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Display method and video recording method

Abstract

Provided are a display method and a video recording method for a user to perceive a position of an extraction range moving within an angle of view, wherein the display method includes an acquisition step of acquiring a reference video that is a motion picture, an extraction step of extracting an extraction video set to be smaller than an angle of view of the reference video within the angle of view from the reference video, a movement step of moving an extraction range of the extraction video over time, a first display step of displaying the extraction video on a display device, and a second display step of displaying a support video based on a positional relationship between the angle of view and the extraction range on the display device, in which the second display step is executed during execution of the first display step.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS (1) This application is a Continuation of copending application Ser. No. 18/305,178, filed on Apr. 21, 2023, which is a Continuation of application Ser. No. 17/704,416, filed on Mar. 25, 2022 (now U.S. Pat. No. 11,665,429, issued May 30, 2023), which is a Continuation of PCT International Application No. PCT/JP2020/028347, filed on Jul. 22, 2020, which claims the benefit under 35 U.S.C. § 119(a) to Patent Application No. 2019-176631, filed in Japan on Sep. 27, 2019, all of which are hereby expressly incorporated by reference in their entirety into the present application.

BACKGROUND OF THE INVENTION
1. Field of the Invention
(1) The present invention relates to a display method of displaying a video and a video recording method of recording a video.

2. Description of the Related Art

(2) Among imaging apparatuses capturing videos, there is an imaging apparatus that extracts (cuts out) a video of a part of an angle of view of a captured video and displays the extraction video, such as imaging apparatuses disclosed in JP2017-46355A and JP2019-22026A.

(3) The imaging apparatuses disclosed in JP2017-46355A and JP2019-22026A have a function of changing a position or the like of an extraction region within the angle of view at a predetermined speed. In a case where this function is used, for example, it is possible to track a subject in the video or cause an angle of a recorded video to slide in a certain direction without manually operating the imaging apparatuses during imaging.

SUMMARY OF THE INVENTION

(4) In a case of displaying a video within an extrvaction range while moving the extraction range, it is required that a position of the extraction range within the angle of view can be checked so that a user can perceive which range within the angle of view is extracted.

(5) However, in a display method of a video using the imaging apparatuses disclosed in JP2017-46355A and JP2019-22026A, while the video within the extraction range moving within the angle of view is displayed, it is difficult to perceive the position of the extraction range from only the displayed video.

(6) The present invention is conceived in view of the above matter, and an object thereof is to resolve problems of the technology in the related art and provide a display method for causing a user to perceive a position of an extraction range moving within an angle of view, and a video recording method employing the display method.

(7) In order to accomplish the above object, a display method according to an aspect of the present invention comprises an acquisition step of acquiring a reference video, an extraction step of extracting an extraction video set to be smaller than an angle of view of the reference video within the angle of view from the reference video, a movement step of moving an extraction range of the extraction video over time, a first display step of displaying the extraction video on a display device, and a second display step of displaying a support video based on a positional relationship between the angle of view and the extraction range on the display device, in which the second display step is executed during execution of the first display step.

(8) According to the display method according to the aspect of the present invention, by displaying the support video based on the positional relationship between the angle of view and the extraction range during display of the extraction video, a user can perceive a position of the extraction range moving within the angle of view.

(9) In addition, in the display method according to the aspect of the present invention, the support video may include the extraction video, and in the second display step, the support video in which a position of the extraction video in the support video is specified may be displayed.

(10) In addition, the display method according to the aspect of the present invention may further comprise a third display step of displaying information related to at least one of the reference video or the extraction video on the display device. In this case, it is more preferable that the third display step is executed during execution of both of the first display step and the second display step.

(11) In addition, in the display method according to the aspect of the present invention, in the first display step, the extraction video may be displayed in a state where a display size of the extraction video is changeable, and in the second display step, the support video may be displayed in a state where an aspect ratio of the support video and a display size of the support video are changeable.

(12) In this case, in the first display step, the extraction video may be displayed in a state where the display size of the extraction video is changeable while an aspect ratio of the extraction video is constantly maintained, and in the second display step, the support video may be displayed in a state where the display size of the support video is changed in accordance with a change in display size of the extraction video.

(13) Alternatively, in the display method, in the second display step, the support video indicating a

video of a part of the reference video may be displayed in a state where the display size of the support video is changed while the aspect ratio of the support video is constantly maintained, in accordance with a change in display size of the extraction video.

(14) In addition, in the display method according to the aspect of the present invention, the second display step may be executed in accordance with a display scheme selected by a user from a first display scheme and a second display scheme, in a case where the first display scheme is selected, in the second display step, the support video may be displayed in a state where an aspect ratio of the support video and a display size of the support video are changeable, and in a case where the second display scheme is selected, in the second display step, the support video indicating a video of a part of the reference video may be displayed in a state where the display size of the support video is changeable while the aspect ratio of the support video is constantly maintained.

(15) In addition, the acquisition step may be an imaging step of capturing the reference video within the angle of view. In this case, in the imaging step, the reference video may be captured within the angle of view using an anamorphic lens, and in the first display step, the extraction video may be displayed by extending a size in a lateral direction of the angle of view using the anamorphic lens.

(16) In addition, in the display method according to the aspect of the present invention, the movement step may be executed during execution of the imaging step, and in the movement step, at least one of a position, a size, a movement speed, or a movement direction of the extraction range may be changed based on an instruction of a user received during execution of the movement step.

(17) In addition, in the display method according to the aspect of the present invention, in the movement step, the extraction range may be moved within the angle of view such that a subject of a tracking target set by a user enters within the extraction range.

(18) In addition, the display device may include a first display device and a second display device that are devices separated from each other. In this case, the first display device may display the extraction video on the first display device, and the second display device may display the support video on the second display device.

(19) In addition, the display method according to the aspect of the present invention may further comprise a third display step of displaying text information related to at least one of the reference video or the extraction video on the second display device. In this case, the third display step may be executed during execution of both of the first display step and the second display step, and in a case where a width and a height of the first display device are inverted during the first display step, the support video of which a width and a height are inverted may be displayed on the second display device in the second display step, and the text information of which a display orientation is maintained may be displayed on the second display device in the third display step.

(20) In addition, the display method according to the aspect of the present invention may further comprise a determination step of determining whether or not a distance between an end of the angle of view and an end of the extraction range is less than a threshold value during execution of the movement step, and an alert step of issuing an alert to a user in a case where the distance is less than the threshold value.

(21) In addition, according to an aspect of the present invention, it is possible to provide a video recording method employing the display method, the video recording method comprising a recording step of recording the extraction video on a recording medium.

(22) In addition, the present invention provides an apparatus for video display including a processor configured to execute an acquisition step of acquiring a reference video, an extraction step of extracting an extraction video set to be smaller than an angle of view of the reference video within the angle of view from the reference video, a movement step of moving an extraction range of the extraction video over time, a first display step of displaying the extraction video on a display device, and a second display step of displaying a support video based on a positional relationship

between the angle of view and the extraction range on the display device, in which the second display step is executed during execution of the first display step.

(23) According to the display method and the video recording method according to the aspects of the present invention, the user can perceive the position of the extraction range moving within the angle of view.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) FIG. **1** is a diagram of an exterior of an imaging apparatus used in a display method according to a first embodiment of the present invention in a view from a front surface side.
(2) FIG. **2** is a diagram of the exterior of the imaging apparatus used in the display method according to the first embodiment of the present invention in a view from a rear surface side.
(3) FIG. **3** is a diagram illustrating a configuration of an imaging apparatus main body comprised in the imaging apparatus used in the display method according to the first embodiment of the present invention.
(4) FIG. **4** is a diagram illustrating a screen example displayed on a display device during imaging in the first embodiment of the present invention.
(5) FIG. **5** is a descriptive diagram for an extraction video.
(6) FIG. **6** is a diagram illustrating an extraction mode selection screen.
(7) FIG. **7** is a diagram illustrating a movement path of an extraction range in a tracking mode.
(8) FIG. **8** is a diagram illustrating the movement path of the extraction range in a panning mode.
(9) FIG. **9** is a descriptive diagram for a support video.
(10) FIG. **10** is a descriptive diagram for information such as setting contents.
(11) FIG. **11** is a diagram illustrating a processing flow related to the display method according to the first embodiment of the present invention (Part **1**).
(12) FIG. **12** is a diagram illustrating the processing flow related to the display method according to the first embodiment of the present invention (Part **2**).
(13) FIG. **13** is a diagram illustrating a screen example of a display device according to a second embodiment of the present invention (Part **1**).
(14) FIG. **14** is a diagram illustrating a screen example of the display device according to the second embodiment of the present invention (Part **2**).
(15) FIG. **15** is a diagram illustrating a display scheme selection screen.
(16) FIG. **16** is a diagram illustrating a configuration of an imaging system used in a display method according to a third embodiment of the present invention.
(17) FIG. **17** is a diagram illustrating a screen example of a display device according to the third embodiment of the present invention.
(18) FIG. **18** is a diagram illustrating a screen example of the display device according to the third embodiment of the present invention in a case where a width and a height of the imaging apparatus are inverted.
DESCRIPTION OF THE PREFERRED EMBODIMENTS
(19) Hereinafter, preferred embodiments (a first embodiment to a fourth embodiment) of the present invention will be described in detail with reference to the appended drawings. The embodiments described below are merely an example for facilitating understanding of the present invention and do not limit the present invention. That is, the present invention may be changed or improved from the embodiments described below without departing from a gist thereof. In addition, the present invention includes equivalents thereof.
First Embodiment
(20) The first embodiment of the present invention relates to a display method using an imaging

apparatus **10** illustrated in FIGS. **1** and **2**. That is, the display method according to the first embodiment of the present invention is implemented by the imaging apparatus **10**.

Basic Configuration of Imaging Apparatus

(21) A basic configuration of the imaging apparatus **10** will be described with reference to FIGS. **1** to **3**.

(22) The imaging apparatus **10** is a portable digital camera, has an exterior illustrated in FIGS. **1** and **2**, and captures a still picture and a motion picture. In addition, the imaging apparatus **10** has functions of displaying a captured image (video) and recording the video. In the present specification, a function of capturing a video that is a motion picture in real time will be mainly described among functions of the imaging apparatus **10**.

(23) The imaging apparatus **10** is configured with an imaging apparatus main body **12** and a housing **14**. The imaging apparatus main body **12** is a part of the imaging apparatus **10** excluding the housing **14**. The housing **14** has approximately the same structure as a housing of a general digital camera and accommodates an imaging portion **20** and a control portion and the like including a controller **30** and a video processing portion **32** illustrated in FIG. **3**.

(24) The imaging portion **20** is a device capturing a video and includes a lens unit **110**, a lens drive portion **120**, a stop portion **130**, a shutter **140**, an imaging sensor **150**, and an analog/digital (A/D) converter **160** as illustrated in FIG. **3**.

(25) The lens unit **110** includes a zoom lens **112** and a focus lens **114**. In the first embodiment, the zoom lens **112** is equipped with an anamorphic lens. Thus, in the first embodiment, the video can be captured within an angle of view (for example, an angle of view having an aspect ratio of 2.35:1) that is wide in a lateral direction. The present invention is not limited to the anamorphic lens, and imaging lenses such as a wide angle lens, an ultra wide angle lens, and a 360-degree lens may be used. In addition, the lens unit **110** may be configured to be interchangeable with other lens units. In addition, the imaging portion **20** may comprise a plurality of lens units **110** having angles of view different from each other.

(26) Here, the angle of view in capturing the video using the imaging portion **20** is decided in accordance with specifications and the like of the lens unit **110** and the imaging sensor **150**, and the video captured within the angle of view corresponds to a "reference video" according to the embodiments of the present invention. An aspect ratio of the reference video is a value corresponding to the angle of view and is, for example, 2.35:1 in a case where the anamorphic lens is used.

(27) The lens drive portion **120** is configured with a drive motor, not illustrated, and a drive mechanism, not illustrated, and moves the lenses of the lens unit **110** along an optical axis.

(28) The stop portion **130** adjusts a size of an opening portion in accordance with setting of a user or automatically, and adjusts a quantity of light passing through the opening portion.

(29) The shutter **140** blocks light transmitted to the imaging sensor **150**.

(30) The imaging sensor **150** is configured with, for example, a charged coupled device (CCD) or a complementary metal oxide semiconductor image sensor (CMOS), forms an image by receiving light from a subject through the lens unit **110**, and generates image data. Specifically, the imaging sensor **150** converts a light signal received through a color filter into an electric signal using a light-receiving element, amplifies the electric signal using an auto gain controller (AGC), and generates analog image data from the signal after amplification.

(31) The A/D converter **160** converts the analog image data generated by the imaging sensor **150** into digital image data. The digital image data corresponds to data of a frame image constituting the reference video that is a motion picture.

(32) The number of pieces of pixel data (that is, the number of pixels) constituting the digital image data is not particularly limited. In the first embodiment, the number of pixels is greater than or equal to 10 million. Preferably, a lower limit of the number of pixels may be greater than or equal to 60 million. In addition, a preferred upper limit of the number of pixels in the first embodiment is

less than or equal to 1 billion and more preferably less than or equal to 5 billion. In a case where the number of pixels is above the lower limit, visibility of an extraction video extracted from the reference video can be secured. In addition, in a case where the number of pixels is below the upper limit, a pixel information amount of the reference video can be further decreased. Thus, a speed of processing performed by the control portion (specifically, the video processing portion **32**) is increased.

(33) The controller **30** controls each portion of the imaging apparatus main body **12** in accordance with an operation of the user or automatically, and, for example, can cause the imaging portion **20** to capture (acquire) the reference video by controlling the imaging portion **20**. In addition, the controller **30** can control the video processing portion **32** such that a video (specifically, the extraction video described later) is recorded on a recording medium. In addition, based on a contrast or the like of the entire or a part of an image indicated by the digital image data generated by the imaging portion **20**, the controller **30** can control the lens drive portion **120** to set a focal point of the lens unit **110** to focus on the subject in the image. In addition, based on brightness of the entire or a part of the image indicated by the digital image data generated by the imaging portion **20**, the controller **30** can control the stop portion **130** and automatically adjust an exposure amount at a time of imaging. In addition, the controller **30** can control the lens drive portion **120** to perform zooming (optical zooming) in accordance with the operation of the user or automatically in accordance with a distance between the subject and the imaging apparatus **10**.

(34) The video processing portion **32**, under control of the controller **30**, performs processing such as gamma correction, white balance correction, and defect correction on the digital image data generated by the imaging portion **20** and furthermore, compresses the processed digital image data in a compression format complying with a predetermined standard. The video processing portion **32** acquires the reference video from the compressed digital image data that is sequentially generated during imaging, and executes various processing on the acquired reference video. As an example of processing performed on the reference video, the video processing portion **32** can extract the extraction video (so-called cropped image) that is smaller than the angle of view within the angle of view of the imaging portion **20** from the reference video. In addition, the video processing portion **32** can change a size of a range (hereinafter, referred to as an extraction range) of the extraction video in order to perform zooming (electronic zooming) on a video of the subject within the extraction video. Here, the size of the extraction range is the number of pixels of the extraction video (in a strict sense, the number of pixels in each of a width and a height of the extraction video).

(35) The control portion including the controller **30** and the video processing portion **32** consists of one or a plurality of microcontrollers or processors. Specifically, for example, the control portion is configured with a central processing unit (CPU) and a control program causing the CPU to execute various processing. The present invention is not limited thereto. The processor may be configured with a field programmable gate array (FPGA), a digital signal processor (DSP), an application specific integrated circuit (ASIC), a graphics processing unit (GPU), a micro-processing unit (MPU), or other integrated circuits (ICs), or may be configured with a combination thereof. In addition, as represented by a system on chip (SoC) or the like, the processor may be such that functions of the entire control portion including the controller **30** and the video processing portion **32** are configured with one integrated circuit (IC) chip. Furthermore, a hardware configuration of each processor above may be implemented by an electric circuit (circuitry) in which circuit elements such as semiconductor elements are combined.

(36) The housing **14** further accommodates an internal memory **230** incorporated in the imaging apparatus main body **12**, a memory card **240** that is attachable to and detachable from the imaging apparatus main body **12** through a card slot **260**, and a buffer **250**. The internal memory **230** and the memory card **240** are the recording medium on which the extraction video is recorded, and are configured with a flash memory, a ferroelectric memory, and the like. The buffer **250** functions as a

work memory of the controller **30** and the video processing portion **32** and is configured with, for example, a dynamic random access memory (DRAM) or a ferroelectric memory. In addition, the buffer **250** stores various setting contents, imaging conditions, and the like.

(37) The recording medium does not need to be disposed inside the imaging apparatus main body **12** and may be an external recording medium connected to the imaging apparatus main body **12** via the Internet. In addition, the recording medium may be connected to the imaging apparatus main body **12** through a cable such as a universal serial bus (USB) cable or a High-Definition Multimedia Interface (HDMI) (registered trademark), or wirelessly.

(38) A display device **40** is attached to a rear surface of the housing **14** as illustrated in FIG. **2**. The display device **40** is configured with a liquid crystal display (LCD), an organic electroluminescence (EL) display, a light emitting diode (LED) display, an electronic paper, or the like. The display device **40** displays various videos including the extraction video and also displays an operation screen for setting of the imaging conditions and the like and mode selection.

(39) In the first embodiment, an aspect ratio of a screen of the display device **40** is different from the aspect ratio of the angle of view and is, for example, 4:3 or 16:9. The screen of the display device **40** has a smaller value corresponding to a width/height than the angle of view.

(40) The housing **14** comprises an operating part **50**. The user performs various operations related to imaging through the operating part **50**. For example, as illustrated in FIGS. **1** and **2**, the operating part **50** includes a release button **310**, a zoom lever **320**, a front operation dial **330**, a rear operation dial **340**, a cross button **350**, and a touch wheel **360** arranged on the housing **14**. In a case where these devices are operated by the user, the devices transmit various control signals toward the controller **30**. For example, in a case where the zoom lever **320** is operated, a control signal for changing a zoom magnification is transmitted toward the controller **30** in accordance with the operation. The controller **30** controls the lens drive portion **120** in order to move the zoom lens **112** in accordance with the control signal.

(41) In addition, in the first embodiment, the display device **40** is a touch panel display and doubles as the operating part **50**. In a case where the user touches the screen of the display device **40**, a control signal corresponding to the touched position is transmitted toward the controller **30**. For example, an extraction mode selection screen (refer to FIG. **6**) described later is displayed on the display device **40**. The user selects one of a plurality of modes and touches one corresponding button of a plurality of mode selection buttons drawn on the screen. Consequently, a control signal for setting the selected mode is transmitted toward the controller **30**. The user can instruct the control portion to perform zooming processing or shutter processing (imaging processing) by touching the screen of the display device **40**.

Screen Example of Display Device during Imaging

(42) Next, a screen example displayed on the display device **40** during imaging in the first embodiment will be described with reference to FIG. **4**.

(43) In the first embodiment, the screen of the display device **40** is divided into three regions during imaging. As illustrated in FIG. **4**, an extraction video P**1**, a support video P**2**, and information IF such as the setting contents are displayed in a first region, a second region, and a third region, respectively, at the same time.

(44) Hereinafter, each of the extraction video P**1**, the support video P**2**, and the information IF such as the setting contents will be described in detail.

Extraction Video

(45) As illustrated in FIG. **5**, the extraction video P**1** is a video that is set to be smaller than an angle of view A**0** of a reference video P**0** within the angle of view A**0**, and is extracted (cut out) from the reference video P**0**.

(46) In the first embodiment, the reference video P**0** is a high image quality video consisting of 10 million or more (preferably, 60 million or more) pixels. Thus, the extraction video P**1** extracted from the reference video P**0** is also a video having sufficiently high image quality.

(47) In the first embodiment, outer edges of the extraction video P**1** have an oblong shape. However, the shape of the outer edges of the extraction video P**1** is not particularly limited and may be a square shape, a parallelogramic shape, a trapezoidal shape, a rhombic shape, a circular shape or an elliptical shape, a triangular shape or a polygonal shape of a pentagonal or higher-faceted shape, or an indefinite shape.

(48) The extraction video P**1** is extracted from the reference video P**0** by the video processing portion **32** as needed during imaging and is displayed in the first region on the screen of the display device **40** by the video processing portion **32**. At this point, the extraction video P**1** is displayed in a state where a display size can be changed to fall within the first region while the aspect ratio is maintained. In a case of performing imaging using the anamorphic lens, the extraction video P**1** is displayed by extending the size in a lateral direction of the angle of view A**0** in a case of using the anamorphic lens. A reason for doing so is because an image size is temporarily compressed in the lateral direction of the angle of view A**0** at a point in time of image forming by the imaging sensor **150**, and the display size is to be restored to an original size in a case of displaying the extraction video P**1**.

(49) In the screen example illustrated in FIG. **4**, the extraction video P**1** is displayed in a region positioned lowest on the screen of the display device **40**. However, the present invention is not limited thereto. For example, the extraction video P**1** may be displayed in a region positioned on the uppermost side or a region at the center on the screen of the display device **40**.

(50) In addition, during imaging, a range of the extraction video P**1** within the angle of view A**0**, that is, an extraction range A**1**, can be moved over time within the angle of view A**0**. Here, "moving over time" means moving the extraction range A**1** relative to the angle of view A**0** such that a position of the extraction range A**1** gradually changes, and may include a case where movement is stopped (paused) in the middle of imaging.

(51) Movement of the extraction range A**1** over time is implemented by the video processing portion **32**. Specifically, in a case where the user selects one mode through the extraction mode selection screen illustrated in FIG. **6**, the video processing portion **32** moves the extraction range A**1** within the angle of view A**0** along a movement path corresponding to the selected mode.

(52) More specifically, in the first embodiment, two types of extraction modes are prepared. One mode is a mode (hereinafter, referred to as a tracking mode) in which the extraction range A**1** is moved to track a subject of a tracking target. The other mode is a mode (hereinafter, referred to as a panning mode) in which the extraction range A**1** is moved in a certain direction.

(53) In a case where the tracking mode is selected, the video processing portion **32** moves the extraction range A**1** to track the subject of the tracking target. In this procedure, in a case where the tracking mode is selected, the user designates the video of the subject within the extraction video P**1** by, for example, touching on the screen. The video processing portion **32** sets the subject designated by the user as the tracking target. Then, the video processing portion **32** moves the extraction range A**1** such that the subject of the tracking target falls within the extraction range A**1** as illustrated in FIG. **7**.

(54) As described above, in a case where the tracking mode is selected, the extraction video P**1** in which the subject of the tracking target is captured can be displayed on the display device **40** at all times as long as the subject of the tracking target is present within the angle of view A**0**. In addition, the user does not need to move the imaging apparatus **10** in order to track the subject. Thus, the angle of view is not manually changed, and distortion (blurred video or the like) of the video occurring due to manual changing of the angle of view can be avoided. This effect is particularly effective in a case of performing imaging within the angle of view using the anamorphic lens.

(55) An algorithm for searching for the subject of the tracking target within the angle of view A**0** is not particularly limited. For example, an image of the subject set as the tracking target may be stored in the buffer **250** as a template image, and the template image is compared with the reference

video P**0** by applying a well-known template matching technology. As a result of comparison, a video of a part matching with the template image may be specified as the video of the subject of the tracking target.

(56) In a case where the panning mode is selected, the video processing portion **32** causes the extraction range A**1** to slide, that is, pan, in a certain direction (for example, the lateral direction of the angle of view A**0**). In this procedure, in a case where the panning mode is selected, the user sets a starting position, a movement direction, a movement speed, and the like of the extraction range A**1** on a setting screen not illustrated. Then, as illustrated in FIG. **8**, the video processing portion **32** causes the extraction range A**1** to automatically pan in the set direction from the set starting position at the set speed.

(57) As described above, in a case where the panning mode is selected, a video of which an imaging angle is continuously changed in a certain direction, that is, a panoramic video, can be displayed on the display device **40**. In addition, the user does not need to move the imaging apparatus **10** in order to change the angle. Thus, the angle of view is not manually changed, and distortion (blurred video or the like) of the video occurring due to manual changing of the angle of view can be avoided. This effect is particularly effective in a case of performing imaging within the angle of view using the anamorphic lens.

(58) Setting items such as a size, an aspect ratio, an area ratio, and a movement speed during movement related to the extraction range A**1** employ initially set contents. Alternatively, the user can set the setting items to any contents on the setting screen not illustrated. The aspect ratio of the extraction range A**1** is an aspect ratio of the extraction video P**1** and is, in a strict sense, a ratio of the number of pixels in each of the width and the height. The area ratio of the extraction range A**1** is a ratio of an area of the extraction range A**1** to the angle of view A**0**. In a case where the angle of view A**0** is divided in units of pixels, the movement speed of the extraction range A**1** is the number of pixels through which the moving extraction range A**1** passes within a unit time period.

(59) In addition, in the first embodiment, an instruction issued by the user can be received through the operating part **50** during movement of the extraction range A**1**, and the size, the movement speed, the movement direction, the position during movement, and the like of the extraction range A**1** can be changed based on the instruction. For example, the size may be changeable by operating the front operation dial **330**, and the movement speed may be changeable by operating the rear operation dial **340**. In addition, the movement direction may be changeable by operating the cross button **350**, and the position during movement may be changeable using the touch panel of the display device **40**. In this case, the user can change various setting contents related to the extraction range A**1** intuitively in real time in accordance with a situation during movement of the extraction range A**1**.

(60) Devices operated in a case of changing the setting contents of the extraction range A**1** are not limited to the above correspondence relationship. For example, the size of the extraction range A**1** may be changed based on an operation of the touch wheel **360**.

Support Video

(61) The support video P**2** is a video based on a positional relationship between the angle of view A**0** and the extraction range A**1** during imaging and is displayed in order for the user to perceive the position of the extraction range A**1** within the angle of view A**0** during imaging. The support video P**2** is displayed on the display device **40** by the video processing portion **32**. Specifically, the video processing portion **32** recognizes the position, the size, and the like of the extraction range A**1** during imaging, generates the support video P**2** based on these information, and displays the support video P**2** on the display device **40**.

(62) In addition, the support video P**2** is a video including the extraction video P**1** as illustrated in FIG. **9**. In the first embodiment, the support video P**2** is configured with the entire reference video P**0** (in a strict sense, the reference video P**0** of which a display size is reduced while an aspect ratio is maintained).

(63) In addition, the support video P**2** is a video in which a position of the extraction video P**1** in the support video P**2** is specified. Specifically, the support video P**2** is a video in which the extraction video P**1** is surrounded by a frame as illustrated in FIG. **9**.

(64) An aspect of specifying the position of the extraction video P**1** in the support video P2 may be an aspect other than an aspect of surrounding using the frame. For example, an aspect of changing only a display color of the extraction video P**1** to a highlighted color in the support video P2, or an aspect of displaying an instruction mark such as a cursor near the extraction video P**1** in the support video P**2** may be used. In addition, the extraction video P**1** may be highlighted by setting a display color of a region other than the extraction video P**1** in the support video P**2** to be semi-transparent or to a gray color or the like.

(65) In addition, in a case where the extraction range A**1** moves during imaging, the position of the extraction video P**1** in the support video P**2** also changes in connection with the movement. In addition, in a case where the size, the aspect ratio, and the position of the extraction range A**1** change during movement, the size, the aspect ratio, and the position of the extraction video P**1** in the support video P**2** also change in accordance with the setting contents after change.

(66) The support video P**2** described so far is generated by the video processing portion **32** as needed during imaging based on the positional relationship between the angle of view A**0** and the extraction range A**1** and is displayed in the second region on the screen of the display device **40** by the video processing portion **32**. At this point, the support video P**2** is displayed in a state where a display size can be changed to fall within the second region while the aspect ratio is constantly maintained.

(67) Here, in a case where a general lens is used, the support video P**2** has the same aspect ratio as the reference video P**0** (that is, the angle of view A**0**). Meanwhile, in a case where imaging is performed using the anamorphic lens, the reference video P**0** is changed to a laterally long video having an aspect ratio of 2.35:1 by extending the reference video P**0** in the lateral direction of the angle of view A**0**, and the reference video P**0** is displayed on the display device **40** as the support video P**2**. An aspect ratio of a display screen of the display device **40** is generally different from an aspect ratio of the support video P**2** (for example, 4:3 or 16:9). Thus, in a case where the support video P**2** is displayed on the display device **40**, spaces (blanks) generally occur in locations adjacent to the support video P**2** in an up-down direction of the display screen. The extraction video P**1** and the support video P**2** can be displayed in balance on the display device **40** at the same time using the spaces.

(68) In the first embodiment, as illustrated in FIG. **4**, the support video P**2** is displayed at a position immediately above the extraction video PI. However, the present invention is not limited thereto, and the support video P**2** may be displayed below the extraction video P**1**.

(69) (Information Such as Setting Contents)

(70) The information IF such as the setting contents is information related to at least one of the reference video P**0** or the extraction video P**1**. In the first embodiment, the information IF such as the setting contents is text information related to each of the reference video P**0** and the extraction video P**1**.

(71) The information IF such as the setting contents is displayed on the display device **40** in cooperation between the controller **30** and the video processing portion **32**. Specifically, the controller **30** reads out the setting contents, the imaging conditions, and the like from the buffer **250**, and the video processing portion **32** displays the information IF such as the setting contents on the display device **40** based on the information read out by the controller **30**.

(72) As illustrated in FIG. **10**, the information IF such as the setting contents includes the setting contents (in FIG. **10**, contents belonging to a category referred to as "at time of setting") for each of the reference video P**0** and the extraction video P**1**, and information (in FIG. **10**, information belonging to a category referred to as "at time of imaging") during imaging.

(73) Information displayed as the information IF such as the setting contents is not particularly

limited. Examples of the information include the aspect ratio and the number of pixels of the extraction video P**1**, the position and the area ratio of the extraction range A**1**, a movement distance of the moving extraction range A**1**, a distance from an end of the extraction range A**1** to an end of the angle of view A**0**, an estimated time period to when the moving extraction range A1 reaches the end of the angle of view A**0**, a setting operation method for the extraction range A**1**, an imaging time period, various imaging conditions (for example, an exposure condition, an f number of a lens, ISO sensitivity, and white balance), the number of pixels (4K, full high definition (HD), or the like) of the extraction region, and a frame rate at a time of motion picture capturing.

(74) The position of the extraction range A**1** is a representative position (for example, a center position or positions of four vertices) of the extraction range A**1** and is represented as coordinates in a case where a reference position (for example, a position of an upper left vertex of the angle of view A**0**) set in the angle of view A**0** is an origin. For the movement distance of the moving extraction range A**1**, a total movement distance of the extraction range A**1** from a point in time of a start of movement is obtained in units of pixels, and the total movement distance is represented as a relative value (ratio) based on a length of the angle of view A**0** in the movement direction. The estimated time period to when the moving extraction range A**1** reaches the end of the angle of view A**0** is a required time period for movement of the extraction range A**1** to the end of the angle of view A**0** and is obtained from the distance from the end of the extraction range A**1** to the end of the angle of view A**0**, and the movement speed of the extraction range A**1**. The setting operation method for the extraction range A**1** is information indicating which device is to be operated in the operating part **50** in a case of setting a "certain content" related to the extraction range A**1**.

(75) In addition, in a case where the extraction range A**1** moves during imaging, the displayed information IF (specifically, the position of the extraction range A**1**) such as the setting contents changes in connection with the movement. In addition, in a case where the size, the aspect ratio, or the like of the extraction range A**1** is changed during movement, the information IF such as the setting contents is updated in accordance with the setting contents after change.

(76) The information IF such as the setting contents is displayed on the display device **40** together with the extraction video P**1** and the support video P**2** by the video processing portion **32** during imaging. In the first embodiment, as illustrated in FIG. **4**, the information IF such as the setting contents is displayed at a position (for example, a right adjacent position) adjacent to each of the extraction video P**1** and the support video P**2** in the lateral direction. However, the present invention is not limited thereto. For example, the information IF such as the setting contents may be displayed at a position above or a position below the extraction video P**1** or a position above or a position below the support video P**2**. In addition, a plurality of regions in which the information IF such as the setting contents is displayed may be provided on the screen of the display device **40**. Information related to the reference video P**0** may be displayed in one of the regions, and information related to the extraction video P**1** may be displayed in another region.

Display Method

(77) Next, the display method using the imaging apparatus **10** will be described with reference to FIGS. **11** and **12**. FIGS. **11** and **12** illustrate a flow of display flow by the imaging apparatus **10**. In the display flow illustrated in FIGS. **11** and **12**, a display method according to the embodiments of the present invention is employed. In other words, each step illustrated in FIGS. **11** and **12** corresponds to constituents of the display method according to the embodiments of the present invention. Furthermore, in the display flow, the display method according to the embodiments of the present invention is employed, and a recording step described later is executed. That is, in the display flow, a video recording method according to the embodiments of the present invention is employed.

(78) At a start of the display flow, the user starts the imaging apparatus **10**. After the start of the apparatus, the controller **30** executes a setting step (S**001**). In the setting step, the extraction range A**1** is set within the angle of view A**0** based on preset initial values or contents of an instruction

issued by the user.

(79) Then, the controller **30** starts executing an imaging step by controlling the imaging portion **20** (S**002**). The imaging step corresponds to an acquisition step of acquiring the reference video P**0** that is a motion picture. In the first embodiment, the imaging step is a step of capturing the reference video P**0** within the angle of view A**0** in a case of using the anamorphic lens.

(80) In a case where the imaging step is executed, the video processing portion **32** executes an extraction step under control of the controller **30** (S**003**). In the extraction step, the video processing portion **32** extracts a video of the extraction range A**1** set in the setting step, that is, the extraction video P**1**, from the reference video P**0**.

(81) The video processing portion **32** executes a first display step of displaying the extraction video P**1** on the display device **40** and a second display step of displaying the support video P**2** on the display device **40** in accordance with extraction of the extraction video P**1** (S**004**). Here, the second display step is executed during execution of the first display step. Accordingly, the extraction video P**1** and the support video P**2** are displayed on the display device **40** at the same time during imaging.

(82) In a case of capturing the reference video P**0** using the anamorphic lens in the imaging step, in the first display step, the extraction video P**1** is displayed by extending the size in the lateral direction of the angle of view A**0** in a case of using the anamorphic lens. In addition, in the first embodiment, in the first display step, the extraction video P**1** is displayed in a state where the display size of the extraction video P**1** can be changed while the aspect ratio of the extraction video P**1** is constantly maintained.

(83) In addition, in the second display step, the support video P**2** in which the position of the extraction video P**1** in the support video P**2** is specified, specifically, the support video P**2** in which the part of the extraction video P**1** is surrounded by a frame as illustrated in FIG. **9**, is displayed. In a case where the display size of the extraction video P**1** is changed, in the second display step, the support video P**2** is displayed in a state where a display size of the support video P**2** is changed in accordance with the change in display size of the extraction video P**1**. At this point, it is preferable that the support video P**2** is displayed in a state where the display size is changed while the aspect ratio of the support video P**2** is constantly set.

(84) Furthermore, in the first embodiment, a third display step of displaying the information IF such as the setting contents on the display device **40** is further executed during execution of both of the first display step and the second display step. Accordingly, the extraction video P**1**, the support video P**2**, and the information IF such as the setting contents are displayed on the display device **40** at the same time during imaging.

(85) In a case where the user pushes the release button **310** after extraction of the extraction video P**1** is started, execution of the recording step is started based on the push as a trigger (S**005**). In the recording step, the extraction video P**1** is recorded in the internal memory **230** or the memory card **240** as the recording medium by the video processing portion **32**. In the first embodiment, a recorded video is limited to only the extraction video P**1**. Other videos, that is, the reference video P**0** and the support video P**2**, are not recorded and are discarded. Accordingly, a used amount of a recording capacity can be further decreased. However, the present invention is not limited thereto. One or both of the reference video P**0** and the support video P**2** may be recorded together with the extraction video P**1**.

(86) In addition, in a case where the user issues an instruction to move the extraction range A**1** within the angle of view A**0** during execution of the imaging step (S**006**), a movement step is executed by the video processing portion **32** (S**007**). In the movement step, the extraction range A**1** moves within the angle of view A**0** along the movement path corresponding to the mode selected by the user from the tracking mode and the panning mode. More specifically, in a case where the tracking mode is selected, the extraction range A**1** is moved within the angle of view A**0** such that the subject of the tracking target set by the user enters within the extraction range A**1**. Meanwhile,

in the movement step in a case where the panning mode is selected, the extraction range A**1** slides (pans) based on the starting position, the movement direction, and the movement speed set by the user.

(87) In a case where the movement step is executed, the video processing portion **32** executes the first display step, the second display step, and the third display step in accordance with movement of the extraction range A**1** (S**008**). Specifically, in the first display step, the extraction video P**1** during movement of the extraction range A**1** is displayed. In the second display step, the support video P**2** is displayed such that the position of the extraction video P**1** in the support video P**2** changes. In the third display step, the information IF such as the setting contents is updated and displayed in accordance with movement of the extraction range A**1**. In step S**008**, in the same manner as in step S**005**, the second display step is executed during execution of the first display step, and the third display step is executed during execution of both of the first display step and the second display step.

(88) In addition, in a case where the movement step is executed, the video processing portion **32** executes the recording step such that the extraction video P**1** during movement of the extraction range A**1** in the movement step is recorded (S**009**).

(89) Meanwhile, in a case where the instruction of the user for movement of the extraction range A**1** is not issued, execution of the first to third display steps and the recording step is repeated until an instruction to finish imaging is issued by the user (S**010**), and the display flow is finished at a point in time when the instruction to finish imaging is issued. At this point in time, imaging ends, and recording of the extraction video P**1** is finished. An operation for issuing the instruction to finish imaging by the user is not particularly limited. For example, an operation of pushing the release button **310** again may be the instruction to finish imaging.

(90) Returning to a processing flow in a case where the movement step is executed, in a case where the user issues an instruction to change at least one of the position, the size, the movement speed or the movement direction (hereinafter, referred to as the "position or the like of the extraction range A**1**") of the extraction range A**1** during execution of the movement step (S**011**), the controller **30** executes the setting step again (S**012**). In the setting step executed again, the position or the like of the extraction range A**1** is set again based on the instruction of the user received during execution of the movement step.

(91) Then, a return is made to step S**007**, and each of the movement step, the first to third display steps, and the recording step is repeatedly executed. In the movement step after the position or the like of the extraction range A**1** is set again, at least one of the position or the like of the extraction range A**1** is changed based on the instruction of the user received during execution of the movement step, and then, the extraction range A**1** is moved.

(92) In addition, in the first to third display steps (that is, step S**008**) after the movement step, the extraction video P**1**, the support video P**2**, and the information IF such as the setting contents based on the extraction range A**1** of which the position or the like is changed are displayed on the display device **40**. Specifically, in the first display step, the extraction video P**1** after the position or the like of the extraction range A**1** is changed is displayed. In the second display step, the support video P**2** in which the position of the extraction video P**1** in the support video P**2** is a position after change is displayed. In the third display step, the information IF such as the setting contents is updated and displayed in accordance with the change in position or the like of the extraction range A**1**.

(93) In addition, in a case where the movement step is executed, the video processing portion **32** appropriately executes a determination step (S**013**). The determination step is executed during execution of the movement step. In the determination step, a determination as to whether or not the distance between the end of the angle of view A**0** and the end of the extraction range A**1** (in a strict sense, an end on a side approaching the end of the angle of view A**0**) is less than a threshold value is performed.

(94) In a case where a determination that the distance is less than the threshold value is made in the

determination step (S**014**), the video processing portion **32** executes an alert step (S**015**) and issues an alert to the user. Accordingly, the user can be prompted to perform an operation for changing the angle of view, the operation for issuing the instruction to finish imaging, or the like by notifying the user that the extraction range A**1** approaches near the end of the angle of view. An alert method in the alert step is not particularly limited. For example, examples of the alert method include displaying an alert message on the display device **40** or changing an outer edge frame of the extraction video P**1** to a predetermined color (specifically, red or the like).

(95) In a case where the movement step is executed, the series of steps S**007** to S**015** is repeated until the instruction to finish imaging is issued by the user (S**016**), and the display flow is finished at a point in time when the instruction to finish imaging is issued. At this point in time, imaging ends, and recording of the extraction video P**1** is finished.

(96) As described above, in the video display method according to the first embodiment, the extraction video P**1** smaller than the angle of view A**0** can be extracted from the reference video P**0**, and the extraction range A**1** can be moved within the angle of view A**0**. Furthermore, during movement of the extraction range A**1**, by displaying the extraction video P**1** on the display device **40**, the user can check the extraction video P**1**. At this point, it is preferable that the position of the extraction range A**1** within the angle of view A**0** can be perceived. Therefore, in the first embodiment, the support video P**2** as an interface representing the position of the extraction range A**1** within the angle of view A**0** is displayed on the display device **40** together with the extraction video P**1**. Accordingly, even in a case where the extraction range A**1** moves within the angle of view A**0**, the user can perceive the position of the extraction range A**1** at each point in time during movement. t. Such an effect is particularly effective in a case where the tracking mode is selected, and the extraction range A**1** randomly moves to track a predetermined subject in accordance with a motion of the subject.

(97) In addition, in the first embodiment, in a case where the instruction to change issued by the user is received during execution of the movement step, at least one of the position, the size, the movement speed or the movement direction of the extraction range A**1** is changed based on the instruction. In this case, the effect that the user can perceive the position of the extraction range A**1** is more remarkably exhibited.

(98) In addition, in the first embodiment, the support video P**2** includes the extraction video P**1**, and the support video P**2** is displayed in a state where the position of the extraction video P**1** in the support video P**2** is specified (for example, a state where the extraction video P**1** is surrounded by a frame). Accordingly, the user can more easily perceive the position of the extraction range A**1**.

(99) In addition, in the first embodiment, information related to at least one of the reference video P**0** or the extraction video P**1**, that is, the information IF such as the setting contents, is displayed on the display device **40** at the same time as the extraction video P**1** and the support video P**2**. Accordingly, the user can check various information indicated by the information IF such as the setting contents and can be notified of more detailed information about the position of the extraction range A**1** specified from the support video P**2**.

Second Embodiment

(100) In the first embodiment, the support video P**2** is configured with the entire reference video P**0**. In the second display step, the support video P**2** is displayed on the display device **40** in a state where the display size of the support video P**2** can be changed. Alternatively, a form of displaying a support video different from the support video P**2** according to the first embodiment, for example, support videos P**21** and P**22** illustrated in FIGS. **13** and **14**, may be considered. Hereinafter, this form will be described as a second embodiment with reference to FIGS. **13** to **15**. Here, FIGS. **13** and **14** illustrate screen examples of the display device **40** in the second embodiment and correspond to FIG. **4**.

(101) Hereinafter, items different from the first embodiment in the second embodiment will be mainly described. In addition, the same elements as the first embodiment among elements

illustrated in FIGS. **13** and **14** will be designated by the same reference numerals as in the first embodiment.

(102) In the second embodiment, the user selects any one of two types of display schemes, and the support video is displayed on the display device **40** using the selected display scheme. That is, the second display step in the second embodiment is executed in accordance with the display scheme selected by the user from a first display scheme and a second display scheme. For the display scheme, a selection screen illustrated in FIG. **15** may be displayed on the display device **40**, and the user may select the display scheme by, for example, touching one display scheme on the screen.

(103) In a case where the first display scheme is selected, in the second display step, the support video P**21** configured with the entire reference video P**0** is displayed on the display device **40**. An aspect ratio and a display size of the support video P**21** can be changed.

(104) In other words, in the second display step in a case where the first display scheme is selected, the support video P**21** can be displayed in a state where the aspect ratio and the display size of the support video P**21** can be changed. For example, as illustrated in FIG. **13**, the support video P**21** of which the display size is reduced by squeezing the support video P**21** in a vertical direction can be displayed. Accordingly, in a case where the first display scheme is selected, a degree of freedom in display of the support video P**21** is increased, compared to the first embodiment. That is, in the second display step in a case where the first display scheme is employed, the support video P**21** can be displayed in a state where the aspect ratio and the display size of the support video P**21** are changed in accordance with the change in display size of the extraction video P**1**. For example, in a case where a region in which the extraction video P**1** is displayed on the display screen of the display device **40** is increased, the aspect ratio and the display size of the support video P**21** can be freely changed in accordance with an extra space in order to display the support video P**21** in the space.

(105) In the second display step in a case where the second display scheme is selected, the support video P**22** configured with a video of a part of the reference video P**0** is displayed on the display device **40**. The support video P**22** is displayed in a state where the display size can be changed while the aspect ratio is constantly maintained. That is, in the second display step in a case where the second display scheme is selected, the support video P**22** can be displayed in a state where the display size is changed while the aspect ratio is constantly maintained, in accordance with the change in display size of the extraction video P**1**.

(106) Furthermore, in a case where the second display scheme is selected, the user can freely designate a range of the support video P**22** (specifically, a range displayed as the support video P**22**) in the reference video P**0** and freely change the designated range by, for example, operating the operating part **50**. That is, in the second display step in a case where the second display scheme is selected, it is possible to display the support video P**22** while moving the range of the support video P**22** in the reference video P**0**.

(107) Examples of a method of designating the range of the support video P**22** in the reference video P**0** include various methods such as a button operation or a touch panel operation. In the second embodiment, a method using an auxiliary video Ps described later is used.

(108) As described above, in a case where the second display scheme is selected, as illustrated in FIG. **14**, a video of the range designated by the user in the reference video P**0** can be set as the support video P**22**, and it is possible to change the display size of the support video P**22** while maintaining the aspect ratio of the support video P**22**. For example, in the reference video P**0**, only a necessary range necessary to be displayed as the support video P**22** is designated, and then, the display size of the support video P**22** is appropriately adjusted. By doing so, a display space of the support video P**22** on the display device **40** can be further decreased.

(109) In addition, in a case where the second display scheme is selected, as illustrated in FIG. **14**, a range instruction video P**3** that is a video indicating the range of the support video P**22** in the reference video P**0** is displayed on the display device **40** together with the extraction video P**1** and

the support video P**22**. The range instruction video P**3** is configured with the reference video P**0** that is reduced, and the auxiliary video Ps displayed in a superimposed manner on the reference video P**0**. The auxiliary video Ps indicates a part of the reference video P**0** corresponding to the support video P**22**. The range of the support video P**22** in the reference video P**0** can be perceived by visually recognizing the auxiliary video Ps.

(110) In addition, the user can move the auxiliary video Ps by, for example, performing a touch-and-drag operation on the screen. By moving the auxiliary video Ps, the range of the support video P**22** in the reference video P**0** can be changed.

(111) In a case where the second display scheme is selected, a step (hereinafter, referred to as a fourth display step) of displaying the range instruction video P**3** is executed in addition to the first to third display steps during execution of all of the first to third display steps. That is, in the second display scheme, all of the extraction video P**1**, the support video P**22**, the information IF such as the setting contents, and the range instruction video P**3** are displayed on the display device **40** at the same time.

(112) As described above, in a case where the second display scheme is selected, the user can freely decide the range of the support video P**22** by operating the auxiliary video Ps. In addition, by checking the support video P**22** and the range instruction video P**3**, the position of the extraction range A**1** within the angle of view A**0** can be perceived.

(113) In a case where the second display scheme is selected, displaying the range instruction video P**3** (that is, executing the fourth display step) may not be necessary. The range instruction video P**3** may not be displayed, and only the support video P**22** may be displayed.

Third Embodiment

(114) In the first embodiment, all of the extraction video P**1**, the support video P**2**, and the information IF such as the setting contents are displayed on the same display device **40** of the imaging apparatus **10**. Alternatively, a form of displaying the extraction video P**1** and the support video P**2** on display devices different from each other may be considered. Hereinafter, this form will be described as a third embodiment with reference to FIGS. **16** to **18**.

(115) Hereinafter, items different from the first embodiment in the third embodiment will be mainly described. In addition, the same elements as the first embodiment among elements illustrated in FIG. **16** will be designated by the same reference numerals as in the first embodiment.

(116) The third embodiment relates to a display method using an imaging system S illustrated in FIG. **16**. That is, the display method according to the third embodiment of the present invention is implemented by the imaging system S. The imaging system S is configured with an imaging apparatus **10**X and an external monitor. As illustrated in FIG. **16**, a basic configuration of an imaging apparatus main body **12**X according to the third embodiment is approximately the same as the basic configuration of the imaging apparatus main body **12** according to the first embodiment.

(117) Meanwhile, the imaging apparatus main body **12**X according to the third embodiment comprises a first display device **410** configured with a touch panel display or the like and is connected to a second display device **420** that is the external monitor. The second display device **420** is configured with a display device such as a liquid crystal monitor, a recorder including a monitor, an information processing terminal including a monitor, such as a laptop personal computer, a smartphone, or a tablet terminal, or the like. The imaging apparatus **10**X and the second display device **420** according to the third embodiment are connected in a wired manner or a wireless manner.

(118) In the third embodiment, a display device **400** that displays a video includes the first display device **410** and the second display device **420** that are devices separated from each other. In addition, in the third embodiment, the video processing portion **32** of the imaging apparatus transmits video signals to each display device. Accordingly, as illustrated in FIG. **17**, the first display device **410** displays the extraction video P**1**, and the second display device **420** displays the support video P**2**.

(119) In the third embodiment, a step (that is, the second display step) of displaying the support video P**2** on the second display device **420** is executed during execution of a step (that is, the first display step) of displaying the extraction video P**1** on the first display device **410**. Consequently, even in the third embodiment, the user can more easily perceive the position of the extraction range A**1** within the angle of view A**0**. A video corresponding to the display scheme selected by the user from the two types of support videos P**21** and P**22** described in the second embodiment may be displayed on the second display device **420**.

(120) In addition, as illustrated in FIG. **17**, the information IF such as the setting contents is displayed on the second display device **420** together with the support video P**2**. Accordingly, in the third embodiment, a step (that is, the third display step) of displaying the information IF such as the setting contents on the second display device **420** is comprised, and the third display step is executed during execution of both of the first display step and the second display step. A part of the information IF such as the setting contents, for example, the imaging conditions (for example, the exposure condition, the f number of the lens, the ISO sensitivity, and the white balance), may be displayed on the first display device **410** as illustrated in FIG. **17**.

(121) In addition, as illustrated in FIG. **16**, an orientation detector **60** is mounted in the imaging apparatus main body **12**X according to the third embodiment. The orientation detector **60** is configured with, for example, an acceleration sensor. In a case where an orientation of the imaging apparatus **10**X changes, for example, in a case where a width and a height of the imaging apparatus **10**X are inverted, the orientation detector **60** detects the motion.

(122) In the third embodiment, in a case where the user inverts the width and the height of the imaging apparatus **10**X during execution of the first display step, that is, during display of the extraction video P**1** on the first display device **410**, a width and a height of the first display device **410** are inverted, and a display orientation of the extraction video P**1** rotates by 90 degrees as illustrated in FIG. **18**. In a case where the orientation detector **60** detects this motion, the controller **30** controls the video processing portion **32** in accordance with the detection result. The video processing portion **32** generates the support video P**2** of which a width and a height are inverted from a state before the orientation detector **60** detects inversion of the width and the height of the imaging apparatus **10**X. The video processing portion **32** transmits the video signals of the support video P**2** to the second display device **420**. Accordingly, in the second display step, the support video P**2** of which the width and the height are inverted as illustrated in FIG. **18** is displayed on the second display device **420**. Accordingly, by changing a display orientation of the support video P**2** in connection with the change in display orientation of the extraction video P**1**, the user easily perceives a correspondence relationship between the extraction video P**1** and the support video P**2** even in a case where the width and the height of the first display device **410** are inverted.

(123) Meanwhile, the information IF such as the setting contents is displayed on the second display device **420**. However, as illustrated in FIG. **18**, a display orientation of the information IF such as the setting contents does not change even after the orientation detector **60** detects inversion of the width and the height of the imaging apparatus **10**X. That is, in the third display step, the information IF such as the setting contents is displayed on the second display device **420** in a state where the display orientation is maintained before and after inversion of the width and the height of the first display device **410**. Accordingly, even in a case where the display orientation of the extraction video P**1** is inverted between the width and the height, the information IF such as the setting contents that are text information is displayed in a normal orientation. Thus, the user easily checks the information IF such as the setting contents.

Fourth Embodiment

(124) In the first to third embodiments, the video is a motion picture. Here, the motion picture means a collection of a plurality of images (frame images) consecutively captured at a constant frame rate. In the first to third embodiments, the extraction video recorded on the recording medium is a motion picture. Alternatively, the extraction video recorded on the recording medium

may be a still picture.

(125) For example, the control portion including the controller **30** and the video processing portion **32** sets a still picture acquired in the acquisition step (specifically, the imaging step) as the reference video P**0**. As illustrated in FIGS. **4** and **5**, the control portion displays the still picture that is the reference video P**0** on the display device **40** as the support video P**2**. In addition, the control portion sets the extraction range A**1** corresponding to the subject in the reference video P**0** and displays the extraction video P**1** captured within the extraction range A**1** on the display device **40**. In a case where the user executes the recording step by issuing an instruction to perform recording processing, the control portion may execute recording of the still picture instead of capturing the motion picture and record the extraction video P**1** that is the still picture on the recording medium such as the memory card **240**.

Other Embodiments

(126) While specific embodiments (first to fourth embodiments) of the display method according to the embodiments of the present invention are illustratively described so far, the embodiments are merely an example, and other embodiments are considered.

(127) For example, in the embodiments, the third display step of displaying the information IF such as the setting contents is executed during display of the extraction video P**1** and the support video P**2** (in other words, during execution of both of the first display step and the second display step). However, the present invention is not limited thereto. The information IF such as the setting contents may not be displayed by not executing the third display step.

(128) In addition, in the embodiments, as the acquisition step of the video, the imaging step of capturing the reference video using the imaging apparatus is executed, and the extraction video smaller than the angle of view of the imaging apparatus is extracted from the captured reference video. However, the present invention is not limited thereto. For example, the acquisition step of the video may be a step of acquiring a video for motion picture editing from an outside as the reference video. Specifically, the reference video may be acquired by downloading a motion picture file of the reference video from an external data distribution apparatus (server). Alternatively, the reference video may be acquired by reading out a video of an editing target from a recording medium on which the motion picture file is recorded.

(129) In addition, in the embodiments, while a digital camera is illustrated as an example of the imaging apparatus, the present invention is not limited thereto. For example, a portable terminal such as a mobile phone including an imaging optical system, a smartphone, and a tablet PC may be used. In addition, the anamorphic lens may be a lens unit externally attached to the imaging optical system of the portable terminal.

Explanation of References

(130) **10**, **10**X: imaging apparatus **12**, **12**X: imaging apparatus main body **14**: housing **20**: imaging portion **30**: controller **32**: video processing portion **40**: display device **50**: operating part **60**: orientation detector **110**: lens unit **112**: zoom lens **114**: focus lens **120**: lens drive portion **130**: stop portion **140**: shutter **150**: imaging sensor **160**: A/D converter **230**: internal memory **240**: memory card **250**: buffer **260**: card slot **310**: release button **320**: zoom lever **330**: front operation dial **340**: rear operation dial **350**: cross button **360**: touch wheel **400**: display device **410**: first display device **420**: second display device A**0**: angle of view A**1**: extraction range IF: information such as setting contents P**0**: reference video P**1**: extraction video P**2**, P**21**, P**22**: support video P**3**: range instruction video Ps: auxiliary video S: imaging system

Claims

1. A display method comprising: an acquisition step of acquiring a reference video; an extraction step of extracting an extraction video of an extraction range set to be smaller than an angle of view of the reference video within the angle of view from the reference video; a first display step of

displaying the extraction video on a display device; and a second display step of displaying a support video based on a positional relationship between the angle of view and the extraction range on the display device, wherein the second display step is executed during execution of the first display step, the display device includes a first display device and a second display device, the first display device displays the extraction video on the first display device, the second display device displays the support video on the second display device, the display method further comprises a third display step of displaying text information related to at least one of the reference video or the extraction video on the second display device, the third display step is executed during execution of both of the first display step and the second display step, and in a case where the extraction video displayed in the first display step is rotated to left or right about a Z axis, the support video is rotated to left or right about the Z axis and displayed on the second display device in the second display step, and the text information is displayed on the second display device in the third display step while a display orientation of the text information is maintained.

2. The display method according to claim 1, further comprising: a movement step of moving the extraction range of the extraction video over time.

3. The display method according to claim 1, wherein the support video includes the extraction video, and in the second display step, the support video in which a position of the extraction video in the support video is specified is displayed.

4. The display method according to claim 1, further comprising: a third display step of displaying information related to at least one of the reference video or the extraction video on the display device, wherein the third display step is executed during execution of both of the first display step and the second display step.

5. The display method according to claim 1, wherein in the first display step, the extraction video is displayed in a state where a display size of the extraction video is changeable, and in the second display step, the support video is displayed in a state where an aspect ratio of the support video and a display size of the support video are changeable.

6. The display method according to claim 5, wherein in the first display step, the extraction video is displayed in a state where the display size of the extraction video is changeable while an aspect ratio of the extraction video is constantly maintained, and in the second display step, the support video is displayed in a state where the display size of the support video is changed in accordance with a change in display size of the extraction video.

7. The display method according to claim 5, wherein in the second display step, the support video indicating a video of a part of the reference video is displayed in a state where the display size of the support video is changed while the aspect ratio of the support video is constantly maintained, in accordance with a change in display size of the extraction video.

8. The display method according to claim 1, wherein the second display step is executed in accordance with a display scheme selected by a user from a first display scheme and a second display scheme, in a case where the first display scheme is selected, in the second display step, the support video is displayed in a state where an aspect ratio of the support video and a display size of the support video are changeable, and in a case where the second display scheme is selected, in the second display step, the support video indicating a video of a part of the reference video is displayed in a state where the display size of the support video is changeable while the aspect ratio of the support video is constantly maintained.

9. The display method according to claim 2, wherein the acquisition step is an imaging step of capturing the reference video within the angle of view.

10. The display method according to claim 9, wherein in the imaging step, the reference video is captured within the angle of view using an anamorphic lens, and in the first display step, the extraction video is displayed by extending a size in a lateral direction of the angle of view using the anamorphic lens.

11. The display method according to claim 9, wherein the movement step is executed during

execution of the imaging step, and in the movement step, at least one of a position, a size, a movement speed, or a movement direction of the extraction range is changed based on an instruction of a user received during execution of the movement step.

12. The display method according to claim 2, wherein in the movement step, the extraction range is moved within the angle of view such that a subject of a tracking target set by a user enters within the extraction range.

13. The display method according to claim 2, further comprising: a determination step of determining whether or not a distance between an end of the angle of view and an end of the extraction range is less than a threshold value during execution of the movement step; and an alert step of issuing an alert to a user in a case where the distance is less than the threshold value.

14. A video recording method employing the display method according to claim 1, the video recording method comprising: a recording step of recording the extraction video on a recording medium.

15. The display method according to claim 2, further comprising: a third display step of displaying information related to at least one of the reference video or the extraction video on the display device, wherein the third display step is executed during execution of both of the first display step and the second display step.

16. The display method according to claim 2, wherein in the first display step, the extraction video is displayed in a state where a display size of the extraction video is changeable, and in the second display step, the support video is displayed in a state where an aspect ratio of the support video and a display size of the support video are changeable.

17. The display method according to claim 16, wherein in the first display step, the extraction video is displayed in a state where the display size of the extraction video is changeable while an aspect ratio of the extraction video is constantly maintained, and in the second display step, the support video is displayed in a state where the display size of the support video is changed in accordance with a change in display size of the extraction video.

18. The display method according to claim 16, wherein in the second display step, the support video indicating a video of a part of the reference video is displayed in a state where the display size of the support video is changed while the aspect ratio of the support video is constantly maintained, in accordance with a change in display size of the extraction video.

19. The display method according to claim 2, wherein the second display step is executed in accordance with a display scheme selected by a user from a first display scheme and a second display scheme, in a case where the first display scheme is selected, in the second display step, the support video is displayed in a state where an aspect ratio of the support video and a display size of the support video are changeable, and in a case where the second display scheme is selected, in the second display step, the support video indicating a video of a part of the reference video is displayed in a state where the display size of the support video is changeable while the aspect ratio of the support video is constantly maintained.

20. The display method according to claim 2, wherein the acquisition step is an imaging step of capturing the reference video within the angle of view.

21. The display method according to claim 20, wherein in the imaging step, the reference video is captured within the angle of view using an anamorphic lens, and in the first display step, the extraction video is displayed by extending a size in a lateral direction of the angle of view using the anamorphic lens.

22. The display method according to claim 1, wherein, in a case where the extraction video displayed in the first display has a width and a height inverted, a width and a height of the support video is inverted and displayed on the second display device in the second display step, and the text information is displayed on the second display device in the third display step while a display orientation of the text information is maintained.