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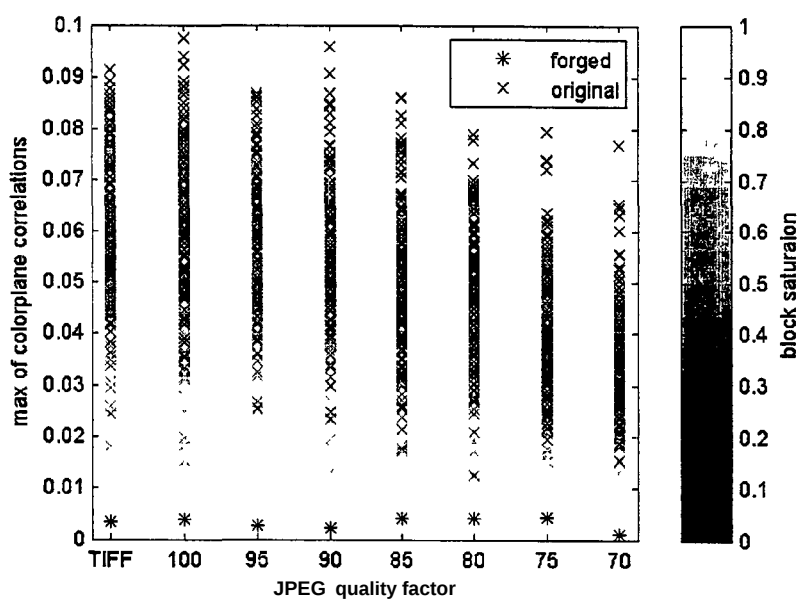
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(54) Title: DETERMINING WHETHER OR NOT A DIGITAL IMAGE HAS BEEN TAMPERED WITH



(57) Abstract: Apparatus and method to verify the integrity of a digital image (i.e., deciding whether or not the entire image or just a portion has been tampered with, and/or finding the doctored area in the image). One first determines the imaging sensor's reference pattern noise, which serves as a unique fingerprint that identifies the imaging sensor that captured the image. To verify the integrity of the content in a region of the image, a correlation detector determines the presence or absence of the imaging sensor's reference pattern noise in that region, thereby verifying whether or not the image has integrity. The correlation detector can also find automatically one or more regions in the image that were tampered with.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/1 1672

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06K 9/00 (2008.04)

USPC - 382/100

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(8): G06K 9/00 (2008.04)

USPC: 382/100

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

USPC: 380/210; 348/E7.056; 375/E7.04; 375/E7.089; 375/E7.187; 375/E7.21 1; 386/E5.001; 713/176; 375/240 18; 375/E7.089 (text search)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

pubWEST(USPT,PGPB, EPAB.JPAB.USOCR); DialogWEB(Engineering); Google Search terms- noise signature camera scanner
imaging device reference tampered altered image covariance forensics

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X --- Y	US 2006/0020830 A1 (ROBERTS) 26 January 2006 (26.01.2006), fig 3, 4, 6; para [0041], [0048], [0050], [0056]-[0060].	1, 10, 11, 13, 22, 23, 25, 27, 28
Y	US 2006/0013434 A1 (SMITH et al.) 19 January 2006 (19.01.2006), [0032]-[0080].	2-9, 12, 14-21, 24, 26
Y	US 2006/0013434 A1 (SMITH et al.) 19 January 2006 (19.01.2006), [0032]-[0080].	2-9, 12, 14-21, 24, 26
A	US 6,580,819 B1 (RHOADS) 17 June 2003 (17 06 2003), abstract; col4 ln 5-20.	1, 13, 28
A	US 2003/0156733 A1 (ZELLER et al.) 21 August 2003 (21.08.2003), abstract; para [0024], [0058], [0060], [0166].	1, 13, 28
A	US 2001/0052131 A1 (HOBSON et al.) 13 December 2001 (13.12.2001), para [0061], [0062].	1, 13, 28

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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

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