

<b>UTILITY PATENT APPLICATION TRANSMITTAL</b>	<i>Attorney Docket No.</i>	500.38315CC5	
	<i>First Inventor</i>	T. NAKANO	
	<i>Title</i>	ELECTRIC CAMERA	
	<i>Express Mail Label No.</i>		
<i>(Only for new nonprovisional applications under 37 CFR 1.53(b))</i>			
<b>APPLICATION ELEMENTS</b> <i>SEE MPEP chapter 600 concerning utility patent application contents.</i>	<b>Commissioner for Patents</b> P.O. Box 1450 Alexandria VA 22313-1450		
<b>ADDRESS TO:</b>			
<div style="display: flex;"><div style="flex: 1;"><p>1. <input type="checkbox"/> <b>Fee Transmittal Form</b> (e.g., PTO/SB/17) <i>(Submit an original and a duplicate for fee processing)</i></p><p>2. <input type="checkbox"/> <b>Applicant claims small entity status.</b> See 37 CFR 1.27.</p><p>3. <input checked="" type="checkbox"/> <b>Specification</b> [Total Pages <u>39</u>] Both the claims and abstract must start on a new page <i>(For information on the preferred arrangement, see MPEP 608 01(a))</i></p><p>4. <input checked="" type="checkbox"/> <b>Drawing(s)</b> (35 U.S.C. 113) [Total Sheets <u>8</u>]</p><p>5. <b>Oath or Declaration</b> [Total Sheets _____] a. <input type="checkbox"/> Newly executed (original or copy) b. <input type="checkbox"/> Copy from a prior application (37 CFR 1.63 (d)) <i>(for continuation/divisional with Box 18 completed)</i> i. <input type="checkbox"/> <b>DELETION OF INVENTOR(S)</b> Signed statement attached deleting inventor(s) Named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b)</p><p>6. <input checked="" type="checkbox"/> <b>Application Data Sheet.</b> See 37 CFR 1.76</p><p>7. <input type="checkbox"/> <b>CD-ROM or CD-R</b> in duplicate, large table or Computer Program (<i>Appendix</i>) i. <input type="checkbox"/> Landscape Table on CD</p><p>8. <b>Nucleotide and/or Amino Acid Sequence Submission</b> <i>(if applicable, all necessary)</i> a. <input type="checkbox"/> Computer Readable Form (CRF) b. <input type="checkbox"/> Specification Sequence Listing on: i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or ii. <input type="checkbox"/> Paper c. <input type="checkbox"/> Statements verifying identity of above copies</p></div><div style="flex: 1; border: 1px solid black; padding: 5px;"><b>ACCOMPANYING APPLICATION PARTS</b><p>9. <input type="checkbox"/> <b>Assignment Papers</b> (cover sheet &amp; documents(s))</p><p>10. <input type="checkbox"/> <b>37 CFR 3.73(b) Statement</b> <input checked="" type="checkbox"/> <b>Power of Attorney</b> <i>(when there is an assignee)</i></p><p>11. <input type="checkbox"/> <b>English Translation Document</b> <i>(if applicable)</i></p><p>12. <input checked="" type="checkbox"/> <b>Information Disclosure Statement</b> (PTO/SB/08 OR PTO-1449) <input type="checkbox"/> Copies of Citations attached</p><p>13. <input type="checkbox"/> <b>Preliminary Amendment</b></p><p>14. <input type="checkbox"/> <b>Return Receipt Postcard</b> (MPEP 503) <i>(Should be specifically itemized)</i></p><p>15. <input type="checkbox"/> <b>Certified Copy of Priority Document(s)</b> <i>(if foreign priority is claimed)</i></p><p>16. <input type="checkbox"/> <b>Nonpublication Request</b> under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.</p><p>17. <input type="checkbox"/> <b>Other:</b> _____ _____ _____</p></div></div>			
<p>18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:</p> <p style="text-align: center;"><input checked="" type="checkbox"/> Continuation    <input type="checkbox"/> Divisional    <input type="checkbox"/> Continuation-in-part (CIP)    of prior application No.: 13/681,495</p> <p>Prior application information: Examiner: <u>Luong Trung Nguyen</u> Art Unit: <u>2663</u></p>			
<b>19. CORRESPONDENCE ADDRESS : THE ADDRESS ASSOCIATED WITH CUSTOMER NUMBER 020457</b>			
<i>Signature</i>	/Ayal I. Sharon /	<i>Date</i>	APRIL 29, 2014
<i>Name (Print/Type)</i>	Ayal I. Sharon	<i>Registration No. (Attorney/Agent)</i>	55,986

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		ELECTRIC CAMERA		
First Named Inventor/Applicant Name:		Takahiro Nakano		
Filer:		Ayal I. Sharon/Krista Hargrove		
Attorney Docket Number:		500.38315CC5		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Basic Filing:</b>				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
Late Filing Fee for Oath or Declaration	1051	1	140	140
<b>Petition:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>1740</b>

Electronic Acknowledgement Receipt	
EFS ID:	18887444
Application Number:	14264243
International Application Number:	
Confirmation Number:	1644
Title of Invention:	ELECTRIC CAMERA
First Named Inventor/Applicant Name:	Takahiro Nakano
Customer Number:	20457
Filer:	Ayal I. Sharon/Krista Hargrove
Filer Authorized By:	Ayal I. Sharon
Attorney Docket Number:	500.38315CC5
Receipt Date:	29-APR-2014
Filing Date:	
Time Stamp:	12:14:16
Application Type:	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1740
RAM confirmation Number	11821
Deposit Account	
Authorized User	

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Application Data Sheet	38315ADS.pdf	1561624	no	8
			4b82e2b4dc89de7cb56d03882092460ef1c76814		
Warnings:					
Information:					
2	Specification	38315Application.pdf	5505966	no	40
			52cdbe1d80d0e843efe24c12038ed3024e31985c		
Warnings:					
Information:					
3	Drawings-only black and white line drawings	38315DRAWINGS.pdf	473115	no	8
			08f7fe6bea83afcbba131d3714ce701af13048be		
Warnings:					
Information:					
4	Transmittal Letter	38315ids.pdf	54668	no	2
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Warnings:					
Information:					
5	Power of Attorney	38315POA.pdf	497214	no	3
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Warnings:					
Information:					
6	Power of Attorney	38315PowerofAttorneycover.pdf	162823	no	1
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Warnings:					
Information:					
7	Information Disclosure Statement (IDS) Form (SB08)	38315sb08.pdf	131504	no	3
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Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
8	Transmittal of New Application	38315utl.pdf	124709	no	1
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Warnings:					
Information:					
9	Fee Worksheet (SB06)	fee-info.pdf	36232	no	2
			bf7f7ad62183c2e99ef43613f85ab245aed21cf6		

<b>Warnings:</b>	
<b>Information:</b>	
<b>Total Files Size (in bytes):</b>	8547855
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	
Title of Invention	ELECTRIC CAMERA		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

## Secrecy Order 37 CFR 5.2

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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## Inventor Information:

<b>Inventor 1</b>					<a href="#">Remove</a>
<b>Legal Name</b>					
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Takahiro		Nakano		
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	Tokyo	<b>Country of Residence i</b>	JP		
<b>Mailing Address of Inventor:</b>					
<b>Address 1</b>	c/o Hitachi, Ltd, Intellectual Property Group				
<b>Address 2</b>	6-1, Marunouchi 1-chome, Chiyoda-ku				
<b>City</b>	Tokyo	<b>State/Province</b>			
<b>Postal Code</b>	100-8220	<b>Country i</b>	JP		
<b>Inventor 2</b>					<a href="#">Remove</a>
<b>Legal Name</b>					
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Ryuji		Nishimura		
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	Tokyo	<b>Country of Residence i</b>	JP		
<b>Mailing Address of Inventor:</b>					
<b>Address 1</b>	c/o Hitachi, Ltd, Intellectual Property Group				
<b>Address 2</b>	6-1, Marunouchi 1-chome, Chiyoda-ku				
<b>City</b>	Tokyo	<b>State/Province</b>			
<b>Postal Code</b>	100-8220	<b>Country i</b>	JP		
<b>Inventor 3</b>					<a href="#">Remove</a>
<b>Legal Name</b>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5	
		Application Number		
Title of Invention	ELECTRIC CAMERA			
Prefix	Given Name	Middle Name	Family Name	Suffix
	Toshiro		Kinugasa	
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
City	Tokyo	Country of Residence i	JP	
<b>Mailing Address of Inventor:</b>				
Address 1	c/o Hitachi, Ltd, Intellectual Property Group			
Address 2	6-1, Marunouchi 1-chome, Chiyoda-ku			
City	Tokyo	State/Province		
Postal Code	100-8220	Country i	JP	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button.				<input type="button" value="Add"/>

**Correspondence Information:**

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
<input type="checkbox"/> An Address is being provided for the correspondence Information of this application.	
Customer Number	020457
Email Address	<input type="button" value="Add Email"/> <input type="button" value="Remove Email"/>

**Application Information:**

Title of the Invention	ELECTRIC CAMERA		
Attorney Docket Number	500.38315CC5	Small Entity Status Claimed	<input type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	

**Filing By Reference :**

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country i

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	
Title of Invention	ELECTRIC CAMERA		

### Publication Information:

<input type="checkbox"/>	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/>	<b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

### Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.			
Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	020457		

### Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status	Pending	<a href="#" style="border: 1px solid black; padding: 2px;">Remove</a>			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
	Continuation of	13681495	2012-11-20		
Prior Application Status	Patented	<a href="#" style="border: 1px solid black; padding: 2px;">Remove</a>			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13681495	Continuation of	12845266	2010-07-28	8339493	2012-12-25
Prior Application Status	Patented	<a href="#" style="border: 1px solid black; padding: 2px;">Remove</a>			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12845266	Continuation of	10660710	2003-09-12	8059177	2011-11-15
Prior Application Status	Patented	<a href="#" style="border: 1px solid black; padding: 2px;">Remove</a>			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
10660710	Division of	09520836	2000-03-08	6765616	2004-07-20
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the <b>Add</b> button.					<a href="#" style="border: 1px solid black; padding: 2px;">Add</a>

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	
Title of Invention	ELECTRIC CAMERA		

**Foreign Priority Information:**

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

<a href="#">Remove</a>			
Application Number	Country <sup>i</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>j</sup> (if applicable)
00-006064	JP	2000-01-11	
Additional Foreign Priority Data may be generated within this form by selecting the <b>Add</b> button.			<a href="#">Add</a>

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications**

- ☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
- NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

**Authorization to Permit Access:**

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

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<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	
Title of Invention	ELECTRIC CAMERA		

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

### Applicant 1

[Remove](#)

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

[Clear](#)

<input checked="" type="radio"/> Assignee	<input type="radio"/> Legal Representative under 35 U.S.C. 117	<input type="radio"/> Joint Inventor
<input type="radio"/> Person to whom the inventor is obligated to assign.	<input type="radio"/> Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name  Hitachi Consumer Electronics Co., Ltd.

### Mailing Address Information:

Address 1	2-1, Otemachi 2-chome, Chiyoda-ku		
Address 2			
City	Tokyo	State/Province	
Country <sup>i</sup>	JP	Postal Code	100-0004
Phone Number		Fax Number	

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5		
		Application Number			
Title of Invention	ELECTRIC CAMERA				
Email Address					
Additional Applicant Data may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>	

## Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.				
<b>Assignee 1</b>				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				<input type="button" value="Remove"/>
If the Assignee or Non-Applicant Assignee is an Organization check here. <input type="checkbox"/>				
Prefix	Given Name	Middle Name	Family Name	Suffix
<b>Mailing Address Information For Assignee including Non-Applicant Assignee:</b>				
Address 1				
Address 2				
City		State/Province		
Country i		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

## Signature:

<input type="button" value="Remove"/>				
NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications				
Signature	/Ayal I. Sharon/		Date (YYYY-MM-DD)	2014-04-29
First Name	Ayal	Last Name	Sharon	Registration Number
				55986
Additional Signature may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	
Title of Invention	ELECTRIC CAMERA		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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ELECTRIC CAMERA

CROSS REFERENCE TO RELATED APPLICATION

5           This application is a continuation of U.S. application serial no. 13/681,495, filed November 20, 2012, which is a continuation of U.S. application serial no. 12/845,266, filed July 28, 2010, now U.S. Patent No. 8,339,493, issued December 25, 2012, which is a continuation of U.S. application serial no. 10/660,710, filed September 12, 2003, now U.S. Patent No. 8,059,177, issued November 15, 2011, and is  
10   related to U.S. application serial no. 10/660,711, filed September 12, 2003, now U.S. Patent No. 7,403,226, issued July 22, 2008, both of which are divisional applications of U.S. application Serial No. 09/520,836, filed March 8, 2000, now U.S. Patent No. 6,765,616, issued July 20, 2004, the subject matter of all the above is incorporated by reference herein.

15   BACKGROUND OF THE INVENTION

          The present invention relates to a photography related to video cameras, camcorders, digital still cameras and others using a solid-state image sensing device, and more particularly to an electric camera using a solid-state image sensing device with a large number of pixels.

20           Electric cameras using solid-state image sensors such as CCDs (charge-coupled devices) include a so-called video camera or camcorder for taking moving images and a so-called digital still camera for taking still images. In recent years, video cameras with a still image taking function and digital still cameras with a moving image taking function have become available.

25           In a video camera to photograph moving images, it is generally assumed that the video is viewed on a display such as television monitor and thus the camera is designed to produce output signals conforming to a television system such as NTSC and

-1b-

PAL. Therefore, the effective number of vertically arranged pixels or picture elements on the image sensing device used in such a camera is determined to enable television signals to be generated. The NTSC system, for example, performs  
5 interlaced scanning on two fields, each of which has an effective scanning line number of about 240 lines (the number of scanning lines actually

displayed on the monitor which is equal to the number of scanning lines in the vertical blanking period subtracted from the total number of scanning lines in each field). To realize this, the image sensing device has about 480 pixel  
5 rows as the standard effective number of vertically arranged pixels. That is, the signals of two vertically adjoining pixels in each field are mixed together inside or outside the image sensing device to generate about 240 scanning lines, and the combinations of pixels to be  
10 cyclically mixed together are changed from one field to another to achieve the interlaced scanning.

Some image sensing devices to take moving images according to the NTSC system have an area of pixels for image stabilization added to the area of effective pixel  
15 area, thus bringing the effective number of vertically arranged pixels to about 480 or more. In this case, an area beyond 480th pixels is read out at high speed during the vertical blanking period and therefore the signals thus read out are not used as effective signals. Therefore, the  
20 video signals can only be generated from those signals coming from the area of about 480 vertically arranged pixels. When such a camera is used to photograph a still image, it is relatively easy to generate a static image signal conforming to, for example, JPEG (Joint Photographic  
25 Expert Group) from the signals coming from the same pixel area that is used to take a moving image. A problem remains, however, that the number of vertically arranged pixels obtained is limited to around 480, making it

impossible to produce more detailed static image signals.

In a camera having an image sensing device with the area of pixels for image stabilization mentioned above, a method of alleviating this problem may involve using the  
5 entire area of effective pixels including the area of image stabilization pixels in photographing a still image. Even when photographing a still image, however, the photographed image needs to be monitored for check and, for that purpose, it is necessary to generate signals conforming to  
10 the television system from signals read out from all effective pixels.

An example of such a conventional camera has been proposed in JP-A-11-187306. In the camera disclosed in this publication, signals from all the effective pixels are  
15 read out taking two or more times the field period of the television system, stored in a memory means such as a field memory, and then subjected to interpolation processing for transformation into signals conforming to the field cycle and horizontal scan cycle of television.

20 This conventional camera, however, requires a large processing circuit, such as field memory, for signal conversion. Another drawback is that the image sensing device readout cycle is a plurality of times the field cycle, degrading the dynamic resolution. Even with the use  
25 of this circuit, the number of pixels obtained as the static image signals is limited to the number of effective pixels used for moving videos plus the area of image stabilization pixels.

In a digital still camera designed for taking still images, there has been a trend in recent years toward an increasing number of pixels used on the moving video image sensing device in order to obtain higher resolution static image signals. When taking a moving image or monitoring the video, it is necessary to generate signals that conform to the television system. The number of pixels on such an image sensing device, however, does not necessarily match the number of scanning lines of the television system and therefore some form of conversion means is required.

The conversion means may involve, as in the video camera with the area of image stabilization pixels, reading out signals from the image sensing device taking a longer time than the field cycle and interpolating them to generate television signals. This method has, in addition to the problem described above, a drawback that the readout cycle increases as the number of pixels increases, further degrading the dynamic resolution.

To mitigate this problem, JP-A-9-270959 discloses an apparatus which mixes together or culls the pixel signals inside the image sensing device to reduce the number of signals to be read and therefore the read cycle. Although this apparatus alleviates the problem of the degraded dynamic resolution, it requires a large processing circuit such as field memory to perform time-axis transformation to generate signals conforming to the television system and the image sensing device itself needs to have a

special structure for performing desired mixing and culling.

#### SUMMARY OF THE INVENTION

The present invention relates to a photography of  
5 video cameras, camcorders, digital still cameras and others  
using a solid-state image sensing device, and more particularly to an electric camera using a solid-state image  
sensing device with a large number of pixels.

The conventional electric cameras, as described  
10 above, have drawbacks that when taking a still picture by  
using a video camera, the number of pixels is not sufficient and that when taking a moving image with a still  
camera, the associated circuit inevitably increases and the  
dynamic image quality deteriorates. Taking both moving and  
15 static images of satisfactory quality with a single camera  
is difficult to achieve. In addition to solving the above  
problems, to obtain good dynamic picture quality by using  
an image sensing device having a large number of pixels  
intended for still images requires extracting a pixel area  
20 that is used to realize an image stabilizing function. The  
conventional art and cameras do not offer a means to  
accomplish this function.

An object of the present invention is to provide  
an electric camera that solves these problems and which  
25 uses an image sensing device with a sufficient number of  
pixels for still images and enables taking of highly  
detailed still images and a moving video taking with



reduced image quality degradation without increasing circuitry such as field memory. It is also an object of the present  
5 invention to provide an electric camera that can also realize the image stabilizing function.

According to one aspect of this invention, the electric camera to realize the above objectives has: an image sensing device with a light receiving surface having N  
10 vertically arranged pixels and an arbitrary number of pixels arranged horizontally, N being equal to or more than three times the number of effective scanning lines M of a display screen of a television system; a driver to drive the image sensing device to vertically mix or cull signal charges accumulated in  
15 individual pixels of every K pixels to produce a number of lines of output signals which corresponds to the number of effective scanning lines M, K being at least one of integers equal to or less than an integral part of a quotient of N divided by M (a number of lines of output signals corresponds to  $1/K$  the number  
20 of vertically arranged pixels N of the image sensing device); and a signal processing unit to generate image signals by using the output signals of the image sensing device.

As explained above, since this invention eliminates the limit on the number of vertically arranged pixels, an  
25 electric camera can be provided which enables taking of highly detailed still images and a satisfactory moving video taking by using an image sensing device with a large enough pixel number even for still images.

#### 30 BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram showing the configu

ration of a first embodiment of an electric camera according to the present invention.

Figure 2 is a schematic diagram showing the structure of an image sensing device in the first embodiment of the electric camera of the invention.

Figure 3 is a drive pulse timing diagram in the first embodiment of the electric camera of the invention.

Figure 4 is a schematic diagram showing a mixing operation in the first embodiment of the electric camera of the invention.

Figure 5 is a schematic diagram showing a readout area in the first embodiment of the electric camera of the invention.

Figure 6 is a schematic diagram showing a mixing operation in the first embodiment of the electric camera of the invention.

Figure 7 is a block diagram showing the configuration of a second embodiment of an electric camera according to the present invention.

Figure 8 is a schematic diagram showing a mixing operation in the second embodiment of the electric camera of the invention.

Figure 9 is a schematic diagram showing a readout area in the second embodiment of the electric camera of the invention.

Figure 10 is a schematic diagram showing the structure of an image sensing device in a third embodiment of the electric camera according to the present invention.

Figure 11 is a drive pulse timing diagram in the third embodiment of the electric camera of the invention.

Figure 12 is a schematic diagram showing an interpolation operation in the third embodiment of the electric camera of the invention.

Figures 13A and 13B are schematic diagrams showing the arrangement of color filters in the image sensing device in a fourth embodiment of the electric camera according to the present invention.

#### 10 DESCRIPTION OF THE EMBODIMENTS

Now embodiments of the present invention will be described by referring to the accompanying drawings. Figure 1 is a block diagram showing the configuration of one embodiment of an electric camera according to the invention.

In Figure 1, reference number 1 represents a lens, 2 an aperture, 3 an image sensing device, 4 a drive circuit, 5 a gain adjust circuit, 6 an analog-digital (A/D) conversion circuit, 7 a signal processing circuit, 8 a vertical interpolation circuit to perform interpolation in a vertical direction, 9 a horizontal interpolation circuit to perform interpolation in a horizontal direction, 10 a recording unit including recording media such as magnetic tape, semiconductor memory and optical disk to record a video signal, 11 a control circuit to control these constitutional elements according to the operating state, 12 an encoder circuit to modulate the video signal into a

standard television signal, 13 a digital-analog (D/A) conversion circuit, 14 a mode selector switch to change over the operation mode between the moving video taking and the still image taking, 15 a record button to start or stop the recording, 16a and 16b gyro sensors to detect vertical image-unstability and lateral image-unstability, respectively, and 17 an image-unstability decision circuit to determine the image-instability from signals output from the gyro sensors.

10           In the above configuration, light coming from the lens 1 through the aperture 2 is focused on a light receiving surface of the image sensing device 3 where it is converted into an electric signal. In this embodiment the image sensing device 3 is of a CCD type. Figure 2 shows  
15 the structure of this image sensing device 3. In Figure 2, denoted 30 are pixels each formed of a photodiode, which are arranged horizontally and vertically in a grid pattern. On these grid-arrayed pixels three types of color filters that pass yellow (Ye), green (G) and cyan (Cy), respectively,  
20           are arranged in such a way that the combination of these three colors is repeated horizontally every three pixels and that the filters of the same colors are lined vertically in so-called vertical stripes. Although an arbitrary number of pixels may be used, this embodiment has  
25 an array of 1200 pixels vertically and 1600 pixels horizontally. A vertical transfer unit 32 is a CCD which is driven by three phase pulses V1, V2, V3. This CCD has a three-gate structure in which each pixel corresponds to

three phase pulses and thus can vertically transfer a signal charge of each pixel independently. Transfer gates 31 for transferring the charge of each pixel to the vertical transfer unit 32 are commonly connected to a gate  
5 of the vertical transfer unit 32 that corresponds to the V2 pulse. An operation to transfer the charge from each pixel to the vertical transfer unit 32 in response to a peak value of the pulse applied to the commonly connected gate and an operation to transfer the charge vertically are  
10 performed separately. A horizontal transfer unit 33 horizontally transfers the charges supplied from the vertical transfer units 32 and outputs them successively through an output amplifier 34 from the output terminal.

Referring back to Figure 1, the operation  
15 performed when the moving video mode is selected by the mode selector switch 14 will be explained. The number of vertically arranged pixels on the image sensing device in this embodiment is 1200, so if the number of effective scanning lines in the field of the NTSC system is assumed  
20 to be 240 lines, then vertically mixing five pixels (= 1200 pixel rows/240 scanning lines) can match the number of lines of output signals from the image sensing device to the number of effective scanning lines.

However, in this embodiment, to realize the image  
25 stabilizing function described later, four vertically arranged pixels are mixed together during motion image taking mode. When four vertically arranged pixels are to be cyclically mixed together, the signals from the area of

960 pixels (= 240 scanning lines × 4 pixels) out of the 1200 vertically arranged pixels are used as effective signals and the remaining 240 pixels (= 1200 (all pixels) - 960 (effective pixels)) are not used for image forming.

5 Figure 3 shows the timing of a vertical drive pulse for the image sensing device in this operation mode, with V1, V2 and V3 representing three phase drive pulses applied to each gate of the CCD or vertical transfer unit 32.

In Figure 3, in a period T1 included in the  
10 vertical blanking period, the drive pulse V2 is held high to transfer the signal charge accumulated in each pixel to under the V2 gate of the vertical CCD. Next, in a period T2, while the V2 pulse is still at middle level, the V3 pulse is raised from low level to middle level; next, while  
15 the V3 pulse is at middle level, the V2 pulse is changed from middle level to low level, after which the V1 pulse is changed from low level to middle level; next, while the V1 pulse is at middle level, the V3 pulse is changed from middle level to low level, after which the V2 pulse is  
20 changed to middle level and finally the V1 pulse is changed from middle level to low level. With this sequence of pulse operations, the signal charges under the V2 gate for one pixel row are transferred and held again under the V2 gate.

25 By repeating this series of operations, the signal charges for a desired number of pixel rows can be transferred. In Figure 3, during a period T3 included in the vertical blanking period before the vertical effective

scanning period (the vertical scanning period minus the vertical blanking period which corresponds to the actually displayed image) and during a period T4 included in the vertical blanking period after the vertical effective scanning period, the above transfer operation for one pixel row is repeated a total of 240 times to transfer the signal charges of the 240 pixel rows not used for image generation to the horizontal transfer unit 33 during the vertical blanking period. For example, if this transfer operation is performed 120 times during the period T3 and 120 times during the period T4, the signal charges from upper 120 pixel rows and lower 120 pixel rows on the light receiving surface are transferred to the horizontal transfer unit 33 during the period T3 and period T4 within the vertical blanking period. During each of the subsequent periods T5 and T6 in the vertical blanking period, the horizontal transfer unit 33 is driven for a predetermined period to output the charges transferred to the horizontal transfer unit 33 from the output terminal. These charges are not used as valid signals as they are output during the vertical blanking period.

Next, in the vertical effective scanning period of Figure 3, the above one-pixel-row transfer operation is performed four times during each horizontal blanking period to transfer the signal charges of four pixel rows to the horizontal transfer unit 33 where they are mixed together. Then, during a horizontal effective scanning period (the horizontal scanning period minus the horizontal blanking

period which corresponds to the actually displayed image), the horizontal transfer unit 33 is driven to read out the signal charges from the horizontal transfer unit to produce an output signal conforming to the television system. If  
5 the above operation is performed on the A field and if, on the B field, the number of pixel rows transferred during the period T3 is set to 122 rows and that during the period T4 is set to 118 rows, then the combination of four pixel rows to be cyclically mixed together shifts by two rows  
10 between the two fields, thus allowing the interlaced scanning to be performed as shown in Figure 4. (Figure 4 shows the light receiving surface of the image sensing device and its relation to the displayed screen is vertically inverted.)

15 Let us return to Figure 1. The output signal from the image sensing device 3 is adjusted in gain by the gain adjust circuit 5 and then converted by the A/D conversion circuit 6 into a digital signal. The digital signal is then processed by the signal processing circuit 7 that  
20 performs color signal processing and luminance signal processing, such as generation of color signals, gamma correction, white balance processing and outline enhancement. The image sensing device in this embodiment has an array of vertical stripes of yellow (Ye), green (G) and  
25 cyan (Cy) color filters, so the color signals for Ye, G and Cy are obtained as a series of color points from one line of output signals at all times no matter how many pixels are vertically combined. From these color signals three



primary color signals R, G, B can be obtained from the following calculations.

$$R = Y_e - G$$

$$B = C_y - G$$

5                     $G = G$

The R, G and B signals undergoes the white balance processing and gamma correction processing in the signal processing circuit 7 and are then converted into color difference signals such as R-Y, B-Y or U and V. The  
10 luminance signals and the color difference signals are then entered through the vertical interpolation circuit 8 into the horizontal interpolation circuit 9. In this operation state the signals just pass through the vertical interpolation circuit 8 without being processed. The horizontal  
15 interpolation circuit 9 performs interpolation on the signals in the horizontal direction.

Figure 5 shows the light receiving surface of the image sensing device. As described above, in the operating state of this embodiment, the signals read out during the  
20 vertical effective scanning period correspond to an area having 960 of the 1200 vertically arranged pixels and a horizontal width of 1600 pixels, as shown shaded at A in Figure 5. If the entire light receiving surface of the image sensing device has a 4-to-3 (width to height) aspect  
25 ratio, the shaded area A is more laterally elongate than this aspect ratio. Hence, if the signals of all horizontal pixels of the light receiving surface are displayed, for example, on an NTSC standard television monitor with the

4-to-3 aspect ratio, the image displayed is compressed horizontally and looks vertically elongate, compared with the original image. It is therefore necessary to output during the horizontal effective scanning period only those  
5 signals coming from a pixel area with the horizontal width conforming to the aspect ratio of the television system, as shown by a shaded area B. When the television system has an 4-to-3 aspect ratio, the number of pixels in the horizontal width of the shaded area B is 1280 (= 960  
10 (vertical effective pixels)  $\times$  4/3).

Returning back to Figure 1, the horizontal interpolation circuit 9 performs interpolation processing on the signals from the horizontal 1280 pixels to expand the signals so that they can be output over the entire  
15 horizontal effective scanning period. It also performs switching among different clocks as required. With the above operation, an area having 960 pixels in height and 1280 pixels in width is demarcated from the light receiving surface as signals conforming to the television system.  
20 Then, the luminance signal and the color difference signal are encoded by the encoder circuit 12 into television signals, which are then converted by the D/A conversion circuit 13 into analog signals for output. When the recording is specified by the record button 15, the signals  
25 are recorded by the recording unit 10. At this time, the signals may be compressed in the MPEG (Moving Picture Expert Group) format.

Next, the image stabilizing operation will be

explained. Image-unstability information obtained by the gyro sensors 16a, 16b that detect vertical and horizontal image-unstabilities is entered into the image-unstability decision circuit 17, which checks the received information for the amount and direction of the image-unstability and converts them into the number of pixels in vertical and horizontal directions on the light receiving surface of the image sensing device. Based on the converted pixel numbers, the position of an extracted area (effective pixel area) on the light receiving surface is shifted in a direction that cancels the image-unstability. This can correct the image-unstability. The positional shifting of the extracted area is performed as follows. The shifting in the vertical direction can be made by changing the number of pixel rows transferred during the periods T3 and T4 in Figure 3 and the shifting in the horizontal direction made by changing the interpolation start position in the horizontal interpolation circuit 9.

The operation during the moving video mode has been described above. Next, the operation performed when the static image mode is selected by the mode selector switch 14 will be explained.

In the static image mode, too, until the recording is requested by the record button 15, the camera outputs signals compatible with the television system to monitor the angle of view. Unlike the moving video photographing, all of the effective pixels on the image sensing device are used in this embodiment during the still image

photographing to produce signals with as high a resolution as possible. Hence, during the monitoring the television signals need to be generated from the signals coming from the entire pixel area.

5           The image sensing device of this embodiment has 1200 vertically arranged pixels, and the number of lines of output signals from the image sensing device can be made to match the number of effective scanning lines of NTSC system, which is assumed to have 240 scanning lines, by  
10 vertically mixing five pixels ( $= 1200/240$ ). To make the image sensing device operate in this manner, the one-pixel-row transfer operation is performed five times during each horizontal blanking period in the vertical effective scanning period shown in the pulse timing diagram of Figure  
15 3. With this operation, the signal charges of five pixel rows can be mixed by the horizontal transfer unit 33. As for the transfer operations during the periods T3 and T4 in the vertical blanking period, because the interlaced scanning is carried out, only two pixel rows are transferred  
20 during the period T3 on the B field, with no transfer operations performed in other vertical blanking periods (In this embodiment,  $1200/240 = 5$  with no remainder produced, so no further transfer is necessary; if, however, a remainder occurs, the remaining pixels need only be trans-  
25 ferred during the periods T3 and T4).

The charges mixed by the horizontal transfer unit 33 are read out by driving the horizontal transfer unit 33 during the horizontal effective scanning period. With the

above operations, the signal charges of all pixels on the image sensing device can be read out in a manner conforming to the television system. The output signal from the image sensing device 3 is, as during the moving image photo-  
5 graphing, adjusted in gain by the gain adjust circuit 5 and converted by the A/D conversion circuit 6 into a digital signal, which is then subjected to the color signal processing and the luminance signal processing in the signal processing circuit 7 before being entered into the  
10 vertical interpolation circuit 8. During the static image monitoring, the vertical interpolation circuit 8 performs a vertical gravity center correction on the received signals.

Figure 6 shows combinations of pixels to be cyclically mixed on the A field and the B field and also  
15 the vertical position of the gravity center of the mixed signals. In the interlaced scanning, scanning lines of the A field and the B field are located at the centers of adjoining scanning lines on other field. Hence, the signal samplings in the camera system for the two fields must be  
20 180 degrees out of phase in the vertical direction. In the operating state of this embodiment, however, because five pixels are mixed together, the gravity centers of the output signals for the A field and the B field are deviated 36 degrees ( $= 1/2$  pixel or  $1/10$  the line-to-line distance  
25 on the same field) from the ideal sampling phase difference of 180 degrees, as shown in Figure 6. To correct this requires generating a signal from two adjoining output lines by interpolation. For example, if we let an nth

output line on a field be  $S_n$  and an  $(n+1)$ th output line on the same field be  $S_{n+1}$ , then a signal  $S_n'$  obtained by calculating  $S_n' = (S_n \times 9/10) + (S_{n+1} \times 1/10)$  is one whose gravity center is shifted by  $1/10$  output line from the gravity center of the  $n$ th output line toward the  $(n+1)$ th output line. The above calculation can also be performed on the signals for the B field to correct the gravity center deviation of sampling. In this embodiment, however, to equalize the effects of interpolation of the A field and the B field, the following calculations are performed to correct the  $n$ th output line by  $1/20$  line toward the  $(n-1)$  line on the A field and by  $1/20$  line toward the  $(n+1)$ th line on the B field.

A field:  $S_n' = (S_n \times 19/20) + (S_{n-1} \times 1/20)$

15 B field:  $S_n' = (S_n \times 19/20) + (S_{n+1} \times 1/20)$

While this embodiment performs the interpolation based on the calculation of two adjoining lines of output signals, a greater number of lines may be used for the interpolation processing. The output signal of the vertical interpolation circuit 8 is supplied to the horizontal interpolation circuit 9, which in this operating state does nothing but passes the signal. Then, as in the case of the moving image photographing, the signal is encoded by the encoder circuit 12 into a television signal, which is then converted by the D/A conversion circuit 13 into an analog signal for output. As described above, the television signals can be generated from all of the pixel area of the image sensing device also during the static

image mode.

Next, the operation performed when the recording is requested by the record button 15 will be described. During the monitoring in the static mode, the signals are mixed together inside the image sensing device to reduce the number of signals and thereby generate television signals. During recording, however, the mixing processing is not performed and all the pixel signals need to be read out independently of each other in order to produce high resolution signals. To realize this, the one-pixel-row transfer operation is performed only once during each horizontal blanking period in the vertical effective scanning period shown in the pulse timing diagram of Figure 3. This causes only the signal charges for one pixel row to be transferred into the horizontal transfer unit 33, which is then driven to read out the signal charges for one pixel row. Repeating this operation the number of times equal to the number of vertically arranged pixel rows enables the signal charges of all pixel rows to be read out independently of each other. The transfer operation is not done during the periods T3 and T4 in the vertical blanking period.

The signal charges thus read out are adjusted in gain by the gain adjust circuit 5 and converted by the A/D conversion circuit 6 into digital signals, which are then subjected to the color signal processing and the luminance signal processing in the signal processing circuit 7, after which the signals are supplied through the vertical inter-

polation circuit 8 and the horizontal interpolation circuit 9 to the recording unit 10 where they are recorded. At this time, no interpolation processing is performed by the vertical interpolation circuit 8 or horizontal interpolation circuit 9. The recording unit 10 may compress the signals in the JPEG (Joint Photographic Expert Group) format, for example. Because during the static image recording, no television signal can be generated, an image immediately before starting the recording or a single color image is output as the television signal for monitoring purpose. With the above operation, high resolution signals obtained from all the pixels of the image sensing device can be recorded. Although in this embodiment the recording unit is used commonly for the moving video mode and for the static image mode, dedicated recording units may be provided separately for these modes.

As explained above, since there is no limit on the number of vertically arranged pixels in this embodiment, an image sensing device with a large enough pixel number even for still images can be used to photograph highly detailed still images and satisfactory moving images.

Further, the signal mixing and the vertical signal transfer during the vertical blanking period allow the signals from the image sensing device with a large number of pixels to be read out in a manner that conforms to the television system. This in turn can reduce image quality degradation and realize the moving image photo-



graphing with an image stabilizing function and the monitoring during still image photographing.

Only the output signals from that horizontal segment which virtually corresponds to the television system's aspect ratio with respect to the vertical segment are extracted and output over the entire horizontal effective scanning period of the television system. This ensures that the output signals obtained conform to the television system's aspect ratio regardless of the extracted vertical segment position.

Further, the image sensing device is driven in such a way as to shift the position of the pixels to be cyclically mixed together every display cycle of the television system in order to output interlaced signals. With this arrangement, the interlaced scanning can be performed even when an image sensing device with a large number of pixels is used.

Further, the output signals produced by the mixing are interpolated so that the gravity centers of the output signals interlaced every display cycle have a phase difference of 180 degrees in the vertical direction. This ensures that the interlaced output signals have no deviation from the ideal 180-degree phase difference during interlacing even when an interlace phase deviation would normally occur, as when odd numbered pixels are mixed together.

In this embodiment, the image sensing device has 1200 vertically arranged pixels, and four pixels are mixed

together during the moving video mode and five pixels during the static image mode. Because the area of image-stabilization pixels may or may not be used and set to any desire size, the number of pixels to be cyclically mixed  
5 together in each mode needs only to be equal to or less than the integral part of a quotient of the number of vertically arranged pixels divided by the number of television system's effective scanning lines (in the above example, 5 or less). (The number of vertically arranged  
10 pixels does not need to be divisible and, in the above example, may be more than 1200).

The number of vertically arranged pixels for static image photographing needs only to be three or more times the number of effective scanning lines on each field  
15 of the television system. In this embodiment the vertically adjoining pixels are mixed together to reduce the number of output lines from the image sensing device during the vertical effective scanning period. The number of lines of output signals can also be reduced by a so-called  
20 culling operation, by which only one line of signal charges of pixels is read out for every predetermined number of lines.

While in this embodiment the vertical transfer unit of the image sensing device is formed as a CCD that is  
25 driven by three phase pulses for each pixel, the image sensing device may have any desired structure as long as it can realize the mixing or culling of pixels that meets the above conditions.

5

Although this embodiment described the case of NTSC system, the invention can also be applied to other television systems, such as PAL standard, with different numbers of effective scanning lines.

10

In summary, a variety of constructions essentially equal in the working principle to this embodiment can be realized by the use of an image sensing device that has an arbitrary number of vertically arranged pixels  $N$  three or more times the number of effective scanning lines  $M$  of each field of the television system and which allows the vertical mixing or culling of that number of pixels which is at least one of integers equal to or less than the integral part of a quotient of  $N$  divided by  $M$  (a number of lines of output signals corresponds to  $1/K$  the number of vertically arranged pixels  $N$  of the image sensing device).

20

Next, another embodiment of the present invention will be described by referring to Figure 7 showing the configuration of the embodiment. The configuration shown in Figure 7 differs from that of Figure 1 in that it has a view angle change switch 18. In Figure 7 constitutional elements identical with those shown in Figure 1 are assigned like reference numbers and explanations on the constitutional elements performing the same operations as those in Figure 1 are omitted here.

25

The operations of the moving video mode, the monitoring during the static image mode and the static image recording are similar in normal condition to the operations of the previous embodiment which was explained with reference to the configuration diagram of Figure 1. An operation performed when during the moving video mode a

30

request to change the angle of view is made by the view angle change switch 18 will be described.

In the normal condition of this embodiment, as explained in the previous embodiment, the mixing of four  
5 vertically arranged pixels, the vertical transfer during the vertical blanking period and the horizontal interpolation processing are performed to extract an area of 960 pixels in height and 1280 pixels in width from the entire pixel area to generate television signals. When a view  
10 angle change (which means a zooming function without image quality degradations in the vertical direction) is requested by the view angle change switch 18, three vertically arranged pixels are mixed together and the signals from the excess vertically arranged pixels are read  
15 out during the vertical blanking periods before and after the vertical effective scanning period.

In this embodiment, signals of 480 pixels ( $= 1200 - 240 \times 3$ ) or 160 lines of output signals after mixing ( $= 480/3$ ) need to be read out during the vertical blanking  
20 period. This allows the signals of 720 vertically arranged pixels to be read out as 240 lines of output signals conforming to the television system. To carry out this reading requires, in the pulse timing diagram of Figure 3, transferring the signals of three pixel rows during each  
25 horizontal blanking period in the vertical effective scanning period and also transferring a total of 480 pixel rows ( $= 160$  lines of output signals) during the T3 and T4 periods in the vertical blanking period. The combinations

of pixels to be cyclically mixed together are changed from one field to another to achieve the interlaced scanning.

The output signals of the image sensing device 3 are supplied to the gain adjust circuit 5. Because the signal level produced as a result of the 3-pixel mixing is 3/4 the signal level of the 4-pixel mixing, the gain of the gain adjust circuit 5 is increased to 4/3 the gain of the 4-pixel mixing to make the 3- and 4-pixel-mixed input signal levels to the subsequent circuit equal. Then, the signals are processed by the A/D conversion circuit 6 and the signal processing circuit 7 before being supplied to the vertical interpolation circuit 8. The combinations of pixels to be cyclically mixed on the A field and the B field and the vertical positions of the gravity centers of the mixed signals are shown in Figure 8. As in the static image monitoring of the previous embodiment, the phase difference between the two fields is 180 degrees. Because the sampling phases of the fields are deviated from the ideal 180-degree phase difference, the vertical position of the gravity centers are corrected by the vertical interpolation circuit 8. The amount of phase deviation in this operating state is 60 degrees (= 1/2 pixel or 1/6 the line-to-line distance on the same field). To correct the phase deviation evenly on the both fields, the following calculations should be performed.

$$\text{A field: } S_n' = (S_n \times 11/12) + (S_{n-1} \times 1/12)$$

$$\text{B field: } S_n' = (S_n \times 11/12) + (S_{n+1} \times 1/12)$$

As described earlier, the interpolation process-

ing may use three or more output lines. Next, the horizontal interpolation circuit 9 horizontally expands the signals from that horizontal segment which corresponds to the 4-to-3 aspect ratio with respect to the 720 vertically  
5 arranged pixels (i.e., signals from a horizontal 960-pixel segment ( $=1600 \times 720/1200$ ) in this operating state) so that the expanded signals can be output during the entire horizontal effective scanning period. With the above operation, an area of 720 pixels in height and 960 pixels  
10 in width can be extracted from the light receiving surface.

Next, when the view angle change is requested again by the view angle change switch 18, two vertically arranged pixels are mixed together, an area of 480 vertically arranged pixels is read out during the vertical  
15 effective scanning period, and the horizontal interpolation circuit 9 expands the signals from the horizontal 640-pixel segment and outputs the expanded signals during the entire horizontal effective scanning period to extract an area of 480 pixels in height and 640 pixels in width. (During the  
20 two-pixel mixing, because the interlace phase deviation does not occur, the gravity center position correction by the vertical interpolation circuit 8 is not performed.) If a further view angle change is requested by the view angle change switch 18, the operation is restored to a normal  
25 state where four vertically arranged pixels are mixed together.

As a result of the above operation, the area extracted from the light receiving surface of the image

sensing device can be changed to three different areas: (A) 960 pixels high by 1280 pixels wide, (B) 720 pixels high by 960 pixels wide and (C) 4880 pixels high by 640 pixels wide. That is, the angle of view can be changed to three  
5 different angles. With the area A produced by the 4-pixel mixing taken as a reference, the area B produced by the 3-pixel mixing can provide an image enlarged by 1.33 times and the area C produced by the 2-pixel mixing can provide an image enlarged by two times. It should be noted here  
10 that because the three different areas are chosen by changing the number of pixel to be cyclically mixed together in order to make the number of the effective output lines from the imaging device agree with the number of the effective scanning lines of the television system,  
15 the angle of view can be changed while maintaining a good image with no image quality degradation in the vertical direction, when compared with an ordinary so-called digital zoom which generates effective scanning lines of signals by interpolating a small number of output lines. During the  
20 monitoring of a static image, too, it is possible to perform the similar operation of changing the angle of view by changing the number of pixel rows to be cyclically mixed together.

As described above, in addition to the advantages  
25 provided by the previous embodiment, this embodiment can also realize the view angle change with little image quality degradation even for still images by using an image sensing device with a large number of pixels and changing

the number of pixels to be cyclically mixed together.

Further, because changes in signal level caused when the number of pixels to be cyclically mixed is changed are absorbed by the gain adjust means, the input signal  
5 level to the subsequent signal processing means can be kept constant.

While in this embodiment, the view angle change is performed by the view angle change switch 18, the angle of view may be changed continuously by a zoom switch. In  
10 this case, when the magnification factor does not reach the value that is obtained by changing the pixel mixing, the digital zoom performs the ordinary interpolation processing. In this embodiment, when the magnification factor is 1 or more and less than 1.33, the 4-pixel mixing is  
15 performed; for the factor of 1.33 or more and less than 2, the 3-pixel mixing is done; and for the factor of 2 or higher, the 2-pixel mixing is carried out. The mixing operation may be interlocked with an optical zooming mechanism.

20 Regardless of the number of pixels in the image sensing device, the structure of the image sensing device or the television system employed, this embodiment, as in the previous embodiment, may also use an image sensing device that has an arbitrary number of vertically arranged  
25 pixels N three or more times the number of effective scanning lines M of each field and which allows the vertical mixing or culling of those numbers of pixels which are at least two of integers equal to or less than the integral



part of a quotient of N divided by M. The use of this image sensing device can form a variety of constructions essentially equal in the working principle to this embodiment.

5               Next, a further embodiment of the present invention will be described. The overall configuration of this embodiment is similar to that of Figure 1, except that the inner structure of the image sensing device 3 is different. The configuration of the image sensing device  
10 in this embodiment is shown in Figure 10. In Figure 10, denoted 30 are pixels formed of photodiodes, which are arranged horizontally and vertically in a grid pattern. On these grid-arrayed pixels three types of color filters that pass yellow (Ye), green (G) and cyan (Cy), respectively,  
15 are arranged in so-called vertical stripes.

              In this embodiment, the image sensing device has an array of pixels measuring 864 pixels vertically and 1152 pixels horizontally. A vertical transfer unit 32 is a CCD which is driven by six phase pulses V1, V2, V3, V4, V5, V6.  
20 This CCD has a two-gate structure in which each pixel corresponds to two phase pulses and six gates corresponding to the six phase pulses are repeated for every three pixels. Transfer gates 31 for transferring the signal charge of each pixel to the vertical transfer unit 32 are  
25 commonly connected to respective gates of the vertical transfer unit 32 corresponding to the pulses V1, V3, V5. An operation to transfer the signal charge from each pixel to the vertical transfer unit 32 in response to peak values

of pulses applied to the commonly connected gates and an operation to transfer the charge vertically are performed separately.

A horizontal transfer unit 33 horizontally  
5 transfers the charges supplied from the vertical transfer units 32 and outputs them successively through an output amplifier 34 from the output terminal. This image sensing device, unlike the one in the previous embodiment, cannot vertically transfer all pixels independently of each other,  
10 but can mix together the signal charges of three vertically adjoining pixels inside the vertical transfer unit 32 before transferring them.

First, the operation performed in this embodiment during the moving video mode will be explained. In the  
15 image sensing device of this embodiment the effective number of vertically arranged pixels is 864. If three pixels are vertically mixed, the signals of the 720  
( $=240 \times 3$ ) of the 864 vertically arranged pixels can be used as the effective signals and the remaining 144 ( $= 864 -$   
20 720) pixels can be used as the image-unstability correction pixel area.

Figure 11 shows the timings of vertical drive pulses for the image sensing device of Figure 10 during this operation mode, with V1, V2, V3, V4, V5, V6 represent-  
25 ing the six phase drive pulses applied to the respective gates of the CCD or vertical transfer unit 32. In Figure 11, during a period T1 included in the vertical blanking period, the drive pulses V1, V3 and V5 are held high to

cause the signal charge of each pixel to be transferred to under the V1, V3 and V5 gates of the vertical CCD. Then, the V2 and V4 pulses are changed from low level to middle level to mix the charges of the adjoining three pixels.

- 5 After the mixing, the V5 pulse is changed from middle level to low level to hold the mixed signal charges under the V1, V2, V3, V4 gates.

Next, a series of operations performed during a period T2 (changing the drive pulses from middle level to  
10 low level or from low level to middle level in the order of V1, V2, V3, V4, V5 and V6) causes one mixed output line (3 pixel rows) to be transferred and held again under the V1, V2, V3, V4 gate. By repeating this series of operations, a  
15 desired number of output lines of mixed signal charges can be transferred.

In Figure 11, during a period T3 included in the vertical blanking period before the vertical effective scanning period and during a period T4 included in the vertical blanking period after the vertical effective scan-  
20 ning period, the transfer operation for one output line is repeated a total of 144 times to transfer 144 output lines of signal charges not used for image forming to the horizontal transfer unit 33 at high speed during the vertical blanking periods. During subsequent periods T5  
25 and T6 in the vertical blanking periods, the horizontal transfer unit 33 is driven for predetermined periods to output the signal charges transferred to the horizontal transfer unit 33 from the output terminal.

Next, in the vertical effective scanning period of Figure 11, the one-output-signal-line transfer operation is performed during each horizontal blanking period. Then, during the horizontal effective scanning period, the

5 horizontal transfer unit 33 is driven to read out the signal charges from the horizontal transfer unit 33. With this operation the signal charges of three pixels mixed together can be read out in a way conforming to the television system. As shown in Figure 11, the signals for

10 the A field are mixed by changing the V2 and V4 pulses to middle level after transferring the signals from the pixels to the vertical transfer unit 32. The signals for the B field, on the other hand, are mixed by changing the V2 and V6 pulses to middle level. With this mixing method, the

15 combinations of pixels to be cyclically mixed together can be changed from one field to another, thereby realizing the interlaced scanning. The output signals from the image sensing device are processed in the similar manner to that of the previous embodiment. A vertical interpolation

20 circuit 8 performs the gravity center correction, as in the 3-pixel mixing in the previous embodiment, and a horizontal interpolation circuit 9 performs interpolation processing to match the aspect ratio with that of the television system.

25           Next, the operation during the monitoring in the static image mode will be explained. It is assumed that the still image photographing is done by using all effective pixels of the image sensing device, as in the previous

embodiment. The image sensing device of this embodiment has 864 vertically arranged pixels and, when 3-pixel mixing is done as in the moving video taking, the number of output lines is 288 ( $=864/3$ ), which means that these signal lines cannot be read out in a manner conforming to the television system. Hence, during the monitoring in the static image mode, vertical 6-pixel mixing is performed. The 6-pixel mixing can be achieved by transferring to the horizontal transfer unit 33 in each horizontal blanking period two output lines of signal charges each of which line has been generated by vertically mixing three pixels within the vertical transfer unit 32. The 6-pixel mixing can reduce the number of output lines from the image sensing device down to 144 ( $= 864/6$ ) lines. The output signals of the image sensing device that were reduced to 144 output lines are interpolated by the vertical interpolation circuit 8 to transform the 144 output lines of signals into 240 lines of signals, which conform to the television system. To generate 240 lines of signals from the 144 lines requires interpolation processing that generates five lines from three lines ( $144/240 = 3/5$ ).

Figure 12 shows how the interpolation is performed using two adjoining output lines. Let three output lines of the image sensing device be  $n$ ,  $n+1$  and  $n+2$ . The five output lines of signals can be generated from the following calculations.

$$n' = n$$

$$n' + 1 = n/2 + (n+1)/2$$

$$n' + 2 = n + 1$$

$$n' + 3 = (n+1)/2 + (n+2)/2$$

$$n' + 4 = n + 2$$

Three or more output lines of signals may be used  
5 for interpolation processing. With the above operation,  
television signals can be generated by using signals of all  
pixels of the image sensing device also during the monitor-  
ing in the static image mode.

Next, the operation performed when the recording  
10 is requested by the record button 15 will be explained. In  
the recording process, the mixing processing is not  
performed and signals of all pixels need to be read  
independently of each other in order to obtain high-  
resolution signals. To realize this, the aperture 2 is  
15 first closed and then, during the period T2 in the pulse  
timing diagram of Figure 11, only the V1 pulse is raised to  
high level to transfer the signal charge of only the pixel  
adjacent to the V1 gate to the vertical transfer unit 32.  
Then, the vertical transfer unit 32 and the horizontal  
20 transfer unit 33 are successively driven to read out the  
signal charges. Similarly, the V3 pulse is raised to high  
level to read the signal charge of the pixel adjacent to  
the V3 gate, followed by raising the V5 pulse to high level  
to read the signal charge of the pixel adjacent to the V5  
25 gate. With the above processing, the signal charges of all  
pixels can be read out independently in three successive  
operations. The signal charges thus read out are recorded  
in the recording unit 10. At this time, they are

rearranged properly to reconstruct the pixel arrangement on the light receiving surface of the image sensing device.

As described above, this embodiment offers the following advantages. If the number of vertically arranged  
5 pixels is not an integral multiple of the number of scanning lines of the television system, the signals conforming to the television system can be generated from the whole area of effective pixels by performing the pixel mixing and the vertical interpolation.

10 In this embodiment, as in the previous embodiment, regardless of the number of pixels in the image sensing device, the structure of the image sensing device or the television system employed, a variety of constructions essentially equal in the working principle to this  
15 embodiment can be realized by using an image sensing device that has an arbitrary number of vertically arranged pixels  $N$  three or more times the number of effective scanning lines  $M$  of each field and which allows the vertical mixing or culling of that number of pixels which is greater by at  
20 least one than the integral part of a quotient of  $N$  divided by  $M$ .

Next, a further embodiment of the present invention will be explained. This embodiment differs from the previous embodiments in that the image sensing device  
25 have different arrangements of color filters. Figures 13A and 13B show arrangements of color filters in this embodiment. These color filters in both examples are arranged in vertical stripes and, regardless of the number of pixels to

be vertically mixed or culled, the R, G, B primary color signals can be generated from one line of output signals. Figure 13A shows a color filter arrangement on the image sensing device in which white filters (W = passing all  
5 colors) are used instead of the green (G) filters used in the previous embodiment. The R, G, B signals can be obtained by the following calculations.

$$R = W - Cy$$

$$G = Ye + Cy - W$$

10  $B = W - Ye$

When this color filter arrangement is used, a higher sensitivity can be obtained than the color filter arrangement of the previous embodiment. Figure 13B show a color filter arrangement that uses, in stead of comple-  
15 mentary colors, color filters that pass the primary colors R, G, B. This color filter arrangement can directly produce the primary color signals, R, G, B and can provide a camera with good color purity and good color S/N.

With the above color filter arrangements, it is  
20 possible to produce color signals corresponding to the three kinds of color filters from each line of output signals at all times no matter how many pixels are vertically mixed or culled. Therefore, color signals conforming to the television system can be generated  
25 easily.



CLAIMS:

1. An electric camera comprising:

an image sensing device with a light receiving surface having N vertically arranged pixels and an arbitrary number of pixels arranged horizontally, N being equal to or more than three times the number of effective scanning lines M of a display screen of a television system;

a driver to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels of every K pixels to produce a number of lines of output signals which corresponds to the number of effective scanning lines M, K being at least one of integers equal to or less than an integral part of a quotient of N divided by M; and

a signal processing unit to generate image signals by using the out put signals of the image sensing device.

**ABSTRACT OF THE DISCLOSURE:**

An electric camera includes an image sensing device with a light receiving surface having  $N$  vertically arranged pixels and an arbitrary number of pixels arranged horizontally,  $N$  being equal to or more than three times the number of effective scanning lines  $M$  of a display screen of a television system, a driver to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels of  $K$  pixels to produce, during a vertical effective scanning period of the television system, a number of lines of output signals which corresponds to  $1/K$  the number of vertically arranged pixels  $N$  of the image sensing device,  $K$  being an integer equal to or less than an integral part of a quotient of  $N$  divided by  $M$ , and a signal processing unit having a function of generating image signals by using the output signals of the image sensing device.

FIG.1

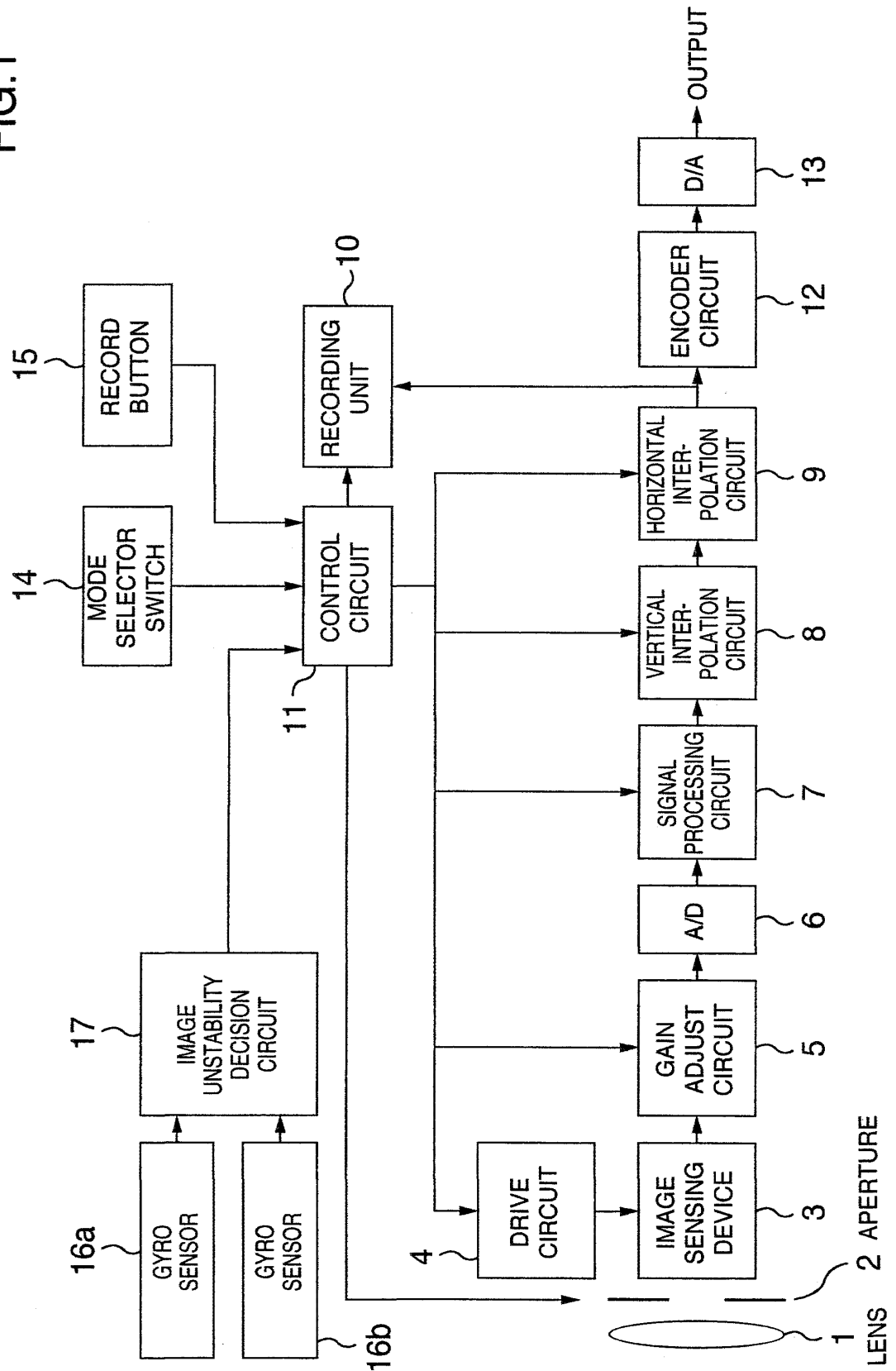


FIG.2

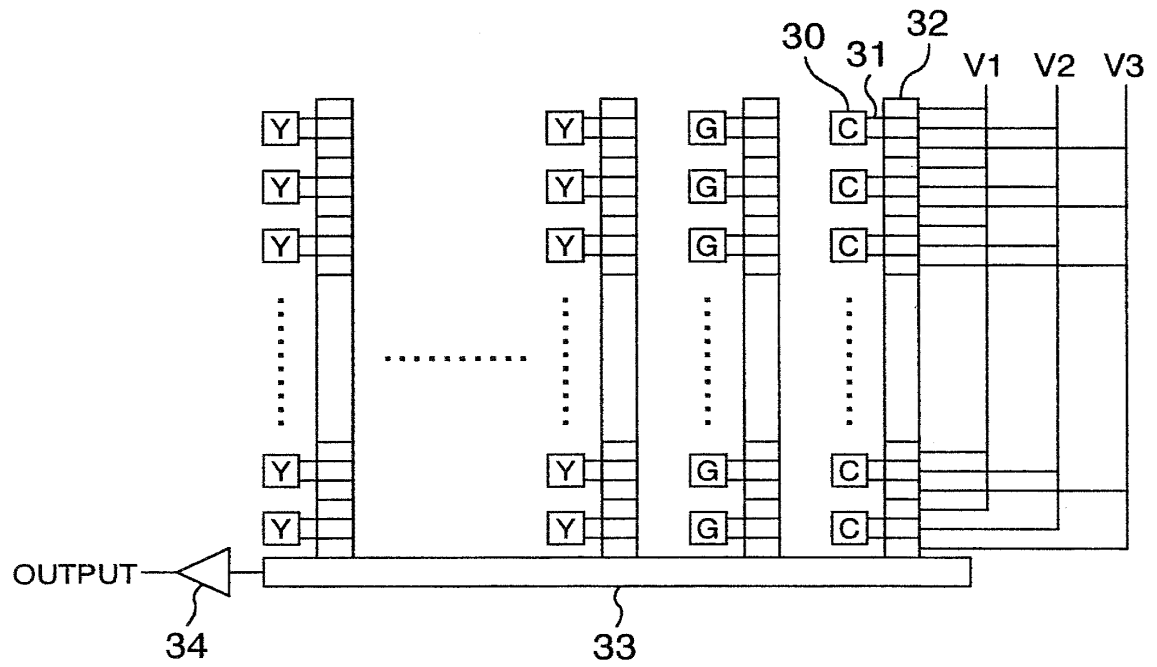


FIG.4

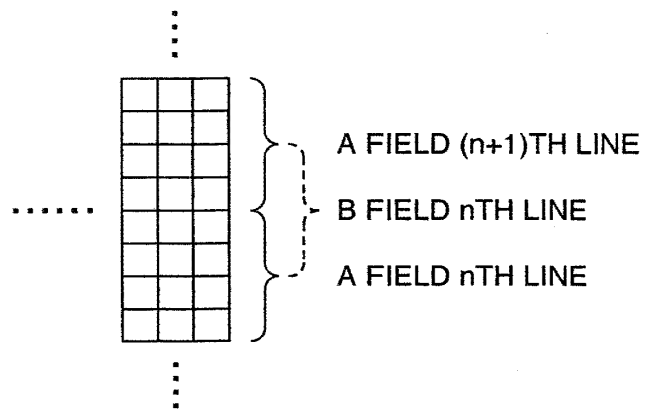


FIG.3

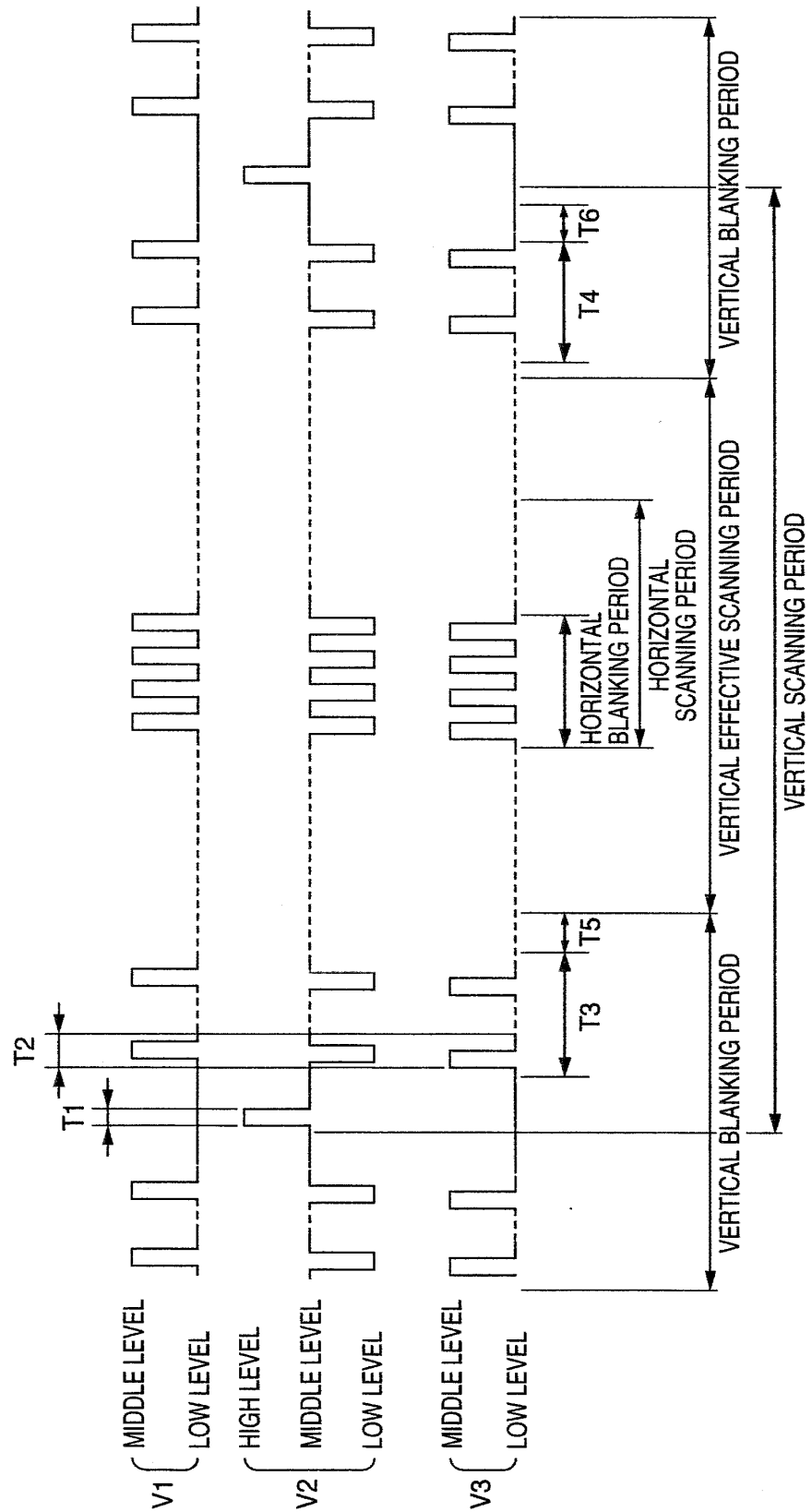


FIG.5

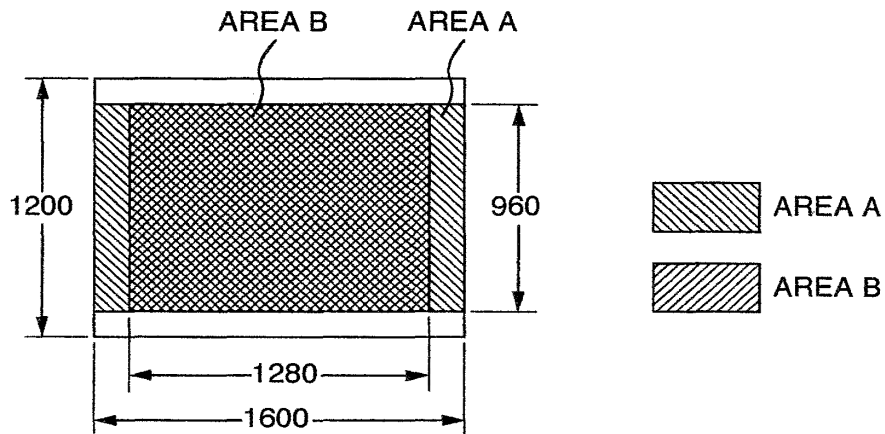


FIG.6

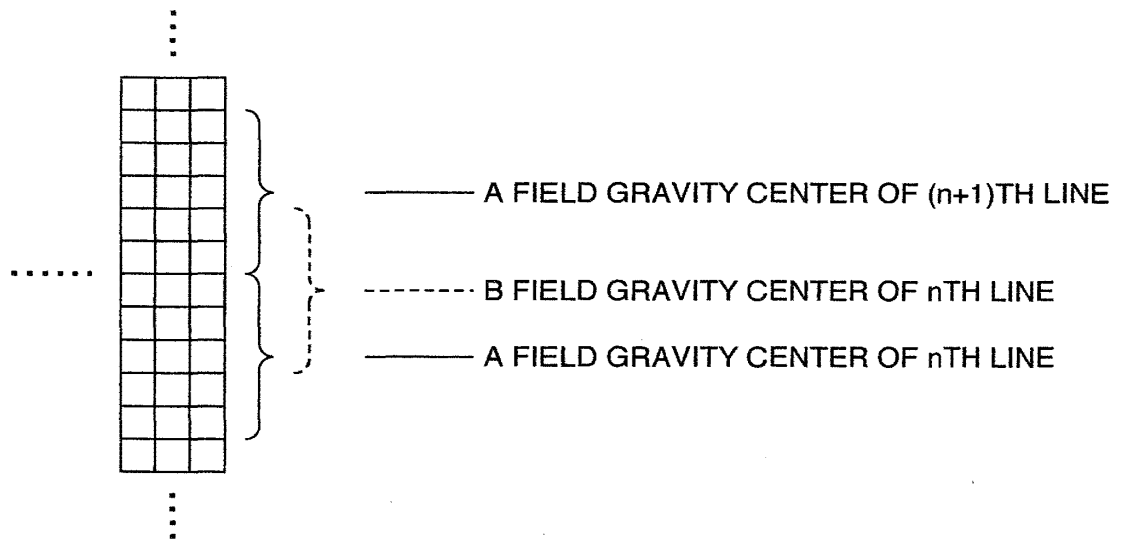


FIG. 7

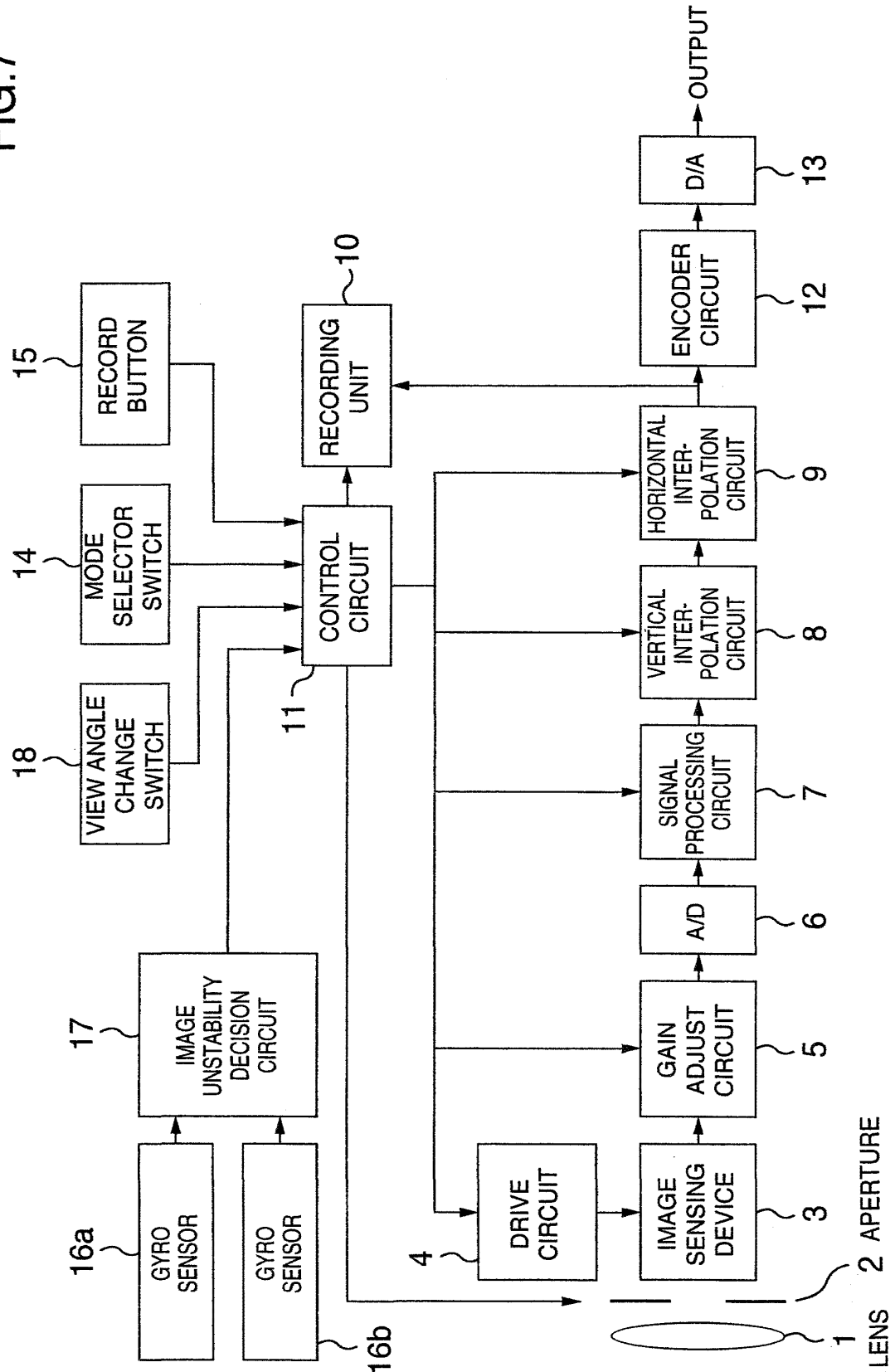


FIG.8

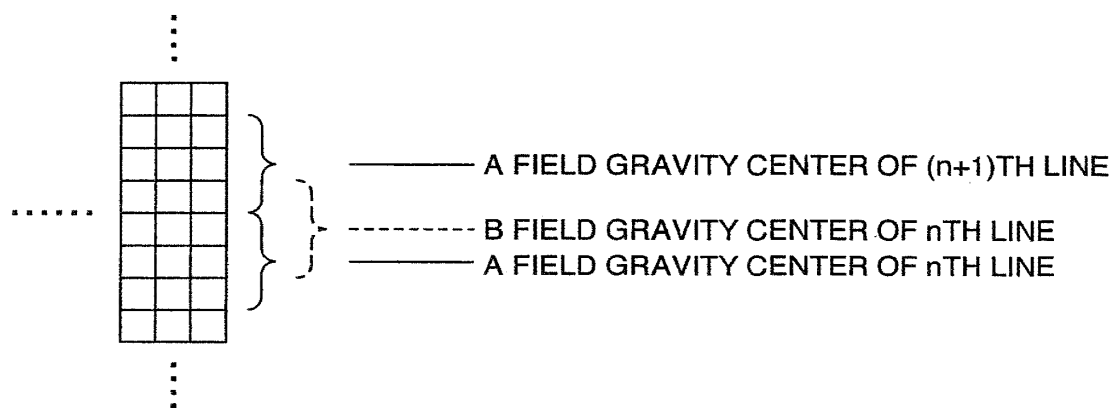


FIG.9

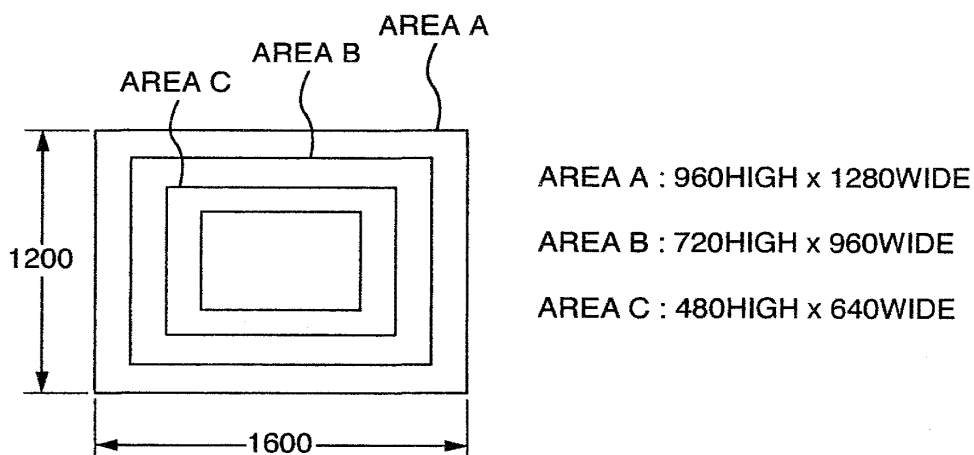




FIG.10

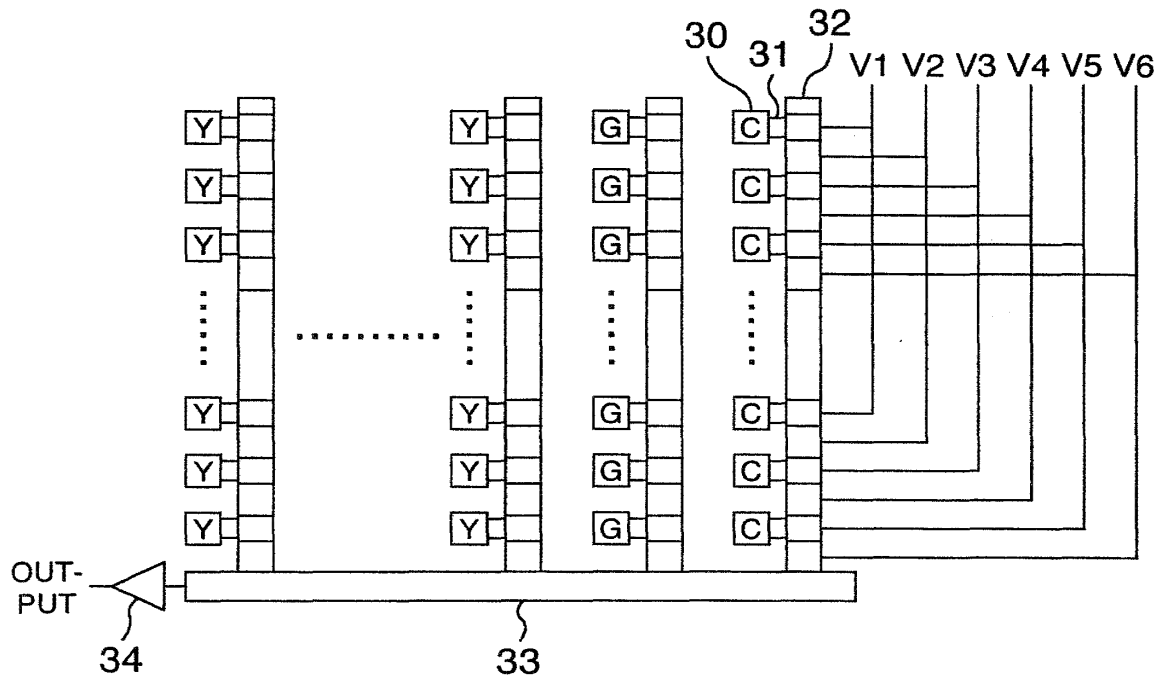


FIG.12

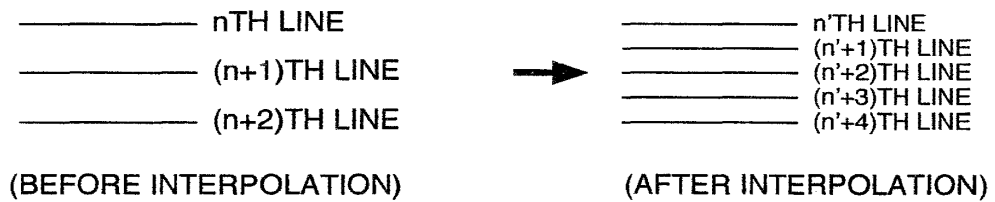


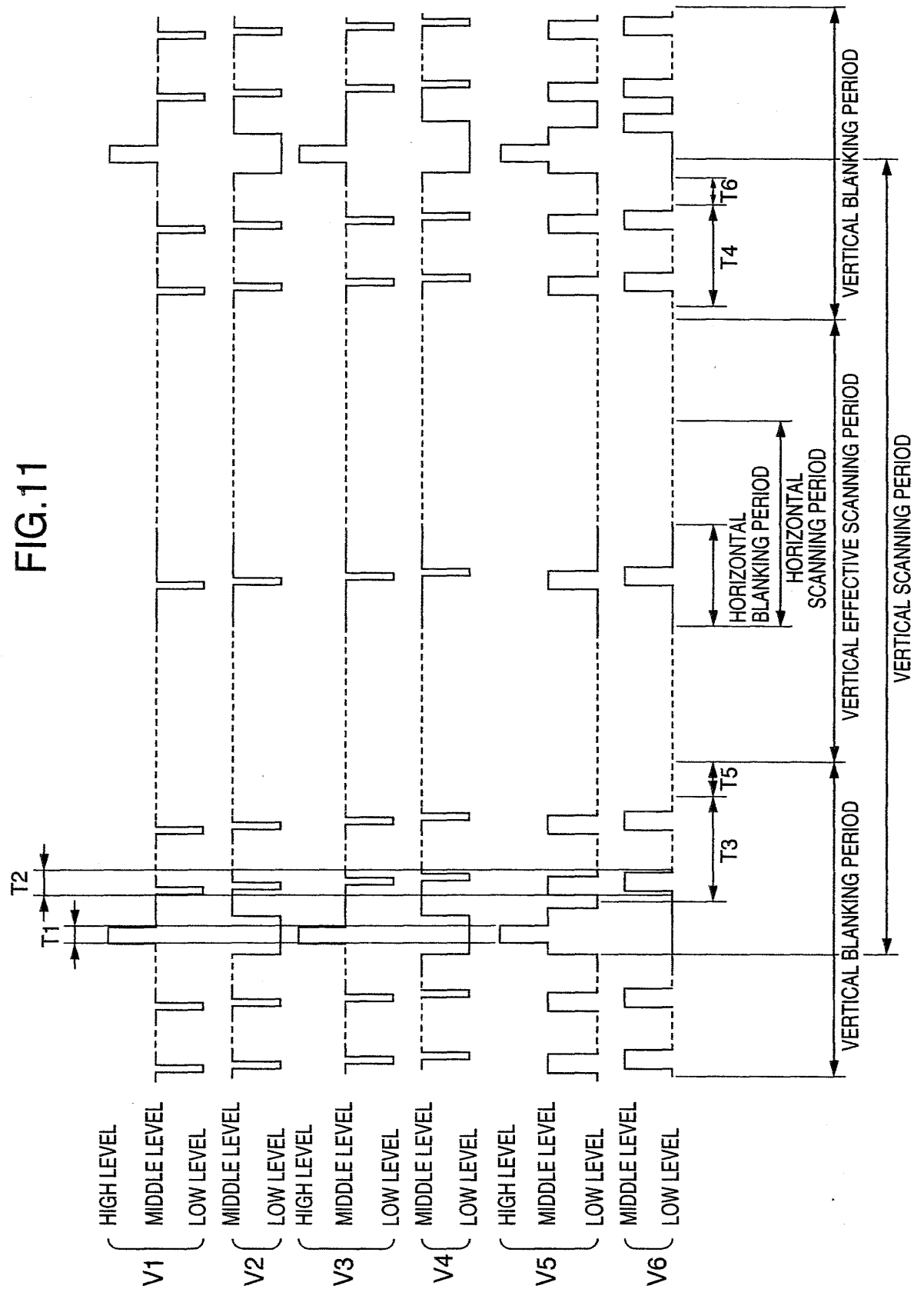
FIG.13A

Ye	W	Cy
Ye	W	Cy
Ye	W	Cy
Ye	W	Cy
Ye	W	Cy

FIG.13B

R	G	B
R	G	B
R	G	B
R	G	B
R	G	B

FIG.11



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: T. NAKANO, ET AL.  
Application No: To be assigned  
Filed: April 29, 2014  
For: ELECTRIC CAMERA  
Group AU: 2663 (Expected)  
Examiner: Luong Trung Nguyen (Expected)

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 CFR 1.97 AND 1.98**

**Mail Stop: NEW APPS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

April 29, 2014

SIR:

Pursuant to Applicants' duty of disclosure, enclosed please find a List, on Forms PTO/SB/08A and PTO/SB/08B, of documents cited in connection with a prior application of the above-identified application, that is, Application No. 13/681,495, filed November 20, 2012.

As all of the documents on the enclosed List were cited in connection with a prior application, Application No. 13/681,495, being relied upon under 35 USC 120 in the above-identified application, copies of these listed documents are not enclosed. See 37 CFR 1.98(d).

This Information Disclosure Statement is being submitted concurrently with the filing of the above-identified application. Clearly, requirements of 37 CFR 1.97(b) are satisfied.

To the extent that the documents on the enclosed List are not in English, it is respectfully submitted that requirements of 37 CFR 1.98(a)(3) are satisfied by English-language abstracts submitted with the respective non-English language

documents, and/or by Search Reports/Official Actions in English or with English translations thereof.

In view of all the foregoing, it is respectfully submitted that all applicable requirements of 37 CFR 1.97 and 1.98 have been satisfied, in connection with all of the documents on the enclosed List. Accordingly, consideration of the listed documents, upon examination of the above-identified application, is respectfully requested.

Kindly charge any shortage in fees due in connection with the filing of this paper to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (case 500.38315CC5), and credit any excess fees to such deposit account.

Respectfully submitted,

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## TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	To be assigned
Filing Date	April 29, 2014
First Named Inventor	T. NAKANO
Title	ELECTRIC CAMERA
Art Unit	n/a
Examiner Name	n/a
Attorney Docket Number	500.38315CC5

### SIGNATURE of Applicant or Patent Practitioner

Signature	/Ayal I. Sharon/	Date (Optional)	April 29, 2014
Name	Ayal I. Sharon	Registration Number	55,986
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

**NOTE:** This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

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\*Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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		Application Number	To be assigned		
		Filing Date	April 29, 2014		
		First Named Inventor	T. NAKANO, et al.		
		Art Unit (expected)	2663		
		Examiner Name (expected)	Luong Trung Nguyen		
Sheet	1	of	2	Attorney Docket Number	500.38315CC5

U.S. PATENT DOCUMENTS						
Examiner Initials'	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)				
		US- 6,661,451		12-2003	Kijima, et al.	
		US- 7,154,539		12-2006	Nishimura, et al.	
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		US- 7,403,226		07-2008	Nakano, et al.	
		US-6,195,125		02-2001	Udagawa et al.	
		US-6,765,616		07-2004	Nakano et al.	
		US-6,906,746		06-2005	Hijishiri et al.	
		US-6,519,000		02-2003	Udagawa, Yoshirou	
		US-5,847,758		12-1998	Iizuka, Tetsuya	

FOREIGN PATENT DOCUMENTS						
Examiner Initials'	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
		JP 9-270959	10-97			
		JP 11-187306	07-99			
		JP 04-323973	11/13/1992	Hitachi, Ltd.		
		JP 11-004456	01/06/1999	Fuji Photo Film Co., Ltd.		
		JP 11-355665	12/24/1999	Fuji Photo Film Co., Ltd.		

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Substitute for form 1449A/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>		<b>Complete if Known</b>			
		Application Number	To be assigned		
		Filing Date	April 29, 2014		
		First Named Inventor	T. NAKANO, et al.		
		Art Unit (expected)	2663		
		Examiner Name (expected)	Luong Trung Nguyen		
Sheet	2	of	2	Attorney Docket Number	500.38315CC5

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)				
		US - 6,970,191		11-2005	Sase et al.	
		US - 5,374,424		03-1998	Sasaki, Takashi	
		US - 6,798,448		09-2004	Motono et al.	
		US - 5,287,192		02-1994	Iizuka, Tetsuya	
		US - 6,765,616		07-2004	Nakano et al.	
		US - 8,059,177		11-2011	Nakano et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> –Number <sup>4</sup> –Kind Code <sup>5</sup> (if known)				

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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POWER OF ATTORNEY BY APPLICANT

私はここのと、添付の伝送書中に同定されている出願書中の、以前のすべての委任状はこれを破棄する。  
I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

☒ 私は下記の顧客番号に関連した特許弁護士を、私/私たちの弁護士あるいは代理人と指名し、添付の伝送書 ((書式PTO/AIA/82A あるいはその同等書類)に記載されている出願に関連した米国特許商標局に対するすべての必要事項を遂行なさせしめる。  
I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

あるいは  
OR

020457

☐ 私は下記の特許弁護士を、私/私たちの弁護士あるいは代理人と指名し、添付の伝送書 ((書式PTO/AIA/82A あるいはその同等書類)に記載されている出願に関連した米国特許商標局に対するすべての必要事項を遂行なさせしめる。  
I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

登録名 Name Registration	番号 Number	登録名 Name Registration	番号 Number

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The address associated with Customer Number:

または  
OR

<input type="checkbox"/> 事務所または個人名 Firm or Individual Name				
住所 Address				
市町村名 City		州名 State		郵便番号 Zip
国名 Country				
電話 Telephone		イーメール Email		

[1/2]

[Page 1 of 2]

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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## 出願者による委任状 POWER OF ATTORNEY BY APPLICANT


私は出願者であり:

I am the Applicant:

- ☐ 発明者あるいは共同発明者である  
Inventor or Joint Inventor
- ☐ 死亡、あるいは禁治産者とされた発明者の法的代理人である  
Legal Representative of a Deceased or Legally Incapacitated Inventor
- ☒ 被譲渡人あるいは発明者が譲渡する義務を負う人物である  
Assignee or Person to Whom the Inventor is Under an Obligation to Assign
- 別面において十分な独占的所有権 (たとえば出願のなかで 37 CFR 1.46(b)(2) のもとにおける請願が出願のなかで受理された、あるいは本書類とともに申請がなされた場合) を有することを示した人物である)  
Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

特許出願人の署名

SIGNATURE of Applicant for Patent

署名 Signature		日付 Date	September 14, 2012
姓名 Name	Shutoku WATANABE	電話 Telephone	
肩書きおよび会社 Title and Company	President and Representative Director Hitachi Consumer Electronics Co., Ltd.		

**注記:** 署名:本書式は 37 CFR 1.33 にのっとり、出願者あるいは出願者の代理人の署名がなされていなければならない。署名およびその証明必要条件については 37 CFR 1.4 を参照のこと。署名がひとつ以上ある場合はその数の書式を提出すること。下記参照\*。

**NOTE:** Signature - This form must be signed by the applicant or applicant's representative in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below \*.

- ☐ \*提出書式の合計数は \_\_\_\_\_ である。
- ☐ \*Total of \_\_\_\_\_ forms are submitted.

[2/2]

[Page 2 of 2]

## プライバシー保護法声明書

1974 年プライバシー保護法 (P.L. 93-579) は、特許出願あるいは特許に関する添付種類の提出に関連して、特定情報があなたに与えられるよう規定しています。したがって、同法規の規定にしたがい、下記のことがらを銘記してください。

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7. 本記録システムの記録は通常使用目的として、44 U.S.C. 2904 及び 2906 に基づく記録管理慣行及びプログラムの改善を推奨するために、米一般調達局長官 (GSA) により、当機関の責任の一部として行われる記録の検査機関中に、GSA、またはその被指名人に開示される場合があります。上記の開示は、本目的のための記録検査を規定する GSA 規定、及び関連 (GSA あるいは商務省) の指令に準拠して行われます。かかる開示は、個人を特定する目的のもとに使用されてはなりません。
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/264,243	04/29/2014	2673	1740	500.38315CC5	1	1

CONFIRMATION NO. 1644

20457  
ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 1800  
ARLINGTON, VA 22209-3873

## FILING RECEIPT



0000000068414548

Date Mailed: 05/14/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

### Inventor(s)

Takahiro Nakano, Tokyo, JAPAN;  
Ryuji Nishimura, Tokyo, JAPAN;  
Toshiro Kinugasa, Tokyo, JAPAN;

### Applicant(s)

Hitachi Consumer Electronics Co., Ltd., Tokyo, JAPAN

### Assignment For Published Patent Application

Hitachi Consumer Electronics Co., Ltd., Tokyo, JAPAN

**Power of Attorney:** The patent practitioners associated with Customer Number 020457

### Domestic Priority data as claimed by applicant

This application is a CON of 13/681,495 11/20/2012 PAT 8736729  
which is a CON of 12/845,266 07/28/2010 PAT 8339493  
which is a CON of 10/660,710 09/12/2003 PAT 8059177  
which is a DIV of 09/520,836 03/08/2000 PAT 6765616

**Foreign Applications** (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)  
JAPAN 00-006064 01/11/2000

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

**If Required, Foreign Filing License Granted:** 05/13/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/264,243**

**Projected Publication Date:** 08/21/2014

**Non-Publication Request:** No

**Early Publication Request:** No

**Title**

ELECTRIC CAMERA

**Preliminary Class**

358

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

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page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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**Title 37, Code of Federal Regulations, 5.11 & 5.15**

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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875						Application or Docket Number 14/264,243			
<b>APPLICATION AS FILED - PART I</b>									
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)		
BASIC FEE <small>(37 CFR 1.16(a), (b), or (c))</small>	N/A	N/A	N/A			N/A	280		
SEARCH FEE <small>(37 CFR 1.16(k), (l), or (m))</small>	N/A	N/A	N/A			N/A	600		
EXAMINATION FEE <small>(37 CFR 1.16(o), (p), or (q))</small>	N/A	N/A	N/A			N/A	720		
TOTAL CLAIMS <small>(37 CFR 1.16(i))</small>	1	minus 20 = *				x 80 =	0.00		
INDEPENDENT CLAIMS <small>(37 CFR 1.16(h))</small>	1	minus 3 = *				x 420 =	0.00		
APPLICATION SIZE FEE <small>(37 CFR 1.16(s))</small>	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00		
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00		
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600		
<b>APPLICATION AS AMENDED - PART II</b>									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)		
	Total <small>(37 CFR 1.16(i))</small>	*	Minus **	=		x	=		
	Independent <small>(37 CFR 1.16(h))</small>	*	Minus ***	=		x	=		
	Application Size Fee (37 CFR 1.16(s))								
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
TOTAL ADD'L FEE					TOTAL ADD'L FEE				
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)		
	Total <small>(37 CFR 1.16(i))</small>	*	Minus **	=		x	=		
	Independent <small>(37 CFR 1.16(h))</small>	*	Minus ***	=		x	=		
	Application Size Fee (37 CFR 1.16(s))								
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
TOTAL ADD'L FEE					TOTAL ADD'L FEE				
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## NOTICE



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## INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

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- A properly executed inventor's oath or declaration has not been received for the following inventor(s):  
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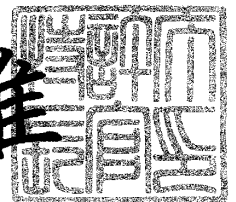
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【発明の名称】 撮像装置

【特許請求の範囲】

【請求項 1】

テレビジョン方式の一表示画面の有効走査線数 $M$ の3倍以上の数 $N$ の画素を垂直方向に、任意の数の画素を水平方向に配した受光面を備えた撮像素子と、

該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの $K$ 画素周期で、垂直方向に混合または間引きを行い、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように該撮像素子を駆動する駆動手段と、

前記撮像素子の出力信号を用いて画像信号を生成する信号処理手段とを備えていることを特徴とする撮像装置。

【請求項 2】

前記駆動手段は、前記撮像素子の垂直方向の画素数 $N$ から前記混合または間引き周期 $K$ と前記有効走査線数 $M$ との積 $K \cdot M$ を減じた数の垂直画素に対応する画素領域の信号電荷を前記テレビジョン方式の垂直帰線期間内に読み出しまたは掃き捨てることにより、前記テレビジョン方式の有効垂直走査期間内に、前記撮像素子の画素の内 $K \cdot M$ の垂直画素に相当する画素領域の信号電荷を切り出して、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように前記撮像素子を駆動することを特徴とする請求項 1 記載の撮像装置。

【請求項 3】

前記信号処理手段は、該撮像素子の該受光面の内、該切り出した垂直領域に対して該テレビジョン方式の縦横比と略等しくなる水平領域部分に相当する出力信号期間のみを切り出して該テレビジョン方式の有効水平走査期間全体にわたって出力する機能を有することを特徴とする請求項 1 または 2 記載の撮像装置。

【請求項 4】

前記駆動手段は、該テレビジョン方式の表示周期毎に該混合または間引きの画素位置をずらすことによりインターレース信号を出力するように該撮像素子を駆動することを特徴とする請求項 1 ～ 3 のいずれか 1 項に記載の撮像装置。

【請求項 5】

前記信号処理手段は、該混合または間引きによって得られるインターレース出力信号の垂直方向の重心位置が表示周期毎に 180 度の位相差となるように補間する機能を有することを特徴とする請求項 4 記載の撮像装置。

【請求項 6】

前記撮像素子は、該垂直方向の画素数 $N$ を該有効走査線数 $M$ で除した商の整数部またはそれ以下の整数の内少なくとも二つの整数画素周期で垂直方向に混合または間引きすることができ、該駆動手段は、該少なくとも二つの整数に対応した少なくとも二つのモードで、該撮像素子を駆動することを特徴とする請求項 1～5 のいずれか 1 項に記載の撮像装置。

【請求項 7】

前記撮像素子の該駆動手段は、装置内部または外部に設けたズームスイッチ等の画角変化を指示するスイッチ手段からの入力情報に対応して、該混合または間引きの画素周期を変化させることを特徴とする請求項 6 記載の撮像装置。

【請求項 8】

前記撮像素子の出力信号の利得を調整する利得調整手段を有し、該撮像素子の混合の画素周期が変化した時にも、該利得調整手段の出力信号レベルが同一になるように、混合画素周期に対応して該利得調整手段の利得を変化させることを特徴とする請求項 6 または 7 記載の撮像装置。

【請求項 9】

前記撮像装置の手振れを検出する手振れ検出手段を有し、該手振れ検出手段で検出した手振れ量に応じて、該受光面内における垂直方向及び水平方向の切り出し位置を、該手振れを補正するように変化させることを特徴とする請求項 1～8 のいずれか 1 項に記載の撮像装置。

【請求項 10】

テレビジョン方式の一表示画面の有効走査線数 $M$ の 3 倍以上の数 $N$ の画素を垂直方向に、任意の数の画素を水平方向に配した受光面を備えた撮像素子と、該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部より大きな整数であるところの $K$ 画素周期で、垂直方向に混合または間引きを行い、前記テレビ

ジョン方式の有効垂直走査期間内に、前記撮像素子の垂直画素数 $N$ の $K$ 分の一のライン数の出力信号を得るように前記撮像素子を駆動する駆動手段と、  
前記撮像素子の出力信号を用いて画像信号を生成する機能を有する信号処理手段とを備えていることを特徴とする撮像装置。

【請求項 1 1】

テレビジョン方式の一表示画面の有効走査線数 $M$ の 3 倍以上の数 $N$ の画素を垂直方向に、任意の数の画素を水平方向に配した受光面を備えた撮像素子と、

該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの $K$ 画素周期で、垂直方向に混合または間引きを行い、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように該撮像素子を駆動する第 1 の駆動手段と、

該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部より大きな整数であるところの $K$ 画素周期で、垂直方向に混合または間引きを行い、前記テレビジョン方式の有効垂直走査期間内に、前記撮像素子の垂直画素数 $N$ の $K$ 分の一のライン数の出力信号を得るように前記撮像素子を駆動する第 2 の駆動手段と、

前記撮像素子の出力信号を用いて画像信号を生成する信号処理手段とを備え、前記第 1 の駆動手段による駆動と前記第 2 の駆動手段による駆動とを、装置内部または外部に設けたスイッチ手段からの入力情報に対応して選択、切り替えを行うことを特徴とする撮像装置。

【請求項 1 2】

シャッターボタン等のトリガー手段を有し、該トリガー手段によりトリガーが発生した時には、該撮像素子の各画素に蓄積した信号電荷を混合せずに全画素独立で読み出すことを特徴とする請求項 1 ～ 1 1 のいずれか 1 項に記載の撮像装置。

【請求項 1 3】

前記撮像素子の受光面を構成する画素配列の各画素に対して、水平方向に第一、第二、および第三の各色を各々透過する色フィルターを三画素周期で周期的に配し、垂直方向には同一種類の色を透過する色フィルターを配したことを特徴と

する請求項 1 ～ 1 2 のいずれか 1 項に記載の撮像装置。

【請求項 1 4】

前記第一、第二、および第三の各色は各々黄色、緑、シアンであることを特徴とする請求項 1 3 記載の撮像装置。

【請求項 1 5】

前記第一、第二、および第三の各色は各々黄色、白色、シアンであることを特徴とする請求項 1 3 記載の撮像装置。

【請求項 1 6】

前記第一、第二、および第三の各色は各々赤、緑、青であることを特徴とする請求項 1 3 記載の撮像装置。

【発明の詳細な説明】

【0 0 0 1】

【発明の属する技術分野】

本発明は、固体撮像素子を用いたビデオカメラ、VTR 一体型カメラ、電子スチルカメラ等の撮像技術に係り、特に、画素数の多い固体撮像素子を用いた撮像装置に関する。

【0 0 0 2】

【従来の技術】

CCD (Charge Coupled Device) 等の固体撮像素子を用いた撮像装置として、動画撮影を目的としたいわゆるビデオカメラと、静止画撮影を目的としたいわゆる電子スチルカメラが存在する。また、近年では、動画撮影用の装置であっても静止画撮影機能を有したもの、或いは静止画撮影用の装置であっても動画撮影機能を有したものも存在している。

【0 0 0 3】

動画撮影を目的としたいわゆるビデオカメラでは、一般的にテレビモニター等の表示装置での表示を前提としており、NTSC、PAL 等のテレビジョン方式に準拠した出力信号を得るように構成されている。そのため、このような装置に用いられる撮像素子の垂直方向の有効画素数は、テレビジョン信号の生成を前提として定まっている。例えば、NTSC 方式ではフィールドあたりの有効走査線



数（フィールドあたりの全走査線数から垂直帰線期間に含まれる走査線数を除いた走査線数であり、実際に表示装置に表示される走査線数の意味）は約240本でかつフィールド毎に飛び越し走査（インターレース走査）を行うが、これを実現するために撮像素子の垂直方向の有効画素数は約480画素が基準となっている。すなわち、各フィールドで垂直方向に隣接する2画素の信号を撮像素子内部或いは撮像素子外部で混合することによって約240本の走査線を生成し、かつフィールド毎に混合する画素の組み合わせを変えることによって飛び越し走査を実現している。

【0004】

また、NTSC方式の動画撮像用の撮像素子として、手振れ補正用の画素領域を有効画素領域に付加して、垂直方向に約480画素以上の有効画素を有するものもあるが、この場合でも約480以上の画素領域は垂直帰線期間中に高速に読み出されて、有効な信号としては用いられず、画像信号はあくまでも垂直約480画素領域の信号から生成される。このような撮像装置で静止画を撮影する場合、動画撮影時と同一の画素領域の信号からJPEG（Joint Photographic Expert Group）等の静止画信号を生成することは比較的容易であるが、得られる画素数が垂直480画素程度に限定されてしまい、より高精細の静止画信号を得ることが出来ないという問題が有る。

【0005】

この問題を軽減する手段として、前述の手振れ補正領域を持つ撮像素子を用いた撮像装置においては、静止画撮影時には手振れ補正用画素領域を含めた全有効画素領域を用いる事が考えられるが、静止画撮影時においても撮影画像確認などの為にモニタリングをする必要が有り、その為には読み出した全有効画素の信号からテレビジョン方式に準拠した信号を生成する必要が有る。

【0006】

このような装置の従来例として特開平11-187306号公報に記載の装置が提案されている。この公報に開示された装置では、先ず、テレビジョン方式の1フィールド期間の複数倍の時間を要して全有効画素の信号を読み出してフィールドメモリー等の記憶手段に記憶し、しかる後に補間処理等によってテレビジ

ンのフィールド周期、水平走査周期に対応した信号への変換を行っている。

【0007】

しかしながら、この従来例では、信号変換のために、フィールドメモリー等の大規模な処理回路が必要であり、また、撮像素子からの読み出し周期がフィールド周期の複数倍となるため動解像度が劣化する。また、このような手段を用いても、静止画信号として得られる画素数は動画時の有効画素数に手振れ補正画素領域を加えた画素数が限度である。

【0008】

一方、静止画撮影を目的としたいいわゆる電子スチルカメラでは、より高精細な静止画信号を得るために、近年動画撮影用の撮像素子に対してより多画素化した撮像素子を用いる傾向に有る。このような装置で動画撮影、またはモニタリングを行う場合には、やはりテレビジョン方式に準拠した信号を生成する必要があるが、前記多画素化した撮像素子では、画素数が必ずしもテレビジョン方式の走査線数に対応していないため、何らかの変換手段が必要である。

【0009】

このような変換手段としては、例えば、前述の手振れ補正用画素領域を有した動画撮像装置と同様に、フィールド周期よりも長い時間を用いて撮像素子から信号を読み出し、補間によってテレビジョン信号を生成する方法が有るが、この場合には前述の問題点と共に、画素数が多くなるにつれて、更に読み出し周期が長くなり動解像度が更に劣化する。

【0010】

また、この問題を軽減する手段として、撮像素子内部で画素信号を混合または間引きすることにより、読み出すべき信号数を減少し、読み出し周期を短くする装置の例が特開平9-270959号公報に開示されている。この装置においては、前記動解像度劣化の問題は軽減されるが、テレビジョン方式に同期した信号を生成するための時間軸変換を行うために、フィールドメモリー等の大規模な処理回路を必要とし、また、所望の混合、間引きを行うために撮像素子自体も特殊な構造を取る必要が有る。

#### 【0011】

##### 【発明が解決しようとする課題】

上述のように従来技術の撮像装置では、動画撮像装置で静止画撮影を行う場合には画素数の不足、静止画撮像装置で動画撮影する場合には、回路規模の増加と共に、動画画質の劣化という問題があり、一つの撮像装置で動画、静止画とも十分な画像を得ることが難しい。また、静止画用の多画素撮像素子を用いて十分な動画画質を得るためには、前記問題点の解決の他に、手振れ補正機能等を実現するための読み出し領域の切り出しを行う必要も有るが、上記従来技術ではこれを実現する手段も提供されていない。

#### 【0012】

本発明の目的は、かかる問題を解決し、静止画に対しても十分な画素数をもつ多画素の撮像素子を用いて、高精細な静止画に加えて、フィールドメモリー等により回路規模を増加すること無く、画質劣化を低減した動画撮影を可能とする撮像装置を提供すること、また、併せて手振れ補正機能の実現も可能とした撮像装置を提供することにある。

#### 【0013】

##### 【課題を解決するための手段】

上記目的を達成するため、本発明のうち、その一つとしては、テレビジョン方式の一表示画面の有効走査線数 $M$ の3倍以上の数 $N$ の画素を垂直方向に、任意の数の画素を水平方向に配した受光面を備えた撮像素子と、該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの $K$ 画素周期で、垂直方向に混合または間引きを行い、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように該撮像素子を駆動する駆動手段と、前記撮像素子の出力信号を用いて画像信号を生成する信号処理手段とを備えた撮像装置とする。

#### 【0014】

##### 【発明の実施の形態】

以下、本発明の実施形態を図面を用いて説明する。図1は、本発明の撮像装置の一つの実施形態を示す構成図である。

#### 【0015】

図1において、符号1はレンズ、符号2は絞り、符号3は撮像素子、符号4は撮像素子を駆動する駆動回路、符号5は利得調整回路、符号6はアナログ→デジタル変換（A/D変換）回路、符号7は信号処理回路、符号8は垂直方向の補間処理を行う垂直補間回路、符号9は水平方向の補間処理を行う水平補間回路、符号10は画像信号を記録する磁気テープ、半導体メモリー、光ディスク等の記録媒体を含む記録部、符号11は動作状態に応じてこれらの構成要素の制御を行う制御回路、符号12は標準テレビジョン信号への変調処理等を行うエンコーダ回路、符号13はデジタル→アナログ変換（D/A変換）回路、符号14は動画撮影、静止画撮影等の動作モードの切り替えを行うモード切り替えスイッチ、符号15は記録開始／停止の指示を行うための記録ボタン、符号16a、16bはそれぞれ撮像装置の縦方向、横方向の手振れを検出する手振れセンサー、符号17は手振れセンサーの出力信号から撮像装置の手振れを判定する手振れ判定回路を示している。

#### 【0016】

上記の構成において、レンズ1から入射された光は、絞り2を介して撮像素子3の受光面上に結像して電気信号に変換される。本実施形態では、撮像素子3をCCD型撮像素子としている。図2にこの撮像素子3の構成を示す。図2において、符号30はフォトダイオードで構成されている画素であり、水平、垂直方向に格子状に配置されている。格子状に配された画素には、それぞれ黄色（Y<sub>e</sub>）、緑（G）、シアン（C<sub>y</sub>）の各色を透過する色フィルターが、水平方向に3画素周期で繰り返し配され、垂直方向には同一の色を配されたいわゆる縦ストライプ状に配されている。画素数は任意であるが、本実施形態では垂直方向に1200画素、水平方向に1600画素が配置されているものとする。垂直転送部32は、V1、V2、V3の3相のパルスで駆動されるCCDである。本CCDは1画素あたり3相パルスに対応する3ゲート構成となっており、各画素の信号電荷を独立で垂直方向に転送することが可能である。画素の電荷を垂直転送部に転送するための転送ゲート31は、垂直転送部32のV2パルスに対応するゲートと共通化されており、共通化されたゲートに対して印加するパルスの波高値によっ

て画素からの電荷を垂直転送部に転送する動作と、垂直方向への転送動作とが区別して行われる。水平転送部33は、垂直転送部32から転送された電荷を水平方向に転送し、出力アンプ34を介して順次出力端子から出力する。

【0017】

図1の説明に戻る。以下、まずモード切り替えスイッチ14によって動画撮影モードが選択された時の動作について説明する。本実施形態における撮像素子の垂直方向の画素数は1200であるため、NTSC方式の場合のフィールド有効走査線数を240ラインとすると、垂直方向に5（＝1200画素／240ライン）画素の混合を行うことにより撮像素子からの出力信号ライン数を有効走査線数と一致させることが出来る。

【0018】

しかしながら、本実施形態では、後に説明する手振れ補正機能を実現するために、動画撮影モード時には、垂直方向に4画素の混合を行うこととする。垂直方向に4画素の混合を行う場合には、垂直方向1200画素の内、960（＝240ライン×4画素）画素分の領域の信号を有効な信号として用い、残りの240（＝1200（全画素）－960（有効画素））画素分の領域の信号は出画に用いない。図3は本動作モードにおける撮像素子の垂直駆動パルスのタイミングを示した図であり、V1、V2、V3は前記垂直転送部32であるCCDの各ゲートに入力される3相の駆動パルスである。

【0019】

図3において、垂直帰線期間に含まれる期間T1において駆動パルスV2をハイレベルの電圧とすることによって各画素に蓄積された信号電荷は垂直CCDのV2ゲート下に転送される。次にT2で示す期間における動作、すなわちV2パルスがミドルレベルの期間にV3パルスをローレベルからミドルレベルに変化させ、次にV3パルスがミドルレベルの期間にV2パルスをミドルレベルからローレベルに変化させた後、V1パルスをローレベルからミドルレベルに変化させ、次にV1パルスがミドルレベルの期間にV3パルスをミドルレベルからローレベルに変化させた後、V2パルスをローレベルからミドルレベルに変化させ、最後にV1パルスをミドルレベルからローレベルに変化させるという一連の動作によ

って、V 2 ゲート下の信号電荷は一ライン分転送されて再びV 2 ゲート下に保持される。

#### 【0020】

この一連の動作を繰り返すことによって、信号電荷を任意のライン数分転送することができる。図3において、垂直有効走査期間（垂直帰線期間を除いた実際に表示させる画像に対応する垂直走査期間の意味）の前の垂直帰線期間に含まれる期間T 3 および垂直有効走査期間の後の垂直帰線期間に含まれる期間T 4 において、合わせて240回上記一行分の転送動作を繰り返すことによって出画に用いない240行分の信号電荷を垂直帰線期間中に水平転送部33に転送する。例えば期間T 3 で120回、期間T 4 で120回の一連の転送を行うと、受光面上の上下それぞれ120行分の信号電荷が垂直帰線期間内の期間T 3 及び期間T 4 に水平転送部33に転送される。その後の垂直帰線期間内の期間T 5 及び期間T 6 に水平転送部33をそれぞれ一定期間駆動することによって水平転送部に転送された電荷は出力端から出力されるが、垂直帰線期間中であるので有効な信号としては用いられない。

#### 【0021】

次に、図3の垂直有効走査期間では、各水平帰線期間に上記一行分の転送動作を4回行うことにより4行分の信号電荷が水平転送部33に転送され水平転送部33で混合される。その後水平有効走査期間（水平帰線期間を除いた実際に表示させる画像に対応する水平走査期間の意味）に水平転送部33を駆動して水平転送部の信号電荷を読み出すことによって、テレビジョン方式に同期した出力信号を得ることができる。また、Aフィールドで上記動作を行い、Bフィールドでは期間T 3 の転送行数を122行、期間T 4 の転送行数を118行とすると、フィールド毎に混合される4行の組み合わせが2行分ずれ、図4に示すようにインターレース走査を行う事ができる。（図4は撮像素子受光面を示しているため、表示画面上とは上下反転している）

図1の説明に戻る。撮像素子3の出力信号は利得調整回路5で利得調整された後、A/D変換回路6でデジタル信号に変換され、信号処理回路7で色信号の生成、ガンマ補正、ホワイトバランス処理、輪郭強調等の色信号処理、輝度信号処

理を施される。ここで本実施形態における撮像素子は、前記黄色（Y<sub>e</sub>），緑（G），シアン（C<sub>y</sub>）の縦ストライプ状の色フィルターが配されたものであるため、どのような画素数で垂直方向に混合を行っても、常に1ラインの出力信号から、Y<sub>e</sub>，G，C<sub>y</sub>の各色信号が点順次で得られる。これらの色信号から、3原色信号R、G、B信号は以下の演算で得ることが出来る。

【0022】

$$R = Y_e - G$$

$$B = C_y - G$$

$$G = G$$

R，G，B信号は信号処理回路7でホワイトバランス処理、ガンマ補正処理等を施された後、R－Y，B－YまたはU，V等の色差信号に変換される。その後、輝度信号および色差信号は垂直補間回路8を介して水平補間回路9に入力される。本動作状態では垂直補間回路では処理は行われず通過するのみである。水平補間回路では水平方向の補間処理が行われる。

【0023】

図5は撮像素子の受光面を示した図である。前述のように本実施形態の本動作状態では、垂直有効走査期間に読み出される信号は垂直1200画素の内の960画素に相当し、水平方向は全画素（1600画素）に相当する領域であり、図5に斜線部Aで示している。ここで、撮像素子の受光面全体の縦横比が縦：横＝3：4であった場合、斜線部Aの領域はそれに対して横長となるため、水平方向全画素分の信号をNTSC方式等縦横比3：4のテレビジョン方式の表示機器で表示すると水平方向が圧縮された縦長の画像となる。従って、図5において斜線部Bで示した、テレビジョン方式の縦横比と合致した水平領域の信号のみを水平有効走査期間に出力する必要がある。テレビジョン方式の縦横比が3：4の場合には斜線部Bの水平画素数は1280（＝960（垂直方向有効画素）×（4／3））となる。

【0024】

図1の説明に戻る。水平補間回路9では水平1280画素分の信号を補間処理により水平方向に伸長し水平有効走査期間全体にわたって出力できるようにし、

また、必要に応じてクロックの乗せ替え等を行う。以上の動作によって、受光面上の垂直960画素、水平1280画素の領域を切り出して、テレビジョン方式に同期した信号として得ることが可能となる。その後、輝度信号及び色差信号はエンコーダ12でテレビジョン信号へのエンコード処理を施され、D/A変換回路13でアナログ信号に変換されて出力される。また、記録ボタン15によって記録の指示がなされた場合には、記録部10で信号の記録が行われる。この時、必要に応じてMPEG (Moving Picture Expert Group) 等の圧縮処理を施すこともできる。

#### 【0025】

次に、手振れ補正の動作に関して説明する。撮像装置の縦方向、横方向の手振れを検出する手振れセンサー16a、16bによって検出された振れ情報は手振れ判定回路17に入力され、ここで手振れ量、方向などが判定され、撮像素子の受光面上での垂直方向、水平方向の画素数に換算される。換算された画素数に対して手振れを打ち消す方向に受光面上での切り出し位置（有効画素領域）をずらすことによって手振れを補正することができる。切り出し位置の移動は、垂直方向に関しては、前述の図3の期間T3および期間T4における転送行数を変化させることにより実現でき、水平方向に関しては前述の水平補間回路における、補間開始位置を変化させることにより実現することができる。

#### 【0026】

以上動画撮影モード時の動作に関して説明した。次に、モード切り替えスイッチ14によって静止画撮影モードが選択された時の動作について説明する。

#### 【0027】

静止画撮影モードにおいても、記録ボタン15によって記録の指示がなされるまでは、撮影画角の確認等のためのモニタリングを行うために、テレビジョン方式に準拠した信号の出力を行う。ただし、静止画撮影時にはできるだけ高精細な信号を得るために、本実施形態では、動画撮影時とは異なり撮像素子の全有効画素数を用いて撮影を行う。従って、モニタリング時には、全画素領域の信号から、テレビジョン信号を生成する必要がある。



#### 【0028】

本実施形態の撮像素子の垂直方向の画素数は1200画素であるため、NTSC方式の有効走査線数を240ラインとすると、垂直方向に5 ( $= 1200 / 240$ ) 画素の混合を行うことにより、出力信号ライン数を有効走査線数と一致させることができる。このように撮像素子を動作させるために、図3に示したパルスタイミング図において、垂直有効走査期間中の各水平帰線期間に前記1行分の転送動作を5回行う。これにより5ライン数分の信号電荷を水平転送部33で混合することができる。また、垂直帰線期間中の期間T3およびT4での転送動作は、インターレース走査を行うために、Bフィールドの期間T3において2行分の転送のみを行い、他の垂直帰線期間では転送動作は行わない（本実施形態では  $1200 / 240 = 5$  であり、余りが生じないため、上記以外の転送は不要だが、仮に余りが生じる場合には、余りの画素数分を期間T3、T4で転送すれば良い）。

#### 【0029】

水平転送部33で混合された電荷は水平有効走査期間に水平転送部を駆動して読み出す。以上により撮像素子の全画素の信号電荷をテレビジョン方式に同期して読み出すことができる。撮像素子3の出力信号は動画撮影時と同様に利得調整回路5で利得調整された後、A/D変換回路6でデジタル信号に変換され、信号処理回路7で色信号処理、輝度信号処理を施され、垂直補間回路8に入力される。静止画撮影モニタリング時には垂直補間回路8で垂直方向の重心補正の処理を行う。

#### 【0030】

図6に本動作状態におけるAフィールド、Bフィールドにおける混合される画素の組み合わせおよび混合された信号の垂直方向の重心位置を示す。インターレース走査では、Aフィールド、Bフィールドでの走査線の位置は相互に他フィールドの走査線間の中心の位置であるため、これに対応して撮像素子の信号の垂直方向のサンプリングはそれぞれのフィールドで180度の位相差となる必要が有る。ところが、本実施形態の本動作状態では混合画素数が5画素であるため、図6に示すように、Aフィールド、Bフィールドでの出力信号の重心位置が180度

の位相差に対して、36度（＝1／2画素、同一フィールドのライン間距離の1／10）ずれている。これを補正するには、隣接2ラインの信号から補間によって信号を生成すれば良く、例えば同一フィールドのnラインの信号を $S_n$ 、n+1ラインの信号 $S_{n+1}$ とすると、 $S_n' = (S_n \times 9 / 10) + (S_{n+1} \times 1 / 10)$ の演算で得られる $S_n'$ はnラインの信号の重心位置に対して1／10ライン分n+1ライン方向に重心位置のずれた信号である。Bフィールドの信号に対して上記演算を行うことによってサンプリングの重心ずれの補正が可能であるが、本実施形態では、Aフィールド、Bフィールドの補間の影響を均一にするために、nラインの信号を、Aフィールドでは1／20ライン分n-1ライン方向に、Bフィールドでは1／20ライン分n+1ライン方向に補正するために、以下の演算を行う。

#### 【0031】

Aフィールド：  $S_n' = (S_n \times 19 / 20) + (S_{n-1} \times 1 / 20)$

Bフィールド：  $S_n' = (S_n \times 19 / 20) + (S_{n+1} \times 1 / 20)$

尚、本実施形態では隣接2ラインの信号からの演算によって補間処理を行っているが、更に複数ラインの信号を用いた補間処理を行う事もできる。垂直補間回路8の出力信号は水平補間回路9に入力されるが、本動作状態では水平補間回路では処理は行われず通過するのみである。その後は、動画撮影時と同様に、エンコーダ12でテレビジョン信号へのエンコード処理を施され、D/A変換回路13でアナログ信号に変換されて出力される。以上説明したように、静止画撮影モードでのモニタリング時にも、撮像素子の全画素領域の信号から、テレビジョン信号を生成する事ができる。

#### 【0032】

次に、記録ボタン15によって記録の指示がなされた場合について説明する。静止画撮影モードにおけるモニタリング時には、テレビジョン信号を生成するために、撮像素子内で信号を混合する事によって信号量の削減を行っているが、記録する際には高精細な信号を得るために混合処理を行わずに、全画素の信号を独立で読み出す必要がある。これを実現するためには、図3に示したパルスタイミング図において、垂直有効走査期間中の各水平帰線期間の前記1行分の転送動作

を1回のみ行う。これにより1行分の信号電荷のみが水平転送部33に転送される。その後水平転送部33を駆動して1行分の信号電荷を読み出す。上記動作を垂直画素数分繰り返す事によって全画素の信号電荷を独立で読み出す事ができる。尚、垂直帰線期間中の期間T3およびT4での転送動作は行わない。

#### 【0033】

読み出された信号電荷は、利得調整回路5で利得調整された後、A/D変換回路6でデジタル信号に変換され、信号処理回路7で色信号処理、輝度信号処理を施され、垂直補間回路8、水平補間回路9を介して記録部10で記録される。この時、垂直補間回路8、水平補間回路9では補間処理は行われない。記録部10では、記録に際してJPEG (Joint Photographic Expert Group) 等の圧縮処理を施すこともできる。尚、上記静止画記録動作中はテレビジョン信号の生成はできないため、モニタリング用の出力には、記録開始直前の画像、または単一色の信号等に置き換えたテレビジョン信号を出力する。以上の動作により、撮像素子全画素から得られる高精細な信号を記録する事ができる。なお、本実施形態においては、動画撮影モード時と静止画撮影モード時の記録部は共通としているが、モードによって記録部を各々専用に設けても良い。

#### 【0034】

以上説明したように、本実施形態では、垂直方向の画素数に上限がなくなるため、静止画に対しても十分な画素数をもつ多画素の撮像素子を用いて、高精細な静止画に加えて、良好な動画撮影が可能になる。

#### 【0035】

また、信号の混合と垂直帰線期間中の垂直転送により、多画素の撮像素子においてもテレビジョン方式に同期した信号読み出しを可能とし、よって画質劣化を低減し、かつ手振れ補正機能を有した動画撮影および静止画撮影におけるモニタリングを実現することができる。

#### 【0036】

また、切り出した垂直領域に対してテレビジョン方式の縦横比と略等しくなる水平領域部分に相当する出力信号のみを切り出してテレビジョン方式の有効水平走査期間全体にわたって出力するように構成することによって、垂直方向の切り

出し位置をどのように行っても、テレビジョン方式の縦横比に等しい出力信号を得ることができる。

【0037】

また、テレビジョン方式の表示周期毎に混合する画素位置をずらすことによりインターレース信号を出力するように撮像素子を駆動することによって、多画素の撮像素子を用いてもインターレース走査を行うことができる。

【0038】

また、混合によって得られるインターレース出力信号の垂直方向の重心位置が表示周期毎に180度の位相差となるように補間することによって、混合周期が奇数の場合のようにインターレースの位相ずれが生じる場合であっても、インターレースずれのない出力信号を得ることができる。

【0039】

なお、本実施形態においては、撮像素子の垂直画素数を1200、動画撮影モード時の混合画素数を4、静止画撮影モード時の混合画素数を5としているが、手振れ補正用の画素領域の有無、大きさは任意であるため、各モードにおける混合画素数は、垂直画素数をテレビジョン方式の有効走査線数で除した商の整数部（上記実施例では5）以下であれば任意で良い（必ずしも割り切れる必要はなく、上記例の場合、垂直画素数は1200以上であっても良い）。

【0040】

また、静止画撮影時の画素数はテレビジョン方式のフィールド有効走査線数の3倍以上程度の垂直画素数をもてば良い。また、本実施形態では撮像素子の垂直有効走査期間中の出力ライン数を減じるために垂直方向の画素混合を行ったが、画素からの信号電荷を複数ライン中の一ラインしか読み出さない、いわゆる間引きによっても同様に出力ライン数を減じる事ができる。

【0041】

また、本実施形態では撮像素子の垂直転送部を1画素あたり3相のパルスで駆動するCCDとしたが、上記条件を満たす画素周期での混合または間引きの実現できる形態であれば、撮像素子の構造は任意で良い。

【0042】

また、本実施形態ではNTSC方式の場合について説明を行ったが、PAL方式等有効走査線数の異なるテレビジョン方式であっても同様に実現する事ができる。

【0043】

従って、以上まとめると、テレビジョン方式のフィールド有効走査線数Mの3倍以上の任意の垂直画素数Nをもち、かつ、NをMで除した商の整数部以下の整数の内少なくとも一つの整数周期での垂直方向の混合または間引きを行うことのできる撮像素子を用いる事により、本実施形態と要旨を同一にする種々の構成を取る事ができる。

【0044】

次に本発明による他の実施形態を図7に示した構成図によって説明する。図7の構成図は、図1に示す構成図に対して画角変化指示スイッチ18を追加したものである。図7において図1に示した構成要素と同一の構成要素に対しては同一の符号を付し、同一の動作を行う場合には説明を省略する。

【0045】

本実施形態における、動画撮影モード、静止画撮影モード時のモニタリング、および静止画記録の動作は、通常状態においては図1の構成図により説明した前述の実施形態の動作と同様である。次に動画撮影モード時に画角変化指示スイッチ18により画角変化が指示された時の動作に関して説明する。

【0046】

本実施形態の通常状態では、前述の実施形態にて説明したのと同様、垂直方向4画素の画素混合と垂直帰線期間中の垂直転送、および水平方向の補間処理により全画素領域の内、垂直960画素、水平1280画素の領域を切り出してテレビジョン信号を生成するものとする。ただし、画角変化（垂直方向の画質劣化を伴わないズーム機能の意味）指示スイッチ18により画角変化が指示された時には、まず垂直方向の混合画素数を3画素とし、垂直有効走査期間の前後の垂直帰線期間中に余分な垂直画素領域の信号を読み出す。

【0047】

本実施形態の場合には、480（＝1200－240×3）画素分、混合後のライン数としては160（＝480／3）ライン分の信号を垂直帰線期間中に読み出せば良い。これにより、垂直720画素分の領域の信号を240ラインの信号としてテレビジョン方式に同期して読み出す事ができる。前記読み出しを実現するには、図3に示したパルスタイミング図において、垂直有効走査期間中の各水平帰線期間に3ライン数分の転送動作を行い、垂直帰線期間中の期間T3およびT4での転送行数を160ラインとすれば良い。また、フィールド毎に混合の組み合わせを変えてインターレース走査を行う。

【0048】

撮像素子3の出力信号は利得調整回路5に入力されるが、3画素混合時の信号レベルは4画素混合時に比べて3／4倍になっているため、利得調整回路の利得を4画素混合時に対して4／3倍して後段の回路の入力信号レベルを同一にする。その後A／D変換回路6、信号処理回路7で各々処理を施され、垂直補間回路8に入力される。3画素混合の場合のAフィールド、Bフィールドにおける混合される画素の組み合わせおよび混合された信号の垂直方向の重心位置は図8に示す通りであり、前述の実施形態における静止画撮影モニタリング時と同様にフィールド間のサンプリング位相が180度の位相差からずれているため、垂直補間回路8で垂直方向の重心補正の処理を行う。本動作状態における位相のずれ量は60度（＝1／2画素、同一フィールドのライン間距離の1／6）であり、これを両フィールドで均一に補正するためには、以下の演算を行えば良い。

【0049】

$$\text{Aフィールド： } S_n' = (S_n \times 11 / 12) + (S_{n-1} \times 1 / 12)$$

$$\text{Bフィールド： } S_n' = (S_n \times 11 / 12) + (S_{n+1} \times 1 / 12)$$

尚、前述のように、3ライン以上の複数ラインの信号を用いた補間処理を行う事もできる。次に水平補間回路9で、垂直720画素に対して縦横比が3：4となる水平領域（本動作状態では水平960（＝1600×720／1200）画素の領域）の信号を補間処理により水平方向に伸長し水平有効走査期間全体にわたって出力できるようにする。以上の動作によって、受光面上の垂直720画素

、水平960画素の領域を切り出すことができる。

【0050】

次に、画角変化指示スイッチ18により再度画角変化が指示された時には、垂直方向の混合画素数を2画素とし、垂直480画素分の領域を垂直有効走査期間に読み出し、水平補間回路で640画素分の領域の信号を伸長し水平有効走査期間全体にわたって出力する事により、受光面上の垂直480画素、水平640画素の領域を切り出す（2画素混合時にはインターレースずれが生じないので垂直補間回路での重心補正は行わない）。更に、画角変化指示スイッチ18により画角変化が指示された時には、垂直方向の混合画素数を4画素とし、通常の状態に戻す。

【0051】

以上の動作により、図9に示すように撮像素子受光面上の切り出し領域を（A）垂直960×水平1280、（B）垂直720×水平960、（C）垂直480×水平640の3種類に変化させる事ができ、すなわち、撮影画角を3種類に変化させる事ができる。4画素混合時の領域Aを基準とすると、3画素混合時の領域Bでは1.33倍、2画素混合時の領域Cでは2倍に拡大した画像を得る事ができる。ここで、3種類の領域の読み出しに際しては、画素混合数を変える事によって、常に、撮像素子からの有効出力ライン数をテレビジョン方式の有効走査線数に一致させているため、少ない出力ライン数から補間処理によって有効走査線数の信号を生成する通常のいわゆる電子ズームと比較して、垂直方向の画質劣化の無い良好な画像を保ったまま、画角を変化させる事ができる。なお、静止画モニタリング時においても画素混合数を変化させて切り出し画角を変化させる同様の動作を行っても良い。

【0052】

以上説明したように、本実施形態では、上述の実施形態によって得られる効果のほか、静止画に対しても十分な画素数をもつ多画素の撮像素子を用い、かつ画素混合数を変化させる事によって、画質劣化の少ない画角変化を実現する事ができる。

【0053】

また、混合の画素周期が変化したときに生じる信号レベルの変化を利得調整手段で吸収することにより、後段の信号処理手段の入力信号レベルを一定に保つことができる。

【0054】

なお、本実施形態においては、画角変化指示スイッチによって間欠的に画角変化を行ったが、ズームスイッチによって連続的に変化させても良い。この時には、倍率変化が画素混合を変化させた時の倍率まで達しない間は通常の補間処理による電子ズームを行う事とする。本実施形態の場合には1倍以上1.33倍未満の間は4画素混合、1.33倍以上2倍未満の間は3画素混合、2倍以上では2画素混合となる。また、この時に光学ズーム機構と連動させても良い。

【0055】

また、本実施形態においても前記実施形態の場合と同様に、撮像素子の画素数、撮像素子の構造、テレビジョン方式等にかかわらず、フィールド有効走査線数Mの3倍以上の任意の垂直画素数Nをもち、かつ、NをMで除した商の整数部以下の整数の内少なくとも二つ整数周期での垂直方向の混合または間引きを行うことのできる撮像素子を用いる事により、本実施形態と要旨を同一にする種々の構成を取る事ができる。

【0056】

次に本発明による他の実施形態について説明する。ここで説明する実施形態の全体構成は、図1に示す構成図と同一であるが、撮像素子3の内部構成が異なっている。本実施形態における、撮像素子の構成を図10に示す。図10において、30はフォトダイオードで構成されている画素であり、水平、垂直方向に格子状に配置されており、これらの画素にはそれぞれ黄色(Ye)、緑(G)、シアン(Cy)の各色を透過する色フィルターが縦ストライプ状に配されている。

【0057】

本実施形態においては垂直方向に864画素、水平方向に1152画素が配置されているものとする。垂直転送部32は、V1、V2、V3、V4、V5、V6の6相のパルスで駆動されるCCDであり、1画素あたり2相パルスに対応す



る2ゲート構成となっており、3画素周期で6相パルスに対応する6ゲートが繰り返すように構成されている。画素の電荷を垂直転送部32に転送するための転送ゲート31は、垂直転送部32のV1、V3、V5の各パルスに対応するゲートと共通化されており、共通化されたゲートに対して印加するパルスの波高値によって画素からの電荷を垂直転送部に転送する動作と、垂直方向への転送動作とが区別して行われる。

#### 【0058】

水平転送部33は、垂直転送部32から転送された電荷を水平方向に転送し、出力アンプ34を介して順次出力端子から出力する。本撮像素子は、前記実施形態における撮像素子とは異なり、全画素を独立した状態で垂直転送を行う事はできないが、垂直方向に隣接する3画素の信号電荷を垂直転送部内で混合した後に転送する事ができる。

#### 【0059】

まず、本実施形態における動画撮影モード時の動作について説明する。本実施形態における撮像素子の垂直方向の有効画素数は864であるため、垂直方向に3画素の混合を行うと垂直864画素の内、720(=240×3)画素分の領域の信号を有効な信号として用い、残りの144(=864-720)画素分の領域を手振れ補正領域とする事ができる。

#### 【0060】

図11は本動作モードにおける図10の撮像素子の垂直駆動パルスのタイミングを示した図であり、V1、V2、V3、V4、V5、V6は前記垂直転送部32であるCCDの各ゲートに入力される6相の駆動パルスである。図11において、垂直帰線期間に含まれる期間T1において駆動パルスV1、V3およびV5をハイレベルの電圧とすることによって各画素に蓄積された信号電荷は垂直CCDのV1、V3およびV5ゲート下に各々転送される。その後V2およびV4パルスをローレベルからミドルレベルに変化させる事によって隣接3画素分の電荷を混合し、混合後V5パルスをミドルレベルからローレベルに変化させる事によって、混合された電荷はV1、V2、V3、V4ゲート下に保持される。

#### 【0061】

次に、T2で示す期間における一連の動作（駆動パルスをV1、V2、V3、V4、V5、V6の順にミドルレベルからローレベルあるいはローレベルからミドルレベルに変化させる）によって、信号電荷は混合後の一行分（3画素分）転送されて再びV1、V2、V3、V4ゲート下に保持される。この一連の動作を繰り返すことによって、混合された信号電荷を任意の行数分転送することができる。

#### 【0062】

図11において、垂直有効走査期間の前の垂直帰線期間に含まれる期間T3および垂直有効走査期間の後の垂直帰線期間に含まれる期間T4において、合わせて144回上記一行分の転送動作を繰り返すことによって出画に用いない144行分の信号電荷を垂直帰線期間中に高速に水平転送部33に転送する。その後の垂直帰線期間内の期間T5及びT6に水平転送部33をそれぞれ一定期間駆動することによって水平転送部に転送された電荷は出力端から出力される。

#### 【0063】

次に、図11の垂直有効走査期間では、各水平帰線期間に上記一行分の転送動作を行い、その後水平有効走査期間に水平転送部を駆動して水平転送部33の信号電荷を読み出すことによって、3画素分混合された信号電荷をテレビジョン方式に同期して読み出す事ができる。また、図11に示すように、Aフィールドでは信号を画素から垂直転送部32に転送した後V2、V4パルスをミドルレベルにして混合を行うのに対して、BフィールドではV2、V6パルスをミドルレベルにして混合を行う。これによって、フィールド毎に混合する画素の組み合わせを変えてインターレース走査を実現する事ができる。撮像素子の出力信号は前記実施形態と同様に処理される。ここで、垂直補間回路8では前記実施形態の3画素混合の場合と同様に重心補正の処理がなされ、水平補間回路9ではテレビジョン方式と縦横比を一致させる補間がなされる。

#### 【0064】

次に、静止画撮影モードのモニタリング時の動作について説明する。静止画撮影時には前記実施形態と同様に撮像素子の全有効画素数を用いて撮影を行うもの

とする。本実施形態の撮像素子の垂直方向の画素数は864画素であり、動画撮影時と同様に3画素混合を行った場合には、出力ライン数が288（＝864／3）ラインとなりテレビジョン方式に同期して信号を読み出す事ができないため、静止画撮影モードのモニタリング時には、垂直方向6画素の混合を行うものとする。6画素の混合は、垂直転送部内で3画素混合された信号電荷を各水平帰線期間内に2ライン数分水平転送部に転送する事によって行う事ができる。6画素混合を行うと撮像素子からの出力ライン数を144（＝864／6）ラインに減少する事ができる。144ラインに減少された撮像素子の出力信号を垂直補間回路8で補間処理によって240ラインの信号に変換することにより、テレビジョン方式に同期した信号を得る事ができる。ここで、144ラインの信号から240ラインの信号を生成する為には、3ラインから5ラインを生成する補間処理を行えば良い（144／240＝3／5）。

【0065】

図12に隣接2ラインの信号を用いて補間を行う場合について示す。撮像素子の3ラインの出力信号をn，n＋1，n＋2とすると、以下の演算によって5ラインの信号を生成する事ができる。

【0066】

$$\begin{aligned}n' &= n \\n' + 1 &= n / 2 + (n + 1) / 2 \\n' + 2 &= n + 1 \\n' + 3 &= (n + 1) / 2 + (n + 2) / 2 \\n' + 4 &= n + 2\end{aligned}$$

尚、3ライン以上の複数ラインの信号を用いた補間処理を行う事もできる。以上により、静止画撮影モードでのモニタリング時にも、撮像素子の全画素領域の信号から、テレビジョン信号を生成する事ができる。

【0067】

次に、記録ボタン15によって記録の指示がなされた場合について説明する。記録する際には高精細な信号を得るために混合処理を行わずに、全画素の信号を独立で読み出す必要がある。これを実現するためには、まず絞り2を閉じ、次に

図1 1に示したパルスタイミング図のT 2期間において、V 1パルスのみをハイレベルとしV 1ゲートに隣接した画素の信号電荷のみを垂直転送部に転送し、その後垂直転送部、水平転送部を順次駆動して信号電荷を読み出す。同様にV 3パルスをハイレベルとしてV 3ゲートに隣接した画素の信号電荷を読み出し、最後にV 5パルスをハイレベルとしてV 5ゲートに隣接した画素の信号電荷を読み出す。以上により、全画素の電荷を3回に分けて独立に読み出す事ができる。読み出された信号電荷は、記録部1 0に記録されるが、その際、撮像素子の受光面上での画素配列を再現するように適宜並べ替えを行う。

#### 【0 0 6 8】

以上説明したように、本実施形態では、垂直方向の画素数がテレビジョン方式における走査線数の整数倍でない場合でも、画素混合および垂直方向の補間処理により全有効画素領域の信号からテレビジョン方式に準拠した信号の生成が可能である。

#### 【0 0 6 9】

なお、本実施形態においても前記実施形態の場合と同様に、撮像素子の画素数、撮像素子の構造、テレビジョン方式等にかかわらず、フィールド有効走査線数Mの3倍以上の任意の垂直画素数Nをもち、かつ、NをMで除した商の整数部より一つ以上大きい整数周期での垂直方向の混合または間引きを行うことのできる撮像素子を用いる事により、本実施形態と要旨を同一にする種々の構成を取る事ができる。

#### 【0 0 7 0】

次に、本発明による他の実施形態について説明する。ここで説明する実施形態は、上述の各実施形態において撮像素子の色フィルタ配列を異ならせたものである。図1 3に本実施形態における色フィルタ配列を示す。いずれも縦ストライプ状に配置したものであり垂直方向の混合または間引きの周期にかかわらず一つの出力ラインの信号からR、G、Bの各原色信号を生成できる。図1 3（a）は前述の実施形態の撮像素子の色フィルタ配列に対して、緑（G）の代わりに白（W＝全色透過）フィルタを配したものであり、R、G、B信号は以下の演算によって得る事ができる。

【0071】

$$R = W - C_y$$

$$G = Y_e + C_y - W$$

$$B = W - Y_e$$

本色フィルター配列を用いた場合には、前述の実施例の色フィルター配列を用いた場合に比べてより高感度化が可能である。また、図13(b)は、補色の代わりに原色R、G、Bを透過する色フィルターを配したものであり、原色信号R、G、Bを直接得る事ができる。本色フィルター配列を用いた場合には、色純度、色S/Nの良好な撮像装置を得る事ができる。

【0072】

以上説明したような色フィルター配列とすることにより、いかなる画素周期で垂直方向の混合または間引きを行っても、常に各ラインの信号から3種類の色フィルターに対応する色信号を得ることができるため、容易にテレビジョン方式の色信号を生成することが可能である。

【0073】

【発明の効果】

以上説明したように、本発明によれば、垂直方向の画素数に上限がなくなるため、静止画に対しても十分な画素数をもつ多画素の撮像素子を用いて、高精細な静止画に加えて、良好な動画撮影を可能とした撮像装置を提供することができる。

【図面の簡単な説明】

【図1】

図1は、本発明による撮像装置の一実施形態の構成を示す構成図である。

【図2】

図2は、本発明による撮像装置の一実施形態における撮像素子の構成図である。

【図3】

図3は、本発明による撮像装置の一実施形態における駆動パルスタイミング図である。

【図４】

図４は、本発明による撮像装置の一実施形態における混合動作を説明する図である。

【図５】

図５は、本発明による撮像装置の一実施形態における読み出し領域を説明する図である。

【図６】

図６は、本発明による撮像装置の一実施形態における混合動作を説明する図である。

【図７】

図７は、本発明による撮像装置の一実施形態の構成を示す構成図である。

【図８】

図８は、本発明による撮像装置の一実施形態における混合動作を説明する図である。

【図９】

図９は、本発明による撮像装置の一実施形態における読み出し領域を説明する図である。

【図１０】

図１０は、本発明による撮像装置の一実施形態における撮像素子の構成図である。

【図１１】

図１１は、本発明による撮像装置の一実施形態における駆動パルスタイミング図である。

【図１２】

図１２は、本発明による撮像装置の一実施形態における補間動作を説明する図である。

【図１３】

図１３は、本発明による撮像装置の一実施形態における撮像素子の色フィルター配列を示す図である。

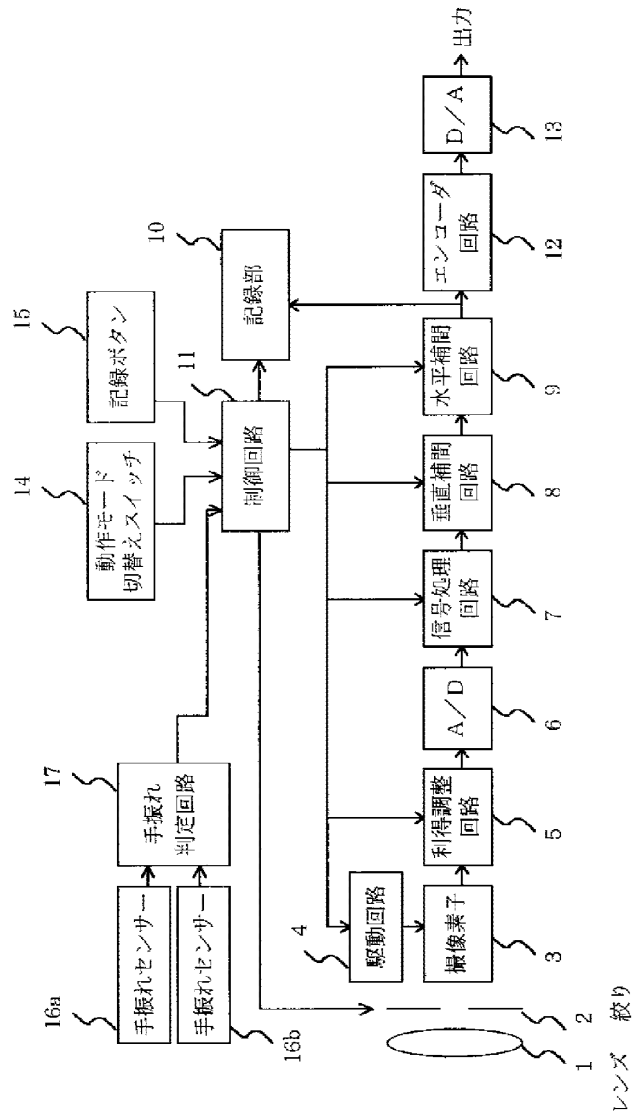
【符号の説明】

1…レンズ、2…絞り、3…撮像素子、4…駆動回路、5…利得調整回路、6…A／D変換回路、7…信号処理回路、8…垂直補間回路、9…水平補間回路、10…記録部、11…制御回路、12…エンコーダ回路、13…D／A変換回路、14…モード切り替えスイッチ、15…記録ボタン、16 a，16 b…手振れセンサー、17…手振れ判定回路、18…画角変化指示スイッチ。

【書類名】 図面

【図 1】

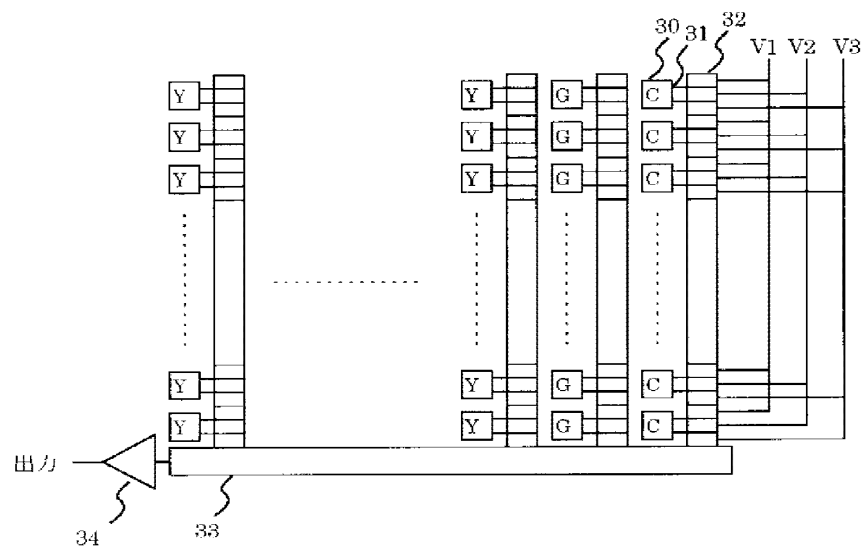
【図 1】





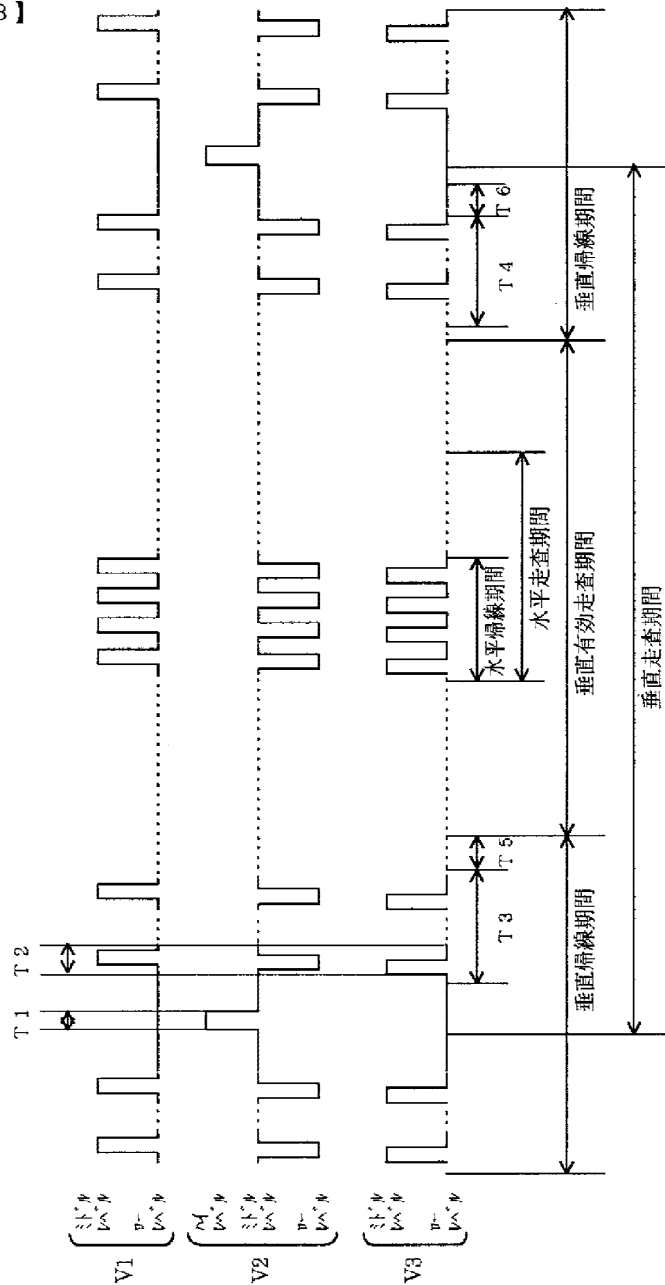
【図 2】

【図 2】



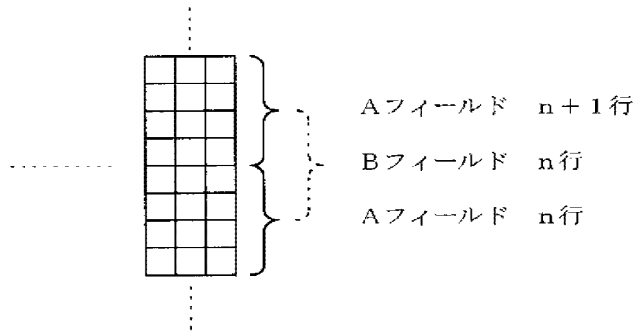
【图 3】

【図 3】



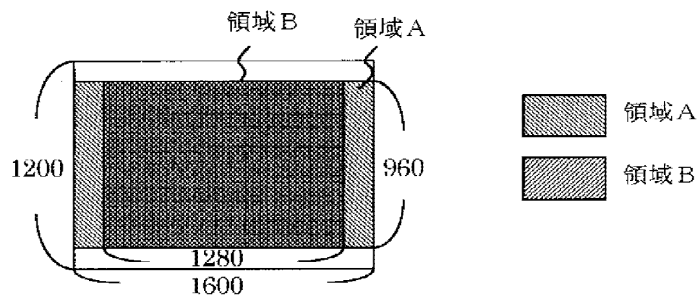
【図 4】

【図 4】



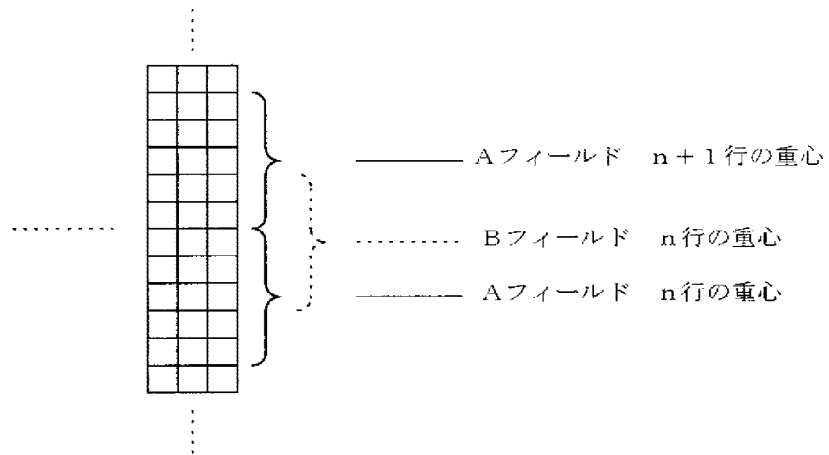
【図 5】

【図 5】



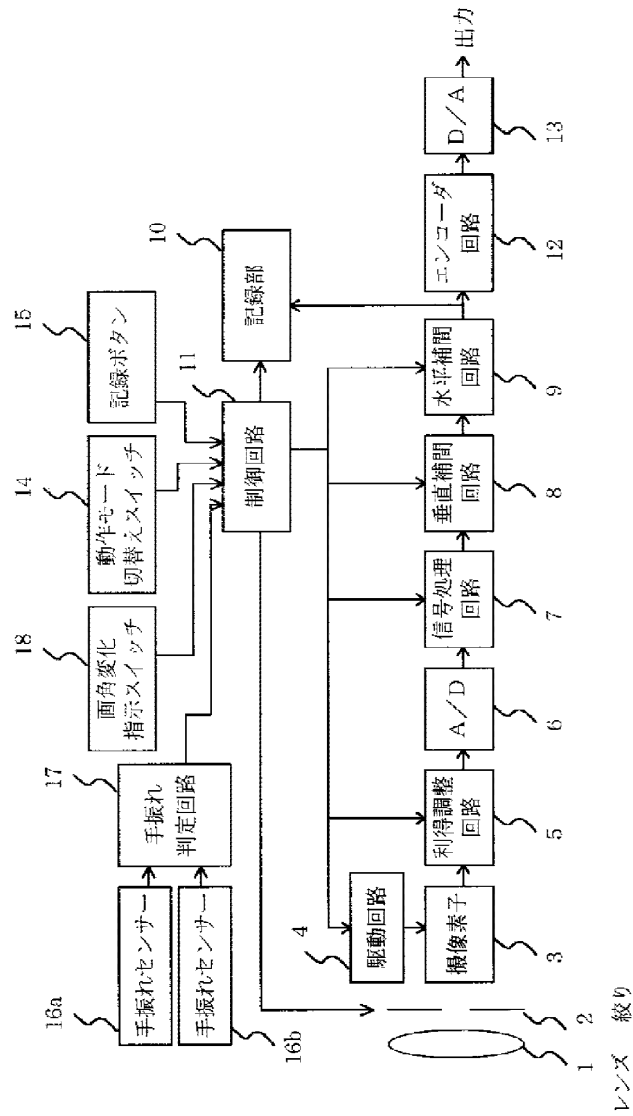
【図6】

【図6】



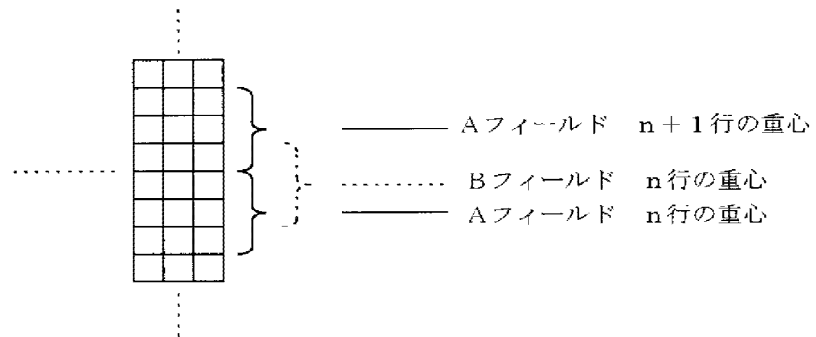
【図 7】

【図 7】



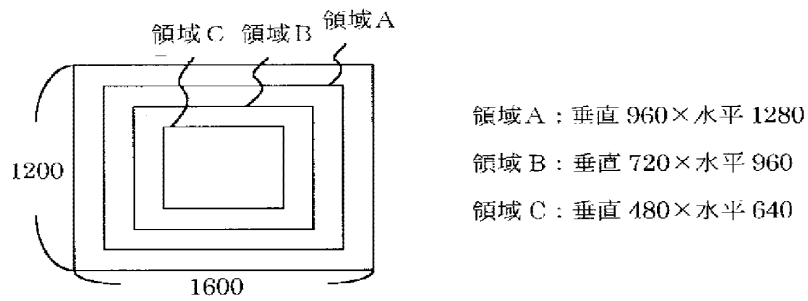
【図 8】

【図 8】



【図 9】

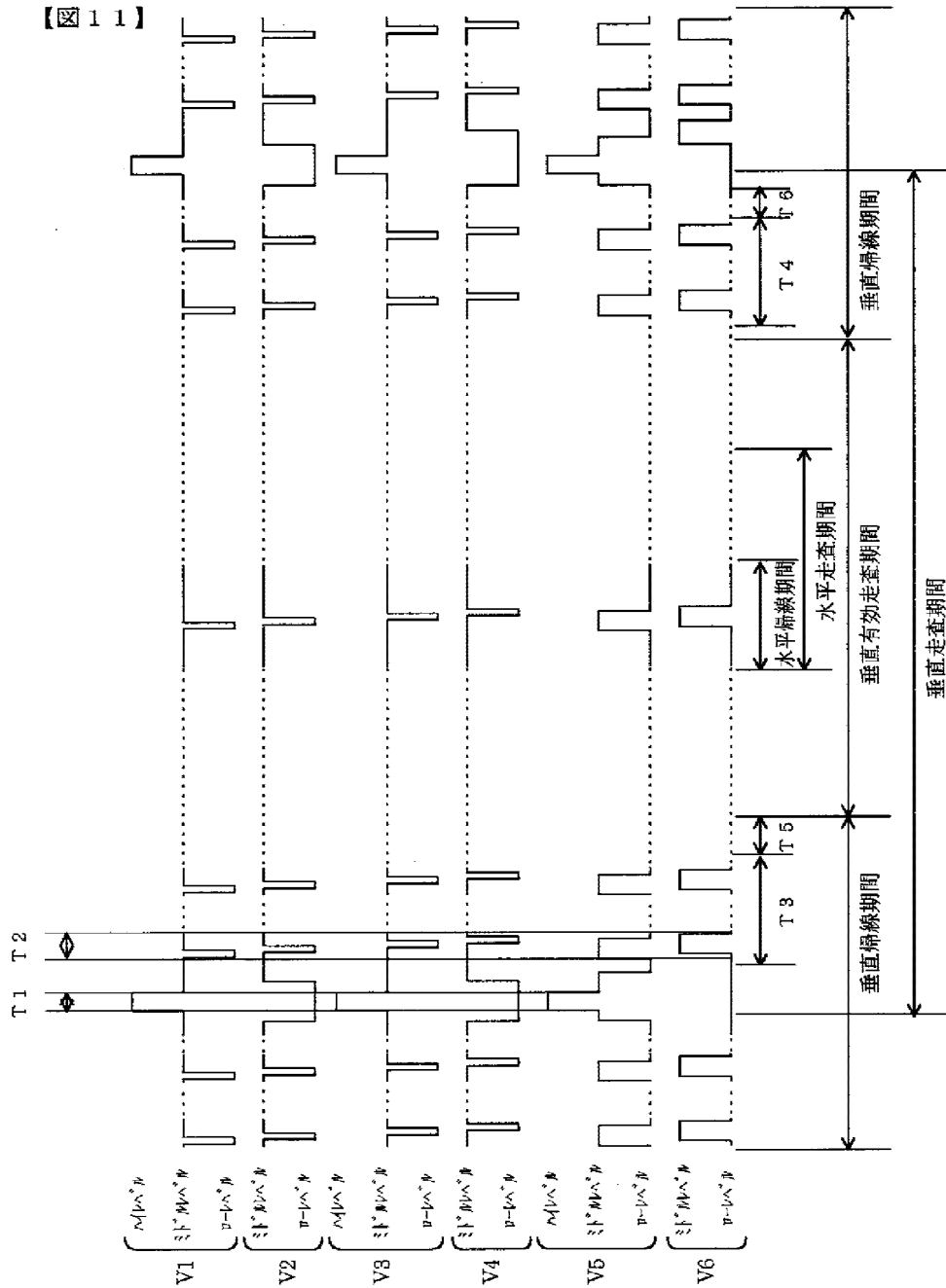
【図 9】



【※ 10】



【図 1 1】





【図 1 2】

【図 1 2】



【図 1 3】

【図 1 3】

Ye	W	Cy
Ye	W	Cy
Ye	W	Cy
Ye	W	Cy
Ye	W	Cy

(a)

R	G	B
R	G	B
R	G	B
R	G	B
R	G	B

(b)

【書類名】 要約書

【要約】

【課題】

静止画撮影に対して十分な画素数を持つ多画素の撮像素子を用いて良好な動画撮影および静止画撮影中のモニタリングを可能とすることを目的とする。

【解決手段】

テレビジョン方式の有効走査線数の3倍以上の任意の垂直方向の画素数を持つ撮像素子を用いて、動画撮影時および静止画撮影中のモニタリング時には、画素混合または間引き、垂直帰線期間中の信号読み出し、補間処理によりテレビジョン信号を生成し、静止画記録時には全画素の信号を独立に読み出して記録する。

【選択図】 図1

【書類名】 手続補正書  
【あて先】 特許庁長官 殿  
【事件の表示】  
【出願番号】 特願2000- 6064  
【補正をする者】  
【識別番号】 000005108  
【氏名又は名称】 株式会社日立製作所  
【代理人】  
【識別番号】 100100310  
【弁理士】  
【氏名又は名称】 井上 学  
【発送番号】 366136  
【手続補正1】  
【補正対象書類名】 明細書  
【補正対象項目名】 特許請求の範囲  
【補正方法】 変更  
【補正の内容】  
【特許請求の範囲】

【請求項 1】

テレビジョン方式の一表示画面の有効走査線数 $M$ の3倍以上の数 $N$ の画素を垂直方向に、任意の数の画素を水平方向に配した受光面であって、該受光面を構成する画素配列の各画素に対して、水平方向に第一、第二、および第三の各色を各々透過する色フィルタを三画素周期で周期的に配し、垂直方向には同一種類の色を透過する色フィルタを配した受光面を備えた撮像素子と、

該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの $K$ 画素周期で、垂直方向に混合または間引きを行い、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように該撮像素子を駆動する駆動手段と、

前記撮像素子の出力信号を用いて画像信号を生成する信号処理手段と、

該画像信号を、テレビジョン方式の表示画面を備えた表示手段に出力する出力手段と、  
を備え、

該駆動手段は、静止画モニタ時の画像信号を該表示手段が表示する場合には、 $K$  1 画素周期で垂直方向に混合または間引きを行い、動画時の画像信号を該表示手段が表示する場合には、 $K$  2 画素周期で垂直方向に混合または間引きを行うことを特徴とする撮像装置。

【請求項 2】

前記駆動手段は、前記撮像素子の垂直方向の画素数 $N$ から前記混合または間引き周期 $K$ と前記有効走査線数 $M$ との積 $K \cdot M$ を減じた数の垂直画素に対応する画素領域の信号電荷を前記テレビジョン方式の垂直帰線期間内に読み出しまたは掃き捨てることにより、前記テレビジョン方式の有効垂直走査期間内に、前記撮像素子の画素の内 $K \cdot M$ の垂直画素に相当する画素領域の信号電荷を切り出して、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように前記撮像素子を駆動することを特徴とする請求項 1 記載の撮像装置。

【請求項 3】

前記信号処理手段は、該撮像素子の該受光面の内、該切り出した垂直領域に対して該テレビジョン方式の縦横比と略等しくなる水平領域部分に相当する出力信号期間のみを切り出して該テレビジョン方式の有効水平走査期間全体にわたって出力する機能を有することを特徴とする請求項 1 または 2 記載の撮像装置。

【請求項 4】

前記駆動手段は、該テレビジョン方式の表示周期毎に該混合または間引きの画素位置をずらすことによりインターレース信号を出力するように該撮像素子を駆動することを特徴とする請求項 1 ～ 3 のいずれか 1 項に記載の撮像装置。

【請求項 5】

前記信号処理手段は、該混合または間引きによって得られるインターレース出力信号の垂直方向の重心位置が表示周期毎に 180 度の位相差となるように補間する機能を有することを特徴とする請求項 4 記載の撮像装置。

【請求項 6】

前記撮像素子の該駆動手段は、装置内部または外部に設けたズームスイッチ等の画角変化を指示するスイッチ手段からの入力情報に対応して、該混合または間引きの画素周期を変化させることを特徴とする請求項 1 ないし 5 のいずれかに記載の撮像装置。

【請求項 7】

前記撮像素子の出力信号の利得を調整する利得調整手段を有し、該撮像素子の混合の画素周期が変化した時にも、該利得調整手段の出力信号レベルが同一になるように、混合画素周期に対応して該利得調整手段の利得を変化させることを特徴とする請求項 1 ないし 6 のいずれかに記載の撮像装置。

【請求項 8】

前記撮像装置の手振れを検出する手振れ検出手段を有し、該手振れ検出手段で検出した手振れ量に応じて、該受光面内における垂直方向及び水平方向の切り出し位置を、該手振れを補正するように変化させることを特徴とする請求項 1 ～ 7 のいずれか 1 項に記載の撮像装置。

【請求項 9】

テレビジョン方式の一表示画面の有効走査線数  $M$  の 3 倍以上の数  $N$  の画素を垂直方向に、任意の数の画素を水平方向に配した受光面であって、該受光面を構成する画素配列の各画素に対して、水平方向に第一、第二、および第三の各色を各々透過する色フィルタを三画素周期で周期的に配し、垂直方向には同一種類の色を透過する色フィルタを配した受光面を備えた撮像素子と、

該画素配列の各画素に蓄積された信号電荷を、 $N$  を  $M$  で除した商の整数部より大きな整数であるところの  $K$  画素周期で、垂直方向に混合または間引きを行い、前記テレビジョン方式の有効垂直走査期間内に、前記撮像素子の垂直画素数  $N$  の  $K$  分の一のライン数の出力信号を得るように前記撮像素子を駆動する駆動手段と、

前記撮像素子の出力信号を用いて画像信号を生成する機能を有する信号処理手段と、  
該画像信号を、テレビジョン方式の表示画面を備えた表示手段に出力する出力手段と、  
を備え、

該駆動手段は、第 1 の画像信号を該表示手段が表示する場合には、 $K-1$  画素周期で垂直方向に混合または間引きを行い、第 2 の画像信号を該表示手段が表示する場合には、 $K-2$  画素周期で垂直方向に混合または間引きを行うことを特徴とする撮像装置。

【請求項 10】

テレビジョン方式の一表示画面の有効走査線数  $M$  の 3 倍以上の数  $N$  の画素を垂直方向に、任意の数の画素を水平方向に配した受光面であって、該受光面を構成する画素配列の各画素に対して、水平方向に第一、第二、および第三の各色を各々透過する色フィルタを三画素周期で周期的に配し、垂直方向には同一種類の色を透過する色フィルタを配した受光面を備えた撮像素子と、

該画素配列の各画素に蓄積された信号電荷を、 $N$  を  $M$  で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの  $K$  画素周期で、垂直方向に混合または間引きを行い、前記有効走査線数  $M$  に相当するライン数の出力信号を得るように該撮像素子を駆動する第 1 の駆動手段と、

該画素配列の各画素に蓄積された信号電荷を、 $N$  を  $M$  で除した商の整数部より大きな整数であるところの  $K$  画素周期で、垂直方向に混合または間引きを行い、前記テレビジョン方式の有効垂直走査期間内に、前記撮像素子の垂直画素数  $N$  の  $K$  分の一のライン数の出力信号を得るように前記撮像素子を駆動する第 2 の駆動手段と、

前記撮像素子の出力信号を用いて画像信号を生成する信号処理手段と、  
該画像信号を、テレビジョン方式の表示画面を備えた表示手段に出力する出力手段と、

を備え、

前記第1の駆動手段は、第1の画像信号を該表示手段が表示する場合には、K1画素周期で垂直方向に混合または間引きを行い、第2の画像信号を該表示手段が表示する場合には、K2画素周期で垂直方向に混合または間引きを行い、

前記第1の駆動手段による駆動と前記第2の駆動手段による駆動とを、装置内部または外部に設けたスイッチ手段からの入力情報に対応して選択、切り替えを行うことを特徴とする撮像装置。

【請求項11】

シャッターボタン等のトリガー手段を有し、該トリガー手段によりトリガーが発生した時には、該撮像素子の各画素に蓄積した信号電荷を混合せずに全画素独立で読み出すことを特徴とする請求項1～10のいずれか1項に記載の撮像装置。

【請求項12】

前記第一、第二、および第三の各色は各々黄色、緑、シアンであることを特徴とする請求項1ないし11のいずれかに記載の撮像装置。

【請求項13】

前記第一、第二、および第三の各色は各々黄色、白色、シアンであることを特徴とする請求項1ないし11のいずれかに記載の撮像装置。

【請求項14】

前記第一、第二、および第三の各色は各々赤、緑、青であることを特徴とする請求項1ないし11のいずれかに記載の撮像装置。

【請求項15】

請求項1ないし14のいずれかにおいて、

前記K1は前記K2よりも小さい値であることを特徴とする撮像装置。

【書類名】 手続補正書  
【あて先】 特許庁長官 殿  
【事件の表示】  
【出願番号】 特願2000- 6064  
【補正をする者】  
【識別番号】 000005108  
【氏名又は名称】 株式会社日立製作所  
【代理人】  
【識別番号】 100100310  
【弁理士】  
【氏名又は名称】 井上 学  
【発送番号】 156904  
【手続補正1】  
【補正対象書類名】 明細書  
【補正対象項目名】 特許請求の範囲  
【補正方法】 変更  
【補正の内容】  
【特許請求の範囲】

【請求項 1】

テレビジョン方式の一表示画面の有効走査線数 $M$ の3倍以上の数 $N$ の画素を垂直方向に、任意の数の画素を水平方向に配した受光面であって、該受光面を構成する画素配列の各画素に対して、水平方向に第一、第二、および第三の各色を各々透過する色フィルターを三画素周期で周期的に配し、垂直方向には同一種類の色を透過する色フィルターを配した受光面を備えた撮像素子と、

該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの $K_1$ 画素周期で、垂直方向に混合または間引きを行い、または、該画素配列の各画素に蓄積された信号電荷の一部を、 $N$ を $M$ で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの $K_2$  ( $K_1 > K_2$ ) 画素周期で、垂直方向に混合または間引きを行い、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように該撮像素子を駆動し、または、該画素配列の各画素に蓄積された信号電荷を混合または間引きを行わないで該撮像素子を駆動する駆動手段と、

前記撮像素子の出力信号を用いて画像信号を生成する信号処理手段と、

該画像信号を、テレビジョン方式の表示画面を備えた表示手段に出力する出力手段と、を備え、

該駆動手段は、静止画モニタ時の画像信号を該表示手段が表示する場合には、該画素配列の各画素に蓄積された信号電荷を $K_1$ 画素周期で垂直方向に混合または間引きを行い、動画時の画像信号を該表示手段が表示する場合には、該画素配列の各画素に蓄積された信号電荷の一部を $K_2$ 画素周期で垂直方向に混合または間引きを行い、静止画を撮像する場合には、混合または間引きを行わないことを特徴とする撮像装置。

【請求項 2】

前記駆動手段は、前記撮像素子の垂直方向の画素数 $N$ から前記混合または間引き周期 $K$ と前記有効走査線数 $M$ との積 $K \cdot M$ を減じた数の垂直画素に対応する画素領域の信号電荷を前記テレビジョン方式の垂直帰線期間内に読み出しまたは掃き捨てることにより、前記テレビジョン方式の有効垂直走査期間内に、前記撮像素子の画素の内 $K \cdot M$ の垂直画素に相当する画素領域の信号電荷を切り出して、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように前記撮像素子を駆動することを特徴とする請求項 1 記載の撮像装置。

【請求項 3】

前記信号処理手段は、該撮像素子の該受光面の内、該切り出した垂直領域に対して該テレビジョン方式の縦横比と略等しくなる水平領域部分に相当する出力信号期間のみを切り

出して該テレビジョン方式の有効水平走査期間全体にわたって出力する機能を有することを特徴とする請求項 1 または 2 記載の撮像装置。

【請求項 4】

前記駆動手段は、該テレビジョン方式の表示周期毎に該混合または間引きの画素位置をずらすことによりインターレース信号を出力するように該撮像素子を駆動することを特徴とする請求項 1～3 のいずれか 1 項に記載の撮像装置。

【請求項 5】

前記信号処理手段は、該混合または間引きによって得られるインターレース出力信号の垂直方向の重心位置が表示周期毎に 180 度の位相差となるように補間する機能を有することを特徴とする請求項 4 記載の撮像装置。

【請求項 6】

前記撮像素子の該駆動手段は、装置内部または外部に設けたズームスイッチ等の画角変化を指示するスイッチ手段からの入力情報に対応して、該混合または間引きの画素周期を変化させることを特徴とする請求項 1 ないし 5 のいずれかに記載の撮像装置。

【請求項 7】

前記撮像素子の出力信号の利得を調整する利得調整手段を有し、該撮像素子の混合の画素周期が変化した時にも、該利得調整手段の出力信号レベルが同一になるように、混合画素周期に対応して該利得調整手段の利得を変化させることを特徴とする請求項 1 ないし 6 のいずれかに記載の撮像装置。

【請求項 8】

前記撮像装置の手振れを検出する手振れ検出手段を有し、該手振れ検出手段で検出した手振れ量に応じて、該受光面内における垂直方向及び水平方向の切り出し位置を、該手振れを補正するように変化させることを特徴とする請求項 1～7 のいずれか 1 項に記載の撮像装置。

【請求項 9】

テレビジョン方式の一表示画面の有効走査線数  $M$  の 3 倍以上の数  $N$  の画素を垂直方向に、任意の数の画素を水平方向に配した受光面であって、該受光面を構成する画素配列の各画素に対して、水平方向に第一、第二、および第三の各色を各々透過する色フィルターを三画素周期で周期的に配し、垂直方向には同一種類の色を透過する色フィルターを配した受光面を備えた撮像素子と、

該画素配列の各画素に蓄積された信号電荷を、 $N$  を  $M$  で除した商の整数部より大きな整数であるところの  $K_1$  画素周期で、垂直方向に混合または間引きを行い、または、該画素配列の各画素に蓄積された信号電荷の一部を、 $N$  を  $M$  で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの  $K_2$  ( $K_1 > K_2$ ) 画素周期で、垂直方向に混合または間引きを行い、前記テレビジョン方式の有効垂直走査期間内に、前記撮像素子の垂直画素数  $N$  の  $K$  分の一のライン数の出力信号を得るように前記撮像素子を駆動し、または、該画素配列の各画素に蓄積された信号電荷を混合または間引きを行わないで該撮像素子を駆動する駆動手段と、

前記撮像素子の出力信号を用いて画像信号を生成する機能を有する信号処理手段と、  
該画像信号を、テレビジョン方式の表示画面を備えた表示手段に出力する出力手段と、  
を備え、

該駆動手段は、第 1 の画像信号を該表示手段が表示する場合には、該画素配列の各画素に蓄積された信号電荷を  $K_1$  画素周期で垂直方向に混合または間引きを行い、第 2 の画像信号を該表示手段が表示する場合には、該画素配列の各画素に蓄積された信号電荷の一部を  $K_2$  画素周期で垂直方向に混合または間引きを行い、第 3 の画像信号を撮像する場合には、混合または間引きを行わないことを特徴とする撮像装置。

【請求項 10】

テレビジョン方式の一表示画面の有効走査線数  $M$  の 3 倍以上の数  $N$  の画素を垂直方向に、任意の数の画素を水平方向に配した受光面であって、該受光面を構成する画素配列の各画素に対して、水平方向に第一、第二、および第三の各色を各々透過する色フィルターを

三画素周期で周期的に配し、垂直方向には同一種類の色を透過する色フィルターを配した受光面を備えた撮像素子と、

該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの $K_1$ 画素周期で、垂直方向に混合または間引きを行い、または、該画素配列の各画素に蓄積された信号電荷の一部を、 $N$ を $M$ で除した商の整数部またはそれ以下の整数の内少なくとも一つの整数であるところの $K_2$  ( $K_1 > K_2$ ) 画素周期で、垂直方向に混合または間引きを行い、前記有効走査線数 $M$ に相当するライン数の出力信号を得るように該撮像素子を駆動し、または、該画素配列の各画素に蓄積された信号電荷を混合または間引きを行わないで該撮像素子を駆動する第1の駆動手段と、

該画素配列の各画素に蓄積された信号電荷を、 $N$ を $M$ で除した商の整数部より大きな整数であるところの $K$ 画素周期で、垂直方向に混合または間引きを行い、前記テレビジョン方式の有効垂直走査期間内に、前記撮像素子の垂直画素数 $N$ の $K$ 分の一のライン数の出力信号を得るように前記撮像素子を駆動する第2の駆動手段と、

前記撮像素子の出力信号を用いて画像信号を生成する信号処理手段と、

該画像信号を、テレビジョン方式の表示画面を備えた表示手段に出力する出力手段と、を備え、

前記第1の駆動手段は、第1の画像信号を該表示手段が表示する場合には、該画素配列の各画素に蓄積された信号電荷を $K_1$ 画素周期で垂直方向に混合または間引きを行い、第2の画像信号を該表示手段が表示する場合には、該画素配列の各画素に蓄積された信号電荷の一部を $K_2$ 画素周期で垂直方向に混合または間引きを行い、第3の画像信号を撮像する場合に、混合または間引きを行わず、

前記第1の駆動手段による駆動と前記第2の駆動手段による駆動とを、装置内部または外部に設けたスイッチ手段からの入力情報に対応して選択、切り替えを行うことを特徴とする撮像装置。

【請求項11】

シャッターボタン等のトリガー手段を有し、該トリガー手段によりトリガーが発生した時には、該撮像素子の各画素に蓄積した信号電荷を混合せずに全画素独立で読み出すことを特徴とする請求項1～10のいずれか1項に記載の撮像装置。

【請求項12】

前記第一、第二、および第三の各色は各々黄色、緑、シアンであることを特徴とする請求項1ないし11のいずれかに記載の撮像装置。

【請求項13】

前記第一、第二、および第三の各色は各々黄色、白色、シアンであることを特徴とする請求項1ないし11のいずれかに記載の撮像装置。

【請求項14】

前記第一、第二、および第三の各色は各々赤、緑、青であることを特徴とする請求項1ないし11のいずれかに記載の撮像装置。

【手続補正2】

【補正対象書類名】 明細書

【補正対象項目名】 0013

【補正方法】 変更

【補正の内容】

【0013】

【課題を解決するための手段】

上記目的を達成するため、本発明では一例として、特許請求の範囲記載の構成を用いる

。



出願人履歴

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新規登録

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住所変更

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株式会社日立製作所

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s): T. NAKANO, et al  
Application No.: 14/264,243  
Filed: April 29, 2014  
For: ELECTRIC CAMERA  
Group AU: 2673  
Conf. No.: 1644

**RESPONSE TO INFORMATIONAL NOTICE TO APPLICANT**

Mail Stop Missing Parts  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

June 10, 2014

Sir:

In response to the Informational Notice to Applicant dated May 14, 2014, in connection with the above-identified application, attached hereto are executed Declarations for the above-identified patent application, in compliance with 37 CFR 1.63.

Please charge any shortages in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (Docket No. 500.38315CC5) and please credit any excess fees to such deposit account.

Respectfully submitted,

/Ayal I. Sharon /  
Ayal I. Sharon  
Registration No. 55,986

AIS/kmh  
(703) 312-6600

申請データシート(37 CFR 1.76)を使った実用及び意匠登録出願宣言書 (37 CFR 1.63) <b>DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION</b> <b>USING AN APPLICATION DATA SHEET (37 CFR 1.76)</b>	
発明の名称 <b>Title of Invention</b>	ELECTRIC CAMERA
<p>下記発明者である私は、つぎのことがらを宣言します。  <b>As the below named inventor, I hereby declare that:</b>          本宣言は  <b>This declaration is directed to:</b></p> <p> <input type="checkbox"/> 添付されている、あるいは  <b>The attached application, or</b>          _____ に、米国出願あるいは PCT 国際出願番号 _____ として出願されているものに  <input checked="" type="checkbox"/> 宛てられています。  <b>United States application or PCT international application</b>  <b>number</b>      13/681495      <b>fled on</b>      November 20, 2012      .       </p> <p>上記の出願は私自身、あるいは私が権限を譲与したものによって行われたものです。  <b>The above-identified application was made or authorized to be made by me.</b></p> <p>私は本出願書中にあらわれるもとの発明者、あるいはもとの共同発明者です。  <b>I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.</b></p> <p>私は本宣言書において故意に虚偽の申し立てを行った場合は 18 U.S.C. 1001 により、罰金あるいは最高五(5)年の禁固刑、あるいはその両方による罰則の対象となることを認めます。  <b>I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.</b></p> <p>私は、特許請求の範囲を含む上記の明細書を確認し内容を理解しています。  <b>I have reviewed and understand the contents of the above-identified application, including the claims.</b></p> <p>私は、連邦規則法典第 37 編規則 1.56 に定義されている、特許性について重要な情報を開示する義務があることを認めます。  <b>I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.</b></p>	
発明者の正式氏名: <b>LEGAL NAME OF INVENTOR:</b> Takahiro NAKANO	
署名: <b>Signature:</b>	日付(任意): <b>Date (Optional):</b> Dec. 17, 2012
備考: 出願データシート(PTO/AIA/14 あるいはその同等用紙)は、発明の自主独立体全体の命名を含め、本用紙に添付すること。 なお残余の発明者ごとにこの用紙の写しを使用する。 <b>Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional copy of the present form for each additional inventor.</b>	

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発明者の正式氏名: <b>LEGAL NAME OF INVENTOR:</b> Ryuji NISHIMURA	
署名: <b>Signature:</b>	日付(任意): <b>Date (Optional):</b> Dec. 18/2012
備考: 出願データシート(PTO/AIA/14 あるいはその同等用紙)は、発明の自主独立体全体の命名を含め、本用紙に添付すること。 なお残余の発明者ごとにこの用紙の写しを使用する。 <b>Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional copy of the present form for each additional inventor.</b>	

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発明者の正式氏名: <b>LEGAL NAME OF INVENTOR:</b> Toshiro KINUGASA			
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">           署名:  <b>Signature:</b>      Toshiro Kinugasa         </td> <td style="width: 50%; border: none;">           日付(任意):  <b>Date (Optional):</b>      12/19/12         </td> </tr> </table>		署名: <b>Signature:</b> Toshiro Kinugasa	日付(任意): <b>Date (Optional):</b> 12/19/12
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Application Number:	14264243
International Application Number:	
Confirmation Number:	1644
Title of Invention:	ELECTRIC CAMERA
First Named Inventor/Applicant Name:	Takahiro Nakano
Customer Number:	20457
Filer:	Ayal I. Sharon/Krista Hargrove
Filer Authorized By:	Ayal I. Sharon
Attorney Docket Number:	500.38315CC5
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Time Stamp:	11:43:56
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1	Oath or Declaration filed	38315CC5.pdf	529451 <small>c5b3f0cda8149e0246d2bf8a7cbf6d3c3b98863</small>	no	4

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### Information:

Total Files Size (in bytes):	529451
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/264,243	04/29/2014	Takahiro Nakano	500.38315CC5	1644
20457 7590 06/13/2014 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			EXAMINER NGUYEN, LUONG TRUNG	
			ART UNIT 2663	PAPER NUMBER
			MAIL DATE 06/13/2014	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



<b>Office Action Summary</b>	<b>Application No.</b> 14/264,243	<b>Applicant(s)</b> NAKANO ET AL.	
	<b>Examiner</b> LUONG T. NGUYEN	<b>Art Unit</b> 2663	<b>AIA (First Inventor to File) Status</b> No

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.

2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims\***

5) ☒ Claim(s) 1 is/are pending in the application.  
5a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

6) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

7) ☒ Claim(s) 1 is/are rejected.

8) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

9) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

**Application Papers**

10) ☐ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 04/29/2014 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

**Priority under 35 U.S.C. § 119**

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

a) ☒ All    b) ☐ Some\*\*    c) ☐ None of the:

1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)  
Paper No(s)/Mail Date \_\_\_\_\_.

3) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

4) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The present application is being examined under the pre-AIA first to invent provisions.

#### ***Priority***

2. Receipt is acknowledged of certified copies of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Information Disclosure Statement***

3. The information disclosure statement (IDS), submitted on 04/29/2014, is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

#### ***Claim Objections***

4. Claim 1 is objected to because of the following informalities:  
Claim 1 (line 11), "the out put" should be changed to --the output--.  
Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 1 is rejected under pre-AIA 35 U.S.C. 102(e) as being by anticipated by Kijima (US 6,661,451).

Regarding claim 1, Kijima et al. discloses an electric camera comprising:

an image sensing device (CCD 12, figure 1, column 3, lines 25-34; column 4, line 57 - column 5, line 42) with a light receiving surface having N vertically arranged pixels and an arbitrary number of pixels arranged horizontally, N being equal to or more than three times the number of effective scanning lines M of a display screen of a television system;

a driver (figure 1, column 3, lines 25-34; column 4, line 57 - column 5, line 42) to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels of every K pixels to produce a number of lines of output signals which corresponds to the number of effective scanning lines M, K being at least one of integers equal to or less than an integral part of a quotient of N divided by M; and

a signal processing unit (image processing portion 26, figure 1, column 2, lines 62-67) to generate image signals by using the output signals of the image sensing device.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Noguchi et al. (US 5,402,173) discloses image pickup system.

Yamashita et al. (US 5,438,365) discloses solid-state imaging apparatus employing independently variable odd and even lines of photodiodes.

Hokari et al. (US 5,638,132) discloses image sensing and display system and image pickup and display system.

Hatakeyama (US 7,352,391) discloses method of controlling the display mode and the recording mode and the recording mode of an electric still camera.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571)272-7315. The examiner can normally be reached on 7:30AM - 5:00PM, MONDAY -THURSDAY.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TWYLER HASKINS can be reached on (571) 272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2663

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUONG T NGUYEN/  
Primary Examiner, Art Unit 2663  
06/12/14

<b>Notice of References Cited</b>	Application/Control No. 14/264,243		Applicant(s)/Patent Under Reexamination NAKANO ET AL.	
	Examiner LUONG T. NGUYEN		Art Unit 2663	Page 1 of 1

#### U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,402,173	03-1995	Noguchi et al.	348/322
*	B	US-5,438,365	08-1995	Yamashita et al.	348/297
*	C	US-5,638,132	06-1997	Hokari et al.	348/556
*	D	US-7,352,391	04-2008	Hatakeyama, Kouki	348/223.1
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			


#### FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

#### NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<b>Search Notes</b> 	<b>Application/Control No.</b> 14264243	<b>Applicant(s)/Patent Under Reexamination</b> NAKANO ET AL.
	<b>Examiner</b> LUONG T NGUYEN	<b>Art Unit</b> 2663

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
348/302,294,311,312,332,272,280,281	6/12/2014	LTN
EAST (USPAT; USPGPUB; JPO; EPO; DERWENT; IBM_TDB; USOCR; FPRS)	6/12/2014	LTN

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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## EAST Search History

## EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	2	13/681495	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 09:13
S2	93	vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1) same standard same (television or TV or NTSC)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 14:25
S3	9	("4707744"   "4750041"   "4752829"   "4758895"   "4774586"   "4972254"   "4996600"   "5051832"   "5287192").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/06/12 14:46
S4	8	("4054915"   "5170249"   "5187569"   "5828406"   "6195125"   "6661451"   "7154539"   "7403226").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/06/12 14:50
S5	668	vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1) and (standard with (television or TV or NTSC))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:19
S6	344	S5 and (@ad<="20000111" or @rlad<="20000111")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:20
S7	5901	348/302,294,312,332.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:21
S8	15	S6 and S7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:21
S9	3	("4426664"   "4879601"   "4996000").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/06/12 15:29
S10	920	348/272.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2014/06/12 15:31



			IBM_TDB			
S11	4	S5 and S10	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:31
S12	682	348/280,281.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:32
S13	2	S5 and S12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:33
S14	8	("4339775"   "4791308"   "4858020"   "5027217"   "5412422"   "5452004"   "5668597"   "5929910").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/06/12 15:33
S15	4	("3885090"   "4339775"   "5146340"   "5153731").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/06/12 15:36
S16	8912	vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:39
S17	157	S16 and (S10 or S12)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:40
S18	30	S17 and (@ad<="20000111" or @rlad<="20000111")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:40
S19	1287	348/311.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:48
S20	3788	348/308.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:48
S21	349	S16 and (S19 or S20)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:48

S22	60	S21 and (@ad<="20000111" or @rlad<="20000111")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 15:49
S23	9	("20010043275"   "5166799"   "5287192"   "5719624"   "5847758"   "5966174"   "6169577"   "6441849"   "7034876").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/06/12 15:49
S24	3	("4426664"   "4879601"   "4996000").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/06/12 15:50
S25	326	vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1) same (scan\$4 adj4 line\$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 16:00
S26	153	S25 and (@ad<="20000111" or @rlad<="20000111")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 16:00
S27	12	("4054915"   "4570178"   "4746988"   "4837628"   "4924316"   "4929824"   "5239380"   "5444482"   "5508739"   "5592575"   "5828406"   "5847756").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2014/06/12 16:02
S28	3432	(scan\$4 adj4 line\$1) with (display or screen or monitor) with (TV or television)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 16:08
S29	77	S16 and S28	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 16:09
S30	49	S29 and (@ad<="20000111" or @rlad<="20000111")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 16:09
S31	43	S5 and S28	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/12 16:28

**EAST Search History (Interference)**

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## BIB DATA SHEET

CONFIRMATION NO. 1644

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
14/264,243	04/29/2014	348	2663	500.38315CC5		
<b>RULE</b>						
<b>APPLICANTS</b> Hitachi Consumer Electronics Co., Ltd., Tokyo, JAPAN, Assignee (with 37 CFR 1.172 Interest); <b>INVENTORS</b> Takahiro Nakano, Tokyo, JAPAN; Ryuji Nishimura, Tokyo, JAPAN; Toshiro Kinugasa, Tokyo, JAPAN; <b>** CONTINUING DATA *****</b> This application is a CON of 13/681,495 11/20/2012 PAT 8736729 which is a CON of 12/845,266 07/28/2010 PAT 8339493 which is a CON of 10/660,710 09/12/2003 PAT 8059177 which is a DIV of 09/520,836 03/08/2000 PAT 6765616 <b>** FOREIGN APPLICATIONS *****</b> JAPAN 00-006064 01/11/2000 <b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b> 05/13/2014						
Foreign Priority claimed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 35 USC 119(a-d) conditions met <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Verified and /LUONG TRUNG NGUYEN/ Acknowledged Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	<b>STATE OR COUNTRY</b> JAPAN	<b>SHEETS DRAWINGS</b> 8	<b>TOTAL CLAIMS</b> 1	<b>INDEPENDENT CLAIMS</b> 1
<b>ADDRESS</b> ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873 UNITED STATES						
<b>TITLE</b> ELECTRIC CAMERA						
<b>FILING FEE RECEIVED</b> 1740	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		

Receipt date: 04/29/2014

PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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<b>Substitute for form 1449A/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>		<b>Complete if Known</b>			
		Application Number	To be assigned		
		Filing Date	April 29, 2014		
		First Named Inventor	T. NAKANO, et al.		
		Art Unit (expected)	2663		
		Examiner Name (expected)	Luong Trung Nguyen		
Sheet	1	of	2	Attorney Docket Number	500.38315CC5

U.S. PATENT DOCUMENTS						
Examiner Initials'	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)				
		US- 6,661,451		12-2003	Kijima, et al.	
		US- 7,154,539		12-2006	Nishimura, et al.	
		US- 5,828,406		10-1998	Parulski et al.	
		US- 4,054,915		10-1977	Sugihara, Yasumasa	
		US- 5,170,249		12-1992	Ohtsubo, et al.	
		US- 5,187,569		02-1993	Tani, Nobuhiro	
		US- 7,403,226		07-2008	Nakano, et al.	
		US-6,195,125		02-2001	Udagawa et al.	
		US-6,765,616		07-2004	Nakano et al.	
		US-6,906,746		06-2005	Hijishiri et al.	
		US-6,519,000		02-2003	Udagawa, Yoshirou	
		US-5,847,758		12-1998	Iizuka, Tetsuya	

FOREIGN PATENT DOCUMENTS						
Examiner Initials'	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
		JP 9-270959	10-97			
		JP 11-187306	07-99			
		JP 04-323973	11/13/1992	Hitachi, Ltd.		
		JP 11-004456	01/06/1999	Fuji Photo Film Co., Ltd.		
		JP 11-355665	12/24/1999	Fuji Photo Film Co., Ltd.		

Examiner Signature	/Luong Nguyen/	Date Considered	06/12/2014
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /LN/

Receipt date: 04/29/2014

PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Substitute for form 1449A/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>		<b>Complete if Known</b>			
		Application Number	To be assigned		
		Filing Date	April 29, 2014		
		First Named Inventor	T. NAKANO, et al.		
		Art Unit (expected)	2663		
		Examiner Name (expected)	Luong Trung Nguyen		
Sheet	2	of	2	Attorney Docket Number	500.38315CC5

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)				
		US - 6,970,191		11-2005	Sase et al.	
		US - 5,374,424		03-1998	Sasaki, Takashi	
		US - 6,798,448		09-2004	Motono et al.	
		US - 5,287,192		02-1994	Iizuka, Tetsuya	
		US - 6,765,616		07-2004	Nakano et al.	
		US - 8,059,177		11-2011	Nakano et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials'	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> –Number <sup>4</sup> –Kind Code <sup>5</sup> (if known)				

Examiner Signature	/Luong Nguyen/	Date Considered	06/12/2014
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /LN/

Receipt date: 04/29/2014

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /LN/



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s): NAKANO, et al  
Application No.: 14/264,243  
Filed: April 29, 2014  
For: ELECTRIC CAMERA  
Conf. No.: 1644

**SUBMISSION OF APPLICATION DATA SHEET AND REQUEST FOR  
CORRECTED FILING RECEIPT**

Mail Stop:  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

June 18, 2014

Sir:

Attached hereto is a corrected Application Data Sheet, to include the correct the Foreign Application number. Applicants respectfully request issuance of a corrected filing receipt which indicates the updated information.

Foreign Application number should read:

JAPAN 2000-006064 01/11/2000

Please charge any shortages in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (Docket No. **500.38315CC5**) and please credit any excess fees to such deposit account.

Respectfully submitted,

/Ayal I. Sharon/  
Ayal I. Sharon  
Registration No. 55,986

AIS/rp  
(703) 312-6600



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	<u>14/264,243</u>
Title of Invention	ELECTRIC CAMERA		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

**Secrecy Order 37 CFR 5.2**

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

**Inventor Information:**

<b>Inventor 1</b>					<a href="#">Remove</a>
<b>Legal Name</b>					
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Takahiro		Nakano		
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	Tokyo	<b>Country of Residence <sup>i</sup></b>	JP		
<b>Mailing Address of Inventor:</b>					
<b>Address 1</b>	c/o Hitachi, Ltd, Intellectual Property Group				
<b>Address 2</b>	6-1, Marunouchi 1-chome, Chiyoda-ku				
<b>City</b>	Tokyo	<b>State/Province</b>			
<b>Postal Code</b>	100-8220	<b>Country <sup>i</sup></b>	JP		
<b>Inventor 2</b>					<a href="#">Remove</a>
<b>Legal Name</b>					
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
	Ryuji		Nishimura		
<b>Residence Information (Select One)</b> <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	Tokyo	<b>Country of Residence <sup>i</sup></b>	JP		
<b>Mailing Address of Inventor:</b>					
<b>Address 1</b>	c/o Hitachi, Ltd, Intellectual Property Group				
<b>Address 2</b>	6-1, Marunouchi 1-chome, Chiyoda-ku				
<b>City</b>	Tokyo	<b>State/Province</b>			
<b>Postal Code</b>	100-8220	<b>Country <sup>i</sup></b>	JP		
<b>Inventor 3</b>					<a href="#">Remove</a>
<b>Legal Name</b>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		

Prefix	Given Name	Middle Name	Family Name	Suffix
	Toshiro		Kinugasa	

Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service

City	Tokyo	Country of Residence <sup>i</sup>	JP
------	-------	-----------------------------------	----

**Mailing Address of Inventor:**

Address 1	c/o Hitachi, Ltd, Intellectual Property Group		
Address 2	6-1, Marunouchi 1-chome, Chiyoda-ku		
City	Tokyo	State/Province	
Postal Code	100-8220	Country <sup>i</sup>	JP

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.

Add

**Correspondence Information:**Enter either Customer Number or complete the Correspondence Information section below.  
For further information see 37 CFR 1.33(a).☐ An Address is being provided for the correspondence information of this application.

Customer Number	020457
Email Address	

Add Email

Remove Email

**Application Information:**

Title of the Invention	ELECTRIC CAMERA		
Attorney Docket Number	500.38315CC5	Small Entity Status Claimed	<input type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	

**Filing By Reference :**

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		

**Publication Information:**
☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

**Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

**Representative Information:**

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	020457		

**Domestic Benefit/National Stage Information:**

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
	Continuation of	13681495	2012-11-20		
Prior Application Status	Patented		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13681495	Continuation of	12845266	2010-07-28	8339493	2012-12-25
Prior Application Status	Patented		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12845266	Continuation of	10660710	2003-09-12	8059177	2011-11-15
Prior Application Status	Patented		<a href="#">Remove</a>		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
10660710	Division of	09520836	2000-03-08	6765616	2004-07-20
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the <b>Add</b> button.					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		

**Foreign Priority Information:**

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)<sup>1</sup> the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

<a href="#">Remove</a>			
Application Number	Country <sup>1</sup>	Filing Date (YYYY-MM-DD)	Access Code <sup>1</sup> (if applicable)
<del>00-006064</del> 2000-006064	JP	2000-01-11	
Additional Foreign Priority Data may be generated within this form by selecting the <b>Add</b> button.			

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications**

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

**Authorization to Permit Access:**

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
<b>Applicant 1</b>			
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
<input type="button" value="Clear"/>			
<input checked="" type="radio"/> Assignee		<input type="radio"/> Legal Representative under 35 U.S.C. 117	
<input type="radio"/> Person to whom the inventor is obligated to assign.		<input type="radio"/> Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor : <input type="text"/>			
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name		Hitachi Consumer Electronics Co., Ltd.	
<b>Mailing Address Information For Applicant:</b>			
Address 1		2-1, Otemachi 2-chome, Chiyoda-ku	
Address 2			
City		Tokyo	State/Province
Country	JP	Postal Code	100-0004
Phone Number		Fax Number	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

**Assignee Information including Non-Applicant Assignee Information:**

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

<b>Assignee 1</b>				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
If the Assignee or Non-Applicant Assignee is an Organization check here. <input type="checkbox"/>				
Prefix	Given Name	Middle Name	Family Name	Suffix
<b>Mailing Address Information For Assignee including Non-Applicant Assignee:</b>				
Address 1				
Address 2				
City		State/Province		
Country		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				

**Signature:**

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.				
Signature	/Ayal I. Sharon/		Date (YYYY-MM-DD)	2014-04-29 06/18/2014
First Name	Ayal	Last Name	Sharon	Registration Number 55986
Additional Signature may be generated within this form by selecting the Add button.				

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	500.38315CC5
		Application Number	<u>14/264,243</u>
Title of Invention	ELECTRIC CAMERA		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



Electronic Acknowledgement Receipt	
EFS ID:	19340578
Application Number:	14264243
International Application Number:	
Confirmation Number:	1644
Title of Invention:	ELECTRIC CAMERA
First Named Inventor/Applicant Name:	Takahiro Nakano
Customer Number:	20457
Filer:	Ayal I. Sharon/Ricardo Perez
Filer Authorized By:	Ayal I. Sharon
Attorney Docket Number:	500.38315CC5
Receipt Date:	18-JUN-2014
Filing Date:	29-APR-2014
Time Stamp:	14:39:48
Application Type:	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
------------------------	----

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	Letter.pdf	69791 44d854b12ee502e0c7e53243155f58b48ef3369f	no	1

### Warnings:

### Information:

2	Application Data Sheet	ApplicationDataSheet.pdf	1230387	no	8
			777ba9df018eb88fb2a7b48f7786b6eddb854c7e5		
<b>Warnings:</b>					
<b>Information:</b>					
This is not an USPTO supplied ADS fillable form					
<b>Total Files Size (in bytes):</b>			1300178		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p>					



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/264,243	04/29/2014	Takahiro Nakano	500.38315CC5

**CONFIRMATION NO. 1644**

**PUBLICATION NOTICE**



20457  
ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 1800  
ARLINGTON, VA 22209-3873

**Title:**ELECTRIC CAMERA

**Publication No.**US-2014-0232915-A1

**Publication Date:**08/21/2014

**NOTICE OF PUBLICATION OF APPLICATION**

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at [www.uspto.gov](http://www.uspto.gov). The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

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In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at [www.uspto.gov](http://www.uspto.gov) using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

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Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s): T. NAKANO, et al  
Application No.: 14/264,243  
Filed: April 29, 2014  
For: ELECTRIC CAMERA  
Group AU: 2663  
Examiner: Luong Trung Nguyen  
**Conf. No.: 1644**

**AMENDMENT**

**MS: Amendment (Fee)**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**October 14, 2014**

Sir:

In response to the Office Action dated June 13, 2014, please amend the  
above-identified application as listed below and as set forth on the following pages:

**Amendments to the Claims;**

**Remarks** are included following the amendments.

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (Currently Amended) An electric camera comprising:

an image sensing device<sub>1</sub> with a light receiving surface having a quantity N of vertically arranged pixels<sub>1</sub> and an arbitrary ~~number~~quantity of pixels arranged horizontally, ~~wherein N being is greater than or equal to or more than three times the number~~a quantity M of effective scanning lines M of a display screen of a television system;

a driver configured to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels<sub>1</sub> at intervals of every K a quantity K of pixels<sub>1</sub> in order to produce a ~~number~~quantity of lines of output signals which corresponds to the ~~number~~quantity M of effective scanning lines<sub>1</sub> ~~M, K being at least one of integers equal to or less than an integral part wherein the quantity K is an integer less than or equal to an integer portion of a quotient of N divided by M; and~~  
a view angle change switch configured to input a request to change the view angle of the moving image; and

a signal processing unit configured to generate image signals by using the ~~out put~~output signals of the image sensing device;

wherein when the request to change the view angle is to magnify the output image by the view angle change switch, the driver changes the quantity of K from a first value (K1) to a second value (K2), in order to read out image signals with the

same quantity of output lines from different areas on the imaging sensing device  
wherein the first value K1 is larger than the second value K2;  
wherein the signal processing unit generates image signals with the same  
scanning lines.

2. (New) An electric camera according to the claim 1,  
wherein the view angle change switch is configured to input a request to  
continuously change the view angle of the moving image,

wherein the signal processing unit is configured to generate magnified  
image signals with interpolation processing, according to a magnification factor set  
by the view angle switch.

3. (New) An electric camera according to the claim 2,  
wherein the view angle switch includes a zoom switch interlocked with an  
optical zoom mechanism.

4. (New) An electric camera comprising:  
an image sensing device, with a light receiving surface having a quantity N  
of pixels arranged vertically, and an arbitrary quantity of pixels arranged horizontally,  
wherein N is greater than three times a quantity M of effective vertical lines of a  
television system;

a signal processing unit configured to generate and output image signals  
with the quantity M of effective vertical lines of a television system, by using output  
signals of the image sensing device,

a zoom switch configured to enable a user to input zooming operation information,

wherein the signal processing unit generates image signals, read out with mixing or culling vertical pixel lines of signals, at pixel intervals of a quantity K of lines, from different areas of the imaging device, the areas being continuously changed, and the quantity K being discontinuously changed according to magnification factors.

5. (New) An electric camera according to the claim 4,  
wherein the zoom switch is interlocked with an optical zoom mechanism.

**REMARKS**

This Amendment is in response to the Office Action dated June 13, 2014. In the Office Action, claim 1 was objected to due to a minor informality, and claim 1 was rejected under pre-AIA 35 U.S.C. §102(e) as being anticipated by Kijima (U.S. 6,661,451).

By the present amendment, claim 1 has been amended, and new claims 2-5 have been added. At entry of this paper, claims 1-5 will be pending for further consideration and examination in the application. All rejections are traversed regarding the claims as previously presented, and are also traversed in so far as the rejections are applicable to the present claims. Reconsideration and allowance of this application, as amended, is respectfully requested.

Support for the amendments and new claims can be found, for example, in Figures 7 and 8, and in the specification at page 24, line 21 through page 29, line 19 (corresponding to paragraphs [0062]-[0072] of the application's U.S. PG-PUB 2014/0232915).

**RE: OBJECTIONS**

In the Office Action, claim 1 was objected to due to a minor informality. By the present response, the claim has been amended to correct the minor informality. Therefore, the objection should be withdrawn.

**RE: 35 U.S.C. §102 REJECTIONS**

In the Office Action, claim 1 was rejected under pre-AIA 35 U.S.C. §102(e) as being anticipated by Kijima (U.S. 6,661,451). The 35 USC §102 rejection is traversed.



In order to properly support a §102 anticipatory-type rejection, "each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." In re Robertson, 169 F.3d 743 (Fed. Cir. 1999). The applied art does not adequately support a §102 anticipatory-type rejection because, at minimum, such applied art does not disclose (or suggest) the following discussed features of Applicant's claims.

In regards to independent claim 1, the rejection should be withdrawn, at minimum, because the Kijima reference fails to disclose the following claimed features:

wherein when the request to change the view angle is to magnify the output image by the view angle change switch, the driver changes the quantity of K from a first value (K1) to a second value (K2), in order to read out image signals with the same quantity of output lines from different areas on the imaging sensing device wherein the first value K1 is larger than the second value K2;

In regards to new independent claim 4, the rejection should not be applied, at minimum, because the Kijima reference fails to disclose the following claimed features:

a zoom switch configured to enable a user to input zooming operation information,

wherein the signal processing unit generates image signals, read out with mixing or culling vertical pixel lines of signals, at pixel intervals of a quantity K of lines, from different areas of the imaging device, the areas being continuously changed, and the quantity K being discontinuously changed according to magnification factors.

In regards to all dependent claims, they are allowable at the very least because they depend from allowable independent claims .

In view of the foregoing amendments and remarks, the Applicant respectfully submits that the claims listed above as presently being under consideration in the application are now in condition for allowance.

**EXAMINER INVITED TO TELEPHONE**

The Examiner is herein invited to telephone the undersigned attorneys at the local Washington, D.C. area telephone quantity of 703/312-6600 for discussing any Examiner's Amendments or other suggested actions for accelerating prosecution and moving the present application to allowance.

**CONCLUSION**

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims listed above as presently being under consideration in the application are now in condition for allowance.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Antonelli, Terry, Stout & Kraus, LLP Deposit Account No. 01-2135 (Docket No. 500.38315CC5), and please credit any excess fees to such deposit account.

Respectfully submitted,

**ANTONELLI, TERRY, STOUT & KRAUS, LLP**

By /Inna S Shestul/  
Inna S. Shestul  
Registration No. 55,616

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1300 North Seventeenth Street, Suite 550  
Arlington, Virginia 22209  
Telephone: (703) 312-6600  
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Electronic Patent Application Fee Transmittal				
<b>Application Number:</b>	14264243			
<b>Filing Date:</b>	29-Apr-2014			
<b>Title of Invention:</b>	ELECTRIC CAMERA			
<b>First Named Inventor/Applicant Name:</b>	Takahiro Nakano			
<b>Filer:</b>	Inna S. Shestul/Karen Jones			
<b>Attorney Docket Number:</b>	500.38315CC5			
Filed as Large Entity				
<b>Utility under 35 USC 111(a) Filing Fees</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
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<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				
Extension - 1 month with \$0 paid	1251	1	200	200

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				200

<b>Electronic Acknowledgement Receipt</b>	
<b>EFS ID:</b>	20403034
<b>Application Number:</b>	14264243
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1644
<b>Title of Invention:</b>	ELECTRIC CAMERA
<b>First Named Inventor/Applicant Name:</b>	Takahiro Nakano
<b>Customer Number:</b>	20457
<b>Filer:</b>	Inna S. Shestul/Karen Jones
<b>Filer Authorized By:</b>	Inna S. Shestul
<b>Attorney Docket Number:</b>	500.38315CC5
<b>Receipt Date:</b>	14-OCT-2014
<b>Filing Date:</b>	29-APR-2014
<b>Time Stamp:</b>	08:26:16
<b>Application Type:</b>	Utility under 35 USC 111(a)

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1		38315cc5-10-14-2014Amend. pdf	69566 28c5e64c40688d10efb4025724ed27d848c fda5e	yes	7				
	<b>Multipart Description/PDF files in .zip description</b>								
	<b>Document Description</b>		<b>Start</b>	<b>End</b>					
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1					
	Claims		2	4					
	Applicant Arguments/Remarks Made in an Amendment		5	7					
<b>Warnings:</b>									
<b>Information:</b>									
2	Fee Worksheet (SB06)	fee-info.pdf	30031 55448cab986e1c7ef80337b7c2ccc1da9351 143e	no	2				
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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875					Application or Docket Number <b>14/264,243</b>		Filing Date <b>04/29/2014</b>		<input checked="" type="checkbox"/> To be Mailed			
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO												
<b>APPLICATION AS FILED – PART I</b>												
(Column 1)			(Column 2)									
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)				
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A						
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A						
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A						
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =						
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).										
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))												
* If the difference in column 1 is less than zero, enter "0" in column 2.												
<b>APPLICATION AS AMENDED – PART II</b>												
(Column 1)			(Column 2)			(Column 3)						
AMENDMENT	<b>10/14/2014</b>		CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		* 5		Minus	** 20	= 0		X \$80 =		0	
	Independent (37 CFR 1.16(h))		* 2		Minus	*** 3	= 0		X \$420 =		0	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))											
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
TOTAL ADD'L FEE											<b>0</b>	
(Column 1)			(Column 2)			(Column 3)						
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		*		Minus	**	=		X \$ =			
	Independent (37 CFR 1.16(h))		*		Minus	***	=		X \$ =			
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))											
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
TOTAL ADD'L FEE												
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>												

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/264,243	04/29/2014	Takahiro Nakano	500.38315CC5	1644

20457 7590 12/09/2014  
ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 550  
ARLINGTON, VA 22209-3873

EXAMINER
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NGUYEN, LUONG TRUNG

ART UNIT	PAPER NUMBER
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2663

MAIL DATE	DELIVERY MODE
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12/09/2014

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



<b>Office Action Summary</b>	<b>Application No.</b> 14/264,243	<b>Applicant(s)</b> NAKANO ET AL.	
	<b>Examiner</b> LUONG T. NGUYEN	<b>Art Unit</b> 2663	<b>AIA (First Inventor to File) Status</b> No

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on 10/14/2014.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_.

2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims\***

5) ☒ Claim(s) 1-5 is/are pending in the application.  
5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.

6) ☐ Claim(s) \_\_\_\_ is/are allowed.

7) ☒ Claim(s) 1-5 is/are rejected.

8) ☐ Claim(s) \_\_\_\_ is/are objected to.

9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

\* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).

**Application Papers**

10) ☐ The specification is objected to by the Examiner.

11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

a) ☐ All    b) ☐ Some\*\*    c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)  
Paper No(s)/Mail Date \_\_\_\_.

3) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.

4) ☐ Other: \_\_\_\_.

### **DETAILED ACTION**

1. The present application is being examined under the pre-AIA first to invent provisions.

#### ***Response to Arguments***

2. Applicant's arguments with respect to claim 1 and newly added claims 2-5 filed on 10/14/2014 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

#### ***Claim Objections***

3. Claims 1-5 are objected to because of the following informalities:

Claim 1 (lines 13-14), "to change the view angle of the moving image" should be changed to --to change a view angle of a moving image--.

Claim 1 (lines 17-18), "to magnify the output image" should be changed to --to magnify an output image--.

Claim 1 (line 19), "first value (K1) to a second value (K2)" should be changed to --first value K1 to a second value K2--.

Claim 1 (lines 19, 22), "image signals" should be changed to --the image signals--.

Claim 2 (line 2), "a request" should be changed to --the request--.

Claim 4 (line 7), "a television system" should be changed to --the television system--.

Claim 4 (line 11), "image signals" should be changed to --the image signals--.

Claims 2-3 are objected as being dependent from claim 1.

Claim 5 is objected as being dependent from claim 4.

Appropriate correction is required.

### ***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit <http://www.uspto.gov/forms/>. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to <http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp>.

5. Claims 1-2 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1, 6, 13, 18 of U.S. Patent No. 6,765,616. Although the claims at issue are not identical, they are not patentably distinct from each other because of the following reasons.

Claim 1 of the instant application is anticipated by patent claims 1 and 6 in that patent claims 1 and 6 contain all the limitations of claim 1 of the instant application. Patent Claims 1 and 6 does not disclose a view angle change switch configured to input a request to change a view angle of the moving image. However, Patent Claims 1 and 6 discloses moving image. It would have been obvious to an ordinary skill in the art at the time the invention was made to include such view angle change switch into the device of Patent Claims 1 and 6 in order to change view angle (zooming) of a moving image.

Claim 1 of the instant application therefore is not patently distinct from the earlier patent claims 1, 6 and as such is unpatentable for obvious-type double patenting.

Regarding Claim 2 of the instant application, see Examiner's comments regarding instant applicant claim 1 above, except for feature "wherein the signal processing unit is configured to generate magnified image signals with interpolation processing, according to a magnification factor set by the view angle switch," which is well known in the art. It would have been obvious to an ordinary skill in the art at the time the invention was made to include such signal processing unit into the device of Patent Claims 1 and 6 in order to generate magnified image signals with interpolation processing.

Claim 2 of the instant application therefore is not patently distinct from the earlier patent claims 1, 6 and as such is unpatentable for obvious-type double patenting.

Claim 1 of the instant application is anticipated by patent claims 13 and 18 in that patent claims 13 and 18 contain all the limitations of claim 1 of the instant application. Patent Claims

13 and 18 does not disclose a view angle change switch configured to input a request to change a view angle of the moving image. However, Patent Claims 13 and 18 discloses moving image. It would have been obvious to an ordinary skill in the art at the time the invention was made to include such view angle change switch into the device of Patent Claims 13 and 18 in order to change view angle (zooming) of a moving image.

Claim 1 of the instant application therefore is not patently distinct from the earlier patent claims 13, 18 and as such is unpatentable for obvious-type double patenting.

Regarding Claim 2 of the instant application, see Examiner's comments regarding instant applicant claim 1 above, except for feature "wherein the signal processing unit is configured to generate magnified image signals with interpolation processing, according to a magnification factor set by the view angle switch," which is well known in the art. It would have been obvious to an ordinary skill in the art at the time the invention was made to include such signal processing unit into the device of Patent Claims 13 and 18 in order to generate magnified image signals with interpolation processing.

Claim 2 of the instant application therefore is not patently distinct from the earlier patent claims 13, 18 and as such is unpatentable for obvious-type double patenting.

6. Claim 4 rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1, 7 of U.S. Patent No. 7,403,226. Although the claims at issue are not identical, they are not patentably distinct from each other because of the following reasons.

Claim 4 of the instant application is anticipated by patent claims 1 and 7 in that patent claims 1 and 7 contain all the limitations of claim 4 of the instant application. Claim 1 of the instant application therefore is not patently distinct from the earlier patent claims 1, 7 and as such is unpatentable for obvious-type double patenting.

7. Claim 3 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1, 6, 13, 18 of U.S. Patent No. 6,765,616 in view of Shiozaki et al. (US 6,781,634).

Regarding instant application claim 3, Patent Claims 1 and 6 fail to disclose wherein the view angle switch includes a zoom switch interlocked with an optical zoom mechanism.

However, Shiozaki et al. discloses an electronic camera which discloses an internal zoom switch 8-b causes interlock control of a zoom focus mechanism 35 (figure 12, column 7, lines 1-10). Therefore, it would have been obvious to an ordinary skill in the art at the time the invention was made to modify the device in Patent Claims 1 and 6 by the teaching of Shiozaki et al. in order to pick up the object image in focus even during the zoom operation.

Regarding instant application claim 3, Patent Claims 13 and 18 fail to disclose wherein the view angle switch includes a zoom switch interlocked with an optical zoom mechanism.

However, Shiozaki et al. discloses an electronic camera which discloses an internal zoom switch 8-b causes interlock control of a zoom focus mechanism 35 (figure 12, column 7, lines 1-10). Therefore, it would have been obvious to an ordinary skill in the art at the time the invention was made to modify the device in Patent Claims 13 and 18 by the teaching of Shiozaki et al. in order to pick up the object image in focus even during the zoom operation.

8. Claim 5 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1, 7 of U.S. Patent No. 7,403,226 in view of Shiozaki et al. (US 6,781,634).

Regarding instant application claim 5, Patent Claims 1 and 7 fail to disclose wherein the zoom switch interlocked with an optical zoom mechanism.

However, Shiozaki et al. discloses an electronic camera which discloses an internal zoom switch 8-b causes interlock control of a zoom focus mechanism 35 (figure 12, column 7, lines 1-10). Therefore, it would have been obvious to an ordinary skill in the art at the time the invention was made to modify the device in Patent Claims 1 and 7 by the teaching of Shiozaki et al. in order to pick up the object image in focus even during the zoom operation.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571)272-7315. The examiner can normally be reached on 7:30AM - 5:00PM, MONDAY -THURSDAY.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TWYLER HASKINS can be reached on (571) 272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUONG T NGUYEN/  
Primary Examiner, Art Unit 2663  
12/08/14



<b>Notice of References Cited</b>	Application/Control No. 14/264,243		Applicant(s)/Patent Under Reexamination NAKANO ET AL.	
	Examiner LUONG T. NGUYEN		Art Unit 2663	Page 1 of 1

#### U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,765,616	07-2004	Nakano et al.	348/322
*	B	US-7,403,226	07-2008	Nakano et al.	348/294
*	C	US-6,781,634	08-2004	Shiozaki et al.	348/374
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

#### FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

#### NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

**EAST Search History****EAST Search History (Prior Art)**


Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S39	24	(zoom\$3 near switch) with interlock\$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 16:07
S40	686	vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1) and (standard with (television or TV or NTSC))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 17:08
S41	2162	348/302.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 17:09
S42	8	S40 and S41	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 17:09
S43	1350	348/311.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 17:10
S44	12	S40 and S43	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 17:10
S45	334	S40 and interpolat\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 17:12
S46	61	(vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1) and (standard with (television or TV or NTSC))) same interpolat\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 17:12
S48	170	S45 and (@ad<="20000308" or @rlad<="20000308")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 17:17
S49	44	zoom\$3 with interlock\$2 with focus\$3 with (operation or function)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/08 18:15

**EAST Search History (Interference)**

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**12/ 8/ 2014 7:11:35 PM**

**C:\ Users\ Inguyen2\ Documents\ EAST\ Workspaces\ 14264243.wsp**

<p align="center"><b><i>Index of Claims</i></b></p> 	<b>Application/Control No.</b> 14264243	<b>Applicant(s)/Patent Under Reexamination</b> NAKANO ET AL.
	<b>Examiner</b> LUONG T NGUYEN	<b>Art Unit</b> 2663


✓	<b>Rejected</b>
=	<b>Allowed</b>

-	<b>Cancelled</b>
÷	<b>Restricted</b>

N	<b>Non-Elected</b>
I	<b>Interference</b>

A	<b>Appeal</b>
O	<b>Objected</b>

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant										<input type="checkbox"/> CPA										<input type="checkbox"/> T.D.										<input type="checkbox"/> R.1.47									
CLAIM		DATE																																					
Final	Original	06/12/2014	12/08/2014																																				
	1	✓	✓																																				
	2		✓																																				
	3		✓																																				
	4		✓																																				
	5		✓																																				

<b>Search Notes</b>  	<b>Application/Control No.</b>  14264243	<b>Applicant(s)/Patent Under Reexamination</b>  NAKANO ET AL.
	<b>Examiner</b>  LUONG T NGUYEN	<b>Art Unit</b>  2663

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
348/302,294,311,312,332,272,280,281	6/12/2014	LTN
EAST (USPAT; USPGPUB; JPO; EPO; DERWENT; IBM_TDB; USOCR; FPRS)	6/12/2014	LTN
348/302, 311	12/8/2014	LTN
EAST (USPAT; USPGPUB; JPO; EPO; DERWENT; IBM_TDB; USOCR; FPRS)	12/8/2014	LTN

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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## POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:



Practitioners associated with Customer Number:

24956

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:



The address associated with Customer Number:

24956

OR


<input type="checkbox"/>	Firm or Individual Name		
	Address		
	City		
	Country		
	Telephone		Email

Assignee Name and Address: HITACHI MAXELL, LTD.  
1-88, Ushitora 1-chome, Ibaraki-shi, Osaka 567-8567, Japan

**A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/SB/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.**

### SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	27/08/2014
Name	Yoshihiro SENZAI	Telephone	
Title	President & Chief Executive Officer, HITACHI MAXELL, LTD.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

**STATEMENT UNDER 37 CFR 3.73(c)**

Applicant/Patent Owner: T. NAKANO

Application No./Patent No.: 14/264,243

Filed/Issue Date: April 29, 2014

Titled: ELECTRIC CAMERA

HITACHI MAXELL, LTD., a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is \_\_\_\_\_%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Takahiro NAKANO To: HITACHI, LTD.

The document was recorded in the United States Patent and Trademark Office at  
Reel 10631, Frame 900, or for which a copy thereof is attached.

2. From: HITACHI, LTD. To: HITACHI CONSUMER ELECTRONICS CO., LTD.

The document was recorded in the United States Patent and Trademark Office at  
Reel 30648, Frame 217, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**STATEMENT UNDER 37 CFR 3.73(c)**3. From: HITACHI CONSUMER ELECTRONICS CO., LTD. To: HITACHI MAXELL, LTD.

The document was recorded in the United States Patent and Trademark Office at  
 Reel 33685, Frame 883, or for which a copy thereof is attached.

4. From: \_\_\_\_\_ To: \_\_\_\_\_

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5. From: \_\_\_\_\_ To: \_\_\_\_\_

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6. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
 Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/John R. Mattingly/

January 16, 2015

Signature

Date

John R. Mattingly

30,293

Printed or Typed Name

Title or Registration Number



## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	ASA-9606-06
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

## Secrecy Order 37 CFR 5.2

<input type="checkbox"/> Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--

## Inventor Information:

Inventor 1 <span style="float: right;">Remove</span>				
Legal Name				
Prefix	Given Name	Middle Name	Family Name	Suffix
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
City		State/Province		Country of Residence
Mailing Address of Inventor:				
Address 1				
Address 2				
City		State/Province		
Postal Code		Country		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button. <span style="float: right;">Add</span>				

## Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).		
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.		
Customer Number		
Email Address		<span>Add Email</span> <span>Remove Email</span>

## Application Information:

Title of the Invention			
Attorney Docket Number		Small Entity Status Claimed	<input type="checkbox"/>
Application Type			
Subject Matter			
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	ASA-9606-06
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		

### Publication Information:

<input type="checkbox"/>	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/>	<b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

### Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.			
Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number			

### Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.			
Prior Application Status		<a href="#" style="border: 1px solid black; padding: 2px;">Remove</a>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the <b>Add</b> button.			

### Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).			
<a href="#" style="border: 1px solid black; padding: 2px;">Remove</a>			
Application Number	Country <sup>1</sup>	Filing Date (YYYY-MM-DD)	Priority Claimed
			<input checked="" type="radio"/> Yes <input type="radio"/> No
Additional Foreign Priority Data may be generated within this form by selecting the <b>Add</b> button.			

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	ASA-9606-06
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		

## Authorization to Permit Access:

<input type="checkbox"/>	Authorization to Permit Access to the Instant Application by the Participating Offices
<p>If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.</p> <p>In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.</p> <p>In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.</p>	

## Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.		
<b>Applicant 1</b>		
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p>		
<input type="button" value="Clear"/>		
<input checked="" type="radio"/> Assignee	<input type="radio"/> Legal Representative under 35 U.S.C. 117	<input type="radio"/> Joint Inventor
<input type="radio"/> Person to whom the inventor is obligated to assign.	<input type="radio"/> Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
Name of the Deceased or Legally Incapacitated Inventor : <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>		
Organization Name	<del>Hitachi Consumer Electronics Co., Ltd.</del> HITACHI MAXELL, LTD.	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	ASA-9606-06
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		

<b>Mailing Address Information:</b>			
Address 1		<del>2-1, Otemachi 2-chome, Chiyoda-ku</del> 1-88, Ushitora 1-Chome, Ibaraki-shi	
Address 2			
City		<del>Tokyo</del> Osaka	State/Province
Country	JP	Postal Code	<del>100-0004</del> 567-8567
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

## Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.				
<b>Assignee 1</b>				
Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).				
If the Assignee is an Organization check here. <input type="checkbox"/>				
Prefix	Given Name	Middle Name	Family Name	Suffix
<b>Mailing Address Information:</b>				
Address 1				
Address 2				
City			State/Province	
Country		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee Data may be generated within this form by selecting the Add button.				

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	ASA-9606-06
		Application Number	14/264,243
Title of Invention	ELECTRIC CAMERA		

**Signature:**

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications					
<b>Signature</b>	/John R. Mattingly/			Date (YYYY-MM-DD)	2015-01-16
First Name	John	Last Name	Mattingly	Registration Number	30293
Additional Signature may be generated within this form by selecting the Add button.					

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s) : T. NAKANO et al. Confirmation No.: 1644  
Serial No. : 14/264,243  
Filed : April 29, 2014  
For : ELECTRIC CAMERA  
Group : 2663  
Examiner : L.T. NGUYEN  
Docket No. : ASA-9606-06  
Customer No.: 24956

**REQUEST TO CHANGE APPLICANT  
AND PETITION UNDER 37 CFR 1.46(c)**

Mail Stop: Petitions  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

January 16, 2015

Madam:

The applicant requests that the applicant be changed in the above-identified application from HITACHI CONSUMER ELECTRONICS CO., LTD. to HITACHI MAXELL, LTD.

An updated Application Data Sheet with only the "Applicant Information" section filled in and showing the changes with strikethrough and underlining is submitted herewith.

Consideration of the Request to Change Applicant and the issuance of a Corrected Filing Receipt showing the change are respectfully requested.



Serial No. 14/264,243  
Request to Change Applicant filed January 16, 2015

ASA-9606-06

The Commissioner is authorized to charge any fees due to Deposit Account  
No. 50-1417 (ASA-9606-06).

Respectfully submitted,

MATTINGLY & MALUR, PC

/John R. Mattingly/  
John R. Mattingly  
Registration No. 30,293  
(703) 684-1120

Electronic Acknowledgement Receipt	
EFS ID:	21229929
Application Number:	14264243
International Application Number:	
Confirmation Number:	1644
Title of Invention:	ELECTRIC CAMERA
First Named Inventor/Applicant Name:	Takahiro Nakano
Customer Number:	20457
Filer:	John Roberts Mattingly
Filer Authorized By:	
Attorney Docket Number:	500.38315CC5
Receipt Date:	16-JAN-2015
Filing Date:	29-APR-2014
Time Stamp:	15:44:00
Application Type:	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
------------------------	----

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	9606-06-Hitachi-Maxell-Ltd-PTO-AIA-80.pdf	42988 6265e789a2d75a1afec95aa7d3ab32b9d8285eb0	no	1

### Warnings:

### Information:

2	Assignee showing of ownership per 37 CFR 3.73.	9606-06-PTO-373c.pdf	135414 a2720b0726b71965d474a1fd07546d20b5f c7284	no	3
<b>Warnings:</b>					
<b>Information:</b>					
3	Application Data Sheet	9606-06-ADS-change-applicant.pdf	985329 bada295457d8e37b24526db7aaacd2df55a 37442	no	6
<b>Warnings:</b>					
<b>Information:</b>					
This is not an USPTO supplied ADS fillable form					
4	Transmittal Letter	9606-06-request-change-applicant.pdf	13559 c62edafffe7384fff72ea64885ccfcbbe2559f 68	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			1177290		
<p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/264,243	04/29/2014	Takahiro Nakano	ASA-9606-06

**CONFIRMATION NO. 1644**

**POA ACCEPTANCE LETTER**



24956  
MATTINGLY & MALUR, PC  
1800 DIAGONAL ROAD  
SUITE 370  
ALEXANDRIA, VA 22314

Date Mailed: 01/27/2015

**NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 01/16/2015.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/cnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/264,243	04/29/2014	Takahiro Nakano	500.38315CC5

**CONFIRMATION NO. 1644**

**POWER OF ATTORNEY NOTICE**



20457  
ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 550  
ARLINGTON, VA 22209-3873

Date Mailed: 01/27/2015

**NOTICE REGARDING CHANGE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 01/16/2015.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/cnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/264,243	04/29/2014	2663	1740	ASA-9606-06	1	1

CONFIRMATION NO. 1644

## REPLACEMENT FILING RECEIPT



0000000073011493

24956  
MATTINGLY & MALUR, PC  
1800 DIAGONAL ROAD  
SUITE 370  
ALEXANDRIA, VA 22314

Date Mailed: 01/27/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

### Inventor(s)

Takahiro Nakano, Tokyo, JAPAN;  
Ryuji Nishimura, Tokyo, JAPAN;  
Toshiro Kinugasa, Tokyo, JAPAN;

### Applicant(s)

HITACHI MAXELL, LTD., Osaka, JAPAN

### Assignment For Published Patent Application

HITACHI MAXELL, LTD., Osaka, JAPAN

**Power of Attorney:** The patent practitioners associated with Customer Number 24956

### Domestic Priority data as claimed by applicant

This application is a CON of 13/681,495 11/20/2012 PAT 8736729  
which is a CON of 12/845,266 07/28/2010 PAT 8339493  
which is a CON of 10/660,710 09/12/2003 PAT 8059177  
which is a DIV of 09/520,836 03/08/2000 PAT 6765616

**Foreign Applications** (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)  
JAPAN 00-006064 01/11/2000

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

**If Required, Foreign Filing License Granted:** 05/13/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/264,243**

**Projected Publication Date:** Not Applicable

**Non-Publication Request:** No

**Early Publication Request:** No  
**Title**

ELECTRIC CAMERA

**Preliminary Class**

348

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

**LICENSE FOR FOREIGN FILING UNDER**  
**Title 35, United States Code, Section 184**  
**Title 37, Code of Federal Regulations, 5.11 & 5.15**

**GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

**NOT GRANTED**

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop



technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

<b>Doc Code: DIST.E.FILE</b> <b>Document Description: Electronic Terminal Disclaimer - Filed</b>		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce
Electronic Petition Request	<b>TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT</b>	
Application Number	14264243	
Filing Date	29-Apr-2014	
First Named Inventor	Takahiro Nakano	
Attorney Docket Number	ASA-9606-06	
Title of Invention	ELECTRIC CAMERA	
<input checked="" type="checkbox"/> Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action  <input checked="" type="checkbox"/> This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.		
Owner	Percent Interest	
HITACHI MAXELL, LTD.	100%	
<p>The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)</p> <p>6765616 7403226</p> <p>as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.</p> <p>In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:</p> <ul style="list-style-type: none"> <li>- expires for failure to pay a maintenance fee;</li> <li>- is held unenforceable;</li> <li>- is found invalid by a court of competent jurisdiction;</li> <li>- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;</li> <li>- has all claims canceled by a reexamination certificate;</li> <li>- is reissued; or</li> <li>- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.</li> </ul>		

<input checked="" type="radio"/> Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.  <input type="radio"/> I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status:  <input type="radio"/> Small Entity <input type="radio"/> Micro Entity <input checked="" type="radio"/> Regular Undiscounted  I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES  I certify, in accordance with 37 CFR 1.4(d)(4) that I am:  <input checked="" type="radio"/> An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application  Registration Number <u>30293</u>  <input type="radio"/> A sole inventor <input type="radio"/> A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application <input type="radio"/> A joint inventor; all of whom are signing this request	
Signature	/John R. Mattingly/
Name	John R. Mattingly

\*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).  
 Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal				
<b>Application Number:</b>		14264243		
<b>Filing Date:</b>		29-Apr-2014		
<b>Title of Invention:</b>		ELECTRIC CAMERA		
<b>First Named Inventor/Applicant Name:</b>		Takahiro Nakano		
<b>Filer:</b>		John Roberts Mattingly/C Sam		
<b>Attorney Docket Number:</b>		ASA-9606-06		
Filed as Large Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
Statutory or Terminal Disclaimer	1814	1	160	160
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Doc Code: DISQ.E.FILE  
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 14264243

Filing Date: 29-Apr-2014

Applicant/Patent under Reexamination: Nakano et al.

Electronic Terminal Disclaimer filed on March 18, 2015

☒ APPROVED

**This patent is subject to a terminal disclaimer**

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

<b>Electronic Acknowledgement Receipt</b>	
<b>EFS ID:</b>	21803060
<b>Application Number:</b>	14264243
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1644
<b>Title of Invention:</b>	ELECTRIC CAMERA
<b>First Named Inventor/Applicant Name:</b>	Takahiro Nakano
<b>Customer Number:</b>	24956
<b>Filer:</b>	John Roberts Mattingly/C Sam
<b>Filer Authorized By:</b>	John Roberts Mattingly
<b>Attorney Docket Number:</b>	ASA-9606-06
<b>Receipt Date:</b>	18-MAR-2015
<b>Filing Date:</b>	29-APR-2014
<b>Time Stamp:</b>	13:15:02
<b>Application Type:</b>	Utility under 35 USC 111(a)

**Payment information:**

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$160
RAM confirmation Number	9959
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Electronic Terminal Disclaimer-Filed	eTerminal-Disclaimer.pdf	33474 3c703c459d97752061a24984ffd29d38a3dc8771	no	2
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	30116 c1ca61f7218fa653d422219251600b4a29dc5590	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			63590		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s) : T. NAKANO et al.  
Serial No. : 14/264,243  
Filed : April 29, 2014  
For : ELECTRIC CAMERA  
Group : 2663  
Examiner : L. T. Nguyen  
Docket No. : ASA-9606-06  
Customer No.: 24956

Confirmation No.: 1644

**AMENDMENT AFTER FINAL REJECTION**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

March 18, 2015

Madam:

In response to the Final Office Action mailed December 9, 2014, please  
amend the above-identified patent application as follows.

**Amendments to the Claims** begin on page 2 of this paper.

**Remarks** begin on page 5 of this paper.

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) An electric camera comprising:

an image sensing device, with a light receiving surface having a quantity N of vertically arranged pixels, and an arbitrary quantity of pixels arranged horizontally, wherein N is greater than or equal to three times a quantity M of effective scanning lines of a display screen of a television system;

a driver configured to drive the image sensing device to vertically mix or cull signal charges accumulated in individual pixels, at intervals of a quantity K of pixels, in order to produce a quantity of lines of output signals which corresponds to the quantity M of effective scanning lines, wherein the quantity K is an integer less than or equal to an integer portion of a quotient of N divided by M;

a view angle change switch configured to input a request to change ~~the~~ a view angle of ~~the~~ a moving image; and

a signal processing unit configured to generate image signals by using the output signals of the image sensing device;

wherein when the request to change the view angle is to magnify ~~the~~an output image by the view angle change switch. the driver changes the quantity of K from a

first value ~~(K1)~~K1 to a second value ~~(K2)~~K2, in order to read out image signals with the same quantity of output lines from different areas on the imaging sensing device wherein the first value K1 is larger than the second value K2;

wherein the signal processing unit generates the image signals with the same scanning lines.

2. (currently amended) An electric camera according to the claim 1,

wherein the view angle change switch is configured to input ~~a~~the request to continuously change the view angle of the moving image,

wherein the signal processing unit is configured to generate magnified image signals with interpolation processing, according to a magnification factor set by the view angle switch.

3. (previously presented) An electric camera according to the claim 2,

wherein the view angle switch includes a zoom switch interlocked with an optical zoom mechanism.

4. (currently amended) An electric camera comprising:

an image sensing device, with a light receiving surface having a quantity N of pixels arranged vertically, and an arbitrary quantity of pixels arranged horizontally, wherein N is greater than three times a quantity M of effective vertical lines of a television system;

a signal processing unit configured to generate and output image signals with the quantity M of effective vertical lines of ~~a~~the television system, by using output signals of the image sensing device,

a zoom switch configured to enable a user to input zooming operation information,

wherein the signal processing unit generates the image signals, read out with mixing or culling vertical pixel lines of signals, at pixel intervals of a quantity K of lines, from different areas of the imaging device, the areas being continuously changed, and the quantity K being discontinuously changed according to magnification factors.

5. (previously presented) An electric camera according to the claim 4,

wherein the zoom switch is interlocked with an optical zoom mechanism.

### **REMARKS**

Claims 1-5 are pending in this application. Claims 1, 2 and 4 have been amended. No new matter has been added.

#### **Claim Objections**

Claims 1, 2 and 4 have been amended as required by the Examiner in order to overcome the objections to claims 1-5.

#### **Double Patenting Rejections**

Claims 1 and 2 are rejected on the ground of nonstatutory type double patenting as being unpatentable over claims 1, 6, 13 and 18 of U.S. Patent No. 6,765,616.

Claim 4 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1 and 7 of U.S. Patent No. 7,403,226.

Claim 3 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1, 6, 13 and 18 of U.S. Patent No. 6,765,616 in view of Shiozaki et al. (U.S. Patent No. 6,781,634).

Claim 5 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1 and 7 of U.S. Patent No. 7,403,226 in view of Shiozaki et al.

The Examiner states that the rejected pending claims and the patented claims relied upon in the rejection are not patentably distinct from each other. Applicant disagrees. Accordingly Applicant, without admitting to the propriety of the rejection, and solely for the purpose of expediting prosecution of the application to allowance, submits herewith a Terminal Disclaimer to render moot the Double Patenting rejection.

### **Conclusion**

In view of the foregoing amendments and remarks, Applicant requests reconsideration of the rejection and allowance of the claims.

The Commissioner is authorized to charge any shortage in the fees due, or credit any overpayment, to Deposit Account No. 50-1417 (referencing Attorney Docket No. ASA-9606-06).

Respectfully submitted,

MATTINGLY & MALUR, PC

/John R. Mattingly/  
John R. Mattingly  
Registration No. 30,293  
703-684-1120

Electronic Patent Application Fee Transmittal				
<b>Application Number:</b>		14264243		
<b>Filing Date:</b>		29-Apr-2014		
<b>Title of Invention:</b>		ELECTRIC CAMERA		
<b>First Named Inventor/Applicant Name:</b>		Takahiro Nakano		
<b>Filer:</b>		John Roberts Mattingly/C Sam		
<b>Attorney Docket Number:</b>		ASA-9606-06		
Filed as Large Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
<b>Extension-of-Time:</b>				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	1251	1	200	200
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>200</b>



<b>Electronic Acknowledgement Receipt</b>	
<b>EFS ID:</b>	21802751
<b>Application Number:</b>	14264243
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1644
<b>Title of Invention:</b>	ELECTRIC CAMERA
<b>First Named Inventor/Applicant Name:</b>	Takahiro Nakano
<b>Customer Number:</b>	24956
<b>Filer:</b>	John Roberts Mattingly/C Sam
<b>Filer Authorized By:</b>	John Roberts Mattingly
<b>Attorney Docket Number:</b>	ASA-9606-06
<b>Receipt Date:</b>	18-MAR-2015
<b>Filing Date:</b>	29-APR-2014
<b>Time Stamp:</b>	13:16:20
<b>Application Type:</b>	Utility under 35 USC 111(a)

**Payment information:**

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$200
RAM confirmation Number	9984
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		9606-06amd02.pdf	27409 a048ccf22df72bbda702033a222b2e2a21e98b421	yes	6
	<b>Multipart Description/PDF files in .zip description</b>				
	<b>Document Description</b>		<b>Start</b>	<b>End</b>	
	Response After Final Action		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	6	
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	30158 108a5bedfdd558281291970c8e2c5b072eedb8e	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			57567		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b> Substitute for Form PTO-875				Application or Docket Number <b>14/264,243</b>		Filing Date <b>04/29/2014</b>		<input type="checkbox"/> To be Mailed	
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO									
<b>APPLICATION AS FILED – PART I</b>									
(Column 1)		(Column 2)							
FOR	NUMBER FILED	NUMBER EXTRA			RATE (\$)	FEE (\$)			
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A			N/A				
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A			N/A				
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*			X \$	=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*			X \$	=			
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL				
<b>APPLICATION AS AMENDED – PART II</b>									
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	<b>03/18/2015</b>	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 5	Minus	** 20	= 0	X \$80 =		0	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X \$420 =		0	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))								
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
					TOTAL ADD'L FEE		<b>0</b>		
(Column 1)		(Column 2)		(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$		=	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$		=	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))								
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
					TOTAL ADD'L FEE				
<p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p>									

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
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Alexandria, Virginia 22313-1450  
www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

24956 7590 03/30/2015  
MATTINGLY & MALUR, PC  
1800 DIAGONAL ROAD  
SUITE 370  
ALEXANDRIA, VA 22314

EXAMINER

NGUYEN, LUONG TRUNG

ART UNIT

PAPER NUMBER

2663

DATE MAILED: 03/30/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/264,243	04/29/2014	Takahiro Nakano	ASA-9606-06	1644
TITLE OF INVENTION: ELECTRIC CAMERA				

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	06/30/2015

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
or Fax (571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24956 7590 03/30/2015  
MATTINGLY & MALUR, PC  
1800 DIAGONAL ROAD  
SUITE 370  
ALEXANDRIA, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/264,243	04/29/2014	Takahiro Nakano	ASA-9606-06	1644

TITLE OF INVENTION: ELECTRIC CAMERA

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	06/30/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, LUONG TRUNG	2663	348-302000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

**NOTE:** Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

**NOTE:** If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

**NOTE:** Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

**NOTE:** This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_



# UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/264,243	04/29/2014	Takahiro Nakano	ASA-9606-06	1644
24956 7590 03/30/2015 MATTINGLY & MALUR, PC 1800 DIAGONAL ROAD SUITE 370 ALEXANDRIA, VA 22314			EXAMINER NGUYEN, LUONG TRUNG	
			ART UNIT 2663	PAPER NUMBER

DATE MAILED: 03/30/2015

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

### Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

<b>Notice of Allowability</b>	<b>Application No.</b> 14/264,243	<b>Applicant(s)</b> NAKANO ET AL.	
	<b>Examiner</b> LUONG T. NGUYEN	<b>Art Unit</b> 2663	<b>AIA (First Inventor to File) Status</b> No

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment After Final and Terminal Disclaimer filed on 03/18/2015.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-5. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [FPHfeedback@uspto.gov](mailto:FPHfeedback@uspto.gov).

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
**Certified copies:**  
a) ☒ All    b) ☐ Some    \*c) ☐ None of the:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).  
\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.  
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.


**Attachment(s)**

1. <input type="checkbox"/> Notice of References Cited (PTO-892)	5. <input type="checkbox"/> Examiner's Amendment/Comment
2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____	6. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance
3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	7. <input type="checkbox"/> Other _____.
4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____.	

/LUONG T NGUYEN/ Primary Examiner, Art Unit 2663	
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<b>Issue Classification</b> 	<b>Application/Control No.</b> 14264243	<b>Applicant(s)/Patent Under Reexamination</b> NAKANO ET AL.	
	<b>Examiner</b> LUONG T NGUYEN	<b>Art Unit</b> 2663	

CPC					
Symbol				Type	Version
H04N		5	3741	F	2013-01-01
H04N		5	23248	I	2013-01-01
H04N		5	23258	I	2013-01-01
H04N		5	23274	I	2013-01-01
H04N		9	045	I	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version


NONE		<b>Total Claims Allowed:</b>	
		5	
(Assistant Examiner)	(Date)		
/LUONG T NGUYEN/ Primary Examiner.Art Unit 2663	3/20/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

<b>Issue Classification</b> 	<b>Application/Control No.</b> 14264243	<b>Applicant(s)/Patent Under Reexamination</b> NAKANO ET AL.
	<b>Examiner</b> LUONG T NGUYEN	<b>Art Unit</b> 2663

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION													
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED								
348			302			H	0	4	N	5 / 374 (2011.0)									
CROSS REFERENCE(S)																			
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																		
				</															

NONE		<b>Total Claims Allowed:</b>	
		5	
(Assistant Examiner)	(Date)		
/LUONG T NGUYEN/ Primary Examiner.Art Unit 2663	3/20/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

2663[illegible]1

<p align="center"><b><i>Index of Claims</i></b></p> 	<b>Application/Control No.</b> 14264243	<b>Applicant(s)/Patent Under Reexamination</b> NAKANO ET AL.
	<b>Examiner</b> LUONG T NGUYEN	<b>Art Unit</b> 2663


✓	<b>Rejected</b>
=	<b>Allowed</b>

-	<b>Cancelled</b>
÷	<b>Restricted</b>

N	<b>Non-Elected</b>
I	<b>Interference</b>

A	<b>Appeal</b>
O	<b>Objected</b>

<input checked="" type="checkbox"/> <b>Claims renumbered in the same order as presented by applicant</b> <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47										
CLAIM		DATE								
Final	Original	06/12/2014	12/08/2014	03/20/2015						
	1	✓	✓	=						
	2		✓	=						
	3		✓	=						
	4		✓	=						
	5		✓	=						

<b>Search Notes</b>  	<b>Application/Control No.</b>  14264243	<b>Applicant(s)/Patent Under Reexamination</b>  NAKANO ET AL.
	<b>Examiner</b>  LUONG T NGUYEN	<b>Art Unit</b>  2663

CPC- SEARCHED		
Symbol	Date	Examiner
H04N 5/335, 5/3741, 5/23248, 5/23258, 5/23274, 5/3454	3/20/2015	LTN
H04N 9/045, 3/155	3/20/2015	LTN

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
348/302,294,311,312,332,272,280,281	6/12/2014	LTN
EAST (USPAT; USPGPUB; JPO; EPO; DERWENT; IBM_TDB; USOCR; FPRS)	6/12/2014	LTN
348/302, 311	12/8/2014	LTN
EAST (USPAT; USPGPUB; JPO; EPO; DERWENT; IBM_TDB; USOCR; FPRS)	12/8/2014	LTN
348/302, 294, 308, 312, 332	3/20/2015	LTN
EAST (USPAT; USPGPUB; JPO; EPO; DERWENT; IBM_TDB; USOCR; FPRS)	3/20/2015	LTN
Inventorship search	3/20/2015	LTN

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	USPAT; UPAD; USPGPUB text search, see interference search	3/20/2015	LTN

	/L.T.N./ Primary Examiner.Art Unit 2663
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**EAST Search History****EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S50	1	14/264243	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 19:56
S51	2	"6765616".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 20:06
S52	10	"7403226".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 20:06
S53	238	((Takahiro) near2 (Nakano)).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/20 20:37
S54	33	((Ryuji) near2 (Nishimura)).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/20 20:40
S55	38	((Toshiro) near2 (Kinugasa)).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/20 20:43
S56	692	vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1) and (standard with (television or TV or NTSC))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 20:53
S58	10001	348/302,294,312,332,308.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 20:53
S59	46	S56 and S58	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 20:54
S60	9498	vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 20:57
S61	506	S60 and S58	US-PGPUB;	OR	ON	2015/03/20

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S62	91	S61 and interpolat\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 20:58
S63	2324	vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1) and interpolat\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:01
S64	91	S63 and S58	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:01
S65	338	S56 and interpolat\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:03
S66	161	S65 and (@ad<="20000111" or @rlad<="20000111")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:03
S67	762	H04N5/3741.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:05
S68	10	S67 and S56	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:06
S69	12	S67 and S63	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:06
S70	23	S67 and S60	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:07
S71	469	H04N5/23274.cpc.	US-PGPUB;	OR	ON	2015/03/20

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S73	4520	H04N5/23258.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:09
S74	46	S73 and (S56 or S60 or S63)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:09
S75	9489	H04N5/23248.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:11
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S78	667	H04N5/3454.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:27
S79	27	S78 and (S56 or S60 or S63)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:28
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S84	790	S83 and (S56 or S60 or S63)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:31
S85	431	S83 and (S56 or S60 or S63) and interpolat\$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:31
S86	89	S85 and (@ad<="20000111" or @rlad<="20000111")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:31
S87	4703	H04N3/155.qpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:33
S88	125	S87 and (S56 or S60 or S63)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:34
S89	33	S88 and (@ad<="20000111" or @rlad<="20000111")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/20 21:34

**EAST Search History (Interference)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S90	1	((vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1) and	US-PGPUB;	OR	ON	2015/03/20 21:40

## EAST Search History

		((standard with (television or TV or NTSC))) same interpolat\$3).clm.	USPAT; UPAD			
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S92	18	((vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1)) and (zoom\$3)).clm.	US- PGPUB; USPAT; UPAD	OR	ON	2015/03/20 21:45
S93	5	((vertical\$2 with (add\$3 or mix\$3 or cull\$3 or combin\$4) with (pixel\$1 or charge\$1)) and (view near angle)).clm.	US- PGPUB; USPAT; UPAD	OR	ON	2015/03/20 21:46

**3/ 20/ 2015 9:48:53 PM****C:\ Users\ Inguyen2\ Documents\ EAST\ Workspaces\ 14264243.wsp**



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 Alexandria, Virginia 22313-1450  
 www.uspto.gov

## BIB DATA SHEET

CONFIRMATION NO. 1644

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
14/264,243	04/29/2014	348	2663	ASA-9606-06		
<b>APPLICANTS</b> HITACHI MAXELL, LTD., Osaka, JAPAN, Assignee (with 37 CFR 1.172 Interest); <b>INVENTORS</b> Takahiro Nakano, Tokyo, JAPAN; Ryuji Nishimura, Tokyo, JAPAN; Toshiro Kinugasa, Tokyo, JAPAN; <b>** CONTINUING DATA *****</b> This application is a CON of 13/681,495 11/20/2012 PAT 8736729 which is a CON of 12/845,266 07/28/2010 PAT 8339493 which is a CON of 10/660,710 09/12/2003 PAT 8059177 which is a DIV of 09/520,836 03/08/2000 PAT 6765616 <b>** FOREIGN APPLICATIONS *****</b> JAPAN 00-006064 01/11/2000 <b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b> 05/13/2014						
Foreign Priority claimed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 35 USC 119(a-d) conditions met <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Verified and /LUONG TRUNG NGUYEN/ Acknowledged Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	<b>STATE OR COUNTRY</b> JAPAN	<b>SHEETS DRAWINGS</b> 8	<b>TOTAL CLAIMS</b> 1	<b>INDEPENDENT CLAIMS</b> 1
<b>ADDRESS</b> MATTINGLY & MALUR, PC 1800 DIAGONAL ROAD SUITE 370 ALEXANDRIA, VA 22314 UNITED STATES						
<b>TITLE</b> ELECTRIC CAMERA						
<b>FILING FEE RECEIVED</b> 1740	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		

It's OK to enter  
/L.T.N./  
03/20/2015

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s)	:	T. NAKANO et al.	Confirmation No.: 1644
Serial No.	:	14/264,243	
Filed	:	April 29, 2014	
For	:	ELECTRIC CAMERA	
Group	:	2663	
Examiner	:	L. T. Nguyen	
Docket No.	:	ASA-9606-06	
Customer No.:		24956	

**AMENDMENT AFTER FINAL REJECTION**

Mail Stop Amendment	March 18, 2015
Commissioner for Patents	
P.O. Box 1450	
Alexandria, VA 22313-1450	

Madam:

In response to the Final Office Action mailed December 9, 2014, please  
amend the above-identified patent application as follows.

**Amendments to the Claims** begin on page 2 of this paper.

**Remarks** begin on page 5 of this paper.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
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www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/264,243	04/29/2014	2663	1740	ASA-9606-06	1	1

CONFIRMATION NO. 1644

## CORRECTED FILING RECEIPT



0000000074930233

24956  
MATTINGLY & MALUR, PC  
1800 DIAGONAL ROAD  
SUITE 370  
ALEXANDRIA, VA 22314

Date Mailed: 05/01/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

### Inventor(s)

Takahiro Nakano, Tokyo, JAPAN;  
Ryuji Nishimura, Tokyo, JAPAN;  
Toshiro Kinugasa, Tokyo, JAPAN;

### Applicant(s)

HITACHI MAXELL, LTD., Osaka, JAPAN

### Assignment For Published Patent Application

HITACHI MAXELL, LTD., Osaka, JAPAN

**Power of Attorney:** The patent practitioners associated with Customer Number 24956

### Domestic Priority data as claimed by applicant

This application is a CON of 13/681,495 11/20/2012 PAT 8736729  
which is a CON of 12/845,266 07/28/2010 PAT 8339493  
which is a CON of 10/660,710 09/12/2003 PAT 8059177  
which is a DIV of 09/520,836 03/08/2000 PAT 6765616

**Foreign Applications** (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)  
JAPAN 2000-006064 01/11/2000

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

**If Required, Foreign Filing License Granted:** 05/13/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/264,243**

**Projected Publication Date:** Not Applicable

**Non-Publication Request:** No

**Early Publication Request:** No  
**Title**

ELECTRIC CAMERA

**Preliminary Class**

348

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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# PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24956 7590 03/30/2015  
**MATTINGLY & MALUR, PC**  
**1800 DIAGONAL ROAD**  
**SUITE 370**  
**ALEXANDRIA, VA 22314**

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/264,243	04/29/2014	Takahiro Nakano	ASA-9606-06	1644

TITLE OF INVENTION: ELECTRIC CAMERA

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	06/30/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, LUONG TRUNG	2663	348-302000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 **MATTINGLY & MALUR, PC**  
 2 \_\_\_\_\_  
 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

**HITACHI MAXELL, LTD.**

**OSAKA, JAPAN**

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☒ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number **301417** (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

**NOTE:** Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

**NOTE:** If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

**NOTE:** Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /JOHN R. MATTINGLY/  
 Typed or printed name JOHN R. MATTINGLY

Date June 29, 2015  
 Registration No. 30293

Electronic Patent Application Fee Transmittal				
<b>Application Number:</b>		14264243		
<b>Filing Date:</b>		29-Apr-2014		
<b>Title of Invention:</b>		ELECTRIC CAMERA		
<b>First Named Inventor/Applicant Name:</b>		Takahiro Nakano		
<b>Filer:</b>		John Roberts Mattingly/Krista Hargrove		
<b>Attorney Docket Number:</b>		ASA-9606-06		
Filed as Large Entity				
<b>Filing Fees for Utility under 35 USC 111(a)</b>				
<b>Description</b>	<b>Fee Code</b>	<b>Quantity</b>	<b>Amount</b>	<b>Sub-Total in USD(\$)</b>
<b>Basic Filing:</b>				
<b>Pages:</b>				
<b>Claims:</b>				
<b>Miscellaneous-Filing:</b>				
<b>Petition:</b>				
<b>Patent-Appeals-and-Interference:</b>				
<b>Post-Allowance-and-Post-Issuance:</b>				
Utility Appl Issue Fee	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
<b>Extension-of-Time:</b>				
<b>Miscellaneous:</b>				
<b>Total in USD (\$)</b>				<b>960</b>

<b>Electronic Acknowledgement Receipt</b>	
<b>EFS ID:</b>	22766768
<b>Application Number:</b>	14264243
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1644
<b>Title of Invention:</b>	ELECTRIC CAMERA
<b>First Named Inventor/Applicant Name:</b>	Takahiro Nakano
<b>Customer Number:</b>	24956
<b>Filer:</b>	John Roberts Mattingly
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	ASA-9606-06
<b>Receipt Date:</b>	29-JUN-2015
<b>Filing Date:</b>	29-APR-2014
<b>Time Stamp:</b>	14:21:45
<b>Application Type:</b>	Utility under 35 USC 111(a)

**Payment information:**

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 960
RAM confirmation Number	657
Deposit Account	501417
Authorized User	MATTINGLY, JOHN R
<p>The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:</p> <p>Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)</p> <p>Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)</p>	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
<b>File Listing:</b>					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	960606IssueFeeTransmittal.pdf	993744 bc8e24d930a5bde6a347c36836a652977f8e4373	no	1
<b>Warnings:</b>					
<b>Information:</b>					
2	Fee Worksheet (SB06)	fee-info.pdf	30122 788be7ae9b8c724458824b0de73363781441d51e	no	2
<b>Warnings:</b>					
<b>Information:</b>					
<b>Total Files Size (in bytes):</b>			1023866		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b>  If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b>  If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b>  If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Receipt date: 04/29/2014

PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Substitute for form 1449A/PTO</b>  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>		<b>Complete if Known</b>			
		Application Number	To be assigned		
		Filing Date	April 29, 2014		
		First Named Inventor	T. NAKANO, et al.		
		Art Unit (expected)	2663		
		Examiner Name (expected)	Luong Trung Nguyen		
Sheet	2	of	2	Attorney Docket Number	500.38315CC5

Change(s) applied  
to document,  
/D.D./  
5/5/2015

U.S. PATENT DOCUMENTS						
Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)				
applied  ent,  s		US - 6,970,191		11-2005	Sase et al.	
		<del>US - 5,974,424</del>		03-1998	Sasaki, Takashi	5,734,424
		US - 6,798,448		09-2004	Motono et al.	
		US - 5,287,192		02-1994	Iizuka, Tetsuya	
		US - 6,765,616		07-2004	Nakano et al.	
		US - 8,059,177		11-2011	Nakano et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials'	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> –Number <sup>2</sup> –Kind Code <sup>5</sup> (if known)				

Examiner Signature	/Luong Nguyen/	Date Considered	06/12/2014
-----------------------	----------------	--------------------	------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /LN/



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
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Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/264,243	08/04/2015	9100604	ASA-9606-06	1644

24956 7590 07/15/2015  
MATTINGLY & MALUR, PC  
1800 DIAGONAL ROAD  
SUITE 210  
ALEXANDRIA, VA 22314

### ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

#### **Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)** (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Takahiro Nakano, Tokyo, JAPAN;  
HITACHI MAXELL, LTD., Osaka, JAPAN;  
Ryuji Nishimura, Tokyo, JAPAN;  
Toshiro Kinugasa, Tokyo, JAPAN;

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