QUESTION PAPER REFERENCE: FD2

PERCENTAGE MARK AWARDED: 58%

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<u>Abstract</u>

Title: A Laminate for a substrate, method of application and preparation.

A laminate 2 for a substrate comprises a carrier sheet 6, a varnish layer 8 having first and second opposing surfaces, and a adhesive layer 10 affixable ✓ to the substrate. The first surface 8a is applied to the carrier sheet 6 and the adhesive layer is applied to the second surface 8b. The carrier sheet 6 can remain in place to position the laminate 2 on the substrate, before subsequent removal.

A method of applying a \checkmark laminate 2 to a substrate involves positioning the substrate, placing the laminate onto the substrate, with an adhesive side of the substrate facing the substrate, and applying heat and pressure to melt the adhesive layer. The laminate 2 is thereby transferred to the substrate. Method of preparation of a laminate 2 also disclosed. Figure 2. \checkmark

Abstract(4/4)

MARKS AWARDED 4/4

A laminate for a substrate, and method of application and preparation.

Field of the Invention ✓

The present invention relates to a laminate for a substrate.

Background

It is known to provide information such as photographs and other indicators in documents such as passports and ID cards. Due to the nature of such documents, there exists a need to provide tamper-proofing and protection of such \checkmark information.

For passports a photo of the individual is provided on a page thereof. To prevent tampering, it is known to cover the photo, and any other information on that page, with a sealing layer. The layer is typically a varnished or polished plastic. The sealing layer may also include other security information printed on the sticky side. Over time, the plastic can wear or start to lift and separate from the passport page. It can therefore become possible to peel the ✓ layer away and change details on the underlying page (ie. tampering).

In recent times, the physical photo has been replaced in favour of a digital photo printed on the sealing ✓ layer or the passport page itself. Further, some nations now incorporate further security measures on the sealing page. However, such additional measures can be visible and so a counterfeiter can spot where the hidden indicia are.

There exists a need to overcome one or more of the aforementioned disadvantages.



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Summary of the Invention and Statements of Advantage

According to a first aspect of the invention there is provided <claim 1>.

The detachable carrier sheet being opposed to the adhesive layer is beneficial \checkmark because the laminate can be easily positioned on the substrate before the carrier sheet is detached. This is due to \checkmark the opposed surfaces of the varnish layer and so relative arrangement of the layers.

Preferably, <Claim 2>.

Providing indicia on one or \checkmark more of the varnish layer and adhesive layer is advantageous because the anti-counterfeiting properties \checkmark of the substrate are improved as a result thereof. The indicia are also thereby protected by the varnish layer.

Preferably, <Claim 3>.

Security indicia on the varnish layer is useful because it is protected by \checkmark the layer. The properties of the varnish layer can also be modified to optimise the application of \checkmark various types of security indicia thereto.

Preferably <Claim 4>. Printing is a known process, low temperature printing \checkmark methods exist which are suitable.

Preferably <Claim 5>. Special security inks are useful because they can be more difficult to detect by counterfeiters. \checkmark

Preferably <Claim 6>.

Preferably <Claim 7>. Auxiliary indicia are useful extra information \checkmark to have incorporated in the laminate.

Preferably <Claim 8>. Colour printing is required by some nations and it is ✓ therefore clearly advantageous to be able to provide the indicia in the required format. ✓

Preferably <Claim 9>. 80gsm paper is readily available paper. Easily removed \checkmark ie. detached, and recyclable.

Preferably, <Claim 10>. Acrylic copolymer varnish is widely available and low \checkmark cost. After heating it is easily peeled from paper ie. detachment of the carrier sheet is simple. \checkmark

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Preferably, <Claim 11>. Low thickness reduces the risk of the laminate ✓ becoming jammed during industrial use. Also, less space required for storage. ✓

Preferably, <Claim 12>. The constituent \checkmark sublayers allow the properties of the varnish layer to be modified. \checkmark

Preferably, <Claim 13>. Each sublayer being $\leq 3\mu$ m thick provides easy \checkmark transfer from the carrier sheet and provides a more tamper-evident surface. \checkmark

Preferably, <Claim 14>. Different types of varnish allow for different types ✓ of indicia to be applied. For example, a visible security indicia in the form of a lustrous or optically ✓ variable print could be applied to one type of acrylic to another type of acrylic, features ✓ which are invisible in normal conditions could be applied.

Preferably <Claim 15>. Temperature-sensitive polyurethane is useful because it can be printed on using standard printers ✓. Auxiliary indicia can therefore be applied thereto.

Preferably <Claim 16>. The substrate being a security document is advantageous ✓ because there exists a need for tamper-proofing of security documents, given their sensitive nature.

Preferably <Claim 17>. All security documents in widespread use.

Preferably <Claim 18>.

Preferably <Claim 19>. Finish is pleasing to the eye.

According to a second aspect of the invention there is provided a method according to <claim 20>. Advantageous because more robust bond between laminate and \checkmark adhesive. Can be implemented with standard commercial presses. \checkmark

Preferably <Claim 21>.

Preferably <Claim 22>. Preferably <Claim 23>. Conditions found to be particularly effective.

According to a third aspect of the intention there is provided a method according to <Claim 24>. Advantageous \checkmark because the indicia can be customised as required by the user. Protection of indicia by \checkmark varnish layer is desirable for reasons of anti-counterfeiting.

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The invention will now be described, by way of examples only, with reference to the accompanying drawings in which: Figure 1 shows a cross-section view of a laminate and passport page in a preapplied state, according to the invention; and Figure 2 shows the cross-section view of Figure 1 with the laminate bonded to Figures(4/4 the passport page. Figure 1 shows a laminate 2 and a passport page 4. Laminate 2 comprises a carrier sheet 6, varnish layer 8, adhesive layer 10 and toner-printed indicia 12. 🗸 The carrier sheet 6 is 80gsm \checkmark paper. Carrier sheet 6 provides a base upon which the other layers are built. The varnish layer 8 is acrylic copolymer varnish. The varnish layer 8 needs to be releasable from \checkmark the carrier sheet 6. Provides a relatively hard \checkmark , protective outer coat for the substrate 4. The varnish layer 8 thereby prevents damage to underlying indicia such as the toner-printed indicia 12. Also improves tamper-proof properties of the final product. ✓ Also gives a consistent sheen to the finish. Varnish layer 8 has toner-printed indicia 12. The indicia must be screen \checkmark printed. Passport page 4 also has printed indicia 14. Figure 1 shows the laminate 2 and passport page 4 in a pre-assembled \checkmark state ie. before the laminate is applied. In the illustrated example the indicia 12, 14 protrude from the respective adhesive layer 10 and passport page 4. It is therefore required to align the laminate 2 and passport page 4 such that \checkmark the indicia 12, 14 do not abut one another. Thus ensures a smooth surface finish following \checkmark application. Figure 2 shows the laminate 2 bonded to the passport page 4. The indicia 12, 14 interdigitabe so as to provide a smooth surface finish. The \checkmark carrier sheet 6 is shown removed from Figure 2, as is the case following application of the laminate to the passport page 4. To prepare the laminate 2, the varnish layer 8 is applied to the carrier \checkmark sheet 6. Indicia are then printed onto the varnish layer 8 (not shown in the illustrated example). This occurs at a low temperature or \checkmark using low temperature printing methods. An adhesive layer 10 is then added. The indicia 12 are then applied to

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Brief Description of Figures



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 A laminate according to any preceding claim wherein the carrier sheet is 80gsm paper. 1 	
 A laminate according to any preceding claim, wherein the varnish layer is an acrylic copolymer varnish. 	
11) A laminate according to any preceding claim, wherein the varnish layer is \leq around 12µm thick. 1	
12) A laminate according to any preceding claim, wherein the varnish layer comprises a plurality of constituent sublayers. 1	
13) A laminate according to claim 12, wherein the constituent sublayers are each $\leq 3\mu m$ thick. 1	
14) A laminate according to claims 12 or 13 wherein the sublayers are different types of varnish.	
15) A laminate according to any preceding claim, wherein the adhesive layer is temperature sensitive polyurethane. 1	
16) A laminate according to any preceding claim, wherein the substrate is a security document, or a page thereof.	
17) A laminate according to claim 16 wherein the security document is one of a passport, driving licence and an ID card.	
18) A security document comprising the laminate of any of claims 1 to 15.	
19) A security document according to claim 18, wherein there exists a smooth surface finish over the laminate.	
20) A method of applying a laminate1, 1 to a substrate, the method comprising: positioning the substrate;	
placing the laminate1 onto the substrate, with an adhesive-side of the laminate facing the substrate: 1	
applying heat and <u>pressure</u> 1 to melt the adhesive layer; thereby transferring the1 laminate to the substrate.	6/11
21) A method according to claim 20 wherein the laminate is the laminate according to any of claims 1-17, and following transfer of the laminate to the substrate, the carrier sheet is removed.	
22) A method according to claims 20 to 21, wherein the heat applied is around 120°-140° centigrade in temperature.1	
23) A method according to any of claims 20-22, wherein the pressure applied is around 69 – 345kPa for around 10 seconds. 1, 1	



