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**Datasheet for the decision
of 9 December 2016**

Case Number: T 0539/13 - 3.2.05

Application Number: 01943674.0

Publication Number: 1294576

IPC: B42D15/10

Language of the proceedings: EN

Title of invention:

A Security Device

Patent Proprietor:

De La Rue International Limited

Opponents:

GIESECKE & DEVRIENT GmbH
Leonhard Kurz Stiftung & Co. KG

Relevant legal provisions:

EPC 1973 Art. 84, 54, 56
EPC Art. 123(2)

Keyword:

Amendments - clarity (yes) - added subject-matter (no)
Novelty - (yes)
Inventive step - (yes)



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Boards of Appeal
Chambres de recours**

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Case Number: T 0539/13 - 3.2.05

**D E C I S I O N
of Technical Board of Appeal 3.2.05
of 9 December 2016**

Appellant I:
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Decision under appeal:

**Interlocutory decision of the Opposition
Division of the European Patent Office posted on
4 January 2013 concerning maintenance of the
European Patent No. 1 294 576 in amended form.**

Composition of the Board:

Chairman M. Poock
Members: S. Bridge
 D. Rogers

Summary of Facts and Submissions

- I. The appeal is directed against the interlocutory decision of the opposition division stating that European patent No. 1 294 576 as amended according to the main request meets the requirements of the European Patent Convention.
- II. Two oppositions were filed against the patent as a whole, each based on Article 100(a) EPC 1973 (lack of novelty, Article 54 EPC 1973 and lack of inventive step, Article 56 EPC 1973).
- III. Oral proceedings were held before the board of appeal on 9 December 2016.
- IV. The requests of appellants I and II (repectively, opponents 1 and 2) were to set aside the decision under appeal and to revoke the patent.
- V. The requests of the respondent (patent proprietor) were to set aside the decision under appeal and to maintain the patent upon the basis of the New Main Request filed at the oral proceedings before the Board on 9 December 2016, or alternatively, to maintain the patent upon the basis of Auxiliary Request 1, filed under cover of a letter dated 8 November 2016.
- VI. Claim 1 according to the New Main Request reads as follows:

"A security device comprising a substrate (1) formed with a surface relief (2) defining an optically variable effect generating structure; and at least two different reflection enhancing materials which are metals (4, 5) on the same side of the substrate as the

surface relief, wherein the metals are provided in respective different layers, one or more transparent layers being provided between the metals, and wherein the metal layer nearer the substrate is on the surface relief and is partially demetallised to leave clear and opaque regions, the arrangement being such that the metals form an underlying metallic pattern, whereby the optically variable effect can be viewed against a background defined by the metals which cause the rainbow diffraction spectrum of the optically variable effect generating structure to be spatially modulated by the reflective hue of the underlying pattern formed by the metals."

VII. Documents:

D4: EP-A-0 400 902; (same patent family as E9)
D5: US-A-5,145,212;
E2: WO-A-91/06925;
E8: EP-A-0 420 261;
E9: DE-T-69 008 236; (same patent family as D4)
E10: "*Optical Document Security*", Rudolf van Renesse, 2nd edition, 1998, ISBN 0-89006-982-4, "*Chapter 10.4.3 Currency*", pages 240 and 241;
E11: US-A-5,757,521;
E13: WO-A-97/19820.

VIII. The arguments of the appellants I and II in the written and oral proceedings can be summarised as follows:

There are no objections to the New Main Request being admitted into the proceedings.

Amended claim 1 according to the New Main Request does not meet the clarity requirements because of the contradiction between the requirements that the metal

layer nearer the substrate is on the surface relief and that the metals form an *underlying* metallic pattern.

The skilled person cannot distinguish a spatial modulation according to amended claim 1 from the spatial modulation caused by the diffraction spectrum of the optically variable effect generating structure.

For these reasons, amended claim 1 is not clear.

The feature of claim 1

"which cause the rainbow diffraction spectrum of the optically variable effect generating structure to be spatially modulated by the reflective hue of the underlying pattern formed by the metals"

was selectively taken out of the context of the original disclosure (page 1, lines 30 to 36) because it was only disclosed in the context of *"using reflection enhancing materials with distinctly differing appearances (such as copper and aluminium)"*. Without this feature claim 1 was generalised in a manner which constitutes added subject-matter.

The feature that it is the *metals* which cause the rainbow diffraction spectrum of the optically variable effect generating structure to be spatially modulated constitutes further added subject-matter.

The feature of claim 1 *"the metal layer nearer the substrate is on the surface relief"* is not originally disclosed in the context of *"two different reflection enhancing materials which are metals on the same side of the substrate as the surface relief"* and thus constitutes still further added subject-matter.

The following features are missing from claim 1 with respect to the original disclosure of the embodiment of figure 2: firstly, the thickness of the dielectric layer, and, secondly, that the second metal layer follows the contours of the surface relief. Therefore claim 1 comprises yet more added subject-matter.

The claims were modified during the opposition proceedings and appellant II filed document E13 with the grounds of appeal, because it is relevant for the novelty of claim 1. Document E13 should be admitted into the proceedings.

Layer 48 in figure 12 of document E13 should be considered as the substrate in the sense of the patent in suit (B1-publication, paragraph [0027], figure 2). The base layer 8 provides the spatial modulation of rainbow diffraction spectrum of the optically variable effect of relief structure 15. The base layer is made of Al (page 17, line 3) and the cover layer can be Au or Cu (page 17, lines 24 and 25, claim 15). In consequence, the subject-matter of claim 1 lacks novelty.

The claims were modified during the opposition proceedings and appellant I filed document D5 with the grounds of appeal, because it is relevant for determining the inventive step of claim 1. Document D5 should be admitted into the proceedings.

Inventive step - Documents D5 and D4

Document D5, filed by appellant I with the grounds of appeal, is relevant for the novelty of claim 1 and should be admitted into the proceedings.

Figure 12 of document D5 constitutes the closest prior art and discloses two spaced apart reflective layers 123 and 129 for which aluminum is usually employed. The rainbow diffraction spectrum of the optically variable effect generating structure on layer 119 is modulated by the reflective hue of the underlying pattern formed by the metals 123 and 129.

The subject-matter of claim 1 only differs therefrom in that two different metals are used for metal layers 123 and 129. The technical effect of this difference is to further enhance the security of the device.

Figure 11 of document D4 discloses a security strip with areas of two differently coloured metals in different layers 12, 14 along the length of the security strip. These make the security strip more difficult to forge in particular with respect to achieving the correct register.

It is therefore obvious for the skilled person to further improve the security of the device of document D5 by using two differently coloured metals for the layers 123 and 129 and thereby immediately arriving at the subject-matter of claim 1 without requiring an inventive step.

Inventive step - Document E9 in combination with either of documents E10 or E8

Examples 3 and 4 (page 13, paragraph 2 to page 15, paragraph 1) of document E9 disclose a security thread comprising two different reflecting metals (12, Al and 14, Cu) disposed in different spaced apart layers (figures 9 and 10). When this security thread is viewed, both highly reflective Al and Cu are visible.

Textbook extract E10 (page 241, second paragraph) and document E8 (column 2, lines 46 to 48) each disclose the existence of holographic security threads.

The skilled person, seeking to further increase security, would to combine the security thread according to document E9 with a holographic security thread according to textbook E10 (or document E8). The effect of this being that the two different coloured metals form an underlying metallic pattern, whereby the optically variable effect can be viewed against a background defined by metals. This causes the rainbow diffraction spectrum of the optically variable effect generating structure to be spatially modulated by the reflective hue of the underlying pattern formed by the metals. Therefore, the subject-matter of claim 1 lacks an inventive step.

Inventive step - Document E13

Figure 12 of document E13 constitutes the closest prior art. Since both relief structures 15 and 10 produce optical-diffraction effects (page 14, lines 11 to 14) and the carrier foil 3 permits the base layer 8 to be seen through the gaps 49 in the cover layer 9 (page 13, lines 19 to 23) it is obvious for the skilled person that the rainbow diffraction spectrum of the optically variable effect generating structure 15 may be modulated by the reflective hue of the underlying pattern formed by the metals 9 and 8. Therefore, the subject-matter of claim 1 lacks an inventive step.

IX. The arguments of the respondent in the written and oral proceedings can be summarised as follows:

The New Main Request should be admitted into the proceedings, because it only involves omitting some of the objected claims and thereby avoids introducing any new issues.

There is no contradiction between the feature that the metal layer nearer the substrate is *on the surface relief* and the feature concerning the arrangement being such that the metals form an *underlying* metallic pattern. Furthermore, the skilled person is familiar with the spatial modulation inherent in the diffraction spectrum of an optically variable effect generating structure and can distinguish an additional spatial modulation induced by the "*pattern formed by the metals*". Thus claim 1 is clear.

When read in its entirety the last feature of claim 1 relates the rainbow diffraction spectrum spatial modulation to the pattern formed by the metals, as is disclosed in the last paragraph of page 1 of the application as filed. It is already implicit in claim 1 that the metals have to have "*distinctly differing appearances*" to provide the additional spatial modulation of the rainbow diffraction spectrum of the optically variable effect generating structure. Similarly, figure 2 provides a basis for the feature that "*the metal layer nearer the substrate is on the surface relief*". The thickness of the dielectric in the embodiment of figure 2 was only disclosed in the context of particular examples. The skilled person knows that it is necessary that the second metal layer follows the contours of the surface relief for the rainbow diffraction spectrum of the optically variable effect generating structure to

be modulated by the hue of the second metal. Thus, claim 1 does not include added subject-matter.

What is now claim 1 was already filed three years before the oral proceedings before the opposition division. The appellants thus had ample time to file document E13 during the opposition proceedings. Document E13 is late filed and should not be admitted into the proceedings.

Since in the embodiment of figures 12 to 14 the pattern on the underside 4 is discernible through the transparent surfaces 49, there is no reflection from the relief structure 15 at the transparent surfaces 49. In consequence, there is no optically variable effect from relief structure 15 at these transparent surfaces 49 and none is viewable against a background defined by the base metal 8. Thus the rainbow diffraction spectrum of the optically variable effect generating structure is only modulated by the reflective hue of the metal cover layer 9. Therefore, there is no spatial modulation of the rainbow diffraction spectrum by a pattern formed of two metals. The subject-matter of claim 1 is new with respect to document E13.

Inventive step - Documents D5 and D4

Document D5 is late filed, less relevant than document E13 and should not be admitted into the proceedings for the reasons which were already advanced in the context of document E13.

The rainbow diffraction spectrum of the optically variable effect generating structure on layer 119 of figure 12 of document D5 is only modulated by the reflective hue of the opaque pattern formed by the one metal 123, because, as is explicitly stated (column 11, lines 58

to 63), there is no optically variable effect in the gaps between metallisation 123. In consequence, the hue of the underlying second metal layer 129 cannot modulate an effect which is absent in the gaps between the opaque metallisation 123. Even if the skilled person were to seek to apply the teachings of documents D5 and D4 in combination, he would not necessarily seek to integrate two different metals into the device of document D5 which requires hindsight knowledge of the invention; a juxtaposition of the respective devices of documents D4 and D5 would suffice. The subject-matter of claim 1 is not rendered obvious by documents D5 and D4.

Inventive step - Document E9 in combination with either of documents E10 or E8

Even if the skilled person seeking to further increase security were to combine the security thread according to document E9 with a holographic security thread according to textbook E10 or document E8, then the holographic element according to textbook E10 or document E8 and the metallic patterns of document E9 would be juxtaposed along the security thread. There is no motivation for the skilled person to integrate these two security features with one another, such that the optically variable effect generating structure has an underlying pattern formed by the two metals such that its rainbow diffraction spectrum is spatially modulated by the reflective hue of the pattern formed by the two metals. There is no teaching in either document that this might be achieved and there is no teaching in terms of which layer has to be disposed where. The subject-matter of claim 1 is not rendered obvious by documents E9 and E10 or E8.

Inventive step - Document E13

The arguments already advanced in the context of the novelty discussion with respect to Figure 12 of document E13 still apply and it is not obvious to modify the device to arrive at the subject-matter of claim 1 without hindsight. Therefore, the subject-matter of claim 1 is not obvious when starting from the device of document E13.

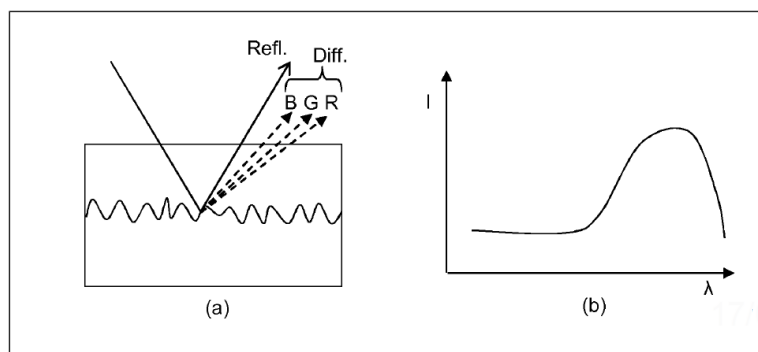
Reasons for the Decision

1. *Clarity of the amendments*

- 1.1 The feature "*wherein the metal layer nearer the substrate is on the surface relief*" (introduced into claim 1 by amendment) discusses the location of the "*the metal layer nearer the substrate*". Even if the term "*on*" were to be understood as implying "*above*" (as advanced by the appellant but which is contested by the respondent) this does not lead to a contradiction with the subsequent feature "*the arrangement being such that the metals form an underlying metallic pattern, whereby the optically variable effect can be viewed against a background defined by the metals*" (also introduced into claim 1 by amendment), because this feature concerns the "*arrangement*" as a whole and further identifies the orientation of the "*arrangement*" with respect to the term "*underlying*" in terms of the viewing direction, as follows: "*the optically variable effect can be viewed against a background defined by the metals*". Since the two separate features refer to different entities, the potential implied relative orientation is not necessarily the same and thus there is no contradiction.

1.2 Furthermore, as explained by the respondent, the skilled person is familiar with the spatial modulation inherent in the diffraction spectrum of an optically variable effect generating structure and can distinguish an additional spatial modulation induced by the "the reflective hue of the underlying pattern formed by the metals" (pages 3 and 4 of the response to the appeals dated 17 September 2013:

"The response of a diffraction grating or other optically variable effect generating structure to incident light involves at least two different physical effects: reflection and diffraction. To illustrate this, a schematic cross section through a conventional metallised hologram is shown below in Figure (a):



At the surface relief, the incident light is both reflected and diffracted. The reflected ray (designated "Refl." in Figure (a)) takes on the colour of the underlying reflective material, e.g. red/orange in the case of copper. The diffractive rays (indicated by broken lines and designated "Diff." in Figure (a)) are returned to the observer at diffraction angles which depend on the wavelength of the light (note that, for clarity, Figure (a) shows only the first order diffraction rays). For example, the red (R), green (G) and blue (B) rays are illustrated in Figure (a) and it will be seen that these are spatially separated. Hence, for

white incident light, the diffracted light will be separated into its component colours and appear as a "rainbow" or "spectrum" of multiple colours spread out over a finite area. This is referred to on page 1, line 34 of the patent.

If the materials forming the surface relief are optically transparent to all (visible) wavelengths, the relative intensity of each of the diffractive rays will be the same as the relative intensities of the corresponding wavelengths in the incident ray. However, the diffracted intensity of each colour is dependent on the absorbent properties of the materials intimately forming the surface relief, and hence where the surface relief comprises a metal reflective layer (for example), the absorbent characteristics of that metal will change the intensity of each diffracted ray. For instance, if the metal absorbs blue light more strongly than red then the blue diffracted light ray will have a weaker intensity than the red ray. The result is a diffraction spectrum characterised by a variation of intensity (I) with wavelength (λ), and a schematic example of such a diffraction spectrum is shown in Figure (b) above").

Since this physical explanation was not contested by the appellants, the board has no reasons not to accept it.

1.3 In consequence, the amended subject-matter of claim 1 is clear (Article 84 EPC 1973).

2. *Added subject-matter*

2.1 The last two features at the end of claim 1 read "...
whereby the optically variable effect can be viewed

against a background defined by the metals which cause the rainbow diffraction spectrum of the optically variable effect generating structure to be spatially modulated by the reflective hue of the underlying pattern formed by the metals".

The reading advanced on behalf of one of the appellants according to which each of *"the metals [...] cause the rainbow diffraction spectrum of the optically variable effect generating structure to be spatially modulated"* is based on an out of context selection of wording straddling the last two features which is incompatible with these features when read as a whole in the context of claim 1: When read in its entirety the last feature of claim 1 relates the rainbow diffraction spectrum modulation to the *"pattern formed by the metals"*, as is disclosed in the last paragraph of page 1 of the application as filed.

2.2 Page 1, lines 30 to 36 of the application as filed discloses :

"For example, by using reflection enhancing materials with distinctly differing appearances (such as copper and aluminium) it is possible to form optically variable images, such as holograms, which will have their "rainbow" diffraction spectrum spatially modulated by the reflective hue of the underlying metallic pattern, to create a new and secure visual effect".

The contested feature of claim 1 *"which cause the rainbow diffraction spectrum of the optically variable effect generating structure to be spatially modulated by the reflective hue of the underlying pattern formed by the metals"* is only a functional feature which describes an effect to be achieved instead of defining

the device-features necessary for achieving this effect. The requirement "*wherein the metals are provided in respective different layers [...], the metal layer nearer the substrate is on the surface relief and is partially de-metallised to leave clear and opaque regions, the arrangement being such that the metals form an underlying metallic pattern, whereby the optically variable effect can be viewed against a background defined by the reflection enhancing materials metals*" implies that the colour of the light reflected from the metals further alters (i.e. modulates) the colours of the already spatially modulated rainbow diffraction spectrum (which is already spatially modulated due to "rainbow" diffraction) - also see the explanation provided in section 1.2 above.

The skilled person will thus recognise that the example of metals of "*distinctly differing appearances (such as copper and aluminium)*" are not necessary for this modulation effect: The expression "*to be spatially modulated by the reflective hue of the underlying pattern formed by the metals*", on the one hand, is not incompatible with, but on the other hand, does not necessarily require, that an *additional* spatial modulation by metals of "*distinctly differing appearances (such as copper and aluminium)*" occurs on the surface relief (by means of differently coloured metals and/or uncoated regions). However, it is implicit in this feature, that the "*reflective hue of the [...] metals*" has to differ between the two metals. Whether such a difference is considered to be "*distinctly*" is a subjective issue which does not affect the resulting additional technical difficulty for a forger to have to provide the two different metals: As explained by the respondent the invention of the patent in suit requires a spatial aspect to the modulation *in addition* to that of the

"rainbow diffraction spectrum of the optically variable effect generating structure" i.e. to be caused by the reflective coating obtained by means of different metals (pages 4 and 5 of the response to the grounds of appeal "In the present invention, ... the surface relief is presented with different metals in different spatial locations, the intensity of the various diffracted light components will vary in a spatial manner. This is what is meant by spatial modulation of the diffraction spectrum").

Thus, the feature *"using reflection enhancing materials with distinctly differing appearances (such as copper and aluminium)"* is not necessary for the subject-matter as claimed: i.e. by leaving out this feature, Article 123(2) EPC has not been contravened.

- 2.3 It was not contested by the appellants, that it is part of the common general knowledge of the skilled person that a common form of security device is formed *"as relief structures in a substrate, which is then provided with a reflective coating, for example a continuous or partial metallic layer to enhance the replay of the device"* (application as filed, page 1, lines 7 to 12). Similarly, when the board considered that it is implicit for the skilled person - from such common general knowledge when considering a security device according to the invention, when taking into account the disclosure as a whole (and in particular figure 2 as filed) - that *"the metal layer nearer the substrate is on the surface relief"*, the appellants did not further contest this issue.

The original disclosure of the embodiment of figure 2 (description as filed, page 7, line 29 to page 8, line 14) only indicates the thickness of the dielectric

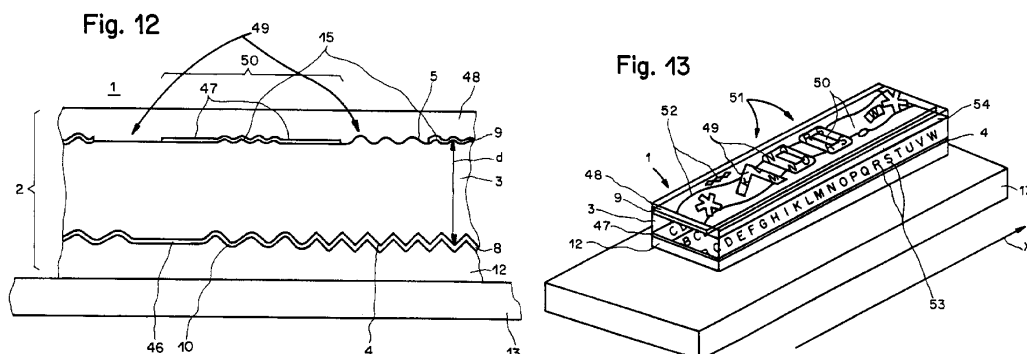
layer for particular examples (i.e. "typical") materials (200nm for zirconium dioxide or zinc sulphide; 50nm for silicon). Furthermore, the cited passage does not explicitly disclose that the second metal layer must follow the contours of the surface relief.

2.4 In consequence, the subject-matter of claim 1 meets the requirements of Article 123(2) EPC.

3. Novelty - Document E13

3.1 Document E13 was filed with the grounds of appeal. It constitutes the reaction of appellant II to the opposition decision and is admitted into the proceedings.

3.2 Figures 12 to 14 of document E13 (page 13, lines 14 to page 14 last line) disclose an optical information carrier 1 with a transparent carrier foil 3.



Formed in the underside 4 and the top side 5 of the transparent carrier foil 3 are surface regions with different, microscopically fine relief structures 10 and 15 respectively of optical gratings which can be separated by smooth regions 46 and 47 respectively. The cover layer 9 is not transparent in relation to visible light and can be made of Au or Cu (page 17, lines 24 and 25, claim 15). The cover layer 9 contains visually easily discernible gaps 49 which are separated by surface portions 50 so that the regions of the underside 4, which are under the gaps 49, are visible. The

base layer 8 is made of Al (page 17, line 3). The relief structure 15 can be levelled off by means of a protective lacquer layer 48 in order to protect the relief structure 15 from mechanical damage.

A surface relief 15 which might be present in the gaps 49 in the non transparent cover layer 9 cannot give rise to an optically variable effect rainbow diffraction effect, because this would prevent the regions of the underside 4, which are under the gaps 49, from being visible through the gaps 49, contrary to what is disclosed with respect to the embodiment of figure 12. This absence of a optically variable effect is achieved when the refractive index of the protective lacquer layer 48 is the same as that of the transparent carrier foil 3.

In consequence, the optically variable effect rainbow diffraction effect of the surface relief 15 is only visible in the surface portions 50 of the metal cover layer 9; i.e. the optically variable effect can be viewed against a background defined by a **single** metal which causes the rainbow diffraction spectrum of the optically variable effect generating structure to be modulated by the reflective hue of the underlying pattern formed by that metal. Since the modulation by the hue of single metal is the same across the pattern formed by the surface portions 50, the rainbow diffraction spectrum of the optically variable effect generating structure is not **spatially** modulated.

Therefore, the subject-matter of claim 1 differs from the embodiment of figures 12 to 14 of document E13, in that the optically variable effect can be viewed against a background defined by the metals, which cause the rainbow diffraction spectrum of the optically

variable effect generating structure to be **spatially** modulated by the reflective hue of the underlying pattern formed by the metals (emphasis added by the board).

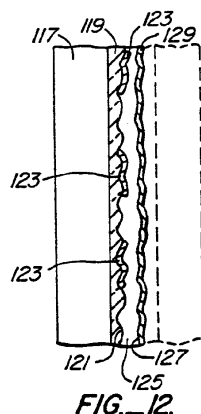
3.3 Therefore, the subject-matter of claim 1 is new with respect to document E13.

4. *Inventive step*

4.1 Documents D5 and D4

4.1.1 Document D5 was filed with the grounds of appeal. It constitutes the reaction of appellant I to the opposition decision and is admitted into the proceedings.

4.1.2 Figure 12 of document D5 constitutes the closest prior art and discloses two spaced apart reflective layers 123 and 129 for which aluminum is usually employed (column 4, lines 42 to 45; column 6, lines 24 to 27 and 49 to 50). The reflective layers form part of respective holograms whereby the second hologram can be viewed through the first one, each hologram being visible while the other is not (column 10, lines 34 to 44 and 53 to 55; column 11, lines 36 to 63).



4.1.3 Since the reflective, opaque material is applied to the surface 121 in a discontinuous pattern, leaving reflective material regions 123 (column 11, lines 45 to 47)

and the layers 119 and 125 have the same refractive indices (which eliminates any reflection from the first hologram surface relief pattern 121 in regions that are not coated by a reflected material 123 - column 11, lines 58 to 63), the rainbow diffraction spectrum of the optically variable effect generating structure on layer 119 is only modulated by the reflective hue of the opaque pattern formed by the one metal 123, because there is no optically variable effect in the gaps between metallisation 123. In consequence, the hue of the underlying second metal layer 129 cannot modulate an effect which is absent in the gaps between the opaque metallisation 123.

- 4.1.4 In consequence, the optically variable effect can be viewed against a background defined by a **single** metal which causes the rainbow diffraction spectrum of the optically variable effect generating structure to be modulated by the reflective hue of the underlying pattern formed by that metal. Since the modulation by the hue of a single metal is the same across the pattern formed by the metallisation 123, the rainbow diffraction spectrum of the optically variable effect generating structure is not **spatially** modulated.

Therefore, the subject-matter of claim 1 differs from the embodiment of figure 12 of document D5, in that the optically variable effect can be viewed against a background defined by the **metals**, which cause the rainbow diffraction spectrum of the optically variable effect generating structure to be **spatially** modulated by the reflective hue of the underlying pattern formed by the **metals** (emphasis added by the board).

- 4.1.5 These differences make the security device more difficult to forge. The resulting objective problem is to

further improve the security of the device of document D5.

- 4.1.6 Document D4 concerns a security thread and teaches that its security can be enhanced by "*comprising adjacent bright shiny areas in contrasting colours along its length*" (column 3, lines 5 to 14): This means "*the counterfeiter must apply not one but at least two reflective materials of different colours*" and the security is enhanced, because "*there will be some misregister between the simulated aluminium and gold bars which will be readily apparent to the naked eye, particularly where there is misregister in the transverse direction at right angles to the security element*" (column 2, line 41 to column 3, line 25).
- 4.1.7 This effect does not necessarily arise in the context of a security element such as the one disclosed in document D5 which is not necessarily in the form of an elongate security thread. Document D4 thus does not provide any motivation for the skilled person to use different metals for the reflective layers of the security element of figure 12 of document D5.
- 4.1.8 Furthermore, even if the skilled person were to seek to apply the teachings of documents D5 and D4 in combination, he would not necessarily seek to integrate two different metals into the device of document D5 since a juxtaposition of the respective devices of documents D4 and D5 would suffice to solve the above objective problem.
- 4.1.9 In consequence, the subject-matter of claim 1 is not rendered obvious by documents D5 and D4.

4.2 Document E9 in combination with either of documents E10 or E8

Document E9 belongs to the same patent family as document D4 and discloses, as already discussed with respect to document D4, a security thread comprising two different reflecting metals (12, Al and 14, Cu) disposed in different spaced apart layers (figures 9 to 11). Textbook extract E10 (page 241, second paragraph) and document E8 (column 2, lines 46 to 48) both disclose the existence of holographic security threads.

Even if the skilled person seeking to further increase security were to combine the security thread according to document E9 with a holographic security thread according to textbook E10 or document E8, then this problem is solved by juxtaposing a holographic element according to textbook E10 or document E8 and the metallic patterns of document E9 along the length of the security thread. There is no motivation for the skilled person to seek to integrate these two security features with one another, such that the optically variable effect generating structure has an underlying pattern formed by the two metals such that its rainbow diffraction spectrum is spatially modulated by the reflective hue of the pattern formed by the two metals. In addition there is no teaching in any of the documents that this might be achieved or of which layer has to be disposed where. The subject-matter of claim 1 is therefore not rendered obvious by documents D9 and E10 or E8.

4.3 Inventive step - Document E13

Figure 12 of document E13 constitutes an alternative closest prior art. The subject-matter of claim 1

differs therefrom in that the optically variable effect can be viewed against a background defined by the metals, which cause the rainbow diffraction spectrum of the optically variable effect generating structure to be **spatially** modulated by the reflective hue of the underlying pattern formed by the metals (emphasis added by the board - see section 3.2 above).

Since there is no hint in document E13 or in documents E2, D5, E11 to modify the device such that the rainbow diffraction spectrum of optically variable effect generating structure 15 may be modulated by the reflective hue of an underlying pattern formed by the metals 9 and 8, it is not obvious to modify the device to arrive at the subject-matter of claim 1 without hindsight. Therefore, the subject-matter of claim 1 is not obvious when starting from the device of document E13.

- 4.4 In consequence, the subject-matter of claim 1 according to the New Main Request is not rendered obvious by the documents advanced in the appeal proceedings.
5. The respondent filed a description adapted to the New Main Request and there were no objections from the appellants.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent as amended in the following version:
Description:
 - Pages 2 to 5 of the amended patent description, "Main Request", received during the oral proceedings of 9 December 2016;
 - Page 13 of the patent specification.Claims:
 - Nos. 1 to 17 of the New Main Request received during the oral proceedings of 9 December 2016.Drawings:
 - Figures 1 to 7 of the patent specification.

The Registrar:

The Chairman:



D. Meyfarth

M. Poock

Decision electronically authenticated