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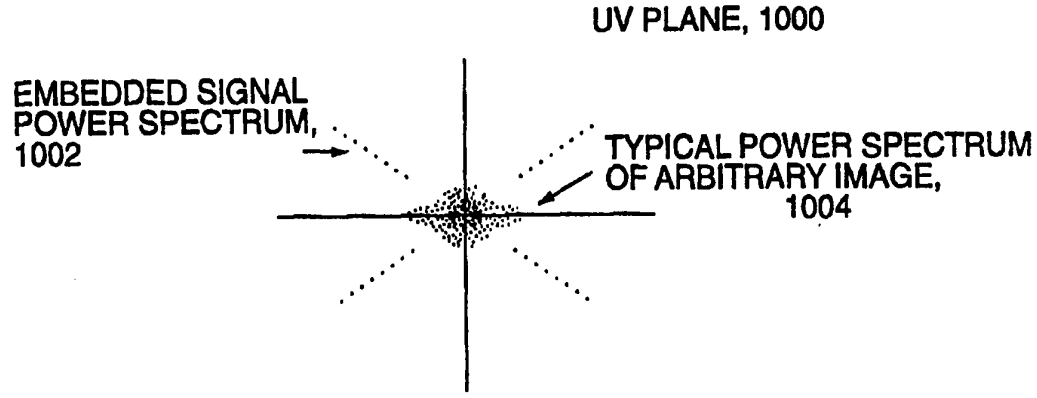
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(54) Title: STEGANOGRAPHY SYSTEMS



(57) Abstract

Various improvements to steganographic systems, and applications therefore, are disclosed. The improvements include facilitating scale and rotation registration for steganographic decoding by use of rotationally symmetric steganographically embedded patterns and subliminal digital graticules; improved techniques for decoding without access to unencoded originals; improving robustness of steganographic coding in motion pictures and/or in the presence of lossy compression/decompression; and representing data by patterned bit cells whose energy in the spatial domain facilitates decoding registration. Applications include enhanced-security financial transactions, counterfeit resistant identification cards, fraud deterrent systems for cellular telephony, covert modem channels in video transmission, photo duplication kiosks with automatic copyright detection, and hotlinked image objects (e.g. with embedded URLs) for use on the internet.

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INTERNATIONAL SEARCH REPORT

Intern· al Application No
PCT/US 96/06618

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N1/32 H04N1/00

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 6 H04N G03G

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP,A,0 581 317 (INTERACTIVE HOME SYSTEMS) 2 February 1994 cited in the application see the whole document ---	1,17
A	EP,A,0 551 016 (CANON KK) 14 July 1993 see column 4, line 44 - column 11, line 38 ---	1,17
A	PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON IMAGE PROCESSING (IC, AUSTIN, NOV. 13 - 16, 1994, vol. 2 OF 3, 13 November 1994, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, pages 86-90, XP000522615 SCHYNDEL VAN R G ET AL: "A DIGITAL WATERMARK" see the whole document --- -/--	1,17,32

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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

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"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

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Date of the actual completion of the international search	Date of mailing of the international search report
21 November 1996	0 5. 12. 96

Name and mailing address of the ISA	Authorized officer
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	Hazel, J

Form PCT ISA 210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Internal Application No
PCT/US 96/06618

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	RESEARCH DISCLOSURE, no. 358, 1 February 1994, page 75 XP000439803 "AUTHENTICATION AND DISPLAY OF SIGNATURES ON ELECTRONIC DOCUMENTS" see the whole document	22
X Y	EP,A,0 649 074 (XEROX CORP) 19 April 1995 see column 5, line 40 - column 13, line 5	32 33
Y	EP,A,0 605 208 (CANON KK) 6 July 1994 see abstract see page 8, line 12 - line 14	33
A	US,A,3 809 806 (WALKER R ET AL) 7 May 1974 see column 1, line 11 - line 25	32

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inte. .onal application No.
PCT/US 96/06618

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 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:

1. Claims 1-31: Method of embedding auxiliary data in and recovering them from image data using encoded calibration data
2. Claims 32,33: Photo-duplication kiosk for detecting copyright data and for interrupting printing

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 searches 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

...ormation on patent family members

Internal Application No
PCT/US 96/06618

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
EP-A-0581317	02-02-94	CA-A-	2101673	01-02-94
		JP-A-	6343128	13-12-94
EP-A-0551016	14-07-93	CA-A-	2086472	07-07-93
		JP-A-	5301380	16-11-93
		US-A-	5457540	10-10-95
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		US-A-	5444779	22-08-95
EP-A-0605208	06-07-94	JP-A-	6205210	22-07-94
		JP-A-	7046400	14-02-95
		CA-A-	2112735	02-07-94
US-A-3809806	07-05-74	NONE		