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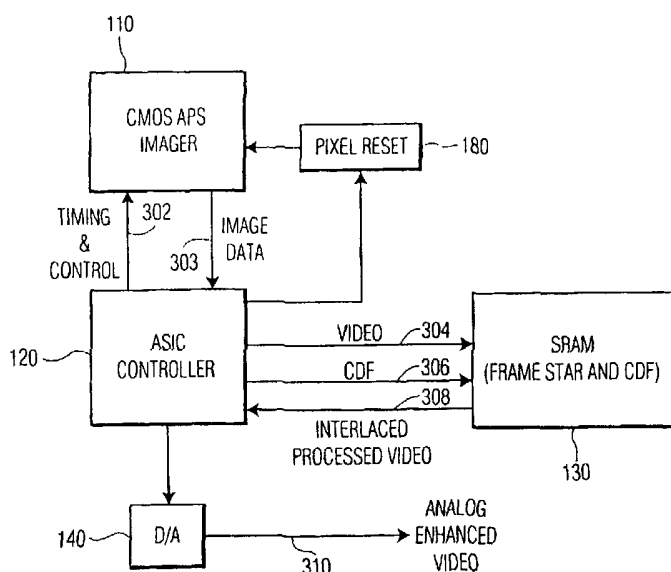
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[Continued on next page]

(54) Title: FULLY INTEGRATED SOLID STATE IMAGER AND CAMERA CIRCUITRY



(57) Abstract: There is shown an single chip CMOS device (100) for capturing a video image. The device includes an APS imager (110) containing an array of pixels for providing a signal representing a scene, a row of extended dynamic range sample and hold circuits (111) for receiving a signal from the array of pixels and a row of linear sample and hold circuits (112) for receiving another signal for said array of pixels. Also included is an image processor (120) for determining a controllable function and for processing a plurality of signals received from the extended dynamic range sample and hold circuits and the linear sample and hold circuits according to said controllable function to form a processed video signal. Further included is a memory (130) for storing the controllable function and the processed video signal.



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/26818

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H04N 5/202

US CL : 348/254

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 348/222.1,254,255,256,296,297,308,372

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,040,570 A (LEVINE et al.) 21 March 2000 (21.03.2000), column 5, lines 18-33 and 56-61; column 7, lines 2-9 and 40-57; column 10, lines 41-46.	1-12
Y	US 5,949,918 A (MCCAFFREY) 07 September 1999 (07.09.1999), column 2, lines 20-57; column 4, lines 16-19; column 7, lines 15-28; column 8, lines 21-25.	1-12
Y	US 5,848,019 A (MATTHEWS et al.) 08 December 1998 (08.12.1998), column 1, lines 13-20.	2
Y	US 5,909,145 A (ZIMMERMAN) 01 June 1999 (01.06.1999), column 3, lines 4-7.	4-6
Y	US 4,484,223 A (TSUNEKAWA) 20 November 1984 (20.11.1984), column 7, lines 67-68; column 8, lines 1-9.	5-6
A	US 6,002,123 A (SUZUKI) 14 December 1999 (14.12.1999), column 4, lines 40-51.	13-17



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

24 November 2004 (24.11.2004)

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/26818

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☒

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US02/26818

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

I. Claims 1-12, drawn to a CMOS imaging device with a row of extended dynamic range sample-and-hold circuits and an image processor.

II. Claims 13-17, drawn to a method of analyzing a signal from an imaging device by generating a histogram in order to modify the sensor's reset sequence.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features because the device of group I is not required to practice the method of group II and the device of group I can be used with a method other than the one claimed in group II.