

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
25 January 2007 (25.01.2007)

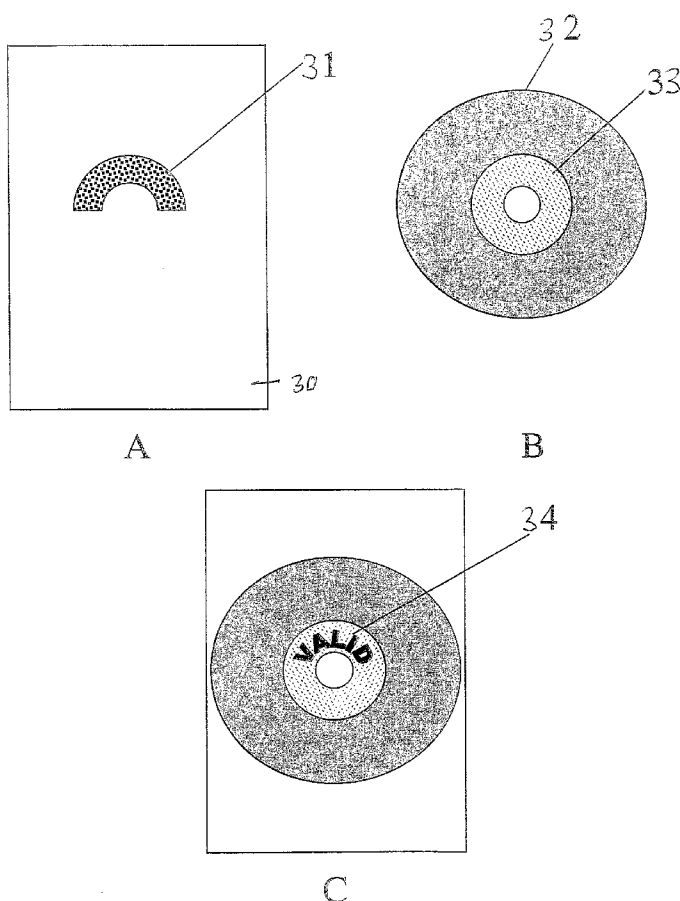
PCT

(10) International Publication Number
WO 2007/010224 A1

- (51) International Patent Classification:
G11B 23/38 (2006.01) **G07D 7/00** (2006.01)
- (21) International Application Number:
PCT/GB2006/002640
- (22) International Filing Date: 17 July 2006 (17.07.2006)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0514701.2 18 July 2005 (18.07.2005) GB
- (71) Applicant (for all designated States except US): **DE LA RUE INTERNATIONAL LIMITED** [GB/GB]; De La Rue House, Jays Close, Viabes, Basingstoke, Hampshire RG22 4BS (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **BOARD, James, Leslie** [GB/GB]; 1 St. Anthony's Avenue, Hemel Hempstead, Hertfordshire HP3 8HQ (GB).
- (74) Agent: **GILL JENNINGS & EVERY LLP**; Broadgate House, 7 Eldon Street, London EC2M 7LH (GB).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report

[Continued on next page]

(54) Title: VISUAL AUTHENTICATION OF OPTICAL STORAGE MEDIUM



(57) Abstract: Self-verification apparatus comprises an optical data storage medium (10) provided with a first member (12) of a visual authentication device. A second member (5) of the visual authentication device is fixed to or generated by an article (2) separate from the optical data storage medium. When the first and second members (12, 5) are viewed together, they cooperate to present a verification image to a viewer, the verification image not being visible when the first and second members are viewed separately.



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

VISUAL AUTHENTICATION OF OPTICAL STORAGE MEDIUM

The invention relates to self-verification apparatus, particularly for use with an optical data storage medium such as a CD or DVD.

5 It is becoming increasingly easier to produce copies of proprietary software provided on optical data storage media such as a CD or DVD as a result of CD and DVD writing devices becoming widely available. As a result of this, software suppliers are providing increasingly sophisticated methods to prevent illegal copying by incorporating anti-copy features into the software. Another approach is to enable
10 counterfeit storage media to be identified by incorporating highly complex security features into the optical data storage media themselves.

For example, US-A-2004/0255317 describes various methods for incorporating security features in a radially inner, normally unused portion, of a compact disc. Examples of these security features include encrypted, printed serial numbers; digital
15 fingerprints or watermarks; holograms; polarized filters; photo-luminescent coatings (detectable by specially tuned lasers); microscopic taggants, i.e., microscopic markers not found in the base material but added to the base material to indicate the object's origin or authenticity; and radio-frequency identification (RFID) devices.

The problem with these approaches is that it is not easy for the average user
20 to determine whether or not he has been given a counterfeit product. Special devices are usually required to analyse the security feature or they need to be viewed by highly skilled personnel.

There is a need therefore for a relatively straightforward method to enable average users to be able to readily detect counterfeit optical data storage media.

25 In accordance with the present invention, we provide a self-verification apparatus comprising an optical data storage medium provided with a first member of a visual authentication device; and a second member of the visual authentication device fixed to or generated by an article separate from the optical data storage medium whereby when the first and second members are viewed together, they
30 cooperate to present a verification image to a viewer, the verification image not being visible when the first and second members are viewed separately.

We have realised that a fair degree of reassurance can be provided to a user that he is in possession of a genuine optical data storage medium by utilising a relatively simple authentication device rather than the highly complex devices of the
35 prior art. It is recognised that a sophisticated counterfeiter might be able to produce

apparently genuine counterfeit copies but the present invention is not intended to prevent this but rather deal with slightly less sophisticated copying by providing a system which is not straightforward for the average person to duplicate.

Essentially, the invention provides a quick way for the average user to establish
5 that there is a link between the first and second members, one of which is provided on or in the optical data storage medium, leading to a reasonable degree of certainty that he is handling a genuine product.

The concept of a two-part visual authentication device is known and there are many conventional methods of achieving this. All of these are suitable for use in the
10 present invention. Typically, these are utilised in the context of revealing a hidden image in a security printed document or the like using a handheld viewer or revealer. The hidden images and the type of revealer can take several forms. The following approaches are described in the prior art.

WO 01/87632 discloses a print feature consisting of an array of dots in which
15 a security pattern or code is produced by displacing some of the dots with respect to the rest. This cannot be seen with the naked eye. The pattern can be made visible by viewing through a planar device carrying transparent and opaque areas of the same periodicity as the printed dots.

WO 97/20298 discloses a method and apparatus for producing Scrambled
20 Indicia®. This process encodes a message or image into an area of print using digital techniques. The message cannot be seen by unaided eye. When the print is viewed using a lenticular screen of the correct characteristics the hidden image/message is revealed. In some cases different images can be seen at different angles of view. Such scrambled indicia can be incorporated into print or into holographic originations.

25 Enschede's microSAM® feature uses screen angle modulation to encode a message or image by modifying the print structure in a manner undetectable by the unaided eye. When the feature is viewed through the correct revealer the hidden message or pattern is seen. The revealer in this case is a piece of plastic film ruled with parallel black lines of the correct pitch and thickness.

30 WO 01/39138 discloses methods and apparatus for authenticating security documents such as banknotes, passports etc. According to this method, a screen pattern is printed onto a surface. A revealing device is designed so that when it is placed over the printing, it produces a clearly visible message or image caused by the moiré effect. The revealing screen may be a line structure or a microlens array.

GB 1407065 describes a security document carrying a pair of metameric inks which match under one illuminant, say North Sky light, but mismatch under another type of illuminant, such as tungsten. For such a set of inks it is also possible to see a difference in the appearance of the two pairs of such inks by viewing under coloured
5 filters. Commonly, a red filter is used for viewing features. Any mismatch in the absence of a viewer is hidden by overprinting the ink pair by a discontinuous red print design which drops out under the filter.

EP 930979 discloses a self-verifying document and describes a number of methods by which a transparent region on the document can be used to authenticate
10 a document. Microlenses, diffraction gratings, colour filters and moire effects are all referred to.

In all the above effects the security benefits rely on the fact that when the document is copied the structure of the hidden images are not precisely replicated by the copying process. For example this will occur if the resolution of the original image
15 is significantly greater than the resolution of the device used to replicate the image.

In some applications of the invention, the article can be supplied separately from the optical data storage medium such that one is equivalent to the known security feature and the other equivalent to the known revealer. However, in particular preferred aspects of the current invention, the article is related to the optical data storage
20 medium. For example, the article may comprise packaging for the optical data storage medium. In this case, the second member may be printed directly or indirectly on the packaging and when the optical data storage medium is removed from the packaging, the two members can be viewed together to check whether the verification image is revealed. In the preferred approach, the first member is provided in or on a transparent
25 portion of the optical storage data medium so that the second member can be viewed through the transparent portion.

Thus a revealer on the optical data storage medium can be used to authenticate the certificate of authenticity or fiscal stamp applied to the packaging supplied with the optical storage medium.

30 In another approach, the packaging comprises a transparent window containing the second member so that when the optical data storage medium is packaged, the two members cooperate together to generate the verification image. Thus, the purchaser will see the verification image at the time of purchase and it will disappear when the optical data storage medium is removed from the packaging.

In other examples, the data stored on the optical data storage medium is to be used on a processor and may for example comprise a software program. In that event, the second member may be provided as a label attached to a processor with which the optical data storage medium is to be associated. For example a personal computer will typically have an operating system preinstalled and will have a certificate of authenticity applied to its outer case for authentication by the user. The computer will also be supplied with a set of DVD's or CD's on which the software associated with the certificate of authenticity is stored, these being supplied as a backup in case the user should need to reinstall the software. In this instance the label adhered to the computer has a hidden image printed on it which can be verified by the viewer integrated into the optically data storage media.

Alternatively the second member could be displayed on a display such as a monitor. Of course, the display on a monitor could be used simply to verify the optical data storage medium even if it has no connection with any associated processor.

In one approach, the second member is computed by the processor in accordance with a preprogrammed algorithm. This algorithm may generate the same second member each time it is activated or may vary the second member, for example by taking account of the time of varying parameter. Thus, in the case of game playing software, the time varying parameter may vary according to the state of the game.

In an alternative approach, the processor can obtain the second member from a remote source, for example via the Internet. Thus, a purchaser or user of the optical data storage medium could enter an identifier of that storage medium which is communicated to the remote source, the identifier being used as an index to locate the appropriate second member which is then transmitted to the processor for display.

In all these preferred aspects, it will be understood that it is not necessary to supply a separate "revealer" since the optical data storage medium and the article are associated with each other.

The region of the optical data storage medium with the first member is usually transparent but does not need to be 100% transparent. It will typically allow a level of transmission as the user views the coded image to be decoded through this region. For example one might use a semi-transparent metal layer or a transparent coloured layer.

The verification image can take a variety of forms but, for ease of recognition, typically comprises one or more of indicia, for example alphanumeric, a graphical device, logos, serial numbers, authentication keys, patterns and the like.

Some examples of self-verification apparatus according to the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 illustrates schematically a personal computer and associated optical data storage media;

5 Figure 2 is a plan view of a security label affixed to the housing of the personal computer shown in Figure 1;

Figure 3 illustrates one of the optical data storage media in more detail.

Figures 4A-4C illustrate first and second members of another example of a visual authentication device and the combined members respectively; and,

10 Figures 5A-5C and 6A-6C are views similar to Figures 4A-4C respectively but of third and fourth examples of visual authentication devices.

Figure 1 shows a security label 1 applied to the housing 2 of a personal computer. The security label 1, shown in detail in Figure 2, is a certificate of authenticity for the operating systems pre-installed on the computer by the computer manufacturer. The security label 1 comprises a security substrate 3 having a security thread 4 and optionally other embedded security features (not shown). The secure substrate 3 is printed with a range of security features including a hidden image feature such as Scrambled Indicia® 5 forming a "second member" of a visual authentication device. Scrambled Indicia® is a technology developed and marketed by Graphic Security Systems Corp and has been widely used on a range of security applications previously. See also WO97/20298. The security label 1 has also been provided with an identifier, for example a barcode 6 and a serial number 7. The identifier can be used by an inspector to authenticate the validity of the label 1. The identifier can also be used by the software owner to validate, or unlock the software application.

15 Alternatively the identifier might be required to access on line help, updates and upgrades to the software.

The computer is supplied with one or more back up CD's or DVD's 10, one of which is shown in detail in Figure 3. These can be used in the event the operating system should need to be reinstalled. A revealer 12 for the Scrambled Indicia® 5, forming a "first member" of the visual authentication device, is integrated into one or more of the CD's or DVD's in a transparent inner ring region 14. In this example the revealer 12 has been integrated directly into the CD/DVD during the manufacture of the CD/DVD. For the Scrambled Indicia® feature 5 the revealer comprises a lens structure which can be formed by embossing. An example is described in WO-A-97/20298. It is therefore relatively straightforward to modify the stamping device used to emboss

20

25

30

35

CD/DVD's to incorporate a revealer device in the inner ring region 14 that is not normally embossed.

The CD/DVD 10 can then be used to authenticate the label 1 attached to the PC housing 2. The user simply takes the CD/DVD 10 and places it such that the transparent inner ring region 14 containing the revealer 12 is over the Scrambled Indicia 5 on the label 1. When the Scrambled Indicia® is viewed through the revealer an image, message or code is revealed constituting a verification image.

As an alternative to forming the revealer during the stamping process of the CD/DVD 10 it may be applied subsequently in a separate process. For example it may be applied as a transparent label, by a casting process or by a relief printing process. Other methods are described in US-A-2004/0255317.

A variety of other visual authentication devices could be used.

1. The revealer in the inner ring 14 could be a combination of a scrambled indicia lens structure and a metameric (e.g. red) filter. Such a device would be capable of decoding or revealing both a metameric hidden image and a scrambled indicia hidden image. Alternatively the hidden image could be a complex combination of the metameric and scrambled indicia features.

2. As a further development of 1 above the revealer could be a combination of two lens structures interlocked and thus capable of unlocking two different codes. By interlocked we mean the two lens structures are interleaved or superposed upon each other in some way. If the two structures are carefully selected and superposed correctly then it is possible to use a single revealer to reveal two differently encoded images.

3. The revealer could be used to reveal a hidden image that is concealed within a holographic or diffractive element in a similar manner to the previously described hidden images. Alternatively, the hidden image could be concealed within a demetallisation pattern. The demetallisation essentially being equivalent to the printed structures referred to earlier.

4. The revealer could comprise both left and right light polarising segments that can then be used to view a liquid crystal ink feature. Such liquid crystal ink features can be printed with SICPA Oasis inks. The ink is available in both right and left handed forms so can be used to produce hidden features.

5. The revealer 12 in the inner ring 14 could comprise a microlens array which when placed over the hidden image magnifies or reconstructs information. Other types of lens could be used e.g. simple magnifiers, or fresnel lenses.

6. Composite verification images could be used, generated in accordance with the techniques described in PCT/GB05/01640.

As can be seen therefore, the current invention is not limited to the use of Scrambled Indicia® but could make use of many different hidden feature and revealer technologies. Where a metamer, dot screen or line screen approach is used the
5 revealer can be printed (instead of embossed) on to the CD. This printing step can be done later in the replication process. Additionally this presents the opportunity for each label to carry a unique pattern that requires a unique decoder. This would further enhance the security of the invention.

10 Some further examples of apparatus according to the invention will now be described.

Figure 4A illustrates a document or item of packaging 30 carrying an area of print 31 within which is hidden an image, for example using the Scrambled Indicia process.

15 Figure 4B illustrates a CD or DVD 32 with a revealer 33 provided in an inner, transparent ring portion.

Figure 4C illustrates the result of overlaying the CD/DVD 32 on the document or packaging 30 with the revealer 33 located so that the hidden image 34 is revealed and the message can be read. In the case of packaging, it will be understood that if the
20 area of print 31 is provided in a transparent window of the packaging 30 then it can be arranged such that the message or hidden image 34 can be viewed while the CD/DVD is in its packaged condition. This provides an indication of authenticity. In that case, it is usually necessary for a window to be provided on the opposite surface of the packaging to that carrying the print 31 so that a light path exists through both leaves
25 of the packaging and the inner ring 33 of the CD/DVD.

Figures 5A and 5B illustrate a first member and a second member respectively of a visual authentication device, utilising a metamer effect. Thus, the first member 40 (Figure 5A) is printed using a pair of metamer inks which appear indistinguishable to the naked eye. However, when this metamer print is viewed through a revealer 42,
30 the two inks can be distinguished and a serial number 44 provided using one of the inks (Figure 5C) can be revealed. In the case of the CD/DVD application, the revealer or filter 42 could be provided in the inner ring of the CD as a printed or dyed region.

In the Figure 6 example, a hidden image 50 (Figure 6A) is created by first printing a background line pattern 52 of a given frequency. Onto this is superposed a
35 message comprising letters made up of a line screen having the same frequency as

that of the background but shifted to the left slightly. The revealer 54 is also a line screen of the same frequency and by lining up the revealer 54 correctly with the hidden image 50, the term VALID appears (Figure 6C). Of course other methods are possible including the use of multiple line frequencies, dots instead of lines, or more complex screen techniques.

5

CLAIMS

1. Self-verification apparatus comprising an optical data storage medium provided
5 with a first member of a visual authentication device; and a second member of the
visual authentication device fixed to or generated by an article separate from the optical
data storage medium whereby when the first and second members are viewed
together, they cooperate to present a verification image to a viewer, the verification
image not being visible when the first and second members are viewed separately.
- 10 2. Apparatus according to claim 1, wherein one of the members of the visual
authentication device comprises one or more lens structures, for example microlens
array(s), and the other member comprises one or more corresponding verification
images encoded into a background.
3. Apparatus according to claim 1 or claim 2, wherein one of the members
15 includes one or more colour filters and the other of the members comprises multiple
coloured indicia chosen such that when viewed through the one member only certain
portions of the indicia are visible so as to define the verification image.
4. Apparatus according to any of the preceding claims, wherein one of the
members provides a first part of a composite verification image and the other of the
20 members provides a second part of the composite verification image.
5. Apparatus according to any of the preceding claims, wherein one of the
members comprises respectively left and right polarising segments, and the other of
the members comprises a corresponding arrangement of left and right polarised liquid
crystal inks.
- 25 6. Apparatus according to any of the preceding claims, wherein one of the
members includes a colour filter and the other of the members comprises one or more
metameric inks.
7. Apparatus according to any of claims 2 to 6, wherein the one of the members
is provided by the first member and the other of the members is provided by the
30 second member.
8. Apparatus according to any of the preceding claims, wherein the first member
is provided on or in a transparent part of the optical data storage medium so that the
second member can be viewed through the transparent portion.

9. Apparatus according to any of claims 1 to 4, or claim 7 or claim 8 when dependent on any of claims 1 to 4, wherein the article comprises an electronic display on which the second member can be displayed.
10. Apparatus according to claim 9, wherein the display is coupled to a processor that computes the second member in accordance with a preprogramed algorithm.
11. Apparatus according to claim 10, wherein the preprogramed algorithm takes account of a time varying parameter.
12. Apparatus according to claim 10 or claim 11, wherein the time varying parameter varies according to a game played using the processor.
13. Apparatus according to claim 9, wherein the display is coupled to a processor that obtains data defining the second member from a remote source, for example via the Internet.
14. Apparatus according to any of claims 1 to 8, wherein the second member is printed directly or indirectly on the article.
15. Apparatus according to claim 14, wherein the second member is printed on a label affixed to the article.
16. Apparatus according to any of claims 1 to 8, 14 or 15, wherein the article comprises packaging for the optical data storage medium.
17. Apparatus according to claim 16, wherein the packaging includes a transparent window within which the second member is provided.
18. Apparatus according to claim 17, wherein the optical data storage medium is located in the packaging with the first and second members aligned so that the verification image is visible from outside the package.
19. Apparatus according to any of claims 1 to 15, wherein the article comprises a processor storing software, the optical data storage medium storing a back-up version of the software.
20. Apparatus according to any of the preceding claims, wherein the verification image comprises one or more of indicia, for example alphanumerics, a graphical device, logos, serial numbers, authentication keys and patterns.
21. Apparatus according to any of the preceding claims, wherein the optical data storage medium comprises one of a CD and DVD.
22. Apparatus according to claim 21, wherein the first member is provided in or on a radially inner, annular portion of the CD or DVD.

1/4

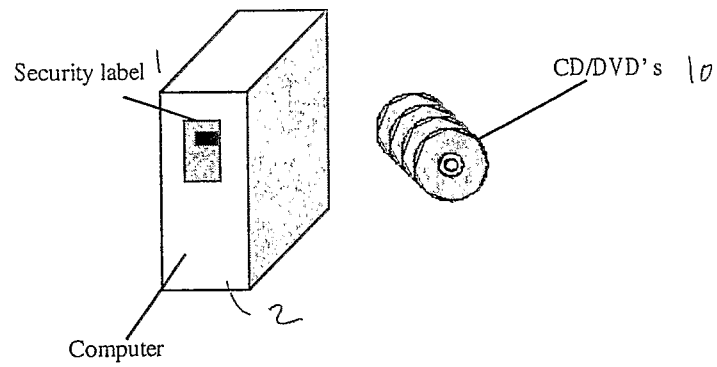


Fig. 1

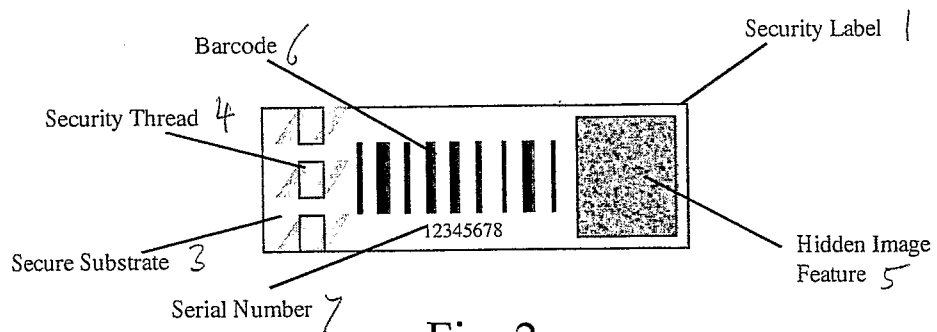


Fig. 2

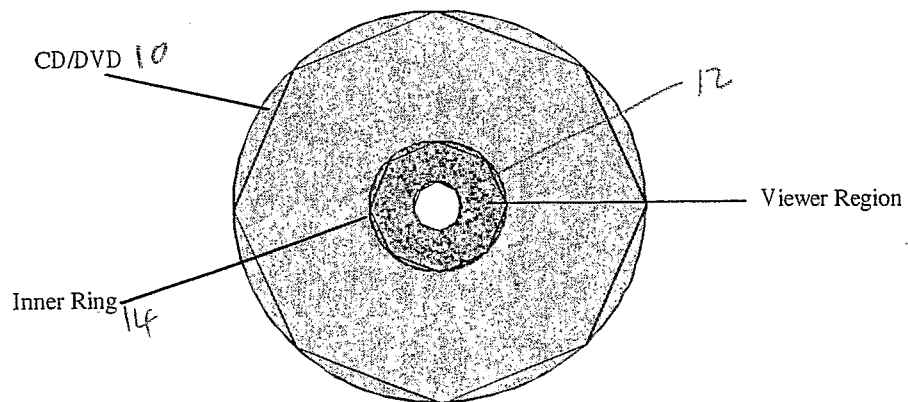
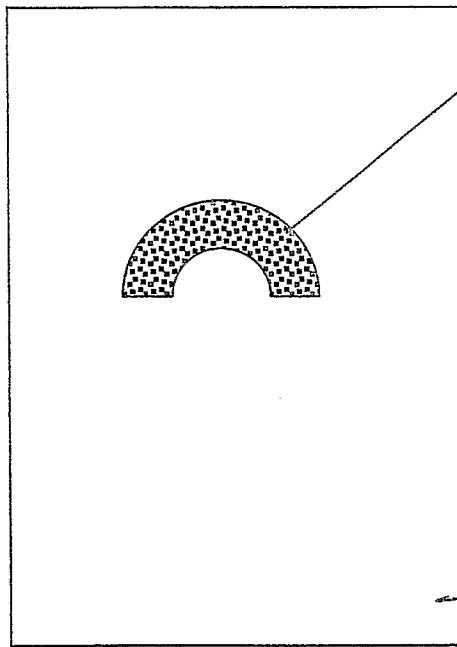
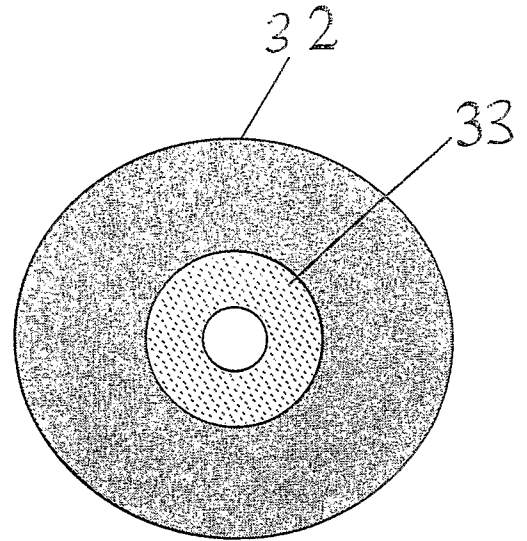


Fig. 3

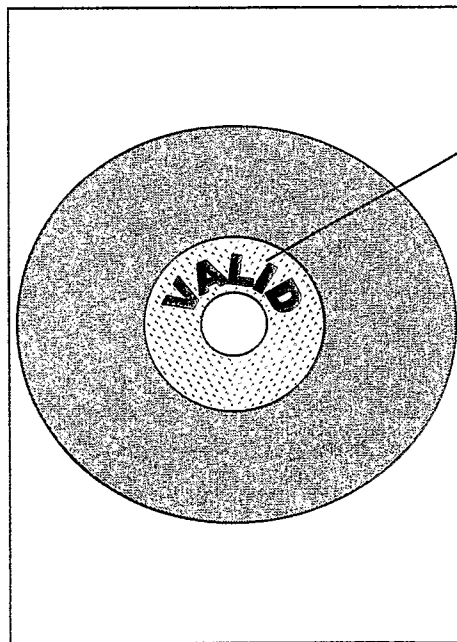
2/4



A



B



C

Fig. 4

3/4

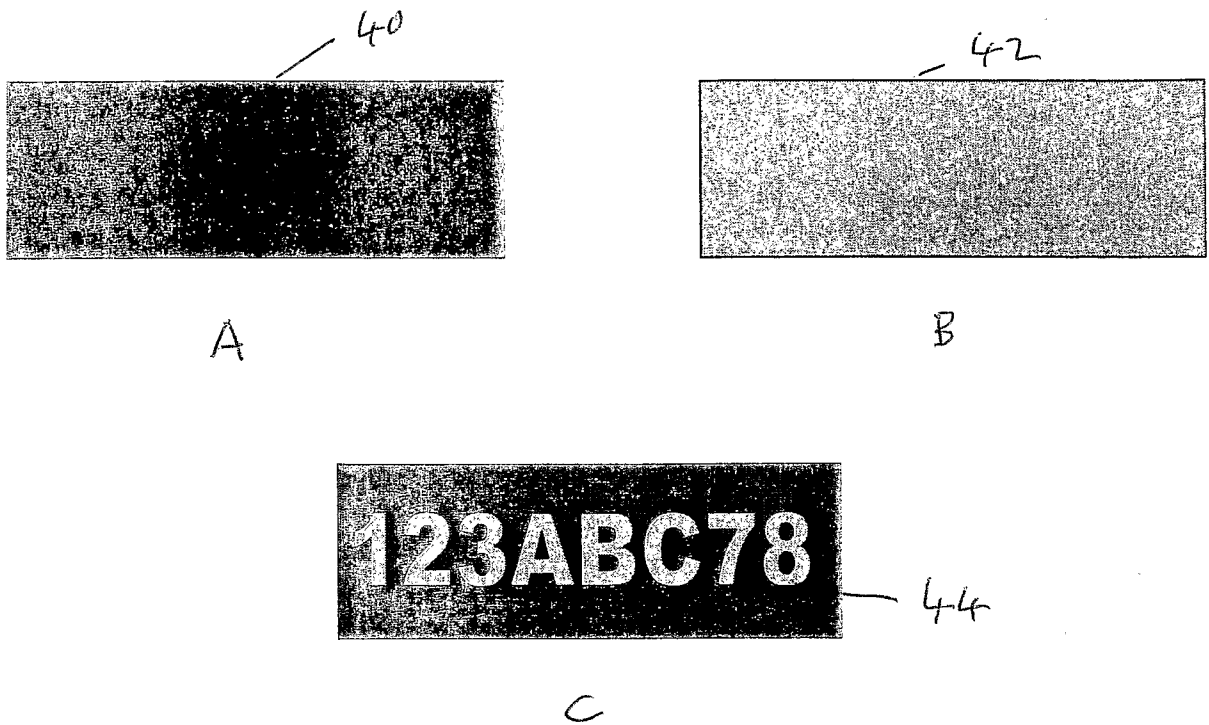


Fig. 5

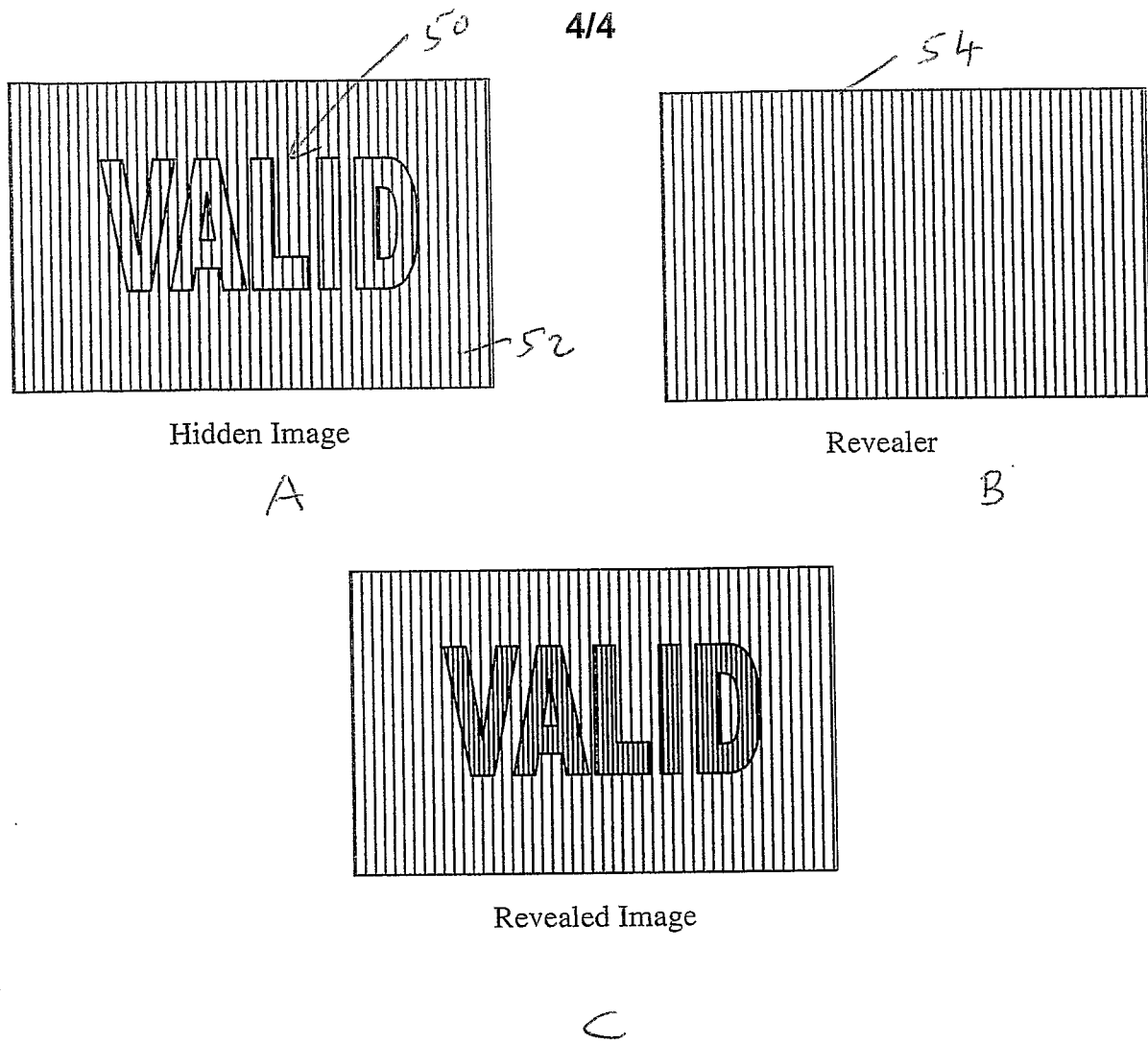


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/002640

A. CLASSIFICATION OF SUBJECT MATTER
INV. G11B23/38 G07D7/00

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)

G11B G07D

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/039195 A1 (LONG MICHAEL D [US] ET AL) 27 February 2003 (2003-02-27) paragraphs [0012], [0043], [0113]; figure 12	1-22
X	WO 00/29878 A (ROLIC AG [CH]; MOIA FRANCO [CH]) 25 May 2000 (2000-05-25) pages 1-3	1-22
X	US 2004/001604 A1 (AMIDROR ISAAC [CH]) 1 January 2004 (2004-01-01)	1-22
Y	paragraph [0011]	1-22
Y	US 2003/223100 A1 (ANDERSON MICHAEL JAY [US]) 4 December 2003 (2003-12-04) paragraphs [0006], [0022]	1-22
	-/--	

☒ Further documents are listed in the continuation of Box C.

☒ 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

"E" earlier document 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

"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

"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

5 October 2006

Date of mailing of the international search report

11/10/2006

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

Damp, Stephan

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/002640

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 434 210 A2 (RICOH KK [JP]) 30 June 2004 (2004-06-30) paragraphs [0011], [0042] -----	1-22
Y	WO 96/00446 A (MINNESOTA MINING & MFG [US]) 4 January 1996 (1996-01-04) page 4 -----	1-22
Y	US 2002/106102 A1 (AU OSCAR CHI-LIM [HK] ET AL) 8 August 2002 (2002-08-08) the whole document -----	1-22
Y	US 2005/069170 A1 (ALASIA ALFRED V [US] ET AL) 31 March 2005 (2005-03-31) the whole document -----	1-22
Y	US 5 708 717 A (ALASIA ALFRED [US]) 13 January 1998 (1998-01-13) the whole document -----	1-22
Y	US 6 062 604 A (TAYLOR JOHN CHARLES [AU] ET AL) 16 May 2000 (2000-05-16) cited in the application the whole document -----	1-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2006/002640

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2003039195	A1	27-02-2003	NONE	
WO 0029878	A	25-05-2000	AT 299598 T AU 1068700 A CN 1326554 A DE 69926139 D1 DE 69926139 T2 EP 1129373 A1 HK 1037731 A1 JP 2002530687 T	15-07-2005 05-06-2000 12-12-2001 18-08-2005 10-08-2006 05-09-2001 07-10-2005 17-09-2002
US 2004001604	A1	01-01-2004	AU 2003239697 A1 WO 2004003858 A2	19-01-2004 08-01-2004
US 2003223100	A1	04-12-2003	DE 10319490 A1 JP 2004005983 A	11-12-2003 08-01-2004
EP 1434210	A2	30-06-2004	US 2004165523 A1	26-08-2004
WO 9600446	A	04-01-1996	DE 69508083 D1 DE 69508083 T2 EP 0766864 A1 JP 10502203 T US 5607188 A	08-04-1999 28-10-1999 09-04-1997 24-02-1998 04-03-1997
US 2002106102	A1	08-08-2002	NONE	
US 2005069170	A1	31-03-2005	CA 2540522 A1 EP 1671259 A2 MX PA06003536 A WO 2005034501 A2	14-04-2005 21-06-2006 08-06-2006 14-04-2005
US 5708717	A	13-01-1998	AT 220818 T AU 713560 B2 AU 1146097 A BR 9612772 A CA 2239086 A1 CN 1207818 A DE 69622434 D1 DE 69622434 T2 EP 0877998 A1 HK 1017936 A1 HU 9902077 A2 IL 124682 A NO 982445 A NZ 324582 A PL 326891 A1 RU 2176823 C2 US 6859534 B1 WO 9720298 A1 ZA 9610012 A	15-08-2002 02-12-1999 19-06-1997 24-10-2000 05-06-1997 10-02-1999 22-08-2002 20-02-2003 18-11-1998 05-09-2003 28-10-1999 08-08-2001 29-07-1998 28-01-1999 26-10-1998 10-12-2001 22-02-2005 05-06-1997 17-06-1997
US 6062604	A	16-05-2000	AP 794 A AT 210560 T WO 9815418 A1 BR 9712244 A CA 2268100 A1 CN 1421322 A	21-12-1999 15-12-2001 16-04-1998 31-08-1999 16-04-1998 04-06-2003

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2006/002640

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6062604	A	CN 1233217 A	27-10-1999
		DE 69709142 D1	24-01-2002
		DE 69709142 T2	29-08-2002
		DE 930979 T1	04-11-1999
		DK 930979 T3	08-04-2002
		EA 1757 B1	27-08-2001
		EG 21015 A	30-09-2000
		EP 0930979 A1	28-07-1999
		ES 2168674 T3	16-06-2002
		HK 1020552 A1	24-05-2002
		ID 21354 A	27-05-1999
		JP 2000505738 T	16-05-2000
		JP 3222475 B2	29-10-2001
		KR 2000049012 A	25-07-2000
		NZ 334788 A	23-06-2000
		PT 930979 T	31-05-2002
		TW 381060 B	01-02-2000
		US 6273473 B1	14-08-2001
		ZA 9709104 A	27-05-1998