



- (51) International Patent Classification:
G07D 7/12 (2006.01) G06K 19/06 (2006.01)
G07D 7/20 (2006.01)
- (21) International Application Number:
PCT/US2014/042431
- (22) International Filing Date:
13 June 2014 (13.06.2014)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
61/834,799 13 June 2013 (13.06.2013) US
- (71) Applicant: DOCUMENT SECURITY SYSTEMS, INC.
[US/US]; 28 East Main Street, Suite 1525, Rochester, NY
14614 (US).
- (72) Inventors: WICKER, David; 4507 Red School Road,
Dansville, NY 14437 (US). CATON, Michael; 6000 Fisher
Road, Oakfield, NY 14125 (US). ACTON, Nicole; 227
Euler Road, Churchville, NY 14428 (US).

(74) Agent: COOK, Justin, M.; McDonnell Boehnen Hulbert & Bergholl LLP, 300 South Wacker Drive, Suite 3100, Chicago, IL 60606 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,

[Continued on next page]

(54) Title: PRINTED AUTHENTICATION FOR LOW RESOLUTION REPRODUCTIONS

(57) Abstract: A document includes an authenticity-indicating feature configured such that a reproduction of the document renders the printed feature visually distinctive from an original rendering of the document. The printed feature includes printed elements arranged on the substrate in a latent image region and a background region. The printed elements in the latent image region include a plurality of regularly spaced printed shapes arranged with a spatial frequency less than about 50 per inch. The printed elements are printed with a carbon-based ink, toner, or dye, and separated from one another by contrasting regions that do not include the carbon-based ink, toner, or dye. The printed elements in the background region are at least partially surrounded by the latent image region such that, in the original rendering of the document, the plurality of regularly spaced printed shapes is not readily distinguishable from the background.

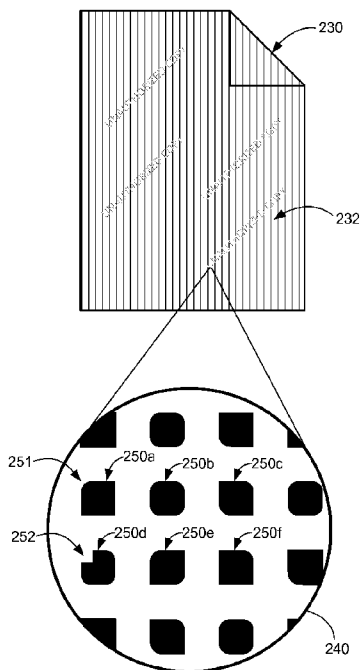


FIG. 2B





MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, KM, ML, MR, NE, SN, TD, TG).

— 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))

Published:

— with international search report (Art. 21(3))

(88) Date of publication of the international search report:

5 February 2015

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/42431

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 supplemental 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 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.:
1-14

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.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/42431

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - G07D 7/12, 7/20; G06K 19/06 (2014.01) CPC - G07D 7/06, 7/127; G06K 19/06009 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) Classification(s): G07D 7/00, 7/12, 7/20; G06K 1/12, 19/06 (2014.01) CPC Classification(s): G07D 7/06, 7/127; G06K 19/06009, 19/06056; USPC 235/494; 101/484; 283/70, 85, 93; 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) MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); Ip.Com, Google Scholar, Proquest; Search terms used: authentication 45 per inch carbon ink, eurion constellation, Omron anti-photocopying feature, printer steganography																			
C. DOCUMENTS CONSIDERED TO BE RELEVANT																			
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X -- Y</td> <td>US 5,710,420 A (MARTIN, T. et al.) January 20, 1998; figure 1; column 1, lines 25-62; column 6, lines 16- column 7, line 58; column 8, lines 28- column 9, line 35; column 43, lines 43-50; column 44, lines 14-40; column 47, lines 36-63.</td> <td>1, 2, 4, 7-10, 12, 13 ---- 3, 5, 6, 11, 14</td> </tr> <tr> <td>Y</td> <td>US 7,044,386 B2 (BERSON, W.) May 16, 2006; figures 1 and 6-7; column 6, lines 21-49.</td> <td>3, 14</td> </tr> <tr> <td>Y</td> <td>US 2012/0229898 A1 (NORTHEY, P. et al.) September 13, 2012; figure 5; paragraphs [0047, 0051].</td> <td>5, 6</td> </tr> <tr> <td>Y</td> <td>US 2006/020468 A1 (PHILLIPS, G. et al.) September 14, 2006; figure 7 and 11-13; paragraphs [0090-0092].</td> <td>11</td> </tr> <tr> <td>A</td> <td>US 5,708,717 A (ALASIA, A.) January 13, 1998; entire document</td> <td>1-14</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X -- Y	US 5,710,420 A (MARTIN, T. et al.) January 20, 1998; figure 1; column 1, lines 25-62; column 6, lines 16- column 7, line 58; column 8, lines 28- column 9, line 35; column 43, lines 43-50; column 44, lines 14-40; column 47, lines 36-63.	1, 2, 4, 7-10, 12, 13 ---- 3, 5, 6, 11, 14	Y	US 7,044,386 B2 (BERSON, W.) May 16, 2006; figures 1 and 6-7; column 6, lines 21-49.	3, 14	Y	US 2012/0229898 A1 (NORTHEY, P. et al.) September 13, 2012; figure 5; paragraphs [0047, 0051].	5, 6	Y	US 2006/020468 A1 (PHILLIPS, G. et al.) September 14, 2006; figure 7 and 11-13; paragraphs [0090-0092].	11	A	US 5,708,717 A (ALASIA, A.) January 13, 1998; entire document	1-14	<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																	
X -- Y	US 5,710,420 A (MARTIN, T. et al.) January 20, 1998; figure 1; column 1, lines 25-62; column 6, lines 16- column 7, line 58; column 8, lines 28- column 9, line 35; column 43, lines 43-50; column 44, lines 14-40; column 47, lines 36-63.	1, 2, 4, 7-10, 12, 13 ---- 3, 5, 6, 11, 14																	
Y	US 7,044,386 B2 (BERSON, W.) May 16, 2006; figures 1 and 6-7; column 6, lines 21-49.	3, 14																	
Y	US 2012/0229898 A1 (NORTHEY, P. et al.) September 13, 2012; figure 5; paragraphs [0047, 0051].	5, 6																	
Y	US 2006/020468 A1 (PHILLIPS, G. et al.) September 14, 2006; figure 7 and 11-13; paragraphs [0090-0092].	11																	
A	US 5,708,717 A (ALASIA, A.) January 13, 1998; entire document	1-14																	
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>“A” document defining the general state of the art which is not considered to be of particular relevance</td> <td>“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</td> </tr> <tr> <td>“E” earlier application or patent but published on or after the international filing date</td> <td>“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</td> </tr> <tr> <td>“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)</td> <td>“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</td> </tr> <tr> <td>“O” document referring to an oral disclosure, use, exhibition or other means</td> <td>“&” document member of the same patent family</td> </tr> <tr> <td>“P” document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>		“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	“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	“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)	“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	“O” document referring to an oral disclosure, use, exhibition or other means	“&” document member of the same patent family	“P” document published prior to the international filing date but later than the priority date claimed									
“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	“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																		
“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)	“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																		
“O” document referring to an oral disclosure, use, exhibition or other means	“&” document member of the same patent family																		
“P” document published prior to the international filing date but later than the priority date claimed																			
Date of the actual completion of the international search 19 November 2014 (19.11.2014)	Date of mailing of the international search report 09 DEC 2014																		
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774																		

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/42431

-Continued from Box III--

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I comprising claims 1-14 comprise at least: a substrate, an authenticity-indicating feature, a latent image hidden within a background image, a region with a printed shape, printed shapes spaced less than 50 per inch, carbon based ink, a contrasting area between the elements.

Group II comprising claims 15-20 comprise at least an imaging system, a computer system, an authenticity-indicating feature, a region with a printed shape, comparing a printed shape to authenticate a document.

Group I contains at least a substrate, a latent image hidden within a background image, printed elements spaced less than 50 per inch, carbon based ink and a contrasting area between the elements that Group II does not. Group II comprises at least an imaging system, a computer system, and comparing a printed shape to authenticate a document that Group I does not.

The common technical features of Groups I and II are an authenticating-indicating feature and a region with a printed shape.

The common features are disclosed by US 5,710,420 A to Martin, T. et al. an authenticating-indicating feature (data written in a machine readable code format such as glyphs (authenticity-indicating printed feature) is printed on a substrate such that is invisible unless heated or irradiated as a security feature; figure 1; column 6, lines 15-23; column 7, lines 38-58; column 8, lines 28-58; column 44; lines 14-41) and a region with a printed shape (glyph codes (printed shapes) can be printed so the glyphs form a background in patterns (background region) capable of being rendered invisible; column 7, lines 38-58).

Since the common technical feature is previously disclosed by the Martin reference, this common feature is not special and so Groups I-II lack unity.