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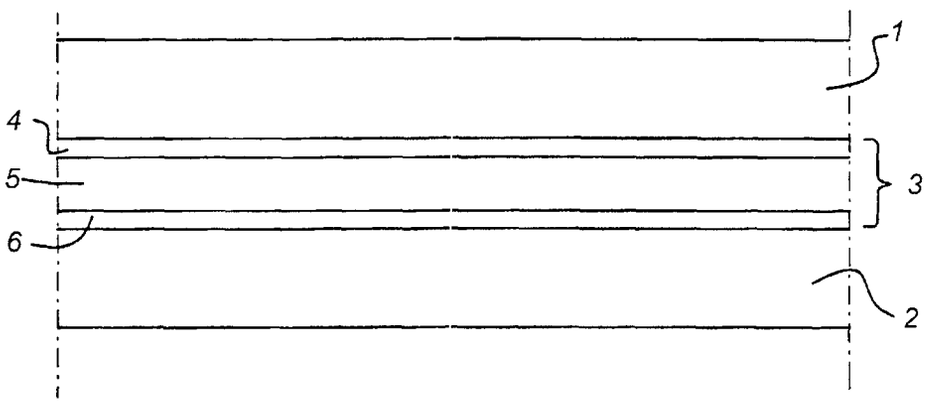
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(54) Laminated structure

(57) Laminate structure, in particular for use in security documents, such as passports, credit cards, identity cards and the like, comprising a substrate which comprises one or more layers, a top layer which is formed from transparent material, and a security element (3) which is arranged between the substrate and the top layer. This security element (3) comprises a number of layers, including a thermoplastic adhesive layer (5) and a hologram layer (6).



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Description

[0001] The invention relates to a laminate structure, in particular for use in security documents, such as passports, credit cards, identity cards and the like, comprising:

- a substrate which comprises one or more layers,
- a top layer which is formed from transparent material,
- a security element which is arranged between the substrate and the top layer and comprises a number of layers, including:
  - a thermoplastic adhesive layer
  - a hologram layer.

Prior art

[0002] A laminate structure of this type is already known from a number of publications which belong to the prior art.

[0003] Reference is made firstly to DE4410431. Figure 4 of this publication shows a structure which is provided with all the characteristic features described above. The hologram layer in the security element is situated on the side of the top layer, and the thermoplastic adhesive layer in the security element is situated on the side of the substrate.

[0004] Furthermore, reference is made to US 5,658,411, in particular Figure 2 of that document. This figure likewise shows a structure which is provided with all the characteristic features described above. In this case too, the hologram layer in the security element is situated on the side of the top layer and the thermoplastic adhesive layer in the security element is situated on the side of the substrate. The hologram layer in this case comprises a deformable layer, into which the hologram is pressed, directly adjoining a reflective metal layer and then an adhesion-promoting layer.

[0005] WO 00/61379, which describes a structure which greatly resembles the structures which are known from DE4410431 and US 6,558,411, is also mentioned.

[0006] Another relevant document is CH0680170, which describes a layered structure which has all the characteristic features described above. The hologram layer in the security element is located on the side of the top layer, and the thermoplastic adhesive layer in the security element is situated on the side of the substrate. A separately defined adhesive layer is situated between the hologram layer and the top layer.

[0007] Another relevant document is US 5,319,475, which describes a similar structure to that which is known from CH0680170.

[0008] All these known structures have the drawback of not yet being sufficiently forgery-proof. It is an object of the invention to describe how a structure which is known from the first paragraph of the present specification has to be designed in order to offer a much higher level of resistance to forgery.

[0009] This object is achieved if the structure described in the first paragraph is characterized in that the thermoplastic adhesive layer in the security element is situated on the side of the said levelling layer of lacquer or adhesive, and in that the hologram layer in the security element is situated on the side of the substrate. The levelling layer of lacquer ensures that the underside of the top layer is level.

[0010] This characteristic feature has the effect of ensuring that the hologram layer is adhesively bonded to the substrate via a thermoplastic adhesive layer. Any attempt to remove the hologram layer undamaged will fail. For example, if the top layer, which lies at the top, is cut off, it will be impossible, given a cold, well-adhering layer of adhesive, for the hologram to be removed without being damaged. If the assembly is heated, so that the layer of adhesive becomes soft, the hologram may already have been damaged as a result of this mobility.

[0011] A preferred embodiment of the invention is characterized in that a levelling layer of lacquer or adhesive is present on the inner side of the top layer at the location of the security element. The result is that any unevenness on the surface of the top layer, which, although very minor, will nevertheless generally be present cannot damage the hologram during the lamination process.

[0012] This application of a levelling layer generally represents an additional step in the manufacturing process. It is therefore preferable to use a top layer which comprises a transparent plastic layer to which a levelling layer of lacquer or adhesive has been applied.

[0013] The invention will be discussed in more detail below with reference to the appended figure, which shows an embodiment of the invention.

[0014] The figure shows a laminate structure comprising a top layer 1, a substrate 2 and a security element 3. The top layer 1 and the substrate 2 form part of a flat laminated structure, such as for example a credit card, an identity card, a page from a passport and the like. In most cases, the top layer 1 will be transparent and the top side of the substrate 2 will be provided with symbols, such as names, addresses and the like. To protect these names, addresses and other symbols from external influences, the top layer 1 is applied, which is transparent so that the printing on the substrate 2 is readily visible. Then, a thin security element can be clamped locally between the two layers, which security element is denoted by 3 in the figure. This element 3 is in turn built up as a laminate structure comprising the layers 4, 5 and 6, the layer 4 being a layer of lacquer or adhesive which is applied first to the inner side of the top layer 1 during the production process, in order to make this inner side as smooth and level as possible at the location of the security element. Layer 5 is a glue or adhesive layer comprising a thermoplastic material, and layer 6 is a hologram layer. Not only is the top layer 1 transparent, but

the layers 4 and 5 are transparent as well, at least at the locations where these layers are situated above the actual hologram in the layer 6. The layer 6 is a hologram layer, which can be produced in various different ways. For more information, reference is made to the prior art, including the publications referred to above, which discuss hologram layers of this type in more detail.

Claims

1. Laminate structure, in particular for use in security documents, such as passports, credit cards, identity cards and the like, comprising:

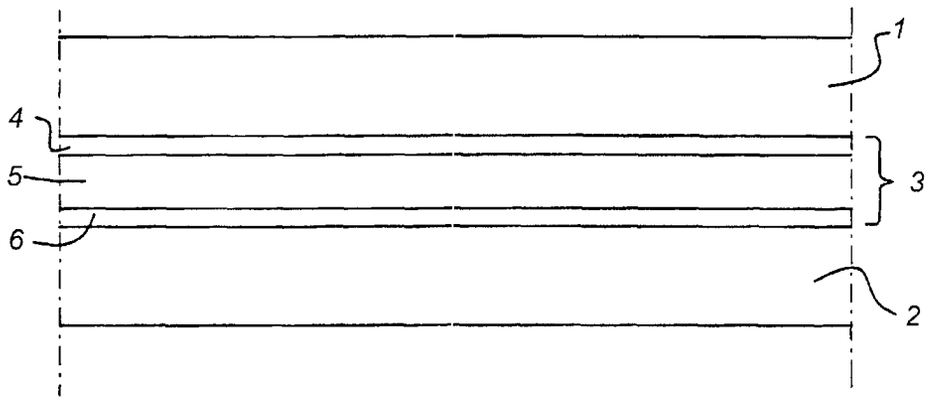
- a substrate which comprises one or more layers,
- a top layer which is formed from transparent material,
- a security element which is arranged between the substrate and the top layer and comprises a number of layers, including:
  - a thermoplastic adhesive layer
  - a hologram layer

characterized in that
the thermoplastic adhesive layer in the security element is situated on the side of the top layer, and **in that** the hologram layer in the security element is situated on the side of the substrate.

2. Laminate structure according to Claim 1, **characterized in that** a levelling layer of lacquer or adhesive is present on the inner side of the top layer at the location of the security element.

3. Top layer for use in a laminate structure according to Claim 1, **characterized in that** the top layer comprises a transparent plastic layer, to which a levelling layer of lacquer or adhesive is applied.

4. Security document, such as a passport, credit card, identity card or the like, **characterized in that** at least part of the document is provided with a laminate structure according to Claim 1 or 2, optionally with the use of a top layer according to Claim 3.


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EUROPEAN SEARCH REPORT

Application Number
EP 02 07 5522

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	WO 95 27925 A (APPLIED HOLOGRAPHICS) 19 October 1995 (1995-10-19) * page 3, line 25 - page 5, line 9; figures 1-4 *	1	B42D15/10
A	US 4 717 615 A (REINHART) 5 January 1988 (1988-01-05) * column 3, line 60 - column 7, line 43; figures 1,2 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B42D
G06K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 May 2002	Evans, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 07 5522

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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07-05-2002

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82