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(54) (TITLE OF THE INVENTION) **ELECTRONIC CAMERA AND ELECTRONIC CAMERA SYSTEM**

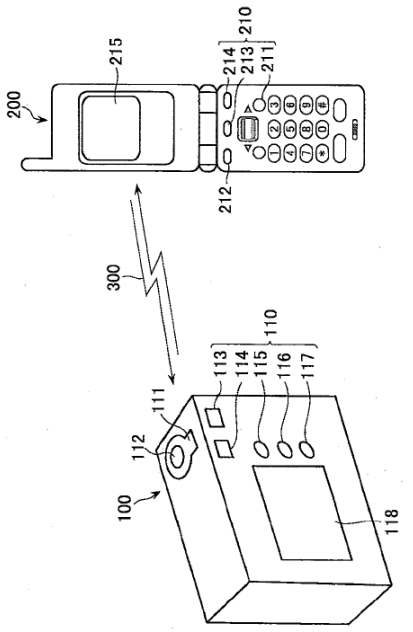
(57) (Abstract)

(PROBLEM) To obtain an electronic camera system capable of confirming a photographed image by a remote control transceiver.

(MEANS FOR SOLVING) An electronic still camera 100 and a mobile phone 200 are connected by a communication medium 300. The communication medium 300 is wireless communication, such as Bluetooth (trademark), or the like. The mobile phone 200 serves as a remote control transceiver of the electronic still camera 100. Once the mobile phone 200 transmits an operation signal to the electronic still camera 100, the electronic still camera 100 performs a camera operation according to the received operation signal. The electronic still camera 100 resizes the photographed image data according to the display resolution of an LCD display 215 of the mobile phone 200 and transmits the reduced image data after resizing to the mobile phone 200. The mobile phone 200 receives the reduced image data and displays the data on the LCD display 215

(SELECTED DRAWING) FIG. 1

(FIG. 1)



(Scope of Patent Claims)
(Claim 1)
An electronic camera, characterized in that the camera is provided with
an imaging device for capturing an object image and outputting an image signal,
a communication circuit for carrying out communication with an external device,
an image processing circuit for generating image data at a predetermined data size using an image signal by the above-mentioned imaging device according to the release instruction from the above-mentioned external device input via the above-mentioned communication circuit, and
a control circuit for controlling the above-mentioned communication circuit to output the image data generated by the above-mentioned image processing circuit to the above-mentioned external device.
(Claim 2)
The electronic camera as recited in Claim 1, characterized in that the camera is further provided with
a recording circuit for recording an image signal by the above-mentioned imaging device on a recording medium, and
a data-editing circuit for editing an image signal recorded by the above-mentioned recording circuit according to the editing instruction from the above-mentioned external device input via the above-mentioned communication circuit, wherein
the above-mentioned recording circuit records the image signal edited by the above-mentioned data-editing circuit on the above-mentioned recording medium.
(Claim 3)
The electronic camera as recited in Claim 2, characterized in that
the above-mentioned editing instruction is a deletion instruction, and
the above-mentioned data-editing circuit deletes an image signal recorded on the above-mentioned recording medium according to the above-mentioned deletion instruction.
(Claim 4)
The electronic camera as recited in Claim 2, characterized in that
the above-mentioned editing instruction is a data addition instruction, and
the above-mentioned data-editing circuit adds the additional data from the above-mentioned external device input via the above-mentioned communication circuit according to the above-mentioned data addition instruction in association with the image signal recorded on the above-mentioned recording medium.
(Claim 5)
The electronic camera as recited in Claim 5, characterized in that
an instruction input from the above-mentioned external device includes the size information of the required data size with the above-mentioned external device, and
the above-mentioned image processing circuit generates image data of the required data size with the above-mentioned external device using an image signal by the above-mentioned imaging device according to the above-mentioned size information.
(Claim 6)
The electronic camera as recited in Claim 1, characterized in that
the camera is further provided with a memory circuit for storing the data indicating the start of image capture, wherein
the above-mentioned control circuit further controls the above-mentioned communication circuit so as to output to the above-mentioned external device the data indicating the start of image capture in the above-mentioned memory circuit according to the above-mentioned release instruction.
(Claim 7)
The electronic camera as recited in Claim 6, characterized in that
the data indicating the start of image capture described above is voice data.
(Claim 8)
The electronic camera as recited in Claim 6 or 7, characterized in that
the above-mentioned control circuit prioritizes the output of the data indicating the start of image capture over the output of the image data generated by the above-mentioned image processing circuit.
(Claim 9)
An electronic camera system, comprising
an electronic camera including an imaging device for capturing an object image and outputting an image signal, a first communication circuit for communicating with an external device, an image processing circuit for generating image data of a predetermined data size using an image signal by the above-mentioned imaging device according to the release instruction input via the above-mentioned first communication circuit, a first control circuit for controlling the

above-mentioned first communication circuit to output the image data generated by the above-mentioned image processing circuit, and
a portable external device including a second communication circuit for communicating with the above-mentioned electronic cameras, an operation member for performing an instruction to the above-mentioned electronic camera, a display device for displaying an image by the image data input via the above-mentioned second communication circuit, and a second control circuit for controlling the above-mentioned second communication circuit to output an operation signal by the above-mentioned operation member.
(Claim 10)
The electronic camera system as recited in Claim 9, characterized in that
at least two portable external devices described above exist,
the above-mentioned electronic camera is further provided with a memory circuit for storing information for every portable external device described above to facilitate a communication via the above-mentioned first communication circuit, and
the above-mentioned first control circuit controls the above-mentioned first communication circuit to output the image data generated by the above-mentioned image processing circuit to at least one portable external device corresponding to the information stored in the above-mentioned memory circuit.
(Detailed Description of the Invention)
(0001)
(Technical Field to which the Invention belongs)
The present invention relates to an electronic camera provided with a communication function.
(0002)
(Description of the Prior Art)
A camera with a communication function for performing a release operation to the camera by operating a remote control transmitter has been known. Once a photographer operates a remote control transmitter to give a release instruction, a camera will take a photograph.
(0003)
(Problem to be Solved by the Invention)
In cameras adopting prior art technologies, it is impossible to check, on the remote control transmitter side, the image captured by a camera by the release instruction from the remote control transmitter.
(0004)
The objective of this invention is to provide an electronic camera that can transmit the captured image data to an external device that is a remote control transmitter and also to provide an electronic camera system using this electronic camera.
(0005)
(Means for Solving the Problems)
The objective described above is achieved by an electronic camera according to the present invention provided with an imaging device for capturing an object image and outputting an image signal, a communication circuit for carrying out communication with an external device, an image processing circuit for generating image data at a predetermined data size using an image signal by the imaging device according to the release instruction from the external device input via the communication circuit, and a control circuit for controlling the communication circuit to output to the external device the image data generated by the image processing circuit.
The electronic camera described above is further provided with a recording circuit for recording an image signal by the imaging device on a recording medium, and a data-editing circuit for editing the image signal recorded by the recording circuit according to the editing instruction from the external device input via the communication circuit. The recording circuit in this case may record the image signal edited by the data-editing circuit on the recording medium.
A deletion instruction may be used as an editing instruction, where the data-editing circuit in this case can delete the image signal recorded on a recording medium according to the deletion instruction.
A data addition instruction may be used as an editing instruction, where the data-editing circuit in this case can add the additional data, in association with the image signal recorded on a recording medium, from the external device input via a communication circuit according to the data addition instruction.
The instruction input into the electronic camera from an external device may include the size information of required data size in an external device. In this case, the image processing circuit can also generate the image data of the required data size in an external device using the image signal by an imaging device according to the size information.

The electronic camera is further provided with a memory circuit for storing the data indicating the start of image capture. The control circuit in this case can further control a communication circuit to output to an external device the data indicating the start of image capture in a memory circuit according to a release instruction.
Voice data may also serve as the data indicating the start of image capture.
The control circuit in case an electronic camera is equipped with the memory circuit may prioritize the output of the data indicating the start of image capture over the output of the image data generated by the image processing circuit.
The electronic camera system of the present invention achieved the objective described above by comprising an electronic camera including an imaging device for capturing an object image and outputting an image signal, a first communication circuit for communicating with an external device, an image processing circuit for generating image data of a predetermined data size using the image signal [output] by the imaging device according to the release instruction input via the first communication circuit, and a first control circuit for controlling the first communication circuit to output the image data generated by the image processing circuit; and a portable external device including a second communication circuit for communicating with the electronic camera, an operation member for performing an instruction to the electronic camera, a display device for displaying an image by image data input via the second communication circuit, and a second control circuit for controlling the second communication circuit to output an operation signal by the operation member.
When at least two portable external devices exist, an electronic camera may be provided with a memory circuit for storing the information for each portable external device for communicating via a first communication circuit. At this time, the first control circuit can control the first communication circuit to output the image data generated by the image processing circuit to at least one portable external device corresponding to the information stored in the memory circuit.
(0006)
(Description of the Embodiments)
Hereinafter, an embodiment of the invention will be described with reference to the drawings.
FIG. 1 is a drawing illustrating the electronic camera system according to one embodiment of the present invention. In FIG. 1, an electronic still camera 100 and a mobile phone 200 are connected by a communication medium 300. The communication medium 300 is wireless communication, such as Bluetooth (registered trademark), for example. According to this embodiment, the mobile phone 200 operates as a remote control transceiver of the electronic still camera 100 and performs wireless data transmission between the electronic still camera 100 and the mobile phone 200. The mobile phone 200 transmits an operation signal to the electronic still camera 100, and the electronic still camera 100 operates the camera according to the received operation signal. Once the image data captured by the electronic still camera 100 is transmitted to the mobile phone 200, the mobile phone 200 receives image data and displays it on an LCD display.
(0007)
The electronic still camera 100 is provided with an electric power switch 111, a release button 112, a zoom-in switch 113, a zoom-out switch 114, an image data delete switch 115, an image data display extension switch 116, a remote control operational mode ON/OFF changeover switch 117, and an LCD display 118. The electric power switch 111 is an operation member for turning on and off the power supply of the electronic still camera 100. The release button 112 is an operation member for starting a photographing operation of the electronic still camera 100. The zoom-in switch 113 (not shown) is an operation member for increasing the zoom magnification of a shooting lens. The zoom-out switch 114 is an operation member for lowering the zoom magnification of a shooting lens. The image data delete switch 115 is an operation member for deleting the captured image data.
(0008)
The image data display extension switch 116 is an operation member for extending the time it takes for the image (freeze image) by the image data captured after the operation of the release button 112 to be displayed on the LCD display 118. Although the display time of a freeze image is 3 seconds, for example, it is usually extended to 10 seconds by the operation of the image data display extension switch 116. The remote control operational mode ON/OFF changeover switch 117 is an operation member for switching a camera to a remote control operational mode.

The electronic still camera 100 is operated by a remote control when set to a remote control operational mode, and operated by the operation member of the camera when not set to a remote control operational mode. Each switch and button of the electronic still camera 100 are named collectively to constitute the operation member 110.

(0009)

The mobile phone 200 is provided with an electric power switch 211, a first function switch 212, a second function switch 213, a third function switch 214, and an LCD display 215. The electric power switch 211 is an operation member for turning on and off the power supply of the mobile phone 200. The first function switch 212 to the third function switch 214 are operation members for performing respective operations to the electronic still camera 100. The function of each function switch is displayed on the LCD display 215. The LCD display 215 displays an image according to the image data transmitted from the electronic still camera 100 and also displays the functions of the first function switch 212 to the third function switch 214. Each switch of the mobile phone 200 is named collectively to constitute the operation member 210.

(0010)

FIG. 2 is a block diagram showing the summary of the electronic still camera 100. In FIG. 2, the electronic still camera 100 is provided with a photographing zoom lens 131, an image sensor 132, an A/D conversion circuit 133, an image processing circuit 134, a buffer memory 135, a CPU 136, a frame memory 137, an LCD display 118, a zoom lens driving device 138, a transceiver circuit 150, and an operation member 110. The operation member 110 contains a release button 112, or the like, described above. Once the operation member 110 is operated, an operation signal by each switch and button is sent to CPU 136. A removable recording medium 140 is provided to the electronic still camera 100.

(0011)

Once the electric power switch 111 is turned on, CPU 136 performs a certain ON operation of the electronic still camera 100 to activate a control program. CPU 136 controls the operation timing for a charge accumulation and accumulated charge reading, for example, with respect to the image sensor 132 comprising a CCD, or the like. Once a zoom operation signal is input from the zoom-in switch 113 and the zoom-out switch 114 (FIG. 1), CPU 136 outputs a lens driving command to the zoom lens driving device 138 according to an operation signal and changes the focal distance of the zoom lens 131.

(0012)

When a release operation signal from the release button 112 (FIG. 1) is input into CPU 136, CPU 136 starts a photographing operation. Photographing is started by the release signal received by the transceiver circuit 150 in a state where the camera is set to a remote control operational mode. On the imaging surface of the image sensor 132, an object image is formed by the photographing zoom lens 131, and the image sensor 132 accumulates a signal charge according to the luminosity of the object light. The signal charge accumulated in the image sensor 132 is discharged by the timing signal by CPU 136 and converted to a digital signal from an analog imaging signal by the A/D conversion circuit 133. The signal converted to digital is then guided to the image processing circuit 134 and subjected to predetermined image processing, such as contour compensation, gamma correction, and color temperature adjustment, and temporarily stored to the buffer memory 135.

(0013)

The image data after image processing is processed as the image data for display by the image processing circuit 134 and stored in the frame memory 137. The data for display stored in the frame memory 137 is displayed on an external monitor, such as LCD display 118, as the photographing result (freeze image). The image processing circuit 134 further performs data compression of the image data after the image processing described above in the buffer memory 135 to a predetermined ratio in a recording format, such as JPEG, or the like. The compressed image data is given a predetermined file name by CPU 136 and recorded on the recording medium 140.

(0014)

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