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(54) Title: SECURITY DOCUMENT HAVING AN IR, MAGNETIC OR FLUORESCENT SEE-THROUGH MOTIF

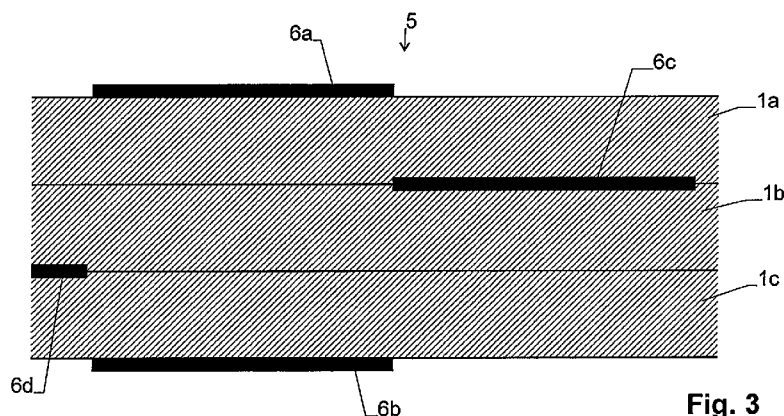


Fig. 3

(57) Abstract: A security document has a substrate (1) that can comprise several substrate layers (1a, 1b, 1c). A see-through motif (5) is formed by means of several dye layers (6a, 6b, 6c, 6d), which are magnetic dye layers or infrared dye layers or UV fluorescent dye layers, thereby providing a high degree of safety. If the substrate has several substrate layers (1a, 1b, 1c), at least some of the dye layers can be arranged between the substrate layers (1a, 1b, 1c).



**Security document having an IR, magnetic or fluorescent
see-through motif**

Technical Field

5

The invention relates to a security document having a substrate layer and carrying a see-through motif and to a method for verifying such a security document.

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Background Art

It has been known to apply see-through motifs to security documents, such as banknotes or passports. Typically, such motifs comprise dye layers of dark colors applied to apposite sides of a substrate layer. In re-
15 reflection, only one such dye layer can be seen and the motif does not appear as a whole. However, when the documented is viewed in transmission, both layers become visible and therefore the motif can be seen as a whole.

20

Disclosure of the Invention

It is a general object of the invention to
25 provide a security document and method of the type above with improved security.

This object is achieved by the document and the method according to the independent claims. Hence, the see-through motif is formed by a combination of at
30 least two dye layers. Each dye layer is a magnetic dye layer and /or an IR dye layer and/or a UV fluorescent dye layer, and the two dye layers are arranged on different sides of the substrate layer.

By forming the see-through motif with mag-
35 netic dye layers and/or IR dye layers and/or UV fluorescent dye layers, the motif obtains at least some characteristics that are not discernible by the human eye,

which makes it less probable that the security feature is counterfeited successfully. At the same time, the motif profits from the improved security provided by the need to print the two dye layers in register, which is difficult without dedicated security printing equipment.

Advantageously, at least one of the dye layers forming the see-through motif is applied to a surface of the document that has the same coloring as said dye layer such that said dye layer is not discernible by the naked eye. This makes it harder for a counterfeiter to discern the presence of the dye layer.

In another advantageous embodiment, the substrate comprises several substrate layers, with the dye layers arranged between the substrate layers or at the outside. This allows to create a large number of complex see-through motifs that are difficult to counterfeit.

Such substrate layers can be laminated to form the substrate. At least one of the dye layers of the motif can be arranged between two such substrate layers, and/or on the top side of a top substrate layer or on the bottom side of a bottom substrate layer.

The substrate or the substrate layers can e.g. be paper layers or plastic layers.

The invention further relates to a method for verifying the above security document. This method comprises the step of testing if the at least two dye layers combine, when examined in transmission, to form said see-through motif.

Brief Description of the Drawings

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings, wherein:

Fig. 1 shows a top view of a security document,

Fig. 2 shows a sectional view along line II-II of Fig. 1 (vertical direction enlarged),

5 Fig. 3 is a sectional view of another embodiment,

Fig. 4 is a sectional view of a third embodiment,

10 Fig. 5 is a top view of a see-through code, and

Fig. 6 is a top view of a see-through text.

Modes for Carrying Out the Invention

15

Definitions:

A „magnetic dye layer“ is a dye layer having a ferroelectric effect and/or having a magnetic DC permeability μ of at least 2.

20 An “IR dye layer” is a dye layer having an absorption of at least 30% at at least one wavelength between 770 nm and 10 μm .

25 A “UV fluorescent dye layer” is a dye layer which, when irradiated with a radiation of a wavelength of 400 nm or less, emits fluorescent light at a wavelength above 400 nm, in particular above 450 nm.

30 A see-through motif is a motif formed by dye layers on opposite sides of a substrate layer (such as a document or a foil applied to a document) and that can be discerned as a whole when the security document is examined in transmission, but that cannot (at least to a much lesser degree). The motif is recognizable as a motif by the human eye (e.g. because it forms a readily recognizable image or picture) or by a machine (e.g. because it
35 forms a machine-readable code). Typically, but not necessarily, a see-through motif is hard to detect when the document is viewed in reflection.

A "substrate layer" is a complete substrate of the security document or a layer of such a complete substrate.

Expressions such as "up", "down", "top",
5 "bottom", "above" and "below" refer to an orientation of said document where one of its surfaces faces up and the other faces down.

The term "paper" includes paper based on wood pulp as well as on cotton.

10

Fig. 1 shows a banknote as an example of a security document. The document comprises a substrate 1. As mentioned, substrate 1 can comprise a single substrate layer or multiple substrate layers, in particular of pa-
15 per or plastic materials. In the sectional view of Fig. 2, substrate 1 is shown to have a single substrate layer 1a.

Substrate 1 carries a plurality of markings, as known to the skilled person, such as security features
20 2, artwork 3 and textual information 4. In addition, substrate 1 carries a see-through motif 5.

See-through motif 5 comprises at least two dye layers 6a, 6b. As mentioned, the dye layers 6a, 6b are magnetic dye layers and/or IR dye layers and/or UV
25 fluorescent dye layers as defined above, i.e. each dye layer 6a, 6b can be magnetic or IR absorbing or fluorescent under UV irradiation. At least one of the dye layers 6a, 6b can also have at least two of these properties and e.g. be magnetic as well as IR absorbing for improved se-
30 curity. In other words, at least one of the dye layers can belong to at least two members of the group comprising magnetic dye layers, IR dye layers and UV fluorescent dye layers.

In an advantageous embodiment, when the docu-
35 ment is viewed in reflection, i.e. it is irradiated with electromagnetic radiation from one side and viewed (in the spectral range of the electromagnetic radiation) from

the same side only one of the dye layers 6a, 6b is visible, or, if both are visible, one of them is much better visible than the other.

When "examined in transmission", both dye
5 layers become visible. The term "examined in transmission" has different meaning depending on if the dye layer facing away from the observer (i.e. from the sensor) is magnetic or IR absorbing or UV fluorescent:

- If the dye layer facing away from the ob-
10 server is a magnetic dye layer, an examination in transmission is typically a magnetic examination, e.g. by measuring the magnetic permeability μ or remanence of the document. For this purpose, a measurement coil can e.g. be placed on one side of the document and be used to
15 measure the magnetic properties originating from both magnetic dye layers.

- If the dye layer facing away from the ob-
server is an infrared absorbing dye layer, an examination in transmission typically involves irradiating the docu-
20 ment from the side facing away from the viewer (sensor) such that the radiation (which is in the infrared spectral range between 770 nm and 10 μm) penetrates the document. Shadows are generated by both dye layers (if both of them are infrared absorbing). The radiation wavelength
25 is chosen such that the substrate 1 transmits a substantive part thereof (at least 30%), while the dye layers absorb or reflect a substantive part thereof (at least 30%).

- If the dye layer facing away from the ob-
30 server is a UV fluorescent dye layer, an examination in transmission involves irradiating the document from the side facing away from the viewer (sensor) with UV radiation such that fluorescent light is generated. The fluorescent light penetrates the document and combines with
35 the dye layer on the other side to generate a see-through motif. The dye layer on the other side can e.g. also be a UV fluorescent dye layer, in which case the document

should be such that it transmits at least part of the UV radiation.

The two dye layers may be of different types, e.g. a UV fluorescent dye layer can be combined with an
5 IR dye layer or a magnetic dye layer, etc.

In the embodiment of Fig. 2, substrate 1 comprises a single substrate layer 1a. Fig. 3 shows an embodiment with several substrate layers 1a, 1b, 1c, which are laminated to form substrate 1. The various substrate
10 layers 1a, 1b, 1c can be of the same material or of different materials.

In such an embodiment, the dye layers 6a, 6b,... forming the see-through motif can be arranged on top of the topmost layer 1a, between the substrate layers 1a,
15 1b, 1c, or at the bottom of the bottommost layer 1c.

A dye layer placed between the substrate layers 1a, 1b, 1c, such as the dye layers 6c and 6d of Fig. 3, is physically protected from the environment and from user access, which improves security and stability. In
20 addition, if at least one of the substrate layers 1a, 1b, 1c is non-transparent in the visible spectral range, the embedded dye layer is difficult to detect.

At least some, or all, of the dye layers 1a, 1b, 1c, 1d are separated by at least one substrate
25 layer. For example, in the embodiment of Fig. 3, dye layers 6a and 6b are separated by means of all three substrate layers 1a, 1b, 1c, while dye layers 6a and 6c are separated by substrate layer 1a only.

In this manner, a complex multilayer structure can be built, which is difficult to imitate.
30

Fig. 4 shows a sectional view of a security document having a window 8. In more general terms, such a document has a first section 9 (the area around window 8) having low transmission and a second section 8 having
35 high transmission. The terms "low transmission" and "high transmission" are to be understood in relation to each other, i.e. the section having low transmission has lower

transmission (by at least 30%) than the section having high transmission. This transmission is to be measured at a given wavelength, which can be in the visible spectrum or in the infrared spectrum, i.e. window 8 can be an infrared window with increased infrared transmission in at least one wavelength between 0.8 and 10 μm , or it can be a visible window with increased transmission in the visible spectrum, i.e. between 400 nm and 770 nm.

In one advantageous embodiment, the dye layers 6a, 6b are arranged at least partially in the first section 9, i.e. in the section with low transmission. This guarantees that the dye layer 6b facing away from the viewer (sensor) is not well visible in reflection.

In another advantageous embodiment, the dye layers 6a, 6b are arranged at least partially in the second section 8, i.e. in the section with high transmission. This allows the dye layers to be seen from both sides, even in reflection, at the given wavelength.

The window 8, i.e. the section with high transmission, can be formed in an otherwise opaque document by several means known to the skilled person, e.g. by applying a non-transparent coating to a transparent substrate layer or by laminating a non-transparent and a transparent substrate layer with at least one opening in the non-transparent layer. In the example of Fig. 4, window 8 is formed by embedding a transparent substrate layer 1b between two non-transparent substrate layers 1a, 1c, with at least partially overlapping openings 13 provided in the non-transparent substrate layers 1a, 1c.

The see-through motif 5 can be any symbol, such as shown in Fig. 1. However, it can also be a computer readable code, such as shown in Fig. 5, where, e.g., a given region 10 of the security document is divided into subregions. For each subregion there can be (a) no dye layer 6a, 6b, (b) only a first one of the dye layers, (c) only a second one of the dye layers, or (d) dye layers 6a, 6b on both sides. Such an arrangement can

e.g. encode 4 values per subregion if two dye layers are used.

Other coding schemes, such as barcodes, QR codes, etc., can be used as well.

5 In yet a further embodiment, see-through motif 5 can be formed by an alphanumeric string or characters, such as shown in Fig. 6, with some parts being created by a first one of the dye layers and other parts being created by a second one of the dye layers. Also, some
10 parts may be formed by both dye layers.

As mentioned, the dye layers 6a, 6b can be magnetic dye layers or infrared dye layers, or both. Infrared and magnetic dye layers can also be combined on the same document.

15 The dye layers 6a, 6b, ... should advantageously be "in register", i.e. their relative positions should be accurate within certain limits. If the limits are chosen to be sufficiently narrow, e.g. 500 μm or less, counterfeiting will become very difficult because
20 regular printing equipment will be unable to print both sides of a document or substrate layer with such accuracy. Security printing equipment, in particular equipment that simultaneously prints both sides of the substrate or of a substrate layer at the same time, is, how-
25 ever, able to provide such register accuracy.

For testing the register accuracy, at least one edge of the first dye layer 6a can be arranged on the same line as an edge of the second dye layer 6b, as shown in Fig. 1.

30 The dye layers can be printed by means of any suitable printing methods, such as offset print, screen print or intaglio. However, best register accuracy can be achieved in offset print, which is therefore a very advantageous method.

35 The see-through motif can be applied to any part of the document. The dye layers 6a, 6b can be applied in combination with regular printing layers, such

as indicated by a dotted line 11 in Fig. 2, either below or above the regular printing layers.

In one advantageous embodiment, as mentioned above, at least one of the dye layers is applied to a surface of the document that has the same colour as the dye layer such that the dye layer becomes hard to see. The colour of the region around the dye layer can either be the native colour of the substrate layer arranged adjacent to the dye layer, or it can be the colour of a printed layer applied below the dye layer.

In yet another embodiment, at least some of the dye layers 6a, 6b, ... can be covered by a non-transparent printed layer 11, such as shown in dotted lines in Fig. 2.

A document of the type shown here can be verified by testing if the dye layers 6a, 6b, ... combine, in transmission, to form the see-through motif. Additional verification steps in reflection can further improve security or, e.g., as mentioned above, allow to read out a larger amount of data.

The various dye layers 6a, 6b, ... can overlap at least partially, or they can cover completely distinct areas.

The technique described above can be applied on any type of security document, such as banknotes, passports, cheques, documents of value, identity documents, authorization documents, certificates, etc.

While there are shown and described presently preferred embodiments of the invention, it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied and practiced within the scope of the following claims.

Claims

1. A security document having at least one substrate layer (1a, 1b, 1c) and carrying a see-through motif (5) formed by a combination of at least two dye layers (6a, 6b, 6d, 6d) arranged on different sides of said substrate layer (1a, 1b, 1c), characterized in that the dye layers are selected from the group comprising magnetic dye layers, IR dye layers and UV fluorescent dye layers.

2. The security document of claim 1 wherein said two dye layers (6a, 6b, 6d, 6d) are magnetic dye layers.

3. The security document of claim 1 wherein said two dye layers (6a, 6b, 6d, 6d) are infrared dye layers.

4. The security document of claim 1 wherein one of said dye layers (6a, 6b, 6d, 6d) is an infrared dye layer and the other of said dye layers (6a, 6b, 6d, 6d) is a magnetic dye layer.

5. The security document of any of the preceding claims wherein at least one of said dye layers (6a, 6b, 6d, 6d) is applied to a surface having the same color as said dye layer such that said dye layer is not discernible by the naked eye.

6. The security document of any of the preceding claims comprising several substrate layers (1a, 1b, 1c).

7. The security document of claim 6 wherein at least one of said dye layers (6a, 6b, 6d, 6d) is arranged between two substrate layers (1a, 1b, 1c).

8. The security document of claim 7 wherein both of said dye layers (6a, 6b, 6d, 6d) are arranged between two substrate layers (1a, 1b, 1c).

9. The security document of any of the claims 6 or 8 wherein at least one of said dye layers (6a, 6b, 6d, 6d) is arranged on a top side of a top substrate

layer (1a) or on a bottom side of a bottom substrate layer (1c).

10. The security document of any of the claims 6 to 10 wherein said see-through motif (5) is
5 formed by a combination of at least three dye layers (6a, 6b, 6d, 6d), wherein at least some of said dye layers (6a, 6b, 6d, 6d) are separated by at least one substrate layer (1a, 1b, 1c).

11. The security document of any of the pre-
10 ceding claims wherein said substrate layer or layers (1a, 1b, 1c) is/are paper layers and/or plastics layers.

12. The security document of any of the pre-
ceding claims comprising a first section (9) having low
transmission at a given wavelength and a second section
15 (8) having high transmission at a given wavelength,
wherein said dye layers (6a, 6b, 6d, 6d) are arranged at
least partially in said first section (9).

13. The security document of any of the pre-
ceding claims comprising a first section (9) having low
20 transmission at a given wavelength and a second section
(8) having high transmission at a given wavelength,
wherein said dye layers (6a, 6b, 6d, 6d) are arranged at
least partially in said second section (8).

14. The security document of any of the
25 claims 12 or 13 wherein the given wavelength is between
0.8 μm and 10 μm .

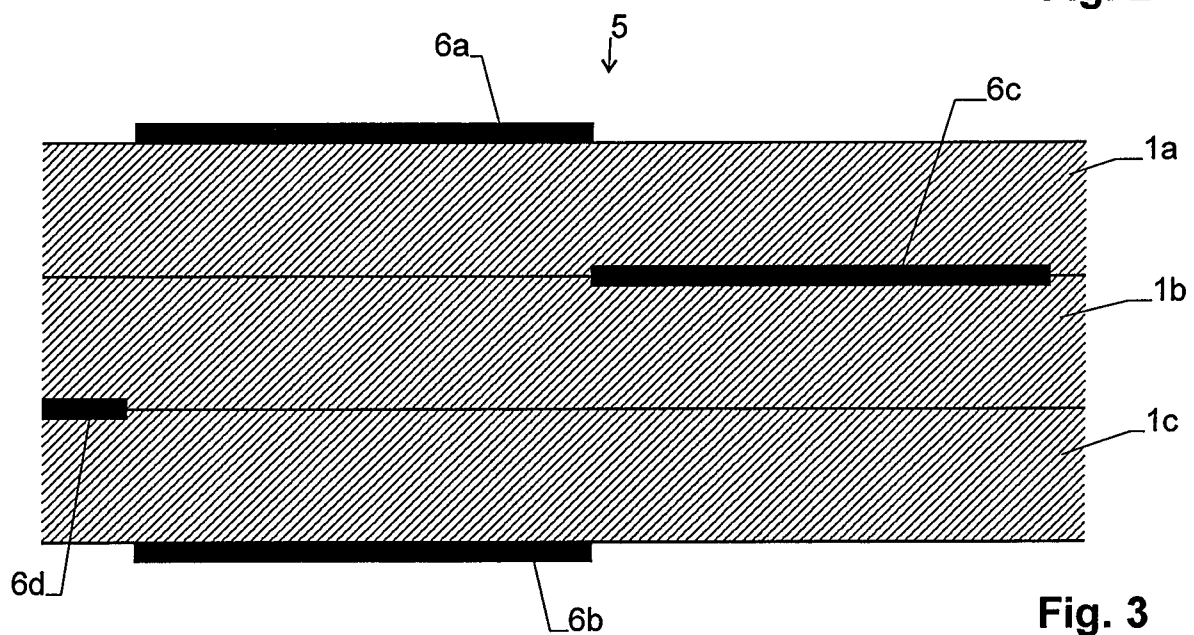
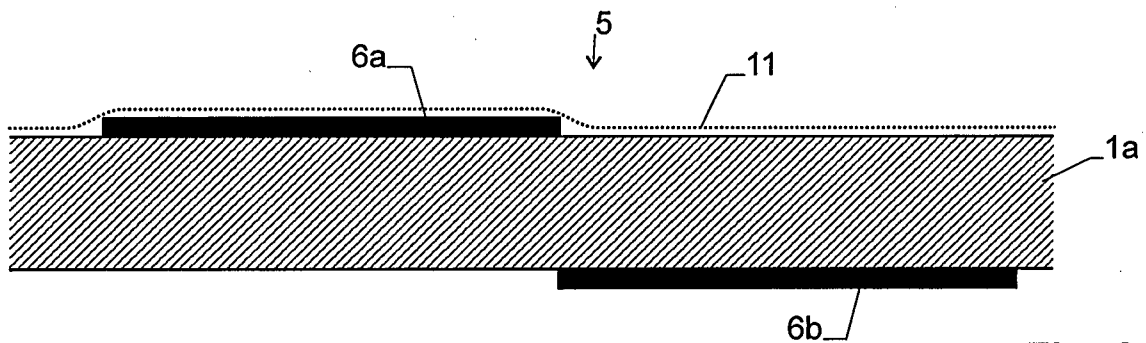
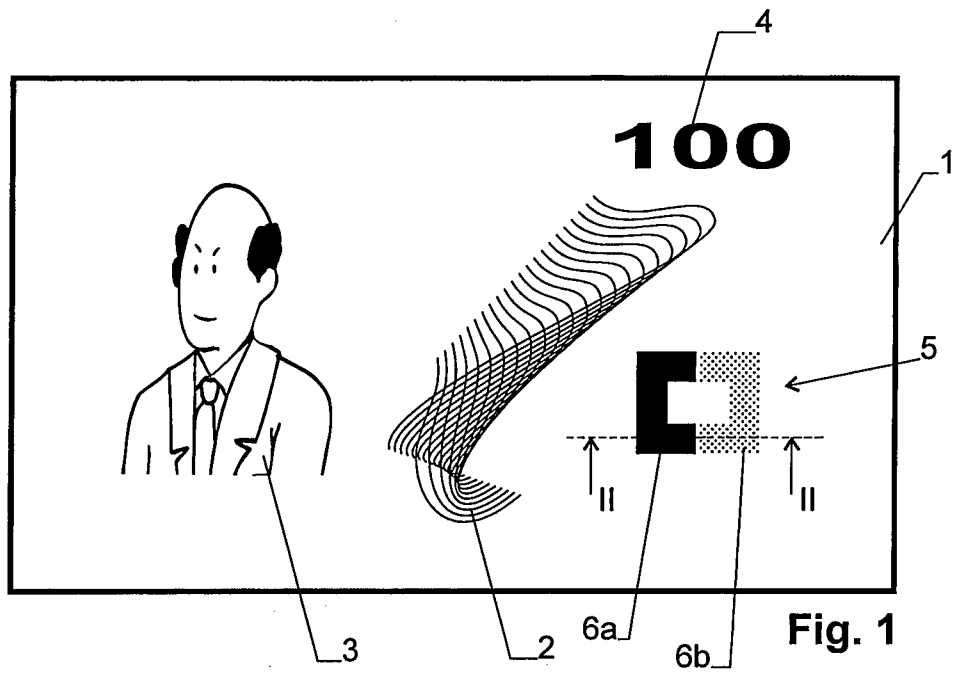
15. The security document of any of the
claims 12 or 13 wherein the given wavelength is between
400 nm and 770 nm.

30 16. The security document of any of the pre-
ceding claims wherein at least one of said dye layers
(6a, 6b, 6d, 6d) is belongs to at least two members of
the group comprising magnetic dye layers, IR dye layers
and UV fluorescent dye layers.

35 17. The security document of any of the pre-
ceding claims wherein said first and said second dye
layer overlap at least partially.

18. A method for verifying the security document of any of the preceding claims comprising the step of testing if said at least two dye layers (6a, 6b, 6d, 6d) combine, in transmission, to form said see-through
5 motif (5).

1/2



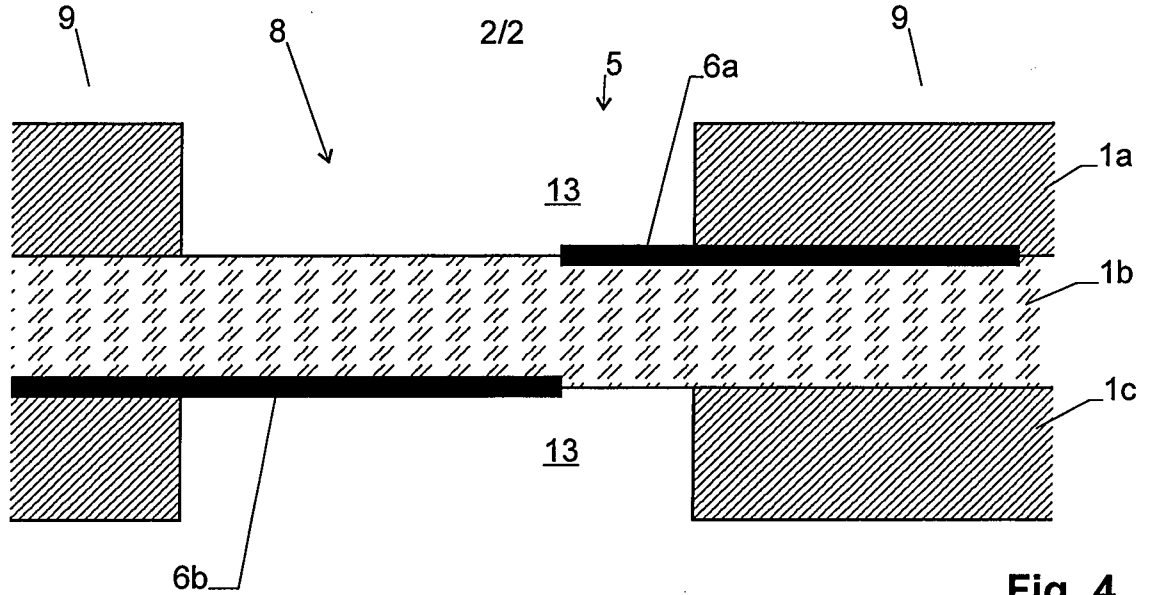


Fig. 4

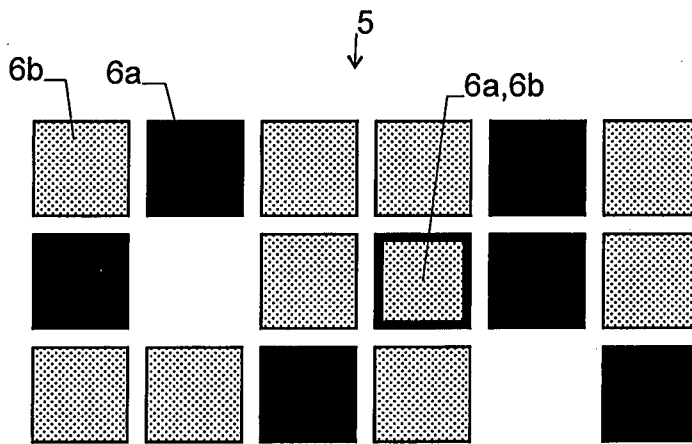


Fig. 5

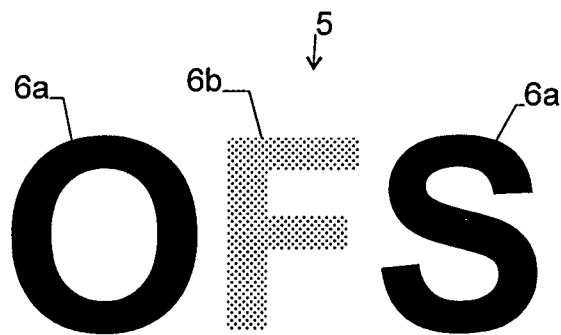


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No

PCT/CH2012/000073

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B42D15/00
 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)
 B42D

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97/47478 A1 (THOMAS DE LA RUE INTERNATIONAL [GB]; HOWLAND PAUL [GB]; DRINKWATER KEN) 18 December 1997 (1997-12-18) page 3, line 36 - page 4, line 20 page 5, line 10 - line 17 page 10, line 16 - page 11, line 8 figures 1-5	1-5, 11-18
X	DE 102 60 124 A1 (GIESECKE & DEVRIENT GMBH [DE]) 1 July 2004 (2004-07-01) the whole document ----- -/-	1,3,5, 11-15, 17,18



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 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

"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

17 January 2013

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31/01/2013

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
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 Fax: (+31-70) 340-3016

Authorized officer

Achermann, Didier

INTERNATIONAL SEARCH REPORT

International application No
PCT/CH2012/000073

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2009/056351 A1 (BUNDESDRUCKEREI GMBH [DE]; MUTH OLIVER [DE]; PAESCHKE MANFRED [DE]; MA) 7 May 2009 (2009-05-07) page 4, line 2 - line 21 page 13, line 13 page 21, line 15 - line 23 -----	1,6-8, 10,16-18
X	EP 1 580 025 A2 (HUECK FOLIEN GMBH [AT]) 28 September 2005 (2005-09-28) the whole document -----	1-4, 6-11, 16-18
X	EP 0 628 408 A1 (ANDRIC DRAGISA [YU]; STOJANOVIC BORISLAV [YU] DOMTAR INC [CA]) 14 December 1994 (1994-12-14) page 4, line 41 - page 5, line 5 page 5, line 26 - line 44 page 6, line 45 - page 7, line 22 page 9, line 16 - line 18 figures -----	1,6,7, 9-11, 16-18
X	WO 2011/007343 A1 (ARJOWIGGINS SECURITY [FR]; VINCENT REMI [FR]) 20 January 2011 (2011-01-20) page 2, line 11 - line 20 page 4, line 30 - line 32 page 5, line 11 - line 16 page 7, line 19 - page 8, line 20 page 11, line 13 - line 32 page 14, line 1 - line 4 page 20, line 1 - line 9; figure 1 page 26, line 1 - line 8; figure 13 page 28, line 4 - line 7; figure 20 -----	1-4,6-18
X	EP 0 310 707 A2 (MANTEGAZZA A ARTI GRAFICI [IT]) 12 April 1989 (1989-04-12) column 3, line 6 - line 30 page 4, line 52 - page 5, line 10; figures 6, 7 -----	1,2,11, 17,18

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/CH2012/000073

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9747478	A1	18-12-1997	AU 723787 B2 07-09-2000
		AU 3100097 A 07-01-1998	
		CA 2258251 A1 18-12-1997	
		DE 19781815 B3 27-12-2012	
		DE 19781815 T1 17-06-1999	
		GB 2330111 A 14-04-1999	
		US 6089614 A 18-07-2000	
		WO 9747478 A1 18-12-1997	
DE 10260124	A1	01-07-2004	AT 545920 T 15-03-2012
		AU 2003293901 A1 14-07-2004	
		DE 10260124 A1 01-07-2004	
		EP 1588332 A2 26-10-2005	
		WO 2004056582 A2 08-07-2004	
WO 2009056351	A1	07-05-2009	AU 2008317836 A1 07-05-2009
		DE 102008012424 A1 07-05-2009	
		EP 2207686 A1 21-07-2010	
		JP 2011502813 A 27-01-2011	
		WO 2009056351 A1 07-05-2009	
EP 1580025	A2	28-09-2005	AT 501989 A1 15-12-2006
		EP 1580025 A2 28-09-2005	
EP 0628408	A1	14-12-1994	AT 190554 T 15-04-2000
		AU 680882 B2 14-08-1997	
		BG 62390 B1 29-10-1999	
		BG 99482 A 31-01-1996	
		BR 9405422 A 08-09-1999	
		CA 2102271 A1 09-12-1994	
		CN 1112359 A 22-11-1995	
		CN 1254777 A 31-05-2000	
		CN 1257787 A 28-06-2000	
		CZ 9500582 A3 13-09-1995	
		CZ 9801256 A3 16-06-1999	
		CZ 9801257 A3 16-06-1999	
		DE 69328085 D1 20-04-2000	
		DE 69328085 T2 16-11-2000	
		DK 0628408 T3 14-08-2000	
		EG 20711 A 29-12-1999	
		EP 0628408 A1 14-12-1994	
		ES 2145022 T3 01-07-2000	
		FI 950529 A 05-04-1995	
		HU 219008 B 29-01-2001	
		JP 3164823 B2 14-05-2001	
		JP H08501838 A 27-02-1996	
		KR 100255715 B1 01-05-2000	
		MY 131650 A 30-08-2007	
		NO 950375 A 08-02-1995	
		NZ 262767 A 26-03-1996	
		PL 180127 B1 29-12-2000	
		PL 180252 B1 31-01-2001	
		PL 307349 A1 15-05-1995	
		PT 628408 E 29-09-2000	
		RO 111921 B1 31-03-1997	
		RU 2110408 C1 10-05-1998	
		SG 52378 A1 28-09-1998	
		SK 28995 A3 10-01-1996	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/CH2012/000073

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 5449200 A	12-09-1995
		WO 9429105 A1	22-12-1994

WO 2011007343 A1	20-01-2011	CA 2768178 A1	20-01-2011
		EP 2454101 A1	23-05-2012
		FR 2948217 A1	21-01-2011
		US 2012182443 A1	19-07-2012
		WO 2011007343 A1	20-01-2011

EP 0310707 A2	12-04-1989	DE 3781894 D1	29-10-1992
		DE 3781894 T2	07-01-1993
		EP 0310707 A2	12-04-1989
		ES 2033789 T3	01-04-1993
		GR 3005849 T3	07-06-1993
		GR 3033780 T3	31-10-2000
		IT 1222851 B	12-09-1990
