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11/256,996	10/24/2005	Isao Hirota	09792909-6351	9520

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EXAMINER	
WHIPKEY, JASON T	
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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.

Office Action Summary	Application No.	Applicant(s)	
	11/256,996	HIROTA, ISAO	
	Examiner	Art Unit	
	Jason T. Whipkey	2622	

-- 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* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 _____.

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

3)☐ 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

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 15-20* is/are rejected.

7)☒ Claim(s) *14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 October 2005* 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☒ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

3. Figures 12 and 13 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheets should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-9, 17, and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim 1 recites the limitation "a predetermined column of the predetermined number of columns and to add the signal charges … in the two or more remaining columns" on lines 14-15. There is insufficient antecedent basis for this limitation in the claim, as lines 8-9 recite, "a predetermined number of columns greater than one." Consequently, if the predetermined number of columns is two, there cannot be two remaining columns other than the predetermined column, as only one remains.

Claims 2-7 are rejected because they are dependent upon claim 1.

Claims 8, 17, and 19 are rejected for the same reason as claim 1.

Claim 9 is rejected because it is dependent upon claim 8.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-3, 5, 6, 8-13, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iizuka (U.S. Patent Application Publication No. 2002/0158980) in view of Hamasaki (U.S. Patent Application Publication No. 2001/0038095).

Regarding **claims 1 and 8**, Iizuka discloses a solid-state imaging device (see Figure 4) comprising:

an imaging unit (image pickup area 5) including a plurality of pixels (photodiodes 2) arranged into a matrix for performing photoelectric conversion (see paragraph 76) and a plurality of vertical transfer units (vertical CCD register 4) arranged in columns for vertically transferring signal charges of the plurality of pixels on a column-by-column basis (see paragraph 77);

a charge control unit (control register section 6) that uses a predetermined number of columns greater than one as a unit (columns are grouped in threes, as shown in Figure 6; see paragraph 173) in a predetermined operation mode (a fast mode; see paragraphs 257-258) and that, in the predetermined operation mode, performs processing to add the signal charges transferred from the vertical transfer units in two or more columns of the predetermined number of columns to output the added signal charges (for example, in Figure 20A, pixels G11, G13, G31, and G33 are added as shown in Figure 20C; see paragraph 174); and

> a horizontal transfer unit (horizontal CCD register 7) that horizontally transfers the signal charges output from the charge control unit (see paragraph 185).

While Iizuka discloses that charges from one out of every three columns are discarded after readout (see paragraph 186), he is silent with regard to not transferring the charges from the vertical transfer unit (i.e., before readout).

Hamasaki discloses a CCD image pickup element that can discard a specified number of columns per group of columns (see paragraph 49), including:

> a charge control unit (timing generator 18; see Figure 1) that performs processing to stop transferring charges from a vertical transfer unit (vertical CCDs 13) in a predetermined column of the predetermined number of columns ("charges … from a given set of columns are stopped and discharged, and those from the rest of the columns are transferred to the horizontal CCD 15"; see paragraph 53).

As stated in paragraph 54, an advantage of inhibiting the transfer of certain columns from a vertical transfer unit is that the driving frequency of the horizontal CCD may be reduced, thus lowering power consumption. For this reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Iizuka's system not transfer unneeded charges from the vertical transfer unit, as described by Hamasaki.

Regarding **claims 2, 9, 11, and 16**, Iizuki discloses:

> in another operation mode (a "normal" operation mode that reads out all columns; see paragraph 204) different from the predetermined operation mode,

the charge control unit performs processing to convert signal charges transferred in parallel from the plurality of vertical transfer units in units of the predetermined number of columns into serially arranged signal charges and to sequentially output the serially arranged signal charges (this is an inherent feature in "normal" CCDs, wherein all vertical registers are read out to a horizontal register, thus converting parallel charge transfer into serial charge transfer).

Regarding **claims 3 and 12**, Iizuki discloses:

the charge control unit is provided with a charge holding unit for holding the signal charges transferred from the plurality of vertical transfer units on a column-by-column basis in units of the predetermined number of columns, and releases the signal charges held in the charge holding unit on a column-by-column basis (see paragraph 116-117, 153, and 224).

Regarding **claims 5 and 13**, Hamasaki discloses

with respect to the predetermined column, the charge control unit drains the signal charges held in the charge holding unit to a charge drain unit (discharge controlling section 17; see paragraph 32).

Regarding **claim 6**, Iizuki discloses:

an accumulation unit (the final row of control register section 6) between the charge control unit and the horizontal transfer unit for temporarily accumulating the signal charges output from the charge control unit (see paragraph 117).

Claim 10 can be treated like claims 1 and 6.

Claim 15 can be treated like claims 1 and 6.

Claim 17 can be treated like claims 1 and 2. Additionally, while Iizuki discloses that the system can operate in a thinning mode and a normal mode, he is silent with regard to these modes being used for capturing a moving image and capturing a moving image.

Official Notice is taken that it was well known in the art at the time the invention was made to thin pixels in a moving image mode (versus a still image mode), as moving images take more time to process and store and are often displayed at a lower resolution (e.g., the NTSC standard) than still images. An advantage of thinning pixels in a moving mode is that processing and storage hardware demands are lowered. For this reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Iizuki's system use the thinning mode and normal mode as a moving mode and a still mode, respectively.

Claim 18 can be treated like claims 1 and 6. Additionally, while Iizuki discloses that the system can operate in a thinning mode and a normal mode, he is silent with regard to these modes being used for capturing a moving image and capturing a moving image.

Official Notice is taken that it was well known in the art at the time the invention was made to thin pixels in a moving image mode (versus a still image mode), as moving images take more time to process and store and are often displayed at a lower resolution (e.g., the NTSC standard) than still images. An advantage of thinning pixels in a moving mode is that processing and storage hardware demands are lowered. For this reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Iizuki's system use the thinning mode and normal mode as a moving mode and a still mode, respectively.

Claim 19 can be treated like claim 17.

Claim 20 can be treated like claim 18.

Allowable Subject Matter

8. Claims 4 and 7 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding **claim 4**, no prior art could be located that teaches or renders obvious a solid-state imaging device including a charge control unit with a predetermined number of columns used as a unit that stops transferring charges in a predetermined column and adds the signal charges in the remaining columns, and wherein the charge control unit includes a charge holding unit that holds and releases charges on a column-by-column basis, wherein the charge control unit is not provided with the charge holding unit for one of the predetermined number of columns.

Regarding **claim 7**, no prior art could be located that teaches or renders obvious a solid-state imaging device including a charge control unit with a predetermined number of columns used as a unit that stops transferring charges in a predetermined column and adds the signal charges in the remaining columns, and wherein an accumulation unit is included between the charge control unit and a horizontal transfer unit, wherein the accumulation unit is provided in units of the predetermined number of columns.

9. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding **claim 14**, no prior art could be located that teaches or renders obvious a solid-state imaging device including a charge control unit with a predetermined number of columns used as a unit that stops transferring charges in a predetermined column and adds the signal charges in the remaining columns, and wherein an accumulation unit is included between the charge control unit and a horizontal transfer unit, wherein the accumulation unit is provided in units of the predetermined number of columns.

Conclusion

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

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Whipkey, whose telephone number is (571) 272-7321. The examiner can normally be reached Monday through Friday from 9:30 A.M. to 6 P.M. eastern standard time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye, can be reached at (571) 272-7372. 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.

/Jason T. Whipkey/
Examiner, Art Unit 2622