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(54) **Optically variable security element and identification document with such element**

(57) The invention relates to an optically variable security element for a secure identification document. The security element of the invention applies to all type of document, whatever the location of the graphic personalization or the security pattern. The security element comprises a security pattern (11) and a revealing layer

(22), said security pattern comprising security markings (A, B, C, D; 5, 6) intended to be displayed with visual effects depending on the tilt angle of the document. The security element is remarkable in that the revealing layer (22) is located inside the inner layers of the document, below an upper layer (20) at least translucent, which is printed with said security pattern (11).

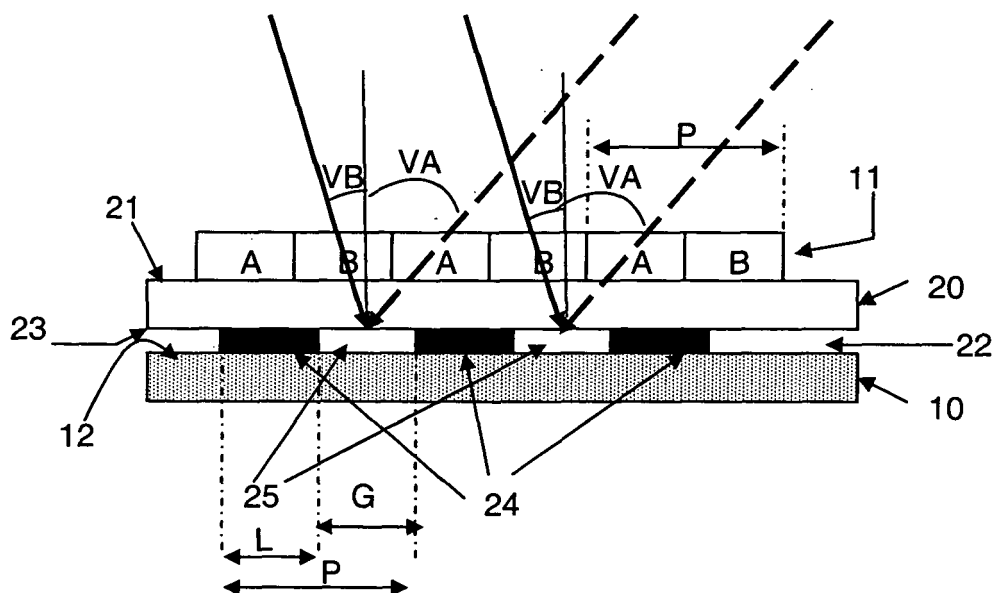


Figure 2

Description

BACKGROUND

[0001] This invention relates generally to identification documents and a method for making such identification documents. More particularly, this invention relates to a secure identification document that allows detecting a fraudulent modification of the existing personalization or a completely falsified document. The invention also relates to a method for making such a document.

[0002] Identification documents, such as driving licenses, identity cards, membership cards, badges or passes, passports, discount cards, banking cards, money cards, multi-application cards, and other papers of value; and security documents such as bank notes are widely used. Because of the value and importance associated with each of these data carriers, they are often the subject of unauthorized copying and alterations, and forgeries.

[0003] To prevent such activities from being carried out on these data carriers, different types of visual and touchable security features have been added to data carriers. One of these security features consists in providing, into the document, an optically variable security element, which comprises at least two security markings. Said markings are decomposed and interleaved, so as to create a complex image that is printed into the document. Then, a filter is placed over this complex image, said filter being arranged so that it enables to visualize each marking at a respective particular angle by tilting the document.

[0004] Figure 1 shows an example of such a lenticular security element. Lenticular imaging is a high-resolution technology that enables to create visual effects such as relief (three-dimensional effect), varying images (flip effect) or animations. Three-dimensional effect offers a depth effect. The animation is a sequence of a plurality of images corresponding either to the full range of the expression of a movement (movie), or to a gradual transformation of an object in another (morphing), or to its magnification or reduction (zooming effect), or to two or more images completely different (flip effect). In figure 1, the illustrated example consists of a simple flip effect between two different images "5" and "6". A complex image 11, comprising two interleaved markings, is printed on a main surface of an internal constitution layer 10 of a document. In the illustrated example the complex image 11 comprises decomposed and interleaved numbers "5" and "6". Then, a filter 12 is fixedly attached at least onto the printed complex image 11. The filter 12 is for example a transparent lenticular layer, well known in the art. By observing through this lenticular layer, either the number 5 or the number 6 is displayed, depending on the tilt angle of the document. The filter 12 used can also be a grid, comprising a set of parallel lines, printed on a transparent layer. In these known embodiments, the security markings intended to be revealed can be printed onto the underneath layer, by laser engraving, through the above

filter layer. For that, the energy of the laser beam is determined so that it can blacken the layer underneath, which is laser sensitive, without engraving the above filter layer. Such security element can be provided in particular on polycarbonate documents because polycarbonate documents typically contain two types of transparent layers, one being sensitive to laser, i.e. the layer deeper from the surface in the above described known embodiment, while the other is not; i.e the layer between the markings and the filter in the above described known embodiment.

[0005] Generally, security markings are printed simultaneously with the personalization information, i.e. during the printing of the information relating to the identity of the holder, such as his photograph and/or his name, address, birth date etc... The security markings may also contain personal data.

[0006] However, this type of optically variable security element, where the displayed information varies depending on the tilt angle of the document, has not been possible to manufacture on documents that are personalized onto their surface. Indeed, it always requires putting another filter layer, also called revealing layer, between the security markings and the viewer, in order the viewer be able to read the security markings through this revealing layer. Consequently, up to now, it is impossible to provide such security feature for PVC and/or PET, or PC documents, where the personalization, which may be made with color, is made onto the main external surface using other common printing technologies, such as inkjet, offset, or thermal transfer for example. In all these documents, the optically variable elements are of non-personalized type, such as for example holograms, or optically variable inks, but they do not secure the personal data as such.

[0007] Considering the above, a problem intended to be solved by the invention is to improve the existing solutions by providing an optically variable security element for an identification document, said security element comprising a security pattern and a revealing layer, said security pattern being intended to be displayed with different visual effects depending on the tilt angle of the document; said security element being simple, of low cost and suitable for all types of identification document, whatever the location of the personalization or the security pattern.

SUMMARY

[0008] The solution of the invention to this problem relates to the fact that the revealing layer is located inside the inner layers of the document, below an upper layer at least translucent, which is printed with said security pattern.

[0009] Thus, the revealing layer is no more located between the viewer and the security markings, but underneath the security pattern. The revealing layer comprises a set of parallel lines that have the same period as the

interleaved markings. In order to be able to read all the security markings of the security pattern, the revealing layer is printed with substantially the same color as security pattern. The viewer can view each marking as if the revealing layer would have been between him and the markings, because the eye only perceives the same color and is insensitive to which parts of the element are deeper than the other.

[0010] In another embodiment, the invention relates to a secure identification document comprising at least one inner layer, an upper layer at least translucent and a security element according to the invention. The document is particularly remarkable in that the revealing layer is placed inside inner layers, below the upper at least translucent layer, said security pattern being printed onto said upper layer at least translucent.

[0011] According to another aspect of the invention, there is provided a method for manufacturing a secure identification document comprising a security element, said security element comprising a security pattern and a revealing layer, said security pattern comprising security markings intended to be displayed with visual effects depending on the tilt angle of the document, said method comprising the following steps:

- providing the revealing layer inside inner layers of the document and below an upper layer at least translucent,
- printing security pattern and /or personalized information onto the said at least translucent upper layer.

[0012] In case where the security pattern is provided simultaneously with the graphical personalization step, the upper layer may be a top layer, and the printing may be made onto its main external surface by common printing technology, or into its thickness by laser engraving.

BRIEF DESCRIPTION OF DRAWINGS

[0013] The invention will be better understood with reference to the drawings, in which:

Figure 1, already described, is a schematic perspective view of a support with an optically variable security element,

Figure 2 is a schematic cross-section of an optically variable security element according to the invention, Figure 3 is a schematic view of each security marking of a security element of a document, each security marking being viewed at respective different tilt angles of the document,

Figure 4 is a schematic cross-section of an optically variable security element according to a variant,

Figure 5 is a detail of the schematic security element of figure 4,

Figure 6 is a schematic cross-section of different possible variants of location of an optically variable security element in an identification document,

Figure 7 is a schematic cross-section of an optically variable security element according to another embodiment,

Figure 8 is a schematic perspective view of a document comprising a security element according to the invention.

DETAILED DESCRIPTION

[0014] Hereafter, an embodiment of the present invention will be described in the context of identity (ID) card and a method for producing it. However, it is to be understood that the invention is usable with any data carrier that includes, but is not limited to, a driving license, a badge or pass, a passport, a discount card, a membership card, a banking card, a credit card, a money card, a multi-application card, and other security documents and papers of value that are to be provided with information or data in such a way that they cannot be easily imitated by common means.

[0015] Figure 2 shows a schematic cross sectional view of an optically variable security element according to a preferred embodiment of the invention. The security element is provided into a document, which comprises at least one inner layer 10 and an upper layer 20 at least translucent. The inner layer(s) may be either at least translucent, or opaque. Translucent means that it let the light pass through the layer and can be at the more completely transparent. In fact, the constitutive layers may comprise an at least translucent core layer covered by at least translucent layers, or an opaque core layer covered by at least translucent layer(s). Moreover, the core layer may also be a multilayer core without departing from the scope of protection sought. In the example illustrated in figure 2, the document comprises only one core layer 10 and only one upper layer 20 at least translucent, on top of the core layer 10. In this example, the translucent layer 20 covers the opaque core layer 10 at least in the region of the security element. This translucent layer 20 is intended to be fixedly attached to the opaque core layer 10, for example by means of lamination technology.

[0016] A revealing layer 22 is provided inside the inner layer(s) of the document, namely between the opaque core layer 10 and the translucent upper layer 20 in the example of figure 2. This revealing layer is made by printing by means of a well known printing technique, for example silk screen printing, or offset printing, or digital press, or thermal printing, or laser printing etc. The revealing layer can be printed either onto the upper surface 12 of the opaque core layer 10 or onto the lower inner surface 23 of the translucent layer 20. This revealing layer 22 is like a filter and comprises a set of substantially opaque lines 24 that are parallel. In fact filter comprises substantially opaque lines 24 and clear gaps 25 between the lines. The opaque lines 24 have a certain width L and so do the gaps 25. The period P of the filter is defined by the sum of the line width L and the gap width G.

[0017] A security pattern 11 comprising security markings A and B, decomposed into bands that are interleaved, is printed onto the main upper surface 21 of the translucent layer 20, i.e. the external surface of the document in this example, above the filter lines 24 of the revealing layer 22.

This security pattern is advantageously printed during the personalization stage of the document and can therefore contain personal data. It is printed using a printing technology commonly used in the field of the cards, such as thermal transfer, inkjet, laser printing, offset, or silk screen, etc... Each security marking A and B is decomposed into bands that are spaced from a distance P from each other, and each band of one security marking A is interleaved with two bands of the other security marking B and reciprocally.

The distance P between each band of each security marking must be substantially the same as the period P of the revealing layer 22.

[0018] When tilting the document, such that only one of the markings A or B is seen against the clear gaps 25 of the revealing layer 22, this marking is seen clearly. In the example of figure 2, one can see that marking A can be viewed when tilting the document at a viewing angle VA, and the marking B can be viewed when tilting the document at a viewing angle VB.

[0019] In order to be able to read all the security markings of a security pattern, at different tilt angles, the revealing layer 22 is preferably printed with substantially the same color as security markings. In this way, the viewer can view each marking as if the revealing layer would have been between him and the markings, because his eye only perceives the same color and is insensitive to which parts of the element are deeper than the other.

[0020] In the embodiment that has been explained in regards with figure 2, only the effect of variable image has been described, i.e. the security element enables to display sequentially either a first security marking A (first image) or a second security marking B (second image) depending on the tilt angle. However, it is possible to display security pattern with other visual effect, such as for example movie or animation, three-dimensional effect, magnification etc. Depending on the desired visual effects, the security pattern may contain a plurality of images, the gap width compare to the line width being determined by the number of images to be displayed, and the distance between the revealing layer and the security pattern is also adjusted. The gap width G essentially defines the resolution requirements for the markings. For the magnification or other moiré band phenomena, it is necessary to tune both the filter and the security pattern.

[0021] Figure 3 shows an example of the different images viewed by a viewer at different tilt angles of a document. In this example, security markings (represented by the numbers 5 and 6) and opaque lines 24 of the revealing layer are printed with the same black color. Consequently, the viewer can view each marking as if the

revealing layer would have been located between him and the markings, because his eye only perceives the same color and is insensitive to which parts of the element are deeper than the other. The period P of the revealing layer 22 is defined by the sum of the line 24 width L and the gap 25 width G and is substantially the same as the distance between each band of each security marking. Therefore, at a first predetermined viewing angle α of the document, the viewer can read the first security marking, which is the number "5" in the illustrated example, and at a second predetermined viewing angle β he can read the second security marking, which is the number "6" in the illustrated example. For simplification, the revealing layer 22, comprising a set of interleaved opaque 24 and transparent or clear 25 lines, is schematized as a roughly square in the drawings. However it can take all types of mathematical forms such as circles, spirals, wavy lines, triangles, etc ... provided the distances P between opaque parts are always identical.

[0022] In this example, the width L of the opaque lines 24 of the revealing layer 22 and the width G of the gaps 25 between the opaque lines are equal, so that the security pattern is able to display two distinct data/images, "5" or "6", that are revealed when tilting the document such that the markings are seen in between the lines 24. The line width L and period P of the revealing layer 22 together define the resolution required from the markings: viewer sees through in between the opaque lines 24 and should only see one meaningful marking (image/data) from the security pattern at a time. If the line width L and the gap G between the lines are equal, one can have two distinct data/images revealed when tilting the document such that the markings seen in between the lines switch. If the gap G is one half of the line width L (i.e. gap G is one third of the period P; for example gap width $G=50\text{ }\mu\text{m}$, line width $L=100\text{ }\mu\text{m}$, and new line every $P=150\text{ }\mu\text{m}$), one can have three images in the markings. If the gap G is one third of the line width L (gap G is one fourth of the period P, for example gap width $G=50\text{ }\mu\text{m}$, line width $L=150\text{ }\mu\text{m}$, and period $P=200\text{ }\mu\text{m}$), one can have four images/data, etc. The gap G essentially defines the resolution requirement for the markings.

[0023] Figure 4 shows the same cross sectional view of a security element as in figure 2, except that the thickness of the transparent layer 20 is much higher, so that the distance between the revealing layer 22 and the security pattern 11 is increased. In this case, the required tilt angle ($VA + VB$) to switch between the markings A and B is consequently smaller than in the case of figure 2. A variant may also consist in providing a plurality of transparent sublayers, in order to increase the distance between the revealing layer 22 and the security pattern 11.

[0024] The distance between the markings A and B of the security pattern 11 and the revealing layer 22 together with the width G of the gaps 25 in the revealing layer 22, defines the tilt angle needed to switch between images/data A and B of the security pattern.

[0025] Ideally, if the markings are decomposed into bands, each having a band width d_1 , the line width L in the revealing layer 22 should be 10 or 20 % larger, and the gap width G in the revealing layer 22 should be equally much smaller (period remains the same), in order to ensure that only one marking A or B is seen clearly at a time.

[0026] Figure 5 is a detail of the schematic security element of figure 4, and enables to explain the relation between the viewing angles VA , VB , the thickness of the translucent layer 20, and the widths of the opaque lines 24 and the gap lines 25 of the revealing layer 22. The viewing angle VA enables to see marking A, and viewing angle VB enables to see marking B. In the illustrated example, for simplification of the explanation, the widths of the opaque lines 24 and the gap lines 25 of the revealing layer 22 are equal, and assumed to be equal to d_1 , which is the width of a band of each marking A or B. The tilt angle to switch between marking A and B is equal to the sum of the viewing angles $VA+VB$. The reference d_2 corresponds to the thickness of the translucent layer(s) 20 and also to the distance between the markings A and B of the security pattern 11 and the revealing layer 22. There is a simple trigonometric relationship between the line and gap widths d_1 and the distance d_2 between the markings and the revealing layer, which is the following: $\tan(VA) = a \cdot d_1/d_2$; $\tan(VB) = b \cdot d_1/d_2$; $a+b=1$. The ratio between the constants a and b depends on the position of the marking with respect to the revealing layer. Indeed, if marking A is located just above the gaps 25 of the revealing layer 22, then $a=0$ and $b=1$ and reciprocally.

[0027] Figure 6 shows other possible variants of location of the optical variable security element according to the invention, in an identification document. In fact, the revealing layer 221, 222, 223, 224 can be located anywhere inside the inner layers 31-34, provided that it is covered by only at least translucent layer(s) and that it is located below the security pattern 111a-111d, 112a-112c, 113a-113b, 114a. In the example of figure 6, the identification document comprises an opaque core layer 10 and a plurality of upper layers 31-34 at least translucent. The revealing layer is provided inside the inner layers 31-34 of the document, and more particularly either between the opaque core layer 10 and the first upper layer 31 (reference 221), or between first and second upper layers 31, 32 at least translucent (reference 222), or between second and third upper layers 32, 33 at least translucent (reference 223), or between the third and fourth upper layers 33, 34 (reference 224). Then, depending on the location of the revealing layer 221, 222, 223, 224, the security pattern can be printed on one or more of the upper layers 31-34 at least translucent that are located above the revealing layer. Consequently, in the examples of figure 6, if the revealing layer 221 is provided between opaque layer 10 and first upper translucent layer 31, then the security pattern can be provided either between two of the upper layers 31-34 (see references 111a, 111 b and 111c) or on the main external surface of top layer 34 (see reference 111d). In the third

example where the revealing layer 223 is provided between translucent upper layers 32 and 33, then the security pattern can be provided either between upper layers 33 and 34 (see reference 113a) and/or on the main external surface of the top layer 34.

[0028] The revealing layer may be printed on either surface of the layers between which it is intended to be provided, or it may be laser engraved in an additional laser-sensitive layer provided between the layers where the revealing layer has to be located.

[0029] The security pattern is printed using offset or other technology commonly used in the manufacturing of identification documents. When it is provided on the main external surface of the top layer 34 (see for example references 111d, 112c, 113b, 114a), it may be printed during personalisation stage using thermal sublimation printing. It can also be laser engraved into an additional laser-sensitive layer provided at the location where the security pattern has to be placed, above the revealing layer.

[0030] In an alternative, more than one security pattern may be provided on at least one upper layer above the revealing layer.

[0031] As the security element, that has just been described, applies to all documents, whatever the location of their printed personalization, i.e it applies also to all documents that are personalized onto their surface; it can also apply to documents having colored personalization. As previously described, the easiest way to realize the security element is to use only one color for the opaque lines 24 of the revealing layer 22 and for the markings to be viewed. However, for documents that have colored personalization, one can realize such security element with varying colors. For that, one can use for example a colored translucent layer, and markings of different colors somewhat translucent, so that the colors seen are mixed when the markings overlap the gap lines 25 of the revealing layer 22.

[0032] Another variant to do such security element with varying colors, is illustrated on figure 7, which shows a schematic cross-section of such a security element. In this embodiment, the security pattern 11 comprises for example four different markings A to D that are intended to be viewed sequentially. For that, the gap width G of the revealing layer 22 is one fourth of the period P , or one third of the line width L of the opaque lines 24. The opaque lines 24 are in black color, while each marking A-D of the security pattern 11 is of different color, for example A is in red, B is in yellow, C is in blue and D is in green. Then, by tilting the document at the different viewing angles VA to VD , it is possible to see the different markings, when they overlap the gap lines of the revealing layer 22, with their own color. As black is sufficiently opaque, it is not possible to see the other markings when they overlap the opaque lines 24.

[0033] Another variant would be to use a revealing layer where opaque lines 24 are printed with a color, like blue for example. Then, the security pattern could be

realized with two different markings, each having its own color, like blue and yellow for example. Then, the blue marking is not seen when viewed such that it overlaps the opaque blue lines, but it is seen in blue when seen in between the blue lines of the revealing layer. On the other hand, the yellow marking is not seen when it overlaps the opaque blue lines, but it is seen in green when viewed at a viewing angle such that it is seen just above the clear gap lines, in between the opaque lines, because in this case the eye mixes the colors seen in the opaque lines of the revealing layer and in between the opaque lines. This embodiment relies on the combination on high resolution in printing and sufficiently long viewing distance for the eyes to perceive the colors mixed.

[0034] Figure 8 shows an ID card comprising, such a security element. The card comprises at least one opaque layer 10 and an at least translucent layer 20. The personalization information 7, 8, comprising personal data 8 and a photography 7 of the owner for example, and a security pattern 11, which can also contain personal data, are printed onto the main external surface 21 of the translucent layer 20, during the last step of the manufacturing process. The revealing layer 22 comprising parallel lines can be printed either onto the upper surface 12 of the opaque layer 10 or on the lower surface 23 of the translucent layer 20. The translucent layer is fixedly attached to the opaque layer. In this case, there is no problem of registration between the complex image 11, constitutive of the security pattern, and the revealing layer 22, provided that the revealing layer 22 and the interleaved bands of the security pattern have substantially the same period P.

[0035] The thus described embodiments increase the security of all types of identification documents because they apply not only to the documents that are personalized inside, but also to all documents that hold personalization information onto their external surface.

[0036] The revealing layer 22 and security pattern 11 of the security element can be made in different ways. For example, the revealing layer can be printed on a layer inside the document, while the security pattern is printed onto the surface of an upper layer or onto the external surface of the document simultaneously to the color personalization; or the revealing layer may be laser engraved inside a laser sensitive layer placed inside the document, while the security pattern is printed onto the surface of an upper layer or onto the external surface of the document simultaneously to the color personalization; or the revealing layer may be printed on a layer inside the document, while the security pattern is laser engraved into an upper layer or into the top layer of the document.

[0037] The security pattern may comprise all types of markings, such as a photography and/or an image and/or a number and/or a text etc.

Claims

1. Security element for an identification document, said security element comprising a security pattern (11) and a revealing layer (22), said security pattern comprising security markings (A, B, C, D; 5, 6) intended to be displayed with visual effects depending on the tilt angle of the document, **characterized in that** the revealing layer (22) is located inside the inner layers of the document, below an upper layer (20, 30, 31-34) at least translucent, which is printed with said security pattern (11).
2. Security element of claim 1, wherein the upper layer (20) is the top layer of the identification document and is printed onto its main external surface (21).
3. Security element of claim 1, wherein said upper layer (31) is covered by at least one another layer (32-34) at least translucent.
4. Security element of claim 3, wherein said another layer (32-34) at least translucent is printed with another security pattern.
5. Security element of claim 1, wherein the revealing layer (22) comprises a set of parallel substantially opaque lines (24) interleaved with clear gap lines (25).
6. Security element of claim 1, wherein the opaque lines (24) of the revealing layer (22) are of substantially the same color as the security pattern (11).
7. Security element of claim 1, wherein each security marking of said security pattern is of different color.
8. Secure identification document comprising at least one inner layer (10), an upper layer (20, 31-34) at least translucent, and a security element as claimed in one of claims 1 to 7, wherein the revealing layer (22) is placed inside inner layer(s) (10) of the document and below the said upper at least translucent layer (20, 31-34), said security pattern (11) being printed onto said upper layer (20, 31-34).
9. Secure identification document of claim 8, wherein said security pattern is provided on the main upper surface of said upper layer (20, 31-34).
10. Method for manufacturing a secure identification document comprising a security element, said security element comprising a security pattern (11) and a revealing layer (22), said security pattern comprising security markings (A, B, C, D; 5, 6) intended to be displayed with visual effects depending on the tilt angle of the document, said method comprising the following steps:

- providing the revealing layer (22) inside inner layer(s) (10) of the document and below an upper layer (20, 30) at least translucent,
 - printing security pattern (11) and /or personalized information (7, 8) on an at least translucent layer (20, 31-34) located above the revealing layer (22). 5
11. Method of claim 10, wherein the security pattern is printed onto the external surface of the said at least translucent layer (20). 10
12. Method of claim 10, wherein the revealing layer is provided by laser engraving into an additional laser sensitive layer, which is located between the inner layer (10) and the upper at least translucent layer (20). 15
13. Method of claim 10, wherein the revealing layer is printed either on the upper surface of an inner layer (10), or on the lower surface of said upper layer (20, 31-34) at least translucent. 20
14. Method according to anyone of claim 10 to 13, wherein the revealing layer (22) is made so as to form a set of parallel substantially opaque lines (24) interleaved with clear gap lines (25). 25

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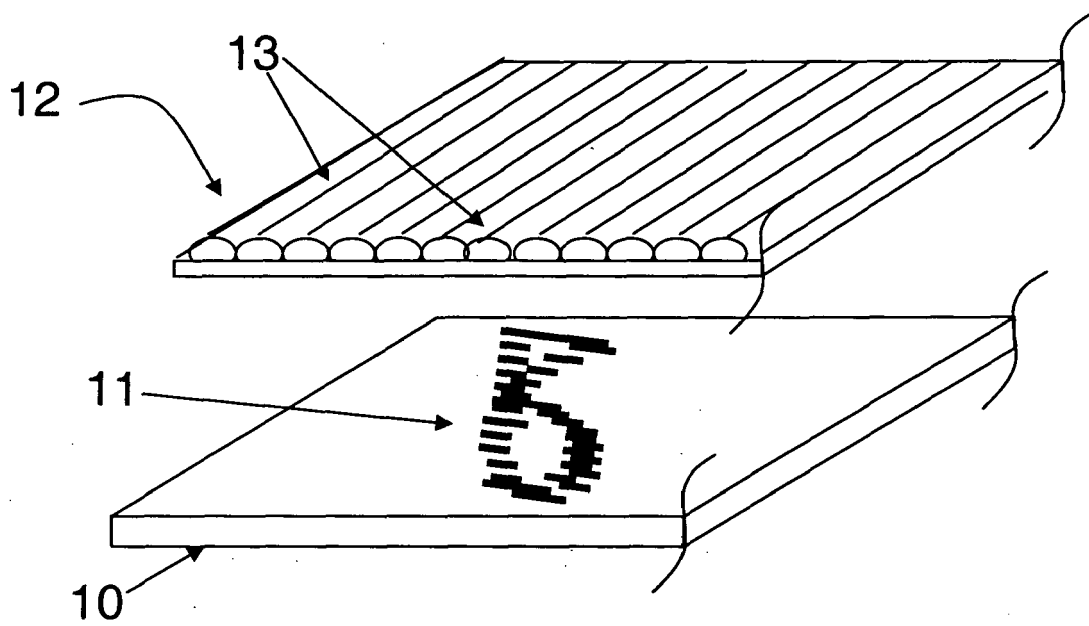


Figure 1

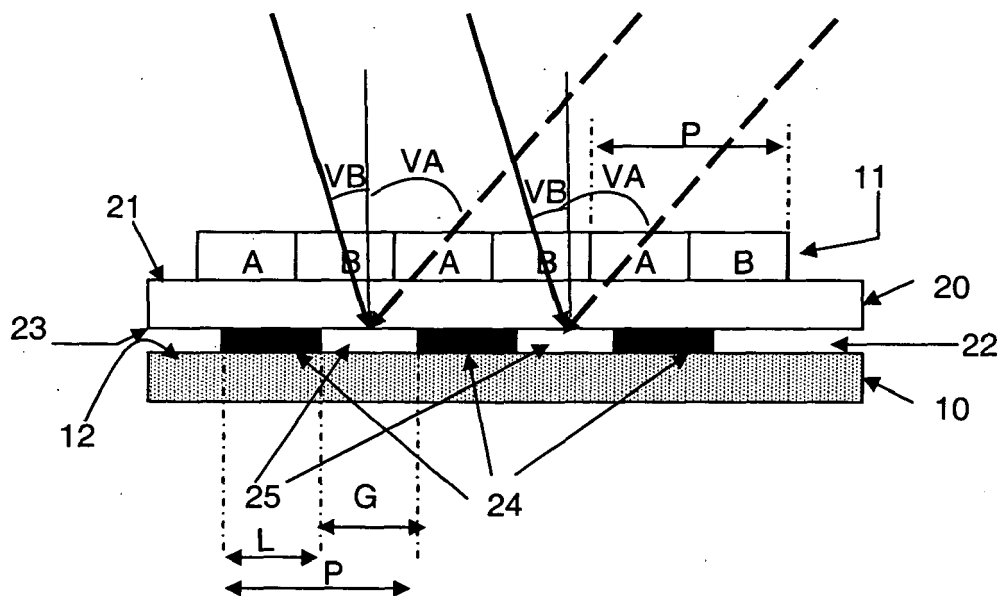


Figure 2

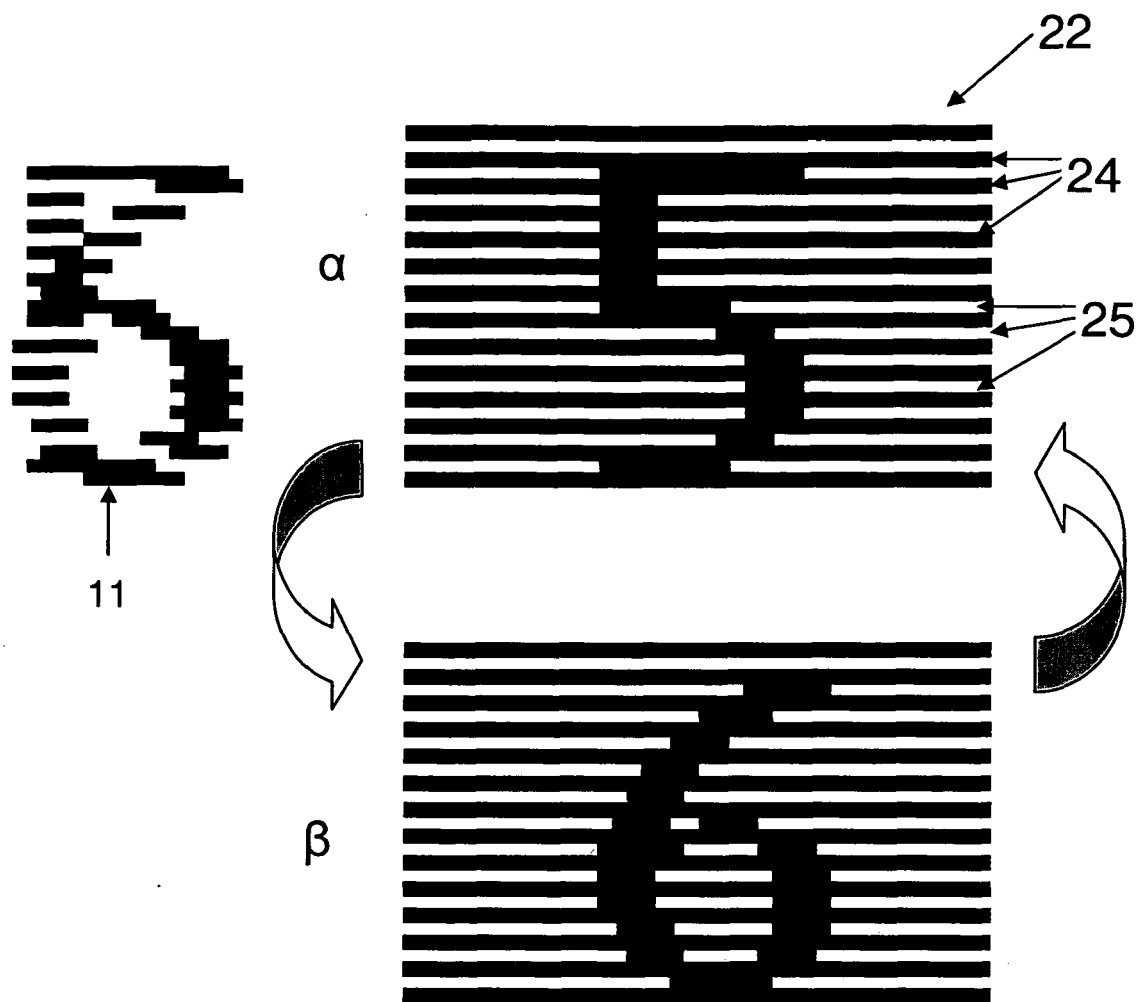


Figure 3

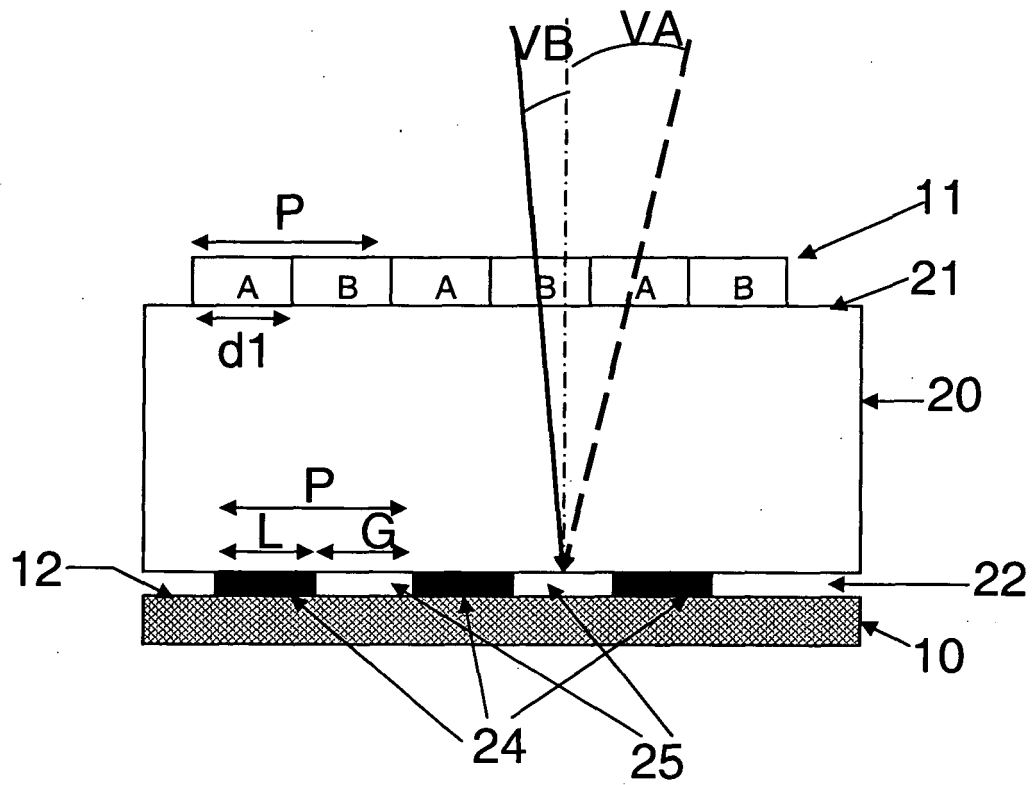


Figure 4

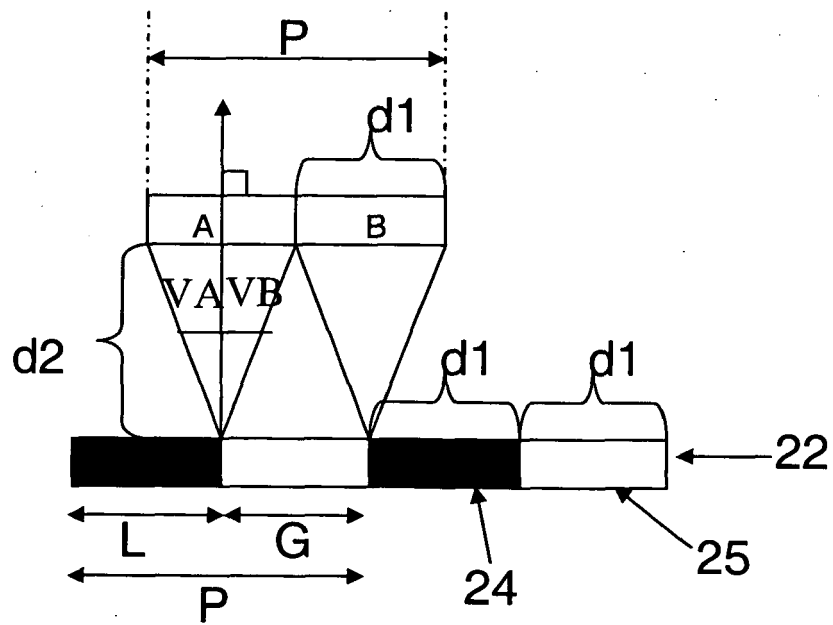


Figure 5

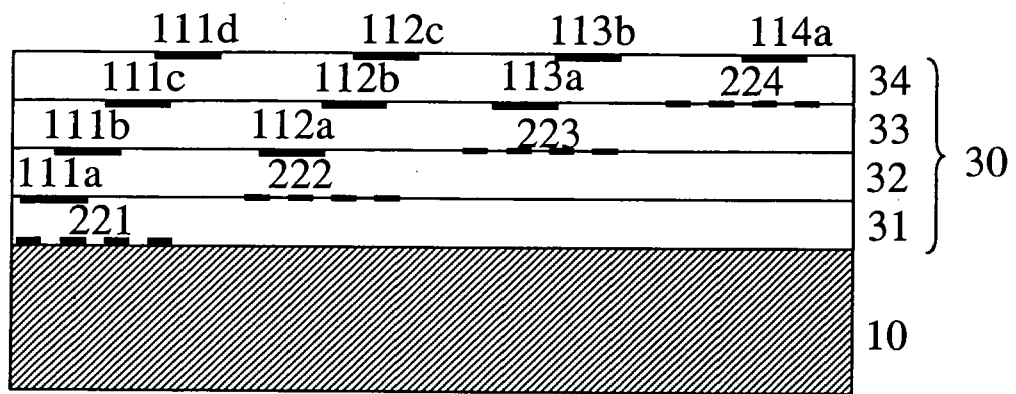


Figure 6

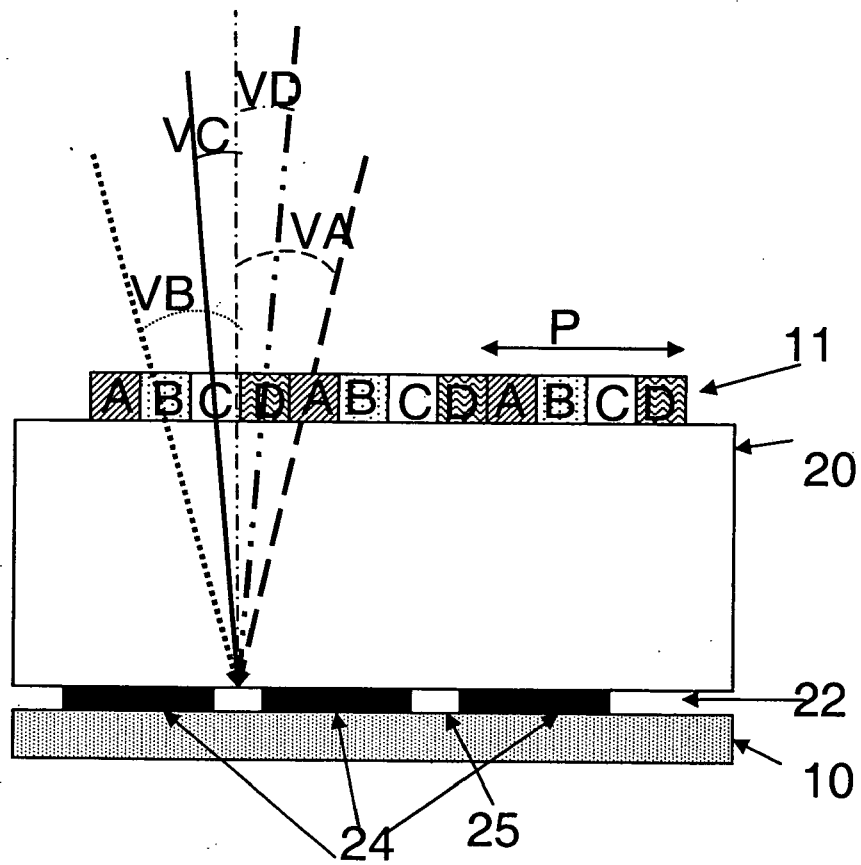


Figure 7

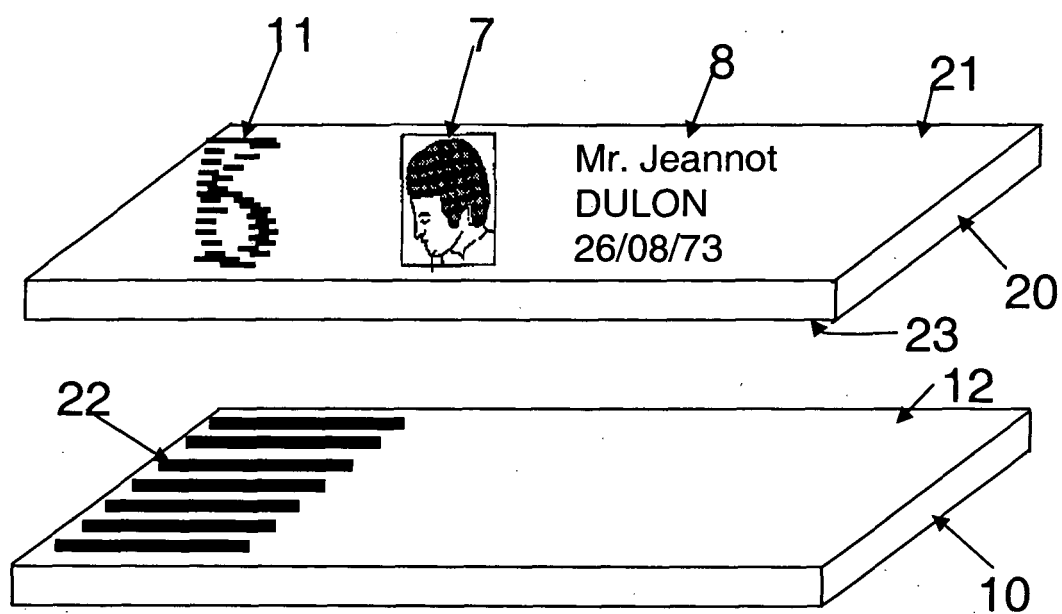


Figure 8



EUROPEAN SEARCH REPORT

Application Number
EP 08 00 9272

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 580 025 A (HUECK FOLIEN GMBH [AT]) 28 September 2005 (2005-09-28) * paragraphs [0011], [0013], [0021] - [0023], [0025]; claims 1,3,5-7; figures 1-3 *	1-14	INV. B42D15/00 B42D15/10
X	DE 10 2006 050047 A1 (GIESECKE & DEVRIENT GMBH [DE]) 30 April 2008 (2008-04-30) * paragraphs [0041], [0049], [0050], [0098], [0100], [0101]; figures 13a,13b *	1-3,8-13	
X	WO 2004/034313 A (COMMW SCIENT AND IND RES [AU]; MCCARTHY LAWRENCE [AU]; SWIEGERS GERHAR) 22 April 2004 (2004-04-22) * figures 15,17 * * page 12, lines 9-19 * * page 14, lines 31-37 * * page 13, lines 32,33 * * page 16, lines 1,2 * * page 16, lines 21,29 * * page 17, lines 30-32 * * page 18, lines 8-11 *	1-3, 5-11,13, 14	TECHNICAL FIELDS SEARCHED (IPC) B42D
X	GB 2 350 319 A (RUE DE INT LTD [GB]) 29 November 2000 (2000-11-29) * abstract; figures 2-4 * * page 3, lines 18-35 * * page 9, lines 21-29 * * page 10, lines 4-9,22-24 * * page 12, lines 17,22-24 *	1-7,10, 11,13,14	
-/--			
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 30 October 2008	Examiner Duquénoy, Alain
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EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 08 00 9272

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