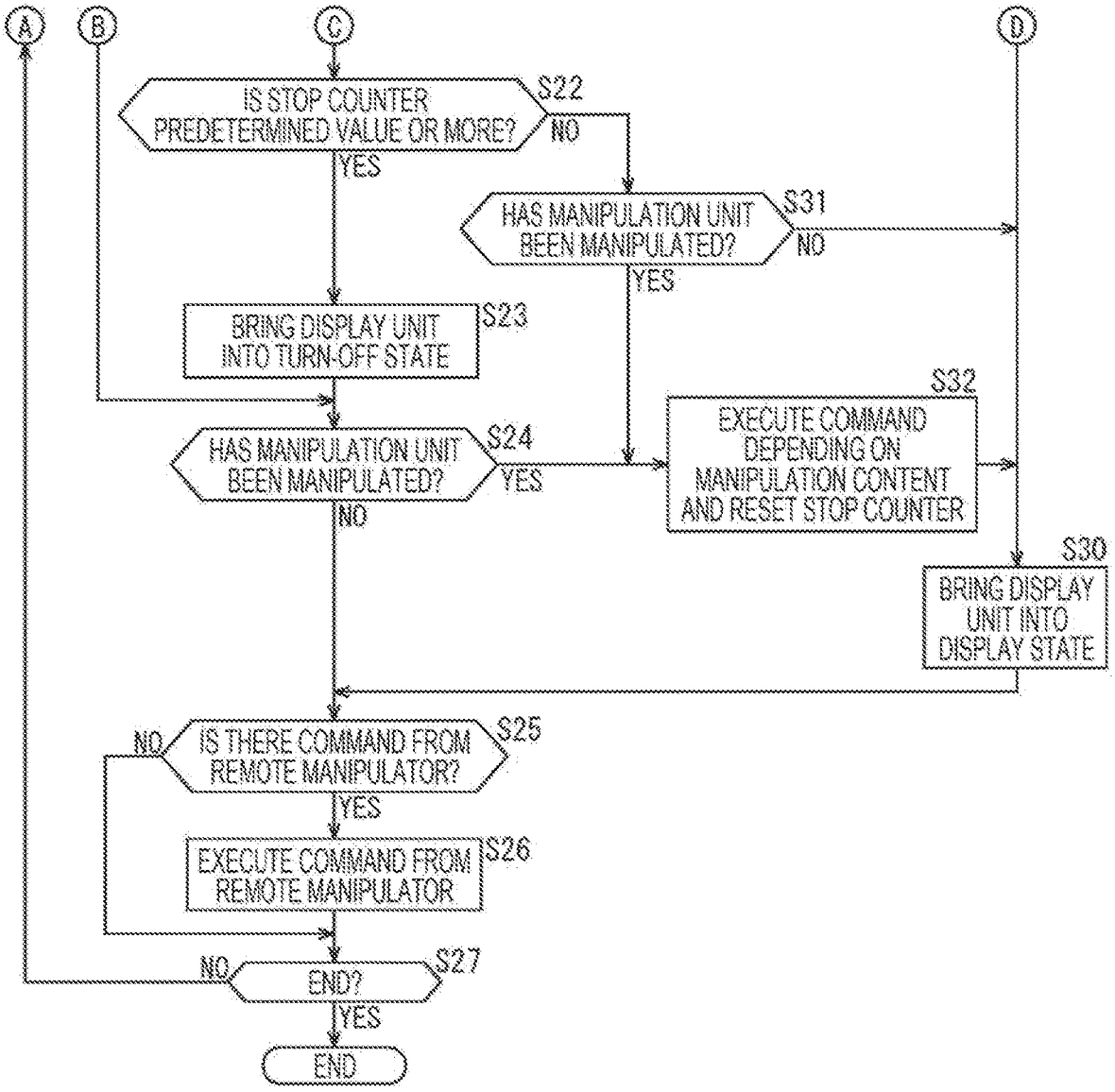

A
B
C
D
IS STOP COUNTER PREDETERMINED VALUE OR MORE?
S22
NO
YES
HAS MANIPULATION UNIT BEEN MANIPULATED?
S31
NO
YES
BRING DISPLAY UNIT INTO TURN-OFF STATE
S23
HAS MANIPULATION UNIT BEEN MANIPULATED?
S24
YES
NO
S32
EXECUTE COMMAND DEPENDING ON MANIPULATION CONTENT AND RESET STOP COUNTER
S30
BRING DISPLAY UNIT INTO DISPLAY STATE
NO
IS THERE COMMAND FROM REMOTE MANIPULATOR?
S25
YES
EXECUTE COMMAND FROM REMOTE MANIPULATOR
S26
NO
END?
S27
YES
END

FIG. 8

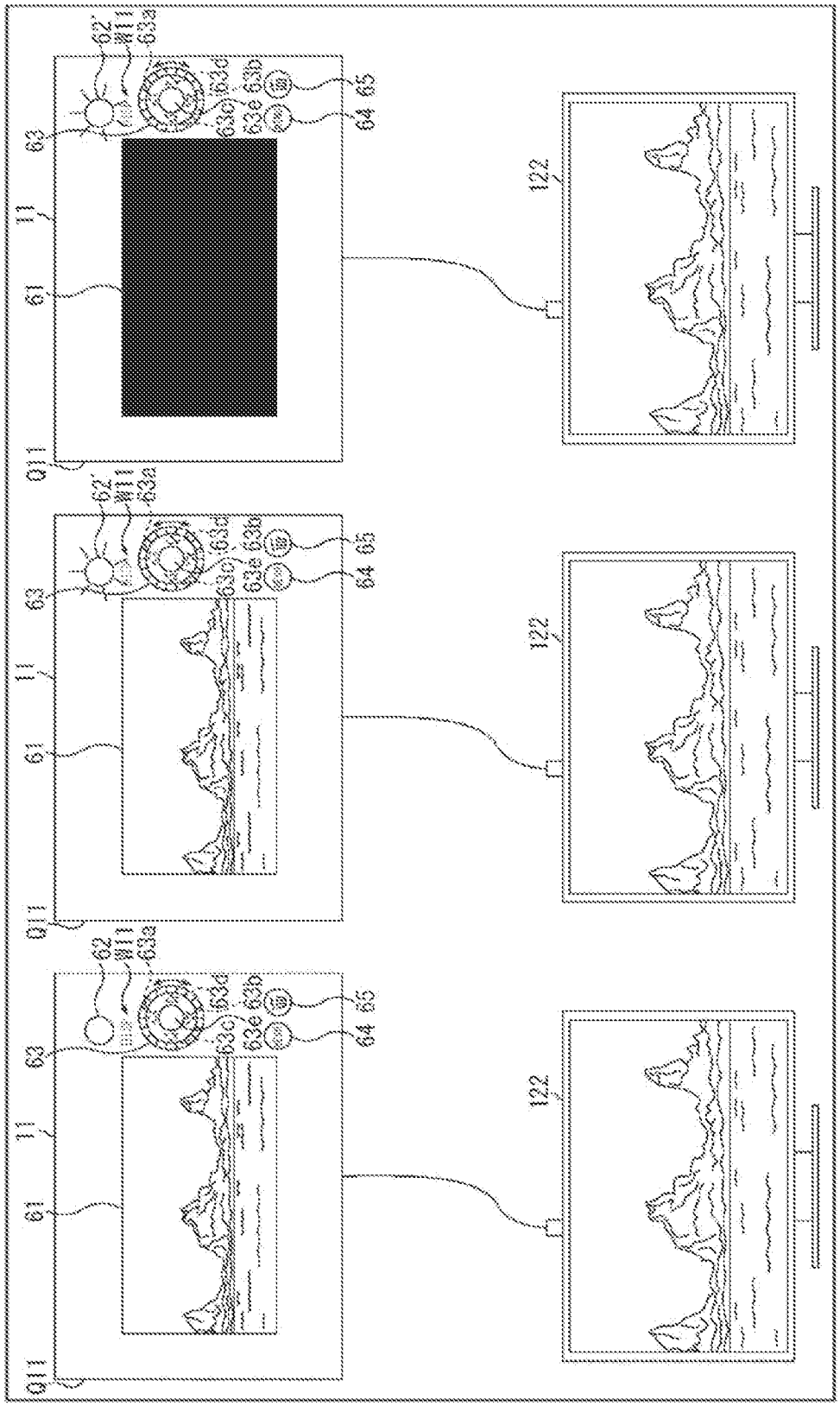
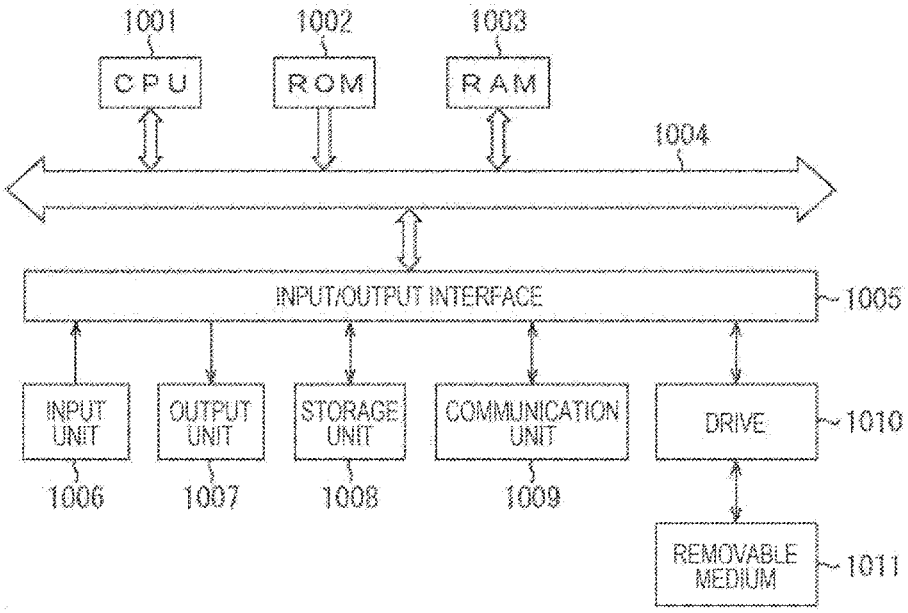


FIG. 9


1001
1002
1003
CPU
ROM
RAM
1004
INPUT/OUTPUT INTERFACE
1005
INPUT UNIT
OUTPUT UNIT
STORAGE UNIT
COMMUNICATION UNIT
DRIVE
1010
1006
1007
1008
1009
REMOVABLE MEDIUM
1011

IMAGING APPARATUS, IMAGING METHOD, AND PROGRAM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation application of U.S. patent application Ser. No. 16/336,648, filed Mar. 26, 2019, which is a U.S. National Phase of International Patent Application No. PCT/JP2017/036455 filed on Oct. 6, 2017, which claims priority benefit of Japanese Patent Application No. JP 2016-207107 filed in the Japan Patent Office on Oct. 21, 2016. Each of the above-referenced applications is hereby incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to an imaging apparatus, an imaging method, and a program, and more particularly, to an imaging apparatus, an imaging method, and a program in which a display unit is brought into a turn-off state when a predetermined time elapses after start of recording an image, the turn-off state is maintained even when a command from a remote commander is received, and the display unit is returned to a display state only when a manipulation unit of a main body is manipulated.

BACKGROUND ART

[0003] In an imaging apparatus of recent years, a display unit for displaying a preview image or an image being captured is provided in the main body of the imaging apparatus. While watching the preview image or the image being captured displayed on the display unit, a user changes the orientation of the imaging apparatus main body and adjusts the angle of view to be captured.

[0004] However, in a case where a captured image is recorded for a long period of time, continuation of the display state of the display unit which is not frequently viewed results in increases in unnecessary power consumption due to backlight of the display unit or the like.

[0005] In view of this, there has been proposed an imaging apparatus that turns off the display unit to reduce the power consumption in a long period of time imaging mode in which exposure time is long (see Patent Document 1).

CITATION LIST

Patent Document

[0006] Patent Document 1: Japanese Patent Application Laid-Open No. 2015-222879

SUMMARY OF THE INVENTION

Problems to be Solved by the Invention

[0007] However, with the imaging apparatus described in Patent Document 1 described above, it is not possible to accept a command from a remote controller and execute the command in a state in which the display unit is turned off or to output a moving image being captured to an external apparatus when the moving image is captured.

[0008] The present disclosure has been made in view of such circumstances, and particularly enables operation in which while a display unit is brought into a turn-off state when a predetermined time elapses from start of capturing a moving image, a command from a remote commander is accepted and executed and a captured moving image is output to an external apparatus.

Solutions to Problems

[0009] The imaging apparatus according to an aspect of the present disclosure is an image apparatus including: an imaging unit configured to capture an image; a manipulation unit configured to accept a user manipulation and give an instruction of an operation depending on content of the accepted manipulation; and a display control unit configured to control display of the captured image, in which the display control unit controls the display of the image from a display state to a turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not detected after start of a predetermined operation.

[0010] The display control unit can be caused to control the display of the image from the display state to the turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not accepted after start of a recording operation as the predetermined operation.

[0011] The display control unit can be caused to control the display of the image from the turn-off state to the display state in a case where the recording operation is stopped after control is performed from the display state in which the image is displayed to the turn-off state in which the display of the image is turned off.

[0012] The display control unit can be caused to control the display of the image from the turn-off state to the display state in a case where manipulation is accepted by the manipulation unit after the display of the image is controlled from the display state to the turn-off state.

[0013] A reception unit configured to receive a signal from a remote manipulation unit that is external to an apparatus main body and configured to accept a user manipulation and transmit an instruction depending on the content of the accepted manipulation as the signal can be further included, in which the display control unit can be caused to control the display of the image from the display state to the turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not accepted and in a state in which the signal from the remote manipulation unit is not received via the reception unit after start of the recording operation as the predetermined operation.

[0014] The display control unit can be caused to perform control to maintain the turn-off state even in a case where the signal from the remote manipulation unit is received via the reception unit after the display of the image is controlled from the display state to the turn-off state.

[0015] The reception unit can be caused to receive an instruction from a remote commander or a smartphone depending on the content of the user manipulation with respect to the remote commander or the smartphone as the remote manipulation unit.

[0016] An input/output unit configured to constantly output the image captured by the imaging unit to external equipment connected to the outside can be further included.

[0017] The input/output unit can be caused to accept, via the external equipment, input of the signal from the remote manipulation unit that is external to the external equipment

and configured to accept the user manipulation and transmit an instruction depending on the content of the accepted manipulation as the signal, and the display control unit can be caused to control the display of the image from the display state to the turn-off state in a case where a predetermined time elapses in a state in which the manipulation with respect to the manipulation unit is not accepted and in a state in which the manipulation with respect to the remote manipulation unit is not accepted via the input/output unit after start of the predetermined operation.

[0018] The display control unit can be caused to perform control to maintain the turn-off state even when the signal from the remote manipulation unit is accepted via the input/output unit after the display of the image is controlled from the display state to the turn-off state.

[0019] The external equipment can be a display apparatus configured to display an image captured by the imaging unit.

[0020] The predetermined operation can be a recording operation, a power-on operation, or various setting operations.

[0021] An abnormality detection unit configured to detect occurrence of an abnormality can be further included, in which in a case where an abnormality is detected by the abnormality detection unit, the display control unit can be caused to control the display of the image to the display state.

[0022] A setting unit configured to perform setting related to imaging by the imaging unit can be further included, in which under a condition that the setting related to the imaging by the imaging unit is completed by the setting unit, the display control units can be caused to control the display of the image from the display state to the turn-off state in a case where a predetermined time elapses in a state in which the manipulation with respect to the manipulation unit is not accepted after start of the predetermined operation.

[0023] The imaging method according to an aspect of the present disclosure is an imaging method including steps of: capturing an image; accepting a user manipulation and giving an instruction of an operation depending on content of the accepted manipulation; and controlling display of the captured image, in which the display of the image is controlled from a display state to a turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the[a] manipulation unit is not detected after start of a predetermined operation.

[0024] The program according to an aspect of the present disclosure is a program causing a computer to function as: an imaging unit configured to capture an image; a manipulation unit configured to accept a user manipulation and give an instruction of an operation depending on content of the accepted manipulation; and a display control unit configured to control display of the captured image, in which the display control unit controls the display of the image from a display state to a turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not detected after start of a predetermined operation.

[0025] According to an aspect of the present disclosure, an image is captured, a user manipulation is accepted, an instruction of an operation depending on content of the accepted manipulation is given, display of the captured image is controlled, and the display of the image is controlled from the display state to the turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not detected after start of a predetermined operation.

Effects of the Invention

[0026] According to an aspect of the present disclosure, the display unit can be brought into the turn-off state when a predetermined time elapses after start of capturing a moving image, a command from the remote commander can be accepted and executed, and moreover the captured moving image can be output to the external apparatus.

BRIEF DESCRIPTION OF DRAWINGS

[0027] FIG. **1** is a front view of an external appearance of an imaging apparatus to which the technique of the present disclosure has been applied.

[0028] FIG. **2** is a top view of an external appearance of an imaging apparatus to which the technique of the present disclosure has been applied.

[0029] FIG. **3** is a rear view of an external appearance of an imaging apparatus to which the technique of the present disclosure has been applied.

[0030] FIG. **4** is a bottom view of an external appearance of an imaging apparatus to which the technique of the present disclosure has been applied.

[0031] FIG. **5** is a diagram explaining a functional configuration example for achieving the imaging apparatus of FIGS. **1** to **4**.

[0032] FIG. **6** is a flowchart explaining imaging processing performed by the imaging apparatus of FIG. **5**.

[0033] FIG. **7** is a flowchart explaining imaging processing performed by the imaging apparatus of FIG. **5**.

[0034] FIG. **8** is a diagram explaining imaging processing performed by the imaging apparatus of FIG. **5**.

[0035] FIG. **9** is a diagram explaining a configuration example of a general-purpose personal computer.

MODE FOR CARRYING OUT THE INVENTION

[0036] Hereinafter, a preferred embodiment of the present disclosure will be described in detail with reference to the accompanying drawings. Note that, in this description and the drawings, configuration elements that have substantially the same function and configuration are denoted with the same reference numerals, and repeated explanation is omitted.

[0037] <Configuration example of external appearance of imaging apparatus>

The imaging apparatus of the present disclosure captures a moving image and, moreover, in a case of recording a captured image, brings the display unit into the turn-off state. When a user manipulation is detected by an external manipulation apparatus, e.g., a remote commander, with the display unit being in the turn-off state, a command corresponding to the manipulation content is transmitted, and the imaging apparatus can accept and execute the command. Furthermore, the imaging apparatus of the present disclosure can output the captured moving image to a display apparatus, which is an external apparatus, and cause the display apparatus to display the captured moving image with the display unit provided on the apparatus main body being in the turn-off state. Before description is given of the imaging apparatus of the present disclosure, first a configuration example of the external appearance of the imaging apparatus

to which the present technology has been applied is described with reference to FIGS. **1** to **4**.

[0038] FIG. **1** illustrates a front view of the external appearance of the imaging apparatus.

[0039] The imaging apparatus **11** includes, for example, a digital camera and the like, and is configured such that a user, a cameraman, has the imaging apparatus **11** with the hand to perform imaging, and furthermore the imaging apparatus **11** can be fixed to a bicycle, a ceiling, a wall, or the like to perform imaging.

[0040] The imaging apparatus **11** includes, on a front surface, a lens **21** for guiding light from a subject to an imaging element, which is not illustrated. Furthermore, a sound collection unit **22-1** and a sound collection unit **22-2** including a microphone for collecting ambient sounds during imaging of a moving image are provided below the lens **21** in the front surface part of the imaging apparatus **11** in the drawing. Basically, sounds collected by the sound collection unit **22-1** are right channel sounds and sounds collected by the sound collection unit **22-2** are left channel sounds.

[0041] Note that the sound collection unit **22-1** and the sound collection unit **22-2** are hereinafter also simply called the sound collection unit **22** in a case where there is no particular necessity for distinction.

[0042] A tally lamp **23** is provided on an upper left of the front surface part of the imaging apparatus **11** in the drawing. The tally lamp **23** is configured to be turned on during imaging of a moving image by the imaging apparatus **11** and turned off in a state where imaging of a moving image is not performed.

[0043] Furthermore, usually, when a moving image or a still image is captured by the imaging apparatus **11**, imaging is performed with the upper surface indicated by arrow A**11** facing upward in the vertical direction, i.e., with the bottom surface indicated by arrow A**12** facing the ground.

[0044] Therefore, the upper surface of the imaging apparatus **11** includes a power button **41**, a shutter button **42**, a sound output unit **43**, and the like as illustrated, for example, in FIG. **2**. Note that FIG. **2** illustrates an upper surface view of the imaging apparatus **11** viewed from top to bottom in FIG. **1**.

[0045] The power button **41** is a button to be manipulated when the power of the imaging apparatus **11** is turned on/off. The shutter button **42** is manipulated, for example, to capture a still image, to start imaging of a moving image, or to stop imaging of a moving image.

[0046] The sound output unit **43** includes, for example, a speaker and the like, and reproduces sounds of a moving image when the moving image is reproduced.

[0047] Furthermore, on a surface opposite to the front surface of the imaging apparatus **11** illustrated in FIG. **1**, i.e., on the back surface of the imaging apparatus **11**, for example, various buttons or the like are provided as illustrated in the right part of FIG. **3**. Note that, in the right part of FIG. **3**, the upper side of the right part of FIG. **3** of the imaging apparatus **11** is the upper surface side and the lower side of the right part of FIG. **3** of the imaging apparatus **11** is the bottom surface side.

[0048] The back surface of the imaging apparatus **11** includes a display unit **61** including, for example, a liquid crystal display (LCD) and the like for displaying various images.

[0049] Furthermore, a tally lamp **62**, a control wheel **63**, a menu button **64**, and a delete button **65** are provided around the display unit **61**.

[0050] Similar to the tally lamp **23** provided on the front surface of the imaging apparatus **11**, the tally lamp **62** is turned on during imaging of a moving image and turned off in a state where imaging of a moving image is not performed.

[0051] The control wheel **63** is manipulated when manipulation is performed on an image, a menu screen, or the like displayed on the display unit **61**.

[0052] In more detail, the control wheel **63** can be rotated in arrow directions in the drawing about a disk-shaped main body. The control wheel **63** is manipulated, for example, when a cursor or the like is moved upward, downward, rightward, or leftward on the menu screen, when scroll manipulation for displaying an upper, left, right or left region of an image obtained by imaging is performed depending on rotation, or the like.

[0053] Furthermore, the control wheel **63** functions as buttons **63***a* to **63***d* that accept pressing manipulation at each triangle mark indicated by the dotted lines in the drawing and accepts an upward, downward, rightward, or leftward manipulation for cursor movement or an image scroll manipulation.

[0054] Furthermore, the buttons **63***a* to **63***d* may be assigned a function for achieving various settings. For example, the button **63***a* may be assigned a screen display switching function. Furthermore, the button **63***b* may be assigned a function for setting exposure compensation. Moreover, the button **63***c* may be assigned a function for setting a drive mode. Furthermore, the button **63***d* may be assigned a function for setting a flash mode.

[0055] The central part of the control wheel **63** includes a button **63***e* for accepting pressing manipulation. The button **63***e* functions as an enter key (ok button) for determining selection in a state where a menu screen or the like is displayed.

[0056] The menu button **64** is manipulated to cause various menu screens to be displayed.

[0057] The delete button **65** is a button to be manipulated when an image displayed on the display unit **61** is deleted.

[0058] Moreover, as illustrated in the left part of FIG. **3**, a cover, which is not illustrated, is attached to a main body side surface Q**11** on the left side when viewed from the back surface of the imaging apparatus **11**. The cover, which is not illustrated, can be removed from the imaging apparatus **11** when a lock button, which is not illustrated, is manipulated.

[0059] Below the cover, which is not illustrated, on the side surface of the main body of the imaging apparatus **11**, various terminals and a slot are provided as illustrated at the main body side surface Q**11** in the left part of FIG. **3**. Here, the left part of FIG. **3** indicates a state in which the cover, which is not illustrated, of the main body side surface Q**11** is removed.

[0060] In this example, under the cover, which is not illustrated, of the main body side surface Q**11** of the imaging apparatus **11**, a terminal **70** of high-definition multimedia interface (HDMI)(registered trademark) and a terminal **71** of universal serial bus (USB)(registered trademark) are provided as input/output terminals for connection to the outside.

[0061] Furthermore, under the cover, which is not illustrated, of the main body side surface Q**11** of the imaging apparatus **11**, a terminal **72** for attachment of a microphone,

a slot **73**, which is a port for insertion of a removable recording medium that can be attached to or detached from the imaging apparatus **11**, and a medium access lamp **74** for giving a notice of access or the like to the removable recording medium are provided.

[0062] Furthermore, on the bottom surface of the imaging apparatus **11**, a socket **91**, which is a fixation part for fixing the imaging apparatus **11** to a tripod or the like, is provided as illustrated, for example, in FIG. **4**. When the imaging apparatus **11** is fixed to a ceiling, a wall or the like by means of the socket **91**, imaging or the like can be performed with the imaging apparatus **11** being in an inversed state or being rotated 90 degrees.

[0063] <Functional configuration example of imaging apparatus>

Next, a functional configuration example of the imaging apparatus **11** is described with reference to FIG. **5**.

[0064] FIG. **5** is a diagram illustrating a functional configuration example of the imaging apparatus **11**. Note that parts corresponding to those in the case of FIGS. **1** to **4** are designated by the same reference numerals in FIG. **5** and description is omitted as appropriate.

[0065] In the example illustrated in FIG. **5**, remote manipulation of the imaging apparatus **11** can be performed by a remote manipulator **121**. External equipment **122** including a recorder with a display, a display, or the like can be connected to the imaging apparatus **11**, for example, with the use of an HDMI cable or a USB cable to the terminal **70** for HDMI, the terminal **71** for USB or the like described above. Further description is given below on the basis of the assumption that the external equipment **122** is a display apparatus including a display or the like. Furthermore, remote manipulation of the external equipment **122** and the imaging apparatus **11** can be performed by external equipment remote manipulator **123** dedicated to the external equipment **122**. Note that the external equipment **122** is hereinafter also called the display apparatus **122**. Furthermore, the external equipment remote manipulator **123**, which is a source for transmitting a command to the imaging apparatus **11**, is simply called the remote manipulator **123** in a case where there is no particular necessity for distinction with respect to the remote manipulator **121**.

[0066] The imaging apparatus **11** includes an imaging unit **131**, the sound collection unit **22**, a manipulation unit **132**, a control unit **133**, a removable recording medium **134**, the sound output unit **43**, the display unit **61**, a communication unit **135**, the input/output terminal **136**, and a battery **137**.

[0067] The imaging unit **131** includes the lens **21** illustrated in FIG. **1**, an imaging element or the like. The imaging unit **131** captures an image by receiving and photoelectrically converting light from a subject under control of the control unit **133**, and feeds an image data of the obtained image to the control unit **133**. Note that the image obtained by the imaging unit **131** is hereinafter also particularly called the captured image.

[0068] The sound collection unit **22** collects ambient sounds under control of the control unit **133** and feeds sound data of the resultant collected sounds to the control unit **133**.

[0069] The manipulation unit **132** includes, for example, the power button **41** and the shutter button **42** illustrated in FIG. **2**, the upper control wheel **63** illustrated in FIG. **3** (including the buttons **63***a* to **63***e*), the menu button **64**, the delete button **65**, a touch panel provided in a manner of being superimposed on the display unit **61**, and the like. The manipulation unit **132** detects and accepts a user manipulation, and feeds a signal corresponding to a command corresponding to the manipulation content to the control unit **133**. In other words, the manipulation unit **132** accepts the user manipulation and outputs a signal that gives an instruction of causing the control unit **133** to execute an operation corresponding to the accepted manipulation content.

[0070] The control unit **133** is driven by power fed from the battery **137** and controls the entire operation of the imaging apparatus **11**. The control unit **133** includes a setting unit **151**, an on screen display (OSD) image generation unit **152**, a display control unit **153**, and a recording control unit **154**.

[0071] The setting unit **151** performs various settings depending on a signal from the manipulation unit **132**. The OSD image generation unit **152** generates an OSD image.

[0072] The OSD image is, for example, an image that indicates a mark indicating an imaging mode or indicating the remaining charge level of the battery, or an image indicating a mark or an image that indicates various settings of a mark or the like that indicates white balance setting, a state related to the imaging apparatus **11**, or the like. For example, the control unit **133** calculates the remaining charge level from a residual voltage of the battery **137** or the like and feeds the remaining charge level to the OSD image generation unit **152** to cause the OSD image generation unit **152** to generate an OSD image indicate the remaining charge level of the battery **137** and, in a case where the remaining charge level is smaller than a predetermined value, cause the OSD image generation unit **152** to generate an OSD image as a caution image indicating that the remaining charge level is small. In addition, the control unit **133** detects an abnormality, e.g., overheat, and causes the OSD image generation unit **152** to generate a caution image with respect to the abnormality.

[0073] The display control unit **153** controls display of various images on the display unit **61** or the external equipment **122**. The recording control unit **154** controls recording of image data obtained by imaging or sound data obtained by sound collection on the removable recording medium **134** or the external equipment **122**.

[0074] The removable recording medium **134** is a recording medium that can be attached to or detached from the imaging apparatus **11** and is brought into a state of being attached to the imaging apparatus **11** when inserted into the slot **73** illustrated in FIG. **3**. The removable recording medium **134** records the image data or the sound data fed from the control unit **133** and feeds the recorded image data or sound data to the control unit **133** as necessary.

[0075] The communication unit **135** receives the command transmitted from the remote manipulator **121** through wireless or wired communication and feeds the command to the control unit **133**.

[0076] The remote manipulator **121** is, for example, a remote commander that is dedicated to the imaging apparatus **11** or is a general-purpose remote commander, and transmits a command through wireless communication, e.g., infrared, or wired communication via the terminal **71** or the like. In addition, the remote manipulator **121** may be achieved by a smartphone or the like such that application software corresponding to the function of the remote commander is installed, for example.

[0077] The input/output terminal **136** includes, for example, the terminal **70** or the terminal **71** illustrated in

FIG. **3**, and is an input/output unit for performing communication with respect to the external equipment **122**.

[0078] For example, the input/output terminal **136** outputs the image data or the sound data fed from the control unit **133** to the external equipment **122** or outputs the command or the like fed from the external equipment **122** to the control unit **133**.

[0079] Here, description is given of an operation obtained when the manipulation unit **132** is manipulated and an instruction of imaging of a moving image is given.

[0080] The display control unit **153** stops the display of the display unit **61** into the turn-off state when a predetermined time elapses after start of recording a moving image and restores the display of the display unit **61** (into the display state) when a certain manipulation is made by the manipulation unit **132**. At this time, when the command is input from the remote manipulator **121** or **123** after the display of the display unit **61** is brought into the turn-off state when a predetermined time elapses from start of recording a moving image, the control unit **133** executes processing corresponding to the command, but the display control unit **153** maintains the turn-off state of the display unit **61**. However, in a case where the recording of a moving image is stopped, the display unit **153** restores the display unit **61** into the display state.

[0081] Furthermore, when recording of a moving image is started, the recording control unit **154** outputs the image data of a moving image captured by the imaging unit **131** or the sound data obtained by sound collection to the display apparatus **122**, which is external equipment, through the input/output terminal **136**, and causes the display apparatus **122** to display the image data or the sound data and causes the removable recording medium **134** or the external equipment **122** to record the image data or the sound data. At this time, even when the display of the display unit **61** is brought into the turn-off state by the display control unit **153**, the recording control unit **154** continues performing outputting to the display apparatus **122**, which is external equipment, and continues performing displaying.

[0082] By such an operation, when a moving image is recorded, the display unit **61** is brought into the turn-off state after a predetermined time elapses after start of capturing a moving image, enabling a reduction in power consumption of the display unit **61**, which is not frequently viewed during imaging. Furthermore, in a case where, for example, a stage is captured in a dark hall or the like, annoying light can be emitted to the surrounding area when the display unit **61** is in the display state. However, since the display unit **61** is turned off when a predetermined time elapses after start of recording the moving image, it is possible to suppress generation of the annoying light from the display unit **61**.

[0083] <Imaging processing by imaging apparatus of FIG. **5**>

Next, imaging processing of a moving image by the imaging apparatus **11** of FIG. **5** is described with reference to the flowcharts of FIGS. **6** and **7**.

[0084] In step S**11** (FIG. **7**), when the power is turned on and the imaging apparatus **11** is activated, the display control unit **153** turns on the display unit **61** into a displayable state (display state) to display information corresponding to various processing.

[0085] In step S**12**, the setting unit **151** determines whether or not initial setting has been completed. In a case where the initial setting has not been completed, the processing proceeds to step S**13**.

[0086] In step S**13**, the OSD image generation unit **152** indicates that the initial setting has not been completed and the initial setting is required, displaying information that prompts initial setting on the display unit **61**.

[0087] In step S**14**, the setting unit **151** determines whether or not the manipulation unit **132** has been manipulated and an operation of requesting input of initial setting has been performed. In a case where an operation of requesting input of the initial setting is absent, the processing returns to step S**12**. In other words, the processing from steps S**12** to S**14** is repeated until the initial setting is performed. Then, in step S**14**, in a case where an operation of requesting input of the initial setting is performed, the processing proceeds to step S**15**.

[0088] In step S**15**, the OSD image generation unit **152** displays an image of accepting input of various initial settings depending on the manipulation content of the manipulation unit **132**. At this time, the setting unit **151** accepts and stores input of the initial setting depending on the manipulation content of the manipulation unit **132**, and the processing returns to step S**11**. Herein, the initial setting is, for example, a setting as to which of the main body of the imaging unit **131**: the upper surface, the bottom surface, and the side surface faces upward in the vertical direction when imaging is performed, or the like.

[0089] When the initial setting is performed by the aforementioned series of processing, in step S**12**, the initial setting is determined as having been completed and the processing proceeds to step S**16**. Note that the necessity of the user's initial setting may be eliminated such that any initial setting is performed during manufacture before shipping. In this case, the processing from steps S**12** to S**15** may be omitted.

[0090] In step S**16**, the imaging unit **131** captures an image on the basis of light from a subject, the light being incident via the lens **21**, and the imaging unit **131** feeds the image to the control unit **133**.

[0091] In step S**17**, the recording control unit **154** outputs the image data of a moving image captured by the imaging unit **131** or the sound data obtained by sound collection to the display apparatus **122**, which is external equipment, through the input/output terminal **136**, and causes the display apparatus **122** to display the image data or the sound data.

[0092] By this processing, as indicated in the left part of FIG. **8**, the display unit **61** is brought into the display state. Therefore, the image captured by the imaging unit **131** is displayed on the display unit **61**. At this time, the display apparatus **122**, which is external equipment, displays the image captured by the imaging unit **131**, the image being fed from the recording control unit **154**.

[0093] In step S**18**, the display control unit **153** is instructed to perform recording by the manipulation unit **132** or one of the remote manipulators **121** and **123**, and determines whether or not recording of the captured image data is in progress. For example, in a case of first processing and where a recording instruction is not given, i.e., in a case where recording is determined as not being in progress, the processing proceeds to step S**28**.

[0094] In step S**28**, the display control unit **153** determines whether or not the manipulation unit **132** has been manipulated, i.e., whether or not a certain command has been input

by the manipulation, and in the case of the presence of a command from the manipulation unit **132** as a result of the detection of the manipulation of the manipulation unit **132**, the processing proceeds to step S**29**.

[0095] In step S**29**, the control unit **133** executes the processing corresponding to the command input as a result of the manipulation of the manipulation unit **132**, and resets a stop counter to be described later to zero. Here, for example, in a case where a command of giving a recording instruction is input, the control recording control unit **154** starts recording the image data captured by the imaging unit **131**.

[0096] When the recording is started, the control unit **133** controls the tally lamp **62** in the turn-off state in the left part of FIG. **8** so as to become a tally lamp **62'** in a turn-on state in the middle part of FIG. **8**. Note that the tally lamp **23** of FIG. **1** is controlled in a way similar to the tally lamp **62** and is brought into the turn-on state when recording is in progress.

[0097] In step S**30** (FIG. **7**), the display control unit **153** turns on the display unit **61** into the display state, and the processing proceeds to step S**25**. For example, in the case of first processing, the display unit **61** is turned on into the display state. Therefore, the display state is maintained.

[0098] By this processing, as indicated in the middle part of FIG. **8**, the display unit **61** is brought into the display state, and the image captured by the imaging unit **131** is displayed on the display unit **61**. Furthermore, at this time, the recording control unit **154** continues feeding the image captured by the imaging unit **131** to the display apparatus **122**, which is external equipment. Therefore, the display apparatus **122** displays the image captured by the imaging unit **131** and fed from the recording control unit **154**. Moreover, the tally lamp **62** is controlled to the turn-on state as indicated by the tally lamp **62'** of FIG. **8**.

[0099] In step S**25**, the display control unit **153** determines whether or not the remote manipulator **121** or **123** has been manipulated and a certain command has been input, and in the case of presence of the command from the remote manipulator **121** or **123** as a result of the manipulation of the remote manipulator **121** or **123**, the processing proceeds to step S**26**.

[0100] In step S**26**, the control unit **133** executes the processing corresponding to the command input as a result of the manipulation of the remote manipulator **121** or **123**. Note that, in step S**25**, in a case where the remote manipulator **121** or **123** is not manipulated and a command is not input, the processing of step S**26** is skipped.

[0101] In step S**27**, the control unit **133** determines whether or not the manipulation unit **132** or the remote manipulator **121** or **123** has been manipulated and an instruction of ending an operation has been given, and ends the operation in a case where the instruction of end has been given. Furthermore, in a case where an instruction of ending an operation is not given, the processing returns to step S**12**.

[0102] Furthermore, in a case where recording is started in any of steps S**29** and S**26**, when the processing of steps S**12**, S**16**, and S**17** is performed after the processing of steps S**25** to S**27**, the processing returns to step S**18**. At this time, in step S**18**, recording is determined to be in progress, and the processing proceeds to step S**19**.

[0103] In step S**19** (FIG. **6**), the control unit **133** determines whether or not an abnormality for which a caution should be issued has occurred. Here, in step S**19**, in a case where it is determined that no abnormality has occurred, the processing proceeds to step S**20**.

[0104] In step S**20**, the display control unit **153** determines whether or not the display unit **61** is turned off into the turn-off state, and in a case of not being in the turn-off state, the processing proceeds to step S**21**.

[0105] In step S**21**, the stop counter for determining whether or not to bring the display of the display unit **61**, which is not illustrated, into the turn-off state is incremented by a predetermined value and counted up by the display control unit **153**.

[0106] In step S**22** (FIG. **7**), the display control unit **153** determines whether or not the stop counter is larger than a predetermined value and the state in which the recording is started and the manipulation unit **132** is not manipulated has elapsed longer than a predetermined time, and in a case of not elapsing longer than the predetermined time, the processing proceeds to step S**31**.

[0107] In step S**31**, the display control unit **153** determines whether or not the manipulation unit **132** has been manipulated, i.e., whether or not any command has been input as a result of the manipulation, and in a case where the manipulation has not been performed or a command has not been input, the processing proceeds to step S**30** and the display unit **61** is turned on into the display state, and the processing proceeds to step S**25**.

[0108] In other words, the processing of steps S**12**, S**16** to S**22**, S**31**, S**30**, and S**25** to S**27** is repeated until the predetermined time counted by the stop counter elapses from the start of recording, and the count of the stop counter is continued to be counted up. Then, in step S**22** (FIG. **7**), in a case where it is determined that the value of the stop counter is larger than a predetermined value and the state in which the recording is started and the manipulation unit **132** is not manipulated elapses a predetermined time or longer, the processing proceeds to step S**23**.

[0109] In step S**23**, the display control unit **153** turns off the display unit **61** into the turn-off state, and the processing proceeds to step S**24**.

[0110] In other words, as a result of this processing, as illustrated in the right part of FIG. **8**, the display unit **61** is turned off and the display unit **61** is brought into the turn-off state. Even in this case, however, the image captured by the imaging unit **131** and fed from the recording control unit **154** is displayed on the display apparatus **122**, which is external equipment. Moreover, as indicated by the tally lamp **62'** in the right part of FIG. **8**, the tally lamp **62** is controlled into the turn-on state indicating that recording is in progress.

[0111] In step S**24**, the control unit **133** determines whether or not the manipulation unit **132** has been manipulated, i.e., determines whether or not the manipulation has been performed and any command has been input. In a case where the manipulation is not detected and a command has not been input, the processing proceeds to step S**25**.

[0112] Furthermore, in the following, when the recording is continued, there is no input command, and the state in which display for which a caution should be issued is absent continues, the display unit **61** remains in the turn-off state. Therefore, in step S**20** (FIG. **6**), the display unit **61** is determined to be in the turn-out state, and the processing from steps S**21** to S**23** is skipped.

[0113] In other words, as a result of the repetition of the processing of steps S**12**, S**16** to S**20** and S**24** to S**27**, the state of the right part of FIG. **8** is continued.

[0114] Here, for example, in step S**25**, when the remote manipulator **121** or **123** is manipulated and, for example, a command to stop recording is input, the recording is stopped by the processing of step S**26**.

[0115] Then, in step S**18**, it is determined that the recording is not in progress, the processing proceeds to step S**28**.

[0116] In other words, in this case, since the processing of steps S**12**, S**16** to S**18**, S**28**, S**29** (however only in the case of Yes in S**28**), S**30** and S**25** to S**27** is performed, as indicated in the left part of FIG. **8**, when the recording is stopped, the tally lamp **62** is brought into the turn-off state such that the processing of step S**30** is invariably involved. Therefore, the display unit **61** is brought into the display state. Furthermore, by the processing of step S**17**, the image captured by the imaging unit **131** and fed from the recording control unit **154** continues being displayed on the display apparatus **122**, which is external equipment.

[0117] Moreover, here, for example, in step S**25**, when the remote manipulator **121** or **123** is manipulated and, for example, a command to start recording is input again, recording is started by the processing of step S**26**.

[0118] Then, in step S**18**, since it is determined that the recording is in progress, the processing proceeds to step S**19**. At this time, when display content for which a caution should be issued is absent, the processing proceeds to step S**20**. Moreover, in step S**20** (FIG. **6**), since the display unit **61** is already in the display state, the processing proceeds to step S**21**.

[0119] In other words, in this case, the processing of steps S**12**, S**16** to S**22**, S**31**, S**30** and S**25** to S**27** is repeated, and the count of the stop counter continues being counted up. Then, in step S**22** (FIG. **7**), in a case where it is determined that the value of the stop counter is larger than a predetermined value and the state in which the recording is started and the manipulation unit **132** is not manipulated elapses a predetermined time or longer, the processing proceeds to step S**23**.

[0120] In step S**23**, the display control unit **153** turns off the display unit **61** into the turn-off state, and the processing proceeds to step S**24**.

[0121] In other words, as a result of this processing, as illustrated in the right part of FIG. **8**, the display unit **61** is turned off and the display unit **61** is brought into the turn-off state. Even in this case, however, the image captured by the imaging unit **131** and fed from the recording control unit **154** is displayed on the display apparatus **122**, which is external equipment. Moreover, as indicated by the tally lamp **62'** in the right part of FIG. **8**, the tally lamp **62** is controlled into the turn-on state indicating that recording is in progress.

[0122] Here, for example, in the processing of step S**24**, when the manipulation unit **132** is manipulated and a certain command is input, the processing proceeds to step S**32**.

[0123] In step S**32**, the control unit **133** executes processing corresponding to the command input as a result of the manipulation of the manipulation unit **132** and moreover resets the stop counter to zero. The processing proceeds to step S**30**. Here, for example, in a case where a command that gives an instruction of stopping the recording is input, the recording control unit **154** stops recording of the image data captured by the imaging unit **131**.

[0124] When the recording is stopped, the control unit **133** performs control to control the tally lamp **62** into the turn-off state as indicated in the left part of FIG. **8**. In this case, since the display unit **61** is turned on into the display state by the processing of step S**30**, as illustrated in the left part of FIG. **8**, the image captured by the display unit **61** is displayed. Furthermore, also at this time, the image captured by the imaging unit **131** and fed from the recording control unit **154** is continued to be displayed on the display apparatus **122**, which is external equipment, by the processing of step S**17**.

[0125] Moreover, here, since the stop counter is reset, for example, when the manipulation unit **132** is manipulated during the period from the start of the recording until the display unit **61** is turned off in the processing of step S**31**, the reset of the stop counter is repeated each time. As a result, even when recording has been started, in a case where the manipulation unit **132** is subsequently manipulated, the display of the display unit **61** is continued until the predetermined time elapses from the last manipulation of the manipulation unit **132**.

[0126] Furthermore, when it is determined in step S**19** that display content for which a caution should be issued is present, the processing proceeds to step S**30**. The display unit **61** is turned on into the display state, and displays information for which a caution should be issued. In other words, in this case, the processing of steps S**12**, S**16** to S**19**, S**30** and S**25** to S**27** is repeated, and, in this case, for example, in a case where the battery **137** has a small remaining charge level or an abnormality, e.g., overheat, is detected, these pieces of information are displayed, and the moving image captured by the imaging unit **131** is displayed.

[0127] To summarize the above processing, the image captured by the imaging unit **131** continues being displayed on the display unit **61** and the display apparatus **122**, which is external equipment, until the recording is started in the first processing.

[0128] Here, when the manipulation unit **132** of the main body or the remote manipulator **121** or **123** is manipulated and an instruction of recording is given, a recording operation is started, an instruction of recording is given, and the state in which the manipulation unit **132** is not manipulated continues for a predetermined time, the display of the display unit **61** is controlled into the turn-off state. In the period from the start of the recording until the predetermined time elapses, the stop counter is reset each time when the manipulation unit **132** of the main body is manipulated and any manipulation including the manipulation related to recording is detected. Thus, the display unit **61** is turned on into the display state until the predetermined time elapses after the last manipulation of the manipulation unit **132**. When the predetermined time elapses from the last manipulation of the manipulation unit **132**, the display unit **61** is controlled into the turn-off state.

[0129] Moreover, in a case where the manipulation of the remote manipulator **121** or **123** is detected with the display unit **61** being in the turn-off state, when the recording is in progress, the control unit **133** executes a command corresponding to the detected manipulation content. However, the display unit **61** is not turned on into the display state, but remains in the turn-off state. However, in a case where the detected manipulation content is to perform the manipulation of stopping the recording, the recording becomes not in progress. At this time, the display unit **61** returns to the display state.

[0130] Furthermore, in a case where a remaining battery charge level is small or an abnormality, such as overheat, is detected, the display unit **61** is constantly turned on into the

display state, and the display unit **61** continues displaying information indicating the occurrence of the abnormality. Note that, in a case where all abnormalities are detected, the display state may not be restored from the turn-off state. The turn-off state may be switched to the display state, for example, only in a case where an abnormality of a specific type occurs among detected abnormalities, or for example, only in a case where an urgent abnormality occurs.

[0131] As a result, the display unit **61**, which is not frequently viewed after the recording is started, can be brought into the turn-off state when a predetermined time elapses without user's consciousness, enabling a reduction in power consumption. Furthermore, in a case where imaging is performed in dark environments, e.g., a concert hall, when the display unit **61** is turned on over a minimally required time, it is possible to prevent to emit annoying light to the surrounding area.

[0132] Note that, heretofore, the description is given of the example in which the captured image data is output to the display apparatus **122**, which is external equipment, from the imaging apparatus **11** and displayed on the display apparatus **122**. However, even during use in a state in which the display apparatus **122**, which is external equipment, is not connected, the processing of step S**17** described above is merely skipped and the imaging apparatus **11** is solely operated without the display apparatus **122** illustrated in FIG. **8**. Therefore, a detailed description is omitted.

[0133] In the above, the description is given of the example in which a moving image is captured by the imaging apparatus **11**. However, the above-described imaging processing may be applied not only to a moving image, but also to capturing of various images. For example, even in a case of capturing a still image with long-time exposure or repeatedly and continuously capturing an image including a still image at predetermined time intervals, the above-described imaging processing can be applied and a similar effect can be obtained.

[0134] Furthermore, in the above, the description is given of the example in which the display unit **61** is controlled to one of the states: the display state and the turn-off state. However, in a case of being controlled to the turn-off state, the display unit **61** may be controlled to a dimming state (for example, a state of brightness such as 30% or 50%) with reduced brightness instead of the turn-off state. Furthermore, the brightness may be gradually reduced in accordance with the elapsed time. For example, in a case where a predetermined time elapses in a state in which the manipulation is not accepted in the manipulation unit **132** after the start of recording, the brightness may be set to about 50%, which is still the display state, and in a case where a predetermined time has further elapsed, the brightness may be set to about 20%, which is still the display state, or in a case where a predetermined time has further elapsed, a full turn-off state may be provided.

[0135] Furthermore, in the above, the description is given of the example in which in a case where a predetermined time elapses in a state in which the manipulation unit **132** provided in the main body of the imaging apparatus **11** is not manipulated after the recording is started, i.e., after the manipulation indicating the start of recording is accepted, the display unit **61** is brought into the turn-off state and the display unit **61** does not return to the display state until the manipulation unit **132** in the main body of the imaging apparatus **11** is manipulated or the recording is stopped.

[0136] However, regarding the case where a command corresponding to the manipulation for stopping recording is accepted from any of the remote manipulators **121** and **123**, the display unit **61** may not be brought into the display state, but remains in the turn-off state such that the turn-off state is maintained until the manipulation unit **132** of the main body is manipulated.

[0137] Furthermore, in a case where a predetermined time elapses without the manipulation unit **132** being manipulated after a command corresponding to the manipulation of giving an instruction of any predetermined operation other than the recording operation is accepted, the display unit **61** may be brought into the turn-off state.

[0138] For example, in a case where a predetermined time elapses in a state in which the manipulation unit **132** of the main body of the imaging apparatus **11** is not manipulated after the power button, which is a part of the manipulation unit **132**, of the imaging apparatus **11** is manipulated and the power is turned on, the display unit **61** may be controlled to the turn-off state and then the display unit **61** may be returned to the display state in a case where the manipulation unit **132** is manipulated. Furthermore, similarly, in a case where a predetermined time elapses in a state in which the manipulation unit **132** of the main body of the imaging apparatus **11** is not manipulated after the manipulation unit **132** for giving an instruction of various setting operations accepts any predetermined manipulation, the display unit **61** may be controlled to the turn-off state and then the display unit **61** may be returned to the display state in a case where a manipulation of giving an instruction of any operation is accepted by the manipulation unit **132**. In both cases, it is possible to achieve power saving, and it is possible to suppress emission of annoying light to the surrounding area in a dark place such as a concert hall.

[0139] <Example of Execution by Software>

Incidentally, the series of processing described above can be executed by hardware, but it can also be executed by software. In a case where the series of processing is executed by software, a program that constitutes the software is installed, from a recording medium, in a computer incorporated in a dedicated hardware or, for example, in a general-purpose personal computer and the like that can execute various functions when various programs are installed.

[0140] FIG. **9** illustrates a configuration example of a general-purpose personal computer. This personal computer includes a central processing unit (CPU) **1001**. An input/output interface **1005** is connected to the CPU **1001** via a bus **1004**. A read only memory (ROM) **1002** and a random access memory (RAM) **1003** are connected to the bus **1004**.

[0141] An input unit **1006** including an input device, e.g., a keyboard or a mouse with which the user inputs a manipulation command, an output unit **1007** for outputting a processing manipulation screen or a processing result image to a display device, a storage unit **1008** including a hard disk drive and the like for storing a program or various data, and a communication unit **1009** including a local area network (LAN) adapter and the like and executing communication processing via a network represented by the Internet are connected to the input/output interface **1005**. Furthermore, a drive **1010** is connected that reads and writes data with respect to a removable medium **1011** including a magnetic disk (including a flexible disk), an optical disk (including a compact disc-read only memory (CD-ROM), a

digital versatile disc (DVD), a magneto-optical disk (including a mini disc (MD)), a semiconductor memory, and the like.

[0142] The CPU **1001** executes various processing according to a program stored in the ROM **1002** or a program that is read from the removable medium **1011**, e.g., a magnetic disk, an optical disk, a magneto-optical disk, or a semiconductor memory, installed in the storage unit **1008**, and loaded in the RAM **1003** from the storage unit **1008**. Data or the like required for the CPU **1001** to execute various processing are also stored in the RAM **1003** as appropriate.

[0143] In the computer configured in the manner described above, the series of processing described above is performed, for example, such that the CPU **1001** loads the program stored in the storage unit **1008** into the RAM **1003** via the input/output interface **1005** and the bus **1004** and executes the program.

[0144] The program to be executed by the computer (CPU **1001**) can be provided by being recorded on the removable medium **1011**, for example, as a package medium or the like. Furthermore, the program can be provided via a wired or wireless transmission medium such as a local area network, the Internet, or digital satellite broadcasting.

[0145] In the computer, the program can be installed in the storage unit **1008** via the input/output interface **1005** by attaching the removable medium **1011** to the drive **1010**. Furthermore, the program can be received by the communication unit **1009** via a wired or wireless transmission medium and installed in the storage unit **1008**. In addition, the program can be pre-installed in the ROM **1002** or the storage unit **1008**.

[0146] Note that the program executed by the computer may be a program by which processing is performed in a chronological order according to the order described in the present description or may be a program by which processing is performed in parallel or at a required timing when a call is made or the like.

[0147] Note that the CPU **1001** in FIG. **10** corresponds to the control unit **133**, the input unit **1006** and the output unit **1007** correspond to the input/output terminal **136**, and the communication unit **1009** corresponds to the communication unit **135**.

[0148] Furthermore, in the present description, a system means a cluster of a plurality of constituent elements (apparatuses, modules (parts), etc.) and it does not matter whether or not all the constituent elements are in the same casing. Therefore, a plurality of apparatuses that are housed in different casings and connected by a network, and a single apparatus in which a plurality of modules are housed in a single casing are both the system.

[0149] Note that the embodiment of the present disclosure is not limited to the aforementioned embodiment, but various modifications may be made without departing from the gist of the present disclosure.

[0150] For example, the present disclosure can adopt a configuration of cloud computing in which one function is shared and jointly processed by a plurality of apparatuses via a network.

[0151] Furthermore, each step described in the above-described flowcharts can be executed by a single apparatus or shared and executed by a plurality of apparatuses.

[0152] Moreover, in a case where a plurality of processing is included in a single step, the plurality of processing included in the single step can be executed by a single apparatus or can be shared and executed by a plurality of apparatuses.

[0153] Note that the present disclosure may adopt the configuration described below.

[0154] <1> An imaging apparatus including:

[0155] an imaging unit configured to capture an image;

[0156] a manipulation unit configured to accept a user manipulation and give an instruction of an operation depending on content of the accepted manipulation; and

[0157] a display control unit configured to control display of the captured image, in which the display control unit controls the display of the image from a display state to a turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not detected after start of a predetermined operation.

[0158] <2> The imaging apparatus according to <1>, in which

[0159] the display control unit controls the display of the image from the display state to the turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not accepted after start of a recording operation as the predetermined operation.

[0160] <3> The imaging apparatus according to <2>, in which

[0161] the display control unit controls the display of the image from the turn-off state to the display state in a case where the recording operation is stopped after control is performed from the display state in which the image is displayed to the turn-off state in which the display of the image is turned off.

[0162] <4> The imaging apparatus according to <3>, in which

[0163] the display control unit controls the display of the image from the turn-off state to the display state in a case where manipulation is accepted by the manipulation unit after the display of the image is controlled from the display state to the turn-off state.

[0164] <5> The imaging apparatus according to <2>, further including:

[0165] a reception unit configured to receive a signal from a remote manipulation unit that is external to an apparatus main body and configured to accept a user manipulation and transmit an instruction depending on the content of the accepted manipulation as the signal, in which

[0166] the display control unit controls the display of the image from the display state to the turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not accepted and in a state in which the signal from the remote manipulation unit is not received via the reception unit after start of the recording operation as the predetermined operation.

[0167] <6> The imaging apparatus according to <5>, in which

[0168] the display control unit performs control to maintain the turn-off state even in a case where the signal from the remote manipulation unit is received via the reception unit after the display of the image is controlled from the display state to the turn-off state.

[0169] <7> The imaging apparatus according to <5>, in which

[0170] the reception unit receives an instruction from a remote commander or a smartphone depending on the content of the user manipulation with respect to the remote commander or the smartphone as the remote manipulation unit.

[0171] <8> The imaging apparatus according to any one of <2> to <7>, further including:

[0172] an input/output unit configured to constantly output the image captured by the imaging unit to external equipment connected to the outside.

[0173] <9> The imaging apparatus according to <8>, in which

[0174] the input/output unit accepts, via the external equipment, input of the signal from the remote manipulation unit that is external to the external equipment and configured to accept the user manipulation and transmit an instruction depending on the content of the accepted manipulation as the signal, and

[0175] the display control unit controls the display of the image from the display state to the turn-off state in a case where a predetermined time elapses in a state in which the manipulation with respect to the manipulation unit is not accepted and in a state in which the manipulation with respect to the remote manipulation unit is not accepted via the input/output unit after start of the predetermined operation.

[0176] <10> The imaging apparatus according to <9>, in which

[0177] the display control unit performs control to maintain the turn-off state even when the signal from the remote manipulation unit is accepted via the input/output unit after the display of the image is controlled from the display state to the turn-off state.

[0178] <11> The imaging apparatus according to <8>, in which

[0179] the external equipment is a display apparatus configured to display an image captured by the imaging unit.

[0180] <12> The imaging apparatus according to any one of <1> to <11>, in which

[0181] the predetermined operation is a recording operation, a power-on operation, or various setting operations.

[0182] <13> The imaging apparatus according to any one of <1> to <12>, further including:

[0183] an abnormality detection unit configured to detect occurrence of an abnormality, in which in a case where an abnormality is detected by the abnormality detection unit, the display control unit controls the display of the image to the display state.

[0184] <14> The imaging apparatus according to any one of <1> to <13>, further including:

[0185] a setting unit configured to perform setting related to imaging by the imaging unit, in which under a condition that the setting related to the imaging by the imaging unit is completed by the setting unit, the display control units controls the display of the image from the display state to the turn-off state in a case where a predetermined time elapses in a state in which the manipulation with respect to the manipulation unit is not accepted after start of the predetermined operation.

[0186] <15> An imaging method including steps of:

[0187] capturing an image;

[0188] accepting a user manipulation and giving an instruction of an operation depending on content of the accepted manipulation; and

[0189] controlling display of the captured image, in which

[0190] the display of the image is controlled from a display state to a turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not detected after start of a predetermined operation.

[0191] <16> A program causing a computer to function as:

[0192] an imaging unit configured to capture an image;

[0193] a manipulation unit configured to accept a user manipulation and give an instruction of an operation depending on content of the accepted manipulation; and

[0194] a display control unit configured to control display of the captured image, in which the display control unit controls the display of the image from a display state to a turn-off state in a case where a predetermined time elapses in a state in which manipulation with respect to the manipulation unit is not detected after start of a predetermined operation.

REFERENCE SIGNS LIST

[0195] **11** Imaging apparatus
23 Tally lamp
61 Display unit
62 Tally lamp
121 Remote manipulator
122 Display apparatus (external equipment)
123 External equipment remote manipulator
131 Imaging unit
132 Manipulation unit
133 Control unit
134 Removable recording medium
135 Communication unit
136 Input/output terminal

137 Battery

[0196] **151** Setting unit
152 OSD image generation unit
153 Display control unit
154 Recording control unit

What is claimed is:

1. An imaging apparatus, comprising:

circuitry configured to:

control a recording operation of a captured image;

control, based on absence of a user input to control the imaging apparatus for a specific time period during the recording operation of the captured image, a display to change from a first state where a live-view image according to the captured image is displayed to a second state where the live-view image is not displayed;

detect an abnormality related to the imaging apparatus; and

control, based on the detection of the abnormality, the display to change from the second state to the first state.

2. The imaging apparatus of claim 1, wherein the first state is a turn-on state of the display and the second state is a turn-off state of the display.

3. The imaging apparatus of claim 1, wherein the imaging apparatus is driven by power fed from a battery.

4. The imaging apparatus of claim 3, wherein the circuitry is further configured to control display of the live-view image based on detection of at least one of the abnormality or a notification.

5. The imaging apparatus of claim 4, wherein the detected abnormality corresponds to a remaining charge level of the battery less than a threshold.

6. The imaging apparatus of claim 4, wherein the detected abnormality corresponds to an overheating of the battery greater than a threshold.

7. The imaging apparatus of claim 1, the circuitry is further configured to control the display to display information related to the detection of the abnormality.

8. The imaging apparatus of claim 2, wherein the circuitry is further configured to:

execute, based on reception of a command when the display of the live-view image is turned-off, a processing operation related to the received command while maintaining the display of the live-view image as turned-off.

9. The imaging apparatus of claim 1, wherein the circuitry is further configured to control display of an On Screen Display (OSD) image, the OSD image is an image that indicates a mark which corresponds to at least one of an imaging mode of the imaging apparatus, a remaining charge level of a battery of the imaging apparatus, information related to a white balance setting of the imaging apparatus, or a state related to the imaging apparatus.

10. The imaging apparatus of claim 1, wherein the captured image is a movie.

11. The imaging apparatus of claim 1, wherein

the circuitry is further configured to control, based on the detection of the abnormality, display of the live-view image at a first timing, control display of a notification at a second timing, and control display of the second state at a third timing,

the first timing, the second timing, and the third timing are in a sequence, and

the notification corresponds to detection of the abnormality.

12. The imaging apparatus of claim 1, wherein

the imaging apparatus further includes a tally lamp, and

the circuitry is further configured to control the tally lamp to a turn-on state, when the recording operation is in progress and the display is in turned off state.

13. A method, comprising:

controlling, by a circuitry, recording of a captured image;

controlling, by the circuitry, a display to change from a first state where a live-view image according to the captured image is displayed to a second state where the live-view image is not displayed based on absence of a user input to control an imaging apparatus for a specific time period during the recording of the captured image;

detecting, by the circuitry, an abnormality related to the imaging apparatus; and

controlling, by the circuitry, the display to change from the second state to the first state based on the detection of the abnormality.

14. A non-transitory computer-readable medium having stored thereon, computer-executable instructions which, when executed by a computer, cause the computer to execute operations, the operations comprising:

controlling recording of a captured image;

controlling, based on absence of a user input to control an imaging apparatus for a specific time period during the recording of the captured image, a display to change from a first state where a live-view image according to the captured image is displayed to a second state where the live-view image is not displayed;

detecting an abnormality related to the imaging apparatus; and

controlling, based on the detection of the abnormality, the display to change from the second state to the first state.

15. A system, comprising:

a remote manipulator configured to transmit a command to an imaging apparatus; and

the imaging apparatus configured to:

control a recording operation of a captured image;

control, based on absence of a user input to control the imaging apparatus for a specific time period during the recording operation of the captured image, a display to change from a first state where a live-view image according to the captured image is displayed to a second state where the live-view image is not displayed;

detect an abnormality related to the imaging apparatus;

control, based on the detection of the abnormality, the display to change from the second state to the first state; and

execute, based on reception of the command from the remote manipulator when the display of the live-view image is turned-off, a processing operation related to the received command while maintaining the display of the live-view image as turned-off.

* * * * *