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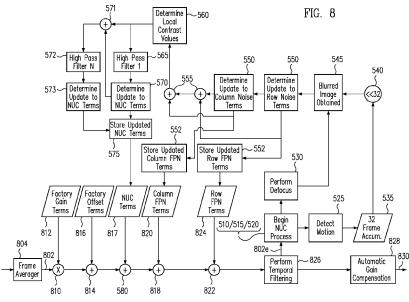
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[Continued on next page]

(54) Title: NON-UNIFORMITY CORRECTION TECHNIQUES FOR INFRARED IMAGING DEVICES



(57) Abstract: Various techniques are disclosed for performing non-uniformity correction (NUC) for infrared imaging devices. Intentionally blurred image frames may be obtained and processed to correct for FPN (e.g., random spatially uncorrelated FPN in one embodiment) associated with infrared sensors of the infrared imaging device. Intentionally blurred image frames may be used to distinguish between FPN associated with the infrared sensors and desired scene information. Advantageously, such techniques may be implemented without requiring the use of a shutter to perform flat field correction for the infrared imaging device.





 before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h)) (88) Date of publication of the international search report: 11 April 2013

INTERNATIONAL SEARCH REPORT

International application No PCT/US2012/041749

A. CLASSIFICATION OF SUBJECT MATTER INV. H04N5/33

ADD.

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) HO4N

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)

EPO-Internal, WPI Data

C. DOCUM	ENTS CONSIDERED TO BE RELEVANT	
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 330 371 B1 (CHEN HAI-WEN [US] ET AL) 11 December 2001 (2001-12-11)	1,16,19, 34,37,38
Υ	abstract; figures 1-4,5d column 1, line 25 - column 1, line 59 column 3, line 66 - column 7, line 12 column 7, line 60 - column 8, line 7	2-15,17, 18, 20-33, 35,36
Υ	US 2010/020229 A1 (HERSHEY JOHN ERIK [US] ET AL) 28 January 2010 (2010-01-28) abstract; figures 1,2 paragraph [0007]	17,18, 35,36
Y	US 2008/259181 A1 (YAMASHITA HARUO [JP] ET AL) 23 October 2008 (2008-10-23) abstract paragraph [0008] 	9,27

Further documents are listed in the continuation of Box C.	X 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	"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
"E" earlier application or patent but 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	"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 22 January 2013	Date of mailing of the international search report $01/02/2013$

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/041749

C(Continua	ation). DOCUMENTS CONSIDERED TO BE RELEVANT	
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Υ	JP 2007 267035 A (SANYO ELECTRIC CO) 11 October 2007 (2007-10-11) abstract; claim 2 paragraphs [0003], [0010], [0032]	2-6, 20-24
Y	EP 2 136 554 A2 (SONY CORP [JP]) 23 December 2009 (2009-12-23) abstract; figure 1 paragraph [0137] paragraph [0176]	7,8,25, 26
Y	EP 1 983 485 A2 (RAYTHEON CO [US]) 22 October 2008 (2008-10-22) abstract; figure 8 paragraph [0027] - paragraph [0028]	10-15, 28-33

International application No. PCT/US2012/041749

INTERNATIONAL SEARCH REPORT

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)
This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
2. Claims 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. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)
This International Searching Authority found multiple inventions in this international application, as follows:
see additional sheet
1. X 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 fees, this Authority did not invite payment of additional fees.
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 and, where applicable, the payment of a protest fee. The additional search fees were accompanied by the applicant's protest but the applicable protest
fee was not paid within the time limit specified in the invitation.
X No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9, 16-27, 34-38

A method and an apparatus of removing noise using an intentionally blurred image processed processed to determine a plurality of NUC terms to reduce a spatially uncorrelated FPN. The remaining features relate to methods of intentional blurring of an image, and their details.

2. claims: 10-15, 28-33

A method and an apparatus of removing noise using an intentionally blurred image processed to determine a plurality of NUC terms to reduce a spatially uncorrelated FPN. The remaining features relate to the details of the processing of the blurred image and of the determination of the NUC terms.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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