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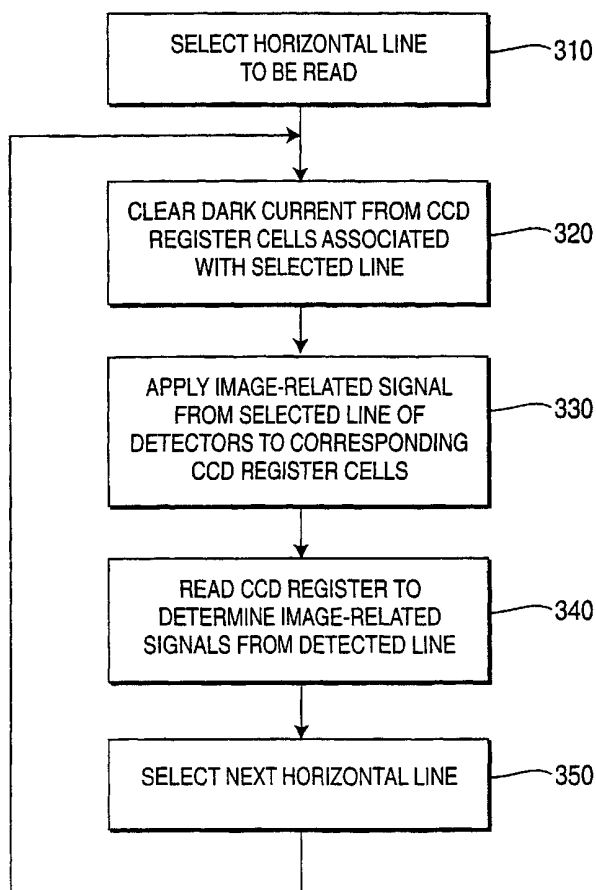
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- (71) Applicant: SARNOFF CORPORATION [US/US]; 201 Washington Road, CN 5300, Princeton, NJ 08543-5300 (US).
- (72) Inventors: LEVINE, Peter, Alan; 38 Dunbar Drive, West Windsor, NJ 08550 (US). TOWER, John, Robertson; 189 Crestview Way, Yardley, PA 19067 (US). MCCAFFREY, Nathaniel, Joseph; 134 Kingswood Stockton Road, Delaware Twp., NJ 08559 (US). PANTUSO, Francis, Paul; 30 Spring Garden Road, Robbinsville, NJ 08691 (US).
- (74) Agents: NEY, Andrew, L.; Ratner & Prestia, 301 One Westlakes (Berwyn), P.O. Box 980, Valley Forge, PA 19482-0980 et al. (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

[Continued on next page]

(54) Title: CMOS/CCD LINE TRANSFER IMAGER WITH LOW DARK CURRENT



(57) Abstract: A method (300) and apparatus (100) for low light imaging in which a plurality of relatively small detectors (110) forming a line is coupled to a respective cell (125) of a CCD register. A charge indicative of detected image information is provided to the respective cells after the cells are substantially discharged via a drain (120). The register is read by a control element (135) to define therefrom a row of pixel information.



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# INTERNATIONAL SEARCH REPORT

International Application No

PC1/US 00/19464

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 H01L27/148 H04N3/15

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)  
 IPC 7 H01L H04N

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 923 370 A (SMITH CHARLES RUSSELL ET AL) 13 July 1999 (1999-07-13)  figures 6-8 column 2, line 42 - line 58 column 7, line 19 -column 9, line 25	1-3, 6-10,12, 13,17
Y	---	4
X	PATENT ABSTRACTS OF JAPAN vol. 016, no. 004 (E-1151), 8 January 1992 (1992-01-08) & JP 03 228373 A (HITACHI LTD;OTHERS: 01), 9 October 1991 (1991-10-09) abstract	1-3, 6-10,12, 13,17
Y	---	4
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- \*E\* earlier document but published on or after the international filing date
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- \*&\* document member of the same patent family

Date of the actual completion of the international search

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9 April 2001

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040. Tx. 31 651 epo nl.  
 Fax: (+31-70) 340-3016

Authorized officer

Visscher, E

## INTERNATIONAL SEARCH REPORT

International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 016, no. 505 (E-1281), 19 October 1992 (1992-10-19) & JP 04 186772 A (HITACHI LTD), 3 July 1992 (1992-07-03) abstract	1-3, 6-10,12, 13,17
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X	--- KEENAN W F ET AL: "A CHANNEL-STOP-DEFINED BARRIER AND DRAIN ANTIBLOOMING STRUCTURE FOR VIRTUAL PHASE CCD IMAGE SENSORS" IEEE TRANSACTIONS ON ELECTRON DEVICES, US, IEEE INC. NEW YORK, vol. 36, no. 9 - I, 1 September 1989 (1989-09-01), pages 1634-1638, XP000087127 ISSN: 0018-9383 figures 1,2 Section II: Structure	1,3,8,9, 12,13
X	--- BURKEY B C ET AL: "THE PINNED PHOTODIODE FOR AN INTERLINER-TRANSFER CCD IMAGE SENSOR" PROCEEDING OF THE INTERNATIONAL ELECTRON DEVICES MEETING, US, NEW YORK, I.E.E.E., vol. PROC. 1984, 9 December 1984 (1984-12-09), pages 28-31, XP000570320 the whole document	16
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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