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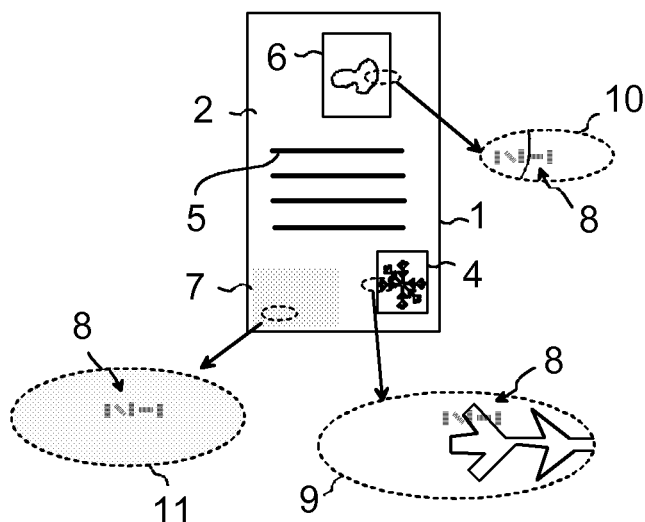
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(54) **Secure document and manufacturing method**

(57) The invention relates to a secure document (1) comprising a first surface (2) and a second surface (3) on opposite sides of the secure document, the elements comprising symbols, text, graphics, or combinations thereof arranged on said first surface (2), a first one of said elements (4, 5, 6, 7) is arranged on said first surface

such that it is visible to a viewer in ordinary lighting conditions. In order to make forgery as difficult as possible, a second one of said elements is a hidden element (8) provided without adding colour at least partially on said first element (4, 5, 6, 7) as surface irregularities including protrusions (15) or recesses (16) as compared to other parts of said first element (4, 5, 6, 7).



**FIG. 1**

**Description****BACKGROUND OF THE INVENTION****FIELD OF THE INVENTION**

[0001] This invention relates to a solution for improving the security of a secure document by making forgery even more difficult.

**DESCRIPTION OF PRIOR ART**

[0002] Previously there are known secure documents with elements comprising text, symbols, graphics, or combinations of these. Such elements are utilized on secure documents in order to make forgery as difficult as possible. Different production methods have been developed in order to produce elements that are as difficult to reproduce (for a forger) as possible. Preferably, it should be possible to detect forgery by visually examining the secure document in ordinary lighting conditions. Therefore, these prior art elements have been produced in such a way that they are immediately visible to a viewer in ordinary lighting conditions, in other words without needing to utilize any special equipment.

[0003] However, despite the attempts to utilize elements that make forgery as difficult as possible, there is always a risk that a forger somehow manages to carry out a forgery in a way that is very difficult to visually detect from the secure document.

**SUMMARY OF THE INVENTION**

[0004] An object of the present invention is to solve the above mentioned drawback and to provide a solution, which makes forgery even more difficult. This object is achieved with a secure document according to independent claim 1 and with a method for manufacturing a secure document according to independent claim 6.

[0005] The use of a second hidden element provided as a surface irregularity at least partially on a first visible element makes it possible to make forgery even more difficult, as the second element acts as a seal on the first element. Therefore, it is no longer sufficient that the forger can deal with the first element, but the forger has to be able to also handle the second element in order for a successful forgery.

**BRIEF DESCRIPTION OF DRAWINGS**

[0006] In the following, the present invention will be described in closer detail by way of example and with reference to the attached drawings, in which

[0007] Figure 1 illustrates a first embodiment of a secure document, and

[0008] Figures 2a to 2c illustrate a method for manufacturing a secure document.

**DESCRIPTION OF AT LEAST ONE EMBODIMENT**

[0009] Figure 1 illustrates a first embodiment of a secure document 1. The document comprises a first surface 2 and a second surface 3 on opposite sides of the document. In Figure 1 the first surface 2 is turned upwards.

[0010] The secure document 1 may be any kind of secure document, in other words such a document that needs to be manufactured in a way that makes forgery difficult. Examples of such documents are pages of passports, stamps, share certificates, tax stamps, visas and so on.

[0011] The secure document 1 comprises first elements including symbols 4, text 5, graphics 6 and 7, or combinations of these, of which some are intended to provide the viewer of the secure document with information and other are intended to complicate forgery. These first elements are provided on the secure document such that they are immediately visible for a viewer in ordinary lighting conditions. Therefore the viewer does therefore not need to have any specific apparatus to view these elements, and the elements are also clearly visible without having to view the secure document from any specific direction. Such first elements may be provided on the secure document by printing, by attaching with an adhesive or by laser engraving, for instance, depending on the material and the type of document.

[0012] In addition, the secure document 1 comprises a second hidden element 8. In the example of Figure 1, a second hidden element is provided in three different locations of the secure document. A first location for a second hidden element 8 is partially on top of the symbol 4, which is illustrated as an enlargement in the ellipse 9. A second location for a second hidden element 8 is partially on top of graphics 6, such as a photograph or a drawing, as illustrated as an enlargement in the ellipse 10. A third location for a second hidden element 8 is partially on top of graphics 7, which in this case consists of a background colour of the secure document, as illustrated as an enlargement in the ellipse 11.

[0013] In the illustrated embodiment, the second hidden element 8 is in all locations provided at least partially on top of said first elements 4, 6 and 7 as surface irregularities including protrusions and recesses when compared to other parts of the respective first element.

[0014] The second element 8 is hidden, which in this context refers to an element produced in a way that makes it much more difficult to detect visually in ordinary lighting conditions when compared to the first elements 4, 6 and 7. One way to accomplish this is to produce the second element 8 as surface irregularities of a microscopic size. The term 'microscopic size' refers in this context to a size that is so small that it is difficult to detect with bare eyes. However, if the viewer knows where to look at and is capable of turning the secure document to a suitable position relative to the direction of the incoming light, then the viewer may be able to visually observe the second element without any extra apparatus. When pro-

duced by Intaglio printing, as explained in connection with Figures 2a to 2c, the height differences of the surface irregularities may be 0.03 mm to 0.07 mm, the width of produced 'lines' may be 0.07 mm to 0.17 mm, and the distance between 'lines' may be 0.08 to 0.18 mm. Naturally the dimensions mentioned are only by way of example without limiting the scope of the invention. However, a forger not aware of the existence, location or shape of the second hidden element 8 may therefore make an error by only focusing on the first element which is clearly visible from the secure document, in which case the forgery may be detected due to errors in the second hidden element 8.

[0015] Figures 2a to 2c illustrate a method for manufacturing a secure document. This method may be utilized for manufacturing the secure document 1 illustrated in Figure 1.

[0016] The manufacturing process begins by taking in to use a sheet 12 with a first 2 and a second surface 3, and by providing this sheet 12 with the first elements 4, 5, 6 or 7 as appropriate. The selected first elements are provided in a way that makes them immediately visible to a viewer in ordinary lighting conditions, such as by printing ink on a surface of the sheet 12.

[0017] In the illustrated embodiment, it is assumed by way of example that the second element 8 will be provided as surface irregularities which are produced by pressing an object with a predetermined shape towards the sheet 12. Figure 2a illustrates a plate 13, such as a steel, zinc or copper plate 13, with a surface into which the symbol, text or graphics of the second element are produced by engraving, etching or machining in some other suitable way.

[0018] Figure 2b illustrates the plate 13 and the sheet 12 arranged on top of it. A cylinder 14 is used in order to subject a pressure towards the sheet 12 and the plate 13 such that the first surface 2 of the sheet 12 turned towards the plate 13 is subjected to such a pressure, that the shape of the second element 8 is produced on the sheet as surface irregularities including protrusions 15 and recesses 16, as illustrated in Figure 2c. With such a manufacturing method, the second surface 3 of the secure document 1 will remain smooth such that the surface irregularities of the second element 8 are not visually detectable from the side of the second surface 3.

[0019] In case the secure document 1 is a paperlike document, in other words a document which is produced of paper or a material similar to paper, then the second hidden element 8 can be produced with Intaglio printing in a security printer without using printing ink. In that case the method of producing the hidden element 8 is very similar to what has been explained above. In prior art security printers utilizing Intaglio printing, the printing process mainly differs from the one explained above in that instead of a plate 13, a second cylinder is utilized. Symbols, text or graphics have been produced into the surface of this second cylinder such that when the document is passed between the two cylinders, the pressure

caused by the cylinders will produce the surface irregularities of the second element to the document similarly as was explained above.

[0020] It is to be understood that the above description and the accompanying figures are only intended to illustrate the present invention. It will be obvious to a person skilled in the art that the invention can be varied and modified without departing from the scope of the invention.

## Claims

1. A secure document (1), comprising:

a first surface (2) and a second surface (3) on opposite sides of the secure document, elements comprising symbols, text, graphics or combinations thereof arranged on said first surface (2),

a first one of said elements (4, 5, 6, 7) is arranged on said first surface such that it is immediately visible to a viewer in ordinary lighting conditions, **characterized in that**

a second one of said elements is a hidden element (8) provided without adding colour at least partially on said first element (4, 5, 6, 7) as surface irregularities including protrusions (15) or recesses (16) as compared to other parts of said first element (4, 5, 6, 7).

2. The secure document according to claim 1, **characterized in that** said surface irregularities of the second hidden element (8) are not detectable from said second surface (3) of said secure document (1).

3. The secure document according to claim 1 or 2, **characterized in that** said secure document (1) is a paperlike document.

4. The secure document according to one of claims 1 to 3, **characterized in that** said first element (4, 5, 6, 7) comprises printing ink.

5. The secure document according to one of claims 1 to 4, **characterized in that** said surface irregularities are of a microscopic size.

6. A method for manufacturing a secure document (1), comprising:

providing a sheet (12) with a first surface (2) and a second surface (3), and

providing a first element (4, 5, 6, 7) comprising symbols, text, graphics or combinations thereof on said first surface (2) to be immediately visible for a viewer in ordinary lighting conditions, **characterized in that** the method comprises:

providing a second element comprising symbols, text, graphics, or combinations thereof as a hidden element (8) without adding colour at least partially on said first element (4, 5, 6, 7) as surface irregularities including protrusions or recesses as compared to other parts of said first element. 5

7. The method according to claim 6, **characterized in that** said first element (4, 5, 6, 7) is provided at least partly by printing. 10

8. The method according to claim 6 or 7, **characterized in that** the second hidden element (8) is provided by surface irregularities of a microscopic size. 15

9. The method according to one of claims 6 to 8, **characterized in that** said sheet (12) is provided as a paperlike sheet, and said second hidden element (8) is provided by subjecting a pressure towards selected parts of said first element (4, 5, 6, 7) in order to produce said second hidden element (8) at least partially on said first element (4, 5, 6, 7) as surface irregularities in said first element. 20 25

10. The method according to one of claims 6 to 9, **characterized in that** said second element (8) is provided by Intaglio printing with a security printer without using printing ink. 30

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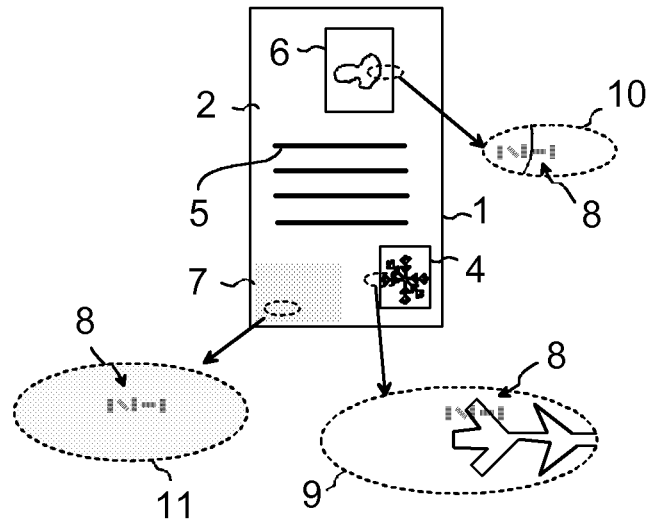


FIG. 1

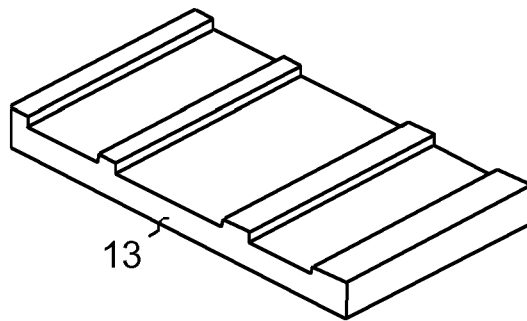


FIG. 2a

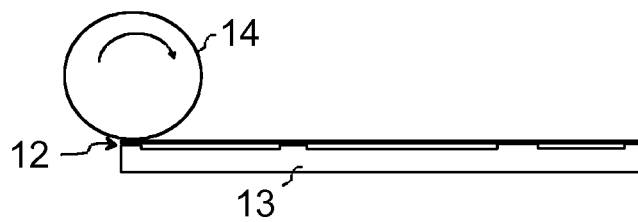


FIG. 2b

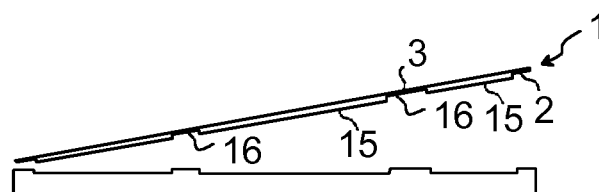


FIG. 2c



## EUROPEAN SEARCH REPORT

Application Number  
EP 10 16 2682

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	WO 03/057494 A1 (GIESECKE & DEVRIENT GMBH [DE]; BRAUN ECKHARD [DE]; PLASCHKA REINHARD []) 17 July 2003 (2003-07-17) * page 8, line 20 - page 9, line 9; figures 1,2 * -----	1-10	INV. B42D15/00
			TECHNICAL FIELDS SEARCHED (IPC)
			B42D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 24 January 2011	Examiner Evans, Andrew
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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 ..... &amp; : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 16 2682

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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24-01-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03057494	A1	17-07-2003	AT 367934 T 15-08-2007
		AU 2003205579 A1	24-07-2003
		CA 2472020 A1	17-07-2003
		CN 1592688 A	09-03-2005
		DE 10201032 A1	24-07-2003
		EP 1467871 A1	20-10-2004
		ES 2289257 T3	01-02-2008
		PT 1467871 E	25-10-2007
		RU 2314209 C2	10-01-2008
		US 2005072326 A1	07-04-2005
		US 2007283824 A1	13-12-2007
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