

A laminate, a document and methods for manufacture thereofTECHNICAL FIELD

The present invention relates to printing and in particular to a laminate and printing process for producing anti-counterfeit documents.

BACKGROUND OF THE INVENTION

It is known to provides means to reduce or prevent tampering of security or identification documents, such as passports, ID cards, driving licences or the like.

For example, it is known to use a sealing layer, commonly formed from a varnished or polished plastic, with an adhesive surface for sticking on to a relevant document to prevent information / images etc. on the document from being tampered with. However, over time the plastic may wear or start to lift and seperate away from document, making it possible to peel the plastic off and giving access to the document contents.

To look to address these issues, it has become common to print directly on to the sealing layer. For example, an image (such as a passport photo) may be printed directly on to the sealing layer. To further increase security, it has become common to use "special inks" to print on to the sealing layer. These "Special inks" may be invisible in normal light providing an additional layer of security. However, the inks used are generally glossy when compared with the documents and so the additional security information can be seen when using plastic sheets as sealing layers. A would-be counterfeiter can therefore readily see the "hidden" indicia on the document.

It is therefore an aim of embodiments of the invention to provide means to produce a tamper proof document, or one which is harder to tamper with their current documents, but which appear the same as existing security documents and allow for implementation of specific indicia types as required. It is also an aim to provide a method of manufacture of said means, and a method of applying said means to a document.

It is an aim to overcome or at least partly mitigate the problems of the prior art.

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✓x1

✓x1

✓x2

SUMMARY OF THE INVENTION

According to a first aspect of the invention there is provided a laminate according to claim 1. The laminate comprises a layer of varnish and a layer of adhesive. The carrier sheet is provided as a base to form the laminate. A laminate formed from a layer of varnish provides a hard, protective outer coat preventing damage to underlying indicia and making it harder to tamper with than conventional plastic sheets. Varnish also provides a consistent sheen when compared with plastic which prevents special inks being seen there through, unlike with plastic. Using a carrier sheet enables the layer of adhesive to be applied to the layer of varnish without requiring the plastic sheet, as is currently known.

✓x1

Furthermore, providing a laminate of the type claimed provides multiple layers onto which indicia may be printed, using printing techniques specific to the composition of the layer itself.

✓x1

In this way, the claimed laminate provides means to print indicia in a plurality of ways (an a plurality of layers if required) without the need to use a plastic sheet as in the prior art. Hence, the present invention overcomes the problems associated with the use of a plastic sheet as described herein, whilst still providing for the requirements of various bodies for the specific types of security indicia.

In embodiments, (feature of claim 2). Using paper allows for the carrier layer to be removed easily from the layer of varnish during subsequent processing using the laminate. As the carrier sheet is alternately disposable, using a recyclable material such as paper also provides an environmental benefit.

✓x1

In embodiments, (feature of claim 3). Using an acrylic copolymer varnish provides the benefits of it being easily peelable from the carrier sheet upon heating, but also susceptible to having indicia printed thereon, providing an additional surface / component of the laminate on which indicia can be printed. Acrylic copolymer is well suited as it has good properties at common temperatures for printing (low) and transferring (high).

✓x1

In embodiments, (feature of claim 4). Providing the layer of varnish of a thickness of up to 3µm allows for a clean transfer from the carrier sheet to a substrate during subsequent processing steps. The thinner the varnish layer, the more difficult it is to tamper with the indicia printed thereon.

✓x1

In embodiments, (feature of claim 5). The layer of varnish is suited to receive indicia printed thereon. This gives an additional surface / component on which to provide indicia. Printing on the layer of varnish allows for printing of types of acrylic which cannot be used via toner printing – thereby making it more difficult to tamper with the indicia printed thereon.

✓x1

In embodiments, (feature of claim 6). Providing both visible and invisible indicia provides two separate layers of security. Using the layer of varnish in conjunction with invisible indicia prevents the invisible indicia from being seen through the laminate, as is common with current plastic sheets.

Examiner's
use only

✓x1

In embodiments, (feature of claims 7 and 10). Using temperature-sensitive Polyurethane provides an acceptable melting temperature when using the adhesive to adhere the laminate to a substrate, but is high enough to allow indicia to be printed thereon using a toner process.

✓x1

In embodiments, (feature of claim 8). The layer of adhesive provides an additional surface / component onto which indicia can be printed. Enhances security. Also, indicia can be provided without affecting the finish of the layer of the varnish.

✓x1

In embodiments, (feature of claim 9).

According to a second aspect of the invention there is provided a document according to claim 11.

In embodiments (feature of claim 12). Laminate is suitable for use with passports – provides enhanced security for passports.

According to a third aspect of the invention there is provided a method according to claim 13. Advantageously, forming a laminate using the claimed method results in a laminate having a hard, protective outer coat of varnish connected to an adhesive which may be used to adhere the laminate to a substrate. Forming the laminate in this manner provides a number of surfaces / components onto which can be provided indicia using a variety of printing techniques, thereby enhancing security by making it more difficult to tamper with the indicia provided thereon.

✓x1

In embodiments, (feature of claim 14). Forming a laminate in the claimed manner allows for indicia to be printed directly on to the varnish. Provides an additional region to print security indicia.

In embodiments, (features of claim 15). Advantageously using a low temperature printing method ensures clarity in the printed indicia.

✓x½

In embodiments, (features of claim 16). Advantageously, the additional layer of varnish gives an added layer of protection. Improves security – reduces tampering.

✓x½

In embodiments, (feature of claim 17). Advantageously, printing two different types of indicia increases security by providing more security indicators which would need to be replicated in a counter-feit document.

✓x½

In embodiments, (feature of claim 18). Advantageously, using a lustrous or optically variable print means that it cannot be replicated / reproduced via conventional toner or lithographic printing, thereby making it more difficult to produce a counterfeit document.

✓ x½

In embodiments, (feature of claim 19). Advantageously, printing on the adhesive layer provides another surface / component onto which indicia can be printed. Furthermore, printing on the adhesive layer allows for indicia to be provided without affecting the finish of the layer of varnish.

✓ x1

In embodiments, (features of claim 20). Advantageously, a toner may be used to print indicia due to the thermal properties of the adhesive. Toners operate at a low enough temperature not to melt the adhesive.

✓ x1

According to a fourth aspect of the invention, there is provided a method according to claim 21. Advantageously, the method provides a means to adhere the laminate to the substrate allowing for the indicia to be sealed to the substrate and for the carrier sheet to be removed – resulting in a final product.

✓ x1

In embodiments, (features of claims 22, 23 and 24). Advantageously, these conditions ensure that the laminate is securely adhered to the substrate, and also allows for the carrier sheet to be removed cleanly – i.e. by not affecting the finish of the varnish.

✓ x½

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described, by way of example only, with reference to the accompanying figures, in which:

Figure 1 is a side cross-sectional view of an embodiment of a laminate according to the invention, shown in relation to a substrate for forming an anti-counterfeit portion of a document; and

Figure 2 is a side cross-sectional view of an embodiment of a document according to an aspect of the invention, illustrating specifically an anti-counterfeit portion of the document.

✓ x2

DETAILED DESCRIPTION

Figure 1 illustrates a side cross-sectional view of a laminate 10 according to the invention. The laminate 10 includes a layer of varnish 14 applied to a carrier sheet 12. The layer of varnish 14 comprises indicia 15 printed thereon. The laminate 10 further includes a layer of adhesive 16 applied to the layer of varnish 14. In the illustrated embodiment, the layer of adhesive additionally includes indicia 18 printed thereon.

Figure 1 additionally shows a substrate 20 onto which the laminate 10 is applied (as described herein below). The substrate 20 comprises a page from a security document, e.g a passport, but it is readily envisaged that the substrate could comprise any portion / section of any document as will be appreciated. In the illustrated embodiment, the substrate 20 comprises indicia 22 printed onto a surface thereof.

A method of manufacture of the laminate 10 is now described with reference to Figure 1.

The layer of varnish 14 is applied onto the carrier sheet 12. Subsequently, the indicia 15 is printed onto the layer of varnish 14, using a suitable printing technique. For use with the layer of varnish 14, the indicia 15 must comprise something that can be screen printed.

The indicia 15 can be visible indicia – ie. indicia which can be viewed under normal light, or invisible indicia – i.e. indicia which cannot be viewed under normal light. For visible indicia, lustrous or optically variable ink can be used. For invisible media, an invisible fluorescent or UV-sensitive ink could be used. As will be appreciated, there may be provided two (or more) different forms of indicia 15 on the layer of varnish 14. The indicia 15 is screen printed.

In the illustrated embodiment, the laminate 10 comprises a single layer of varnish 14. The layer of varnish 14 must be applied such that its thickness is no more than 3µm. However, additionally, one or more further layers of varnish may be applied, with the total thickness of varnish up to 12µm.

The layer of adhesive 16 is then applied to the layer of varnish 14. The adhesive comprises a temperature-sensitive adhesive, such as temperature-sensitive polyurethane.

Finally, indicia 18 is printed onto the layer of adhesive 16. Given the properties of the adhesive, the indicia 18 must be printed onto the layer of the adhesive 16 using a toner. The reason for this is the toner operates at a lower temperature than other printing techniques, such as screen printing, which may otherwise melt the adhesive during the printing process.

As discussed above, Figure 1 also illustrates a substrate 20 comprising indicia 22 printed thereon. The indicia 22 may be printed using any conventional printing technique.

The indicia 15, 18, 22 is selected from a group comprising: images, text, numerical values, barcodes, signatures, etc.

Figure 2 illustrates a side cross-sectional view of a portion of a document 100. The portion of the document 100 comprises the substrate 20 and the layer of varnish 14, sealed together via the layer of adhesive 16. The indicia 18, 22 are sealed by the adhesive layer 16, which has been melted during manufacture of the document 100 as will be described herein below.

To manufacture the portion of the document 100, the laminate 10 is first positioned on the substrate 20. In the illustrated embodiment, the laminate is positioned such that the indicia 18 and indicia 22 are correctly position with respect to one another. When positioned heat and pressure is applied to the laminate 10 and substrate 20. Specifically, the laminate 10 and substrate 20 are heated to between 120–140°C and pressure is applied at 69-345hPa for up to 10s. This acts to melt the adhesive 16 and stick the laminate 10 to the substrate 20. In doing so, the indicia 15, 18, 22 is sealed to the substrate 20. Furthermore, the carrier sheet 12 may be removed from the layer of varnish 14 in the same process.

In the illustrated embodiment, the carrier sheet 12 comprises paper.

The layer of varnish 14 is formed from an acrylic copolymer varnish.

The layer of adhesive 16 comprises temperature sensitive polyurethane. The layer of adhesive 16 has a melting point between 120-140°C such that it melts during the sealing process described above.

✓x14

MARKS AWARDED 37.5/56

CLAIMS

- 1) A laminate for providing an anti-counterfeit portion of a document, the laminate comprising:
 - a carrier sheet;
 - a layer of varnish applied to the carrier sheet, and
 - a layer of temperature-sensitive adhesive applied to the layer of varnish;
 - the laminat comprising indicia printed on one or more of the layers
- 2) A laminate as claimed in claim 1, wherein the carier sheet comprises paper.
- 3) A laminate as claimed in claim 1 or claim 2, wherein the varnish comprises an acrylic copolymer varnish.
- 4) A laminate as claimed in any preceding claim, wherein the layer of varnish has a thickness of up to 3µm.
- 5) A laminate as claimed in any preceding claim wherein the layer of varnish comprises one or more types of indicia printed thereon.

✓x14

✓x1

✓x1

✓x1

- 6) A laminate as claimed in claim 5, where the one or more types of indicia comprises a visible indicia, which can be viewed in normal light and/or an invisible indicia which is invisible under normal light.
- 7) A laminate as claimed in any preceding claim, wherein the temperature-sensitive adhesive comprises temperature-sensitive polyurethane.
- 8) A laminate as claimed in any preceding claim, wherein the layer of temperature-sensitive adhesive comprises indicia printed thereon.
- 9) A laminate as claimed in any preceding claim, wherein the indicia comprises one or more selected from a group comprising; an image; text; numerical values; bar codes, and signatures.
- 10) A laminate as claimed in any preceding claim, wherein the adhesive comprises a melting point greater than 120 degrees centigrade.
- 11) A document comprising a laminate as claimed in any preceding claim adhered to at least a portion thereof.
- 12) A document as claimed in claim 11, wherein the document comprises a passport.
- 13) A method for manufacturing a laminate suitable for use in providing an anti-counterfeit portion of a document, the method comprising:
providing a layer of varnish on a carrier sheet;
applying a layer of temperature-sensitive adhesive to the layer of varnish;
and
providing indicia on one or more of the layers of the substrate.
- 14) A method as claimed in claim 13, comprising printing indicia on the layer of varnish.
- 15) A method as claimed in claim 14, wherein the indicia is printed on the layer of varnish using a low-temperature printing method.
- 16) A method as claimed in any one of claims 13 to 15, wherein the layer of varnish applied to the carrier sheet comprises a first varnish layer, and the method comprises applying a second layer of varnish to the first varnish layer.
- 17) A method as claimed in any one of claims 14 or 15, comprising printing more than one type of indicia on the layer of varnish.
- 18) A method as claimed in any one of claims 14, 15 or 17, wherein the indicia is printed onto the layer of varnish using a lustrous or optically-variable print.

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✓x2

✓x1

✓x1

✓x1

✓x3

✓x1

✓x½

- 19) A method as claimed in any one of claims 13 to 18, comprising printing indicia onto the layer of temperature sensitive adhesive.
- 20) A method as claimed in claim 19, wherein the indicia is printed onto the layer of temperature sensitive adhesive using a toner.
- 21) A method of applying the laminate of any of claims 1 to 10 to a substrate for providing an anti-counterfeit portion of a document, the method comprising:
positioning the laminate on the substrate; and
applying heat and pressure for a period of time so as to melt the layer of adhesive such that the laminate adheres to the substrate on the indicia is sealed to the substrate.
- 22) A method as claimed in claim 21, wherein the laminate is heated to a temperature of between 120-140°C to melt the layer of adhesive.
- 23) A method as claimed in claim 21 or 22, comprising applying a pressure between 69-345 hPa to melt the substrate.
- 24) A method as claimed in any one of claims 21 to 23, comprising applying heat and pressure or a period of time up to 10s.
- 25) A method of any of claims 21 to 24, comprising positioning the laminate with respect to indicia printed on the substrate such that the adhesive, melts about any indicia provided on the layer of the adhesive and indicia on the substrate.
- 26) A method of any of claims 21 to 25, comprising removing the carrier sheet from the layer of varnish.

MARKS AWARDED 41.5/60

A LAMINATE, A DOCUMENT, AND METHODS FOR MANUFACTURE THEREOF

ABSTRACT

The present invention relates to printing, and in particular to a laminate and printing process for producing anti-counterfeit documents. The described laminate 10 comprises a layer of varnish 14 provided on a carrier sheet 12 and a layer of adhesive 16 provided on the layer of varnish 12. Indicia 15, 18 is provided on one or more of the layers. A method of manufacture of the laminate 10, a document 100 having an anti-counterfeit region thereon are also described.

[FIG 1]

MARKS AWARDED 3/4

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✓x1

✓x1

✓x9

✓x1

✓2

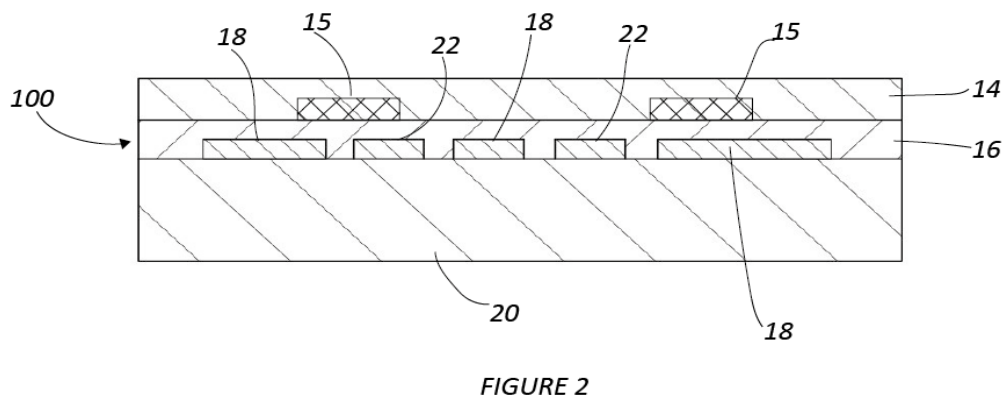
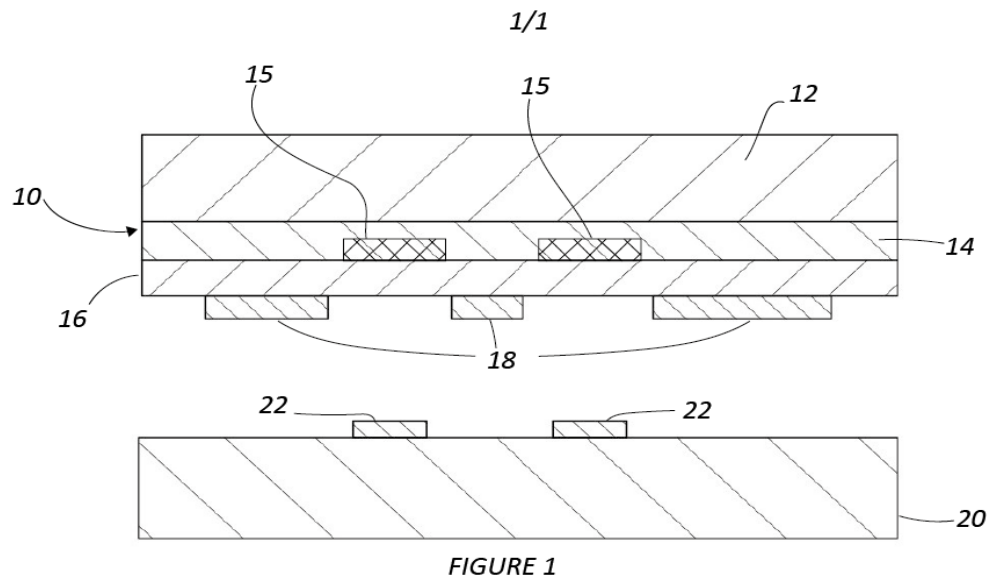
✓x1

✓x½

✓2

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✓x1



✓x1