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**Datasheet for the decision  
of 15 June 2021**

**Case Number:** T 0282/18 - 3.4.02

**Application Number:** 08155661.5

**Publication Number:** 1990210

**IPC:** G02B5/04, G02B5/18, G02B5/28,  
B42D25/324, B42D25/36,  
B42D25/373

**Language of the proceedings:** EN

**Title of invention:**  
Structured surfaces that exhibit color by rotation

**Patent Proprietor:**  
Viavi Solutions Inc.

**Opponent:**  
Giesecke+Devrient Currency Technology GmbH

**Relevant legal provisions:**  
EPC Art. 54(1), 56  
RPBA Art. 12(4)

**Keyword:**  
Admission of document filed in appeal (no)  
Novelty and inventive step (main request: yes)

**Decisions cited:**

T 0085/93, T 1641/11



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Case Number: T 0282/18 - 3.4.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.02**  
**of 15 June 2021**

**Appellant:** Giesecke+Devrient Currency Technology GmbH  
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**Respondent:** Viavi Solutions Inc.  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
29 November 2017 concerning maintenance of the  
European Patent No. 1990210 in amended form.**

**Composition of the Board:**

**Chairman** B. Müller  
**Members:** F. J. Narganes-Quijano  
C. Kallinger

## Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the interlocutory decision of the opposition division finding European patent No. 1990210 as amended according to the main request filed on 23 March 2016 to meet the requirements of the EPC.

The opposition filed by the appellant against the patent as a whole was based on the grounds for opposition of lack of novelty and lack of inventive step (Article 100(a), together with Articles 52(1), 54 and 56 EPC).

- II. Among the documents cited during the first-instance proceedings, the following documents were referred to by the parties during the appeal proceedings:

D3: WO 2006/018232 A1

D4: WO 2007/079851 A1

D5: WO 2007/093300 A2

D6: WO 03/095657 A2.

In its decision the opposition division held in respect of the main request *inter alia* that

- claim 1 did not benefit from the second of the claimed priorities and documents D4 and D5 constituted state of the art within the meaning of Article 54(2) EPC, and

- the subject-matter of independent claims 1 and 15 was new over document D3 and involved an inventive step over a combination of document D3 with document D6, and over a combination of any of documents D4, D5 and D6 with document D3.

III. With the statement setting out the grounds of appeal the appellant submitted the following document:

D7: "Optical Document Security", R. L. van Renesse; Artech House, 3rd edition, 2005; front page, bibliographic page, page xvii, and chapter 7 (pages 223 to 264).

IV. Oral proceedings before the board were held on 15 June 2021.

The appellant requested that the decision under appeal be set aside and the patent be revoked.

The respondent (patent proprietor) requested:

- that the appeal be dismissed and the patent be maintained in its amended form according to the main request filed on 23 March 2016; or

- in the alternative, should the patent as maintained by the opposition division be found by the board not to meet the requirements of the EPC, that the patent be maintained with the claims amended according to one of auxiliary requests 1 to 5 filed on 23 March 2016; or

- as a further auxiliary request in the event that any one or more dependent claims should be found by the board not to meet the requirements of the EPC, that the patent be maintained with the claims as granted but with said one or more dependent claims deleted and the remaining claims renumbered accordingly.

V. The wording of claim 1 of the main request - with the feature labelling 1.1 to 1.7 used by the appellant during the proceedings being inserted therein by the board - is as follows

"[1.1] An optically variable device comprising [1.2] a substrate having an array of structures formed thereon, therein or supported thereby, [1.3] wherein the each of the structures form a pyramidal structure and [1.4] wherein each pyramidal structure has at least three slanted faces and [1.5] wherein more than one color seen when viewing the pyramids varies [1.6] as the substrate is rotated at least 30 degrees about an axis orthogonal to the substrate, **characterized in that** [1.7] said structures are coated with an optically variable color-shifting coating."

Independent claim 15 of the main request reads as follows:

"A method of providing a device that exhibits color by rotation comprising:

a) providing a substrate having an array of small pyramidal or inverted pyramidal structures formed therein or thereon wherein the pyramidal structures are sized so that they can only be discerned with the human eye with the aid of magnification and wherein each pyramidal structure has at least three slanted faces; and,

b) coating the pyramidal or inverted pyramidal structures with a multilayer optically variable color shifting coating such that more than one color seen when viewing the pyramids varies as the substrate is rotated at least 30 degrees about an axis orthogonal to the substrate."

The main request includes dependent claims 2 to 14 directed to particular embodiments of the optically variable device defined in claim 1.

## **Reasons for the Decision**

1. The appeal is admissible.
  
2. *Priority issues and documents D4 and D5*

It was undisputed by the parties that document D4 (published on 19 July 2007) and document D5 (published on 23 August 2007) constitute state of the art within the meaning of Article 54(2) EPC for the claimed invention - implying, in particular, that the respondent conceded that the invention defined in the claims of the requests on file did not benefit from the first of the priorities claimed in the patent and dated 7 May 2007.

In the decision under appeal the opposition division held that claim 1 did not benefit from the second of the claimed priorities dated 31 October 2007. However, the second of the claimed priorities was filed after the publication of both documents D4 and D5 and, consequently, the question of whether or not the claimed invention benefits from the second of the priorities has no effect on the status of documents D4 and D5 as state of the art. In addition, the mentioned question has no effect on the issues considered in the present appeal proceedings and relating to the allowability of the present main request.

In view of these considerations, there is no need for the board to take a decision on the question disputed

by the parties of whether or not the claimed invention benefits from the second of the claimed priorities.

3. *Document D7 - Admission*

3.1 With the statement of grounds of appeal the appellant filed document D7 as evidence of the properties of color-shifting coatings, and submitted in support of its admissibility into the proceedings that document D7 constituted a standard textbook in the technical field of optical security features and therefore evidence of the common general knowledge in this field. The appellant further submitted with reference to decision T 1641/11 that such evidence could be submitted at any time, and that the document was filed in reaction to the appealed decision.

3.2 The board first notes that there is no element in the decision under appeal that would justify filing, in reaction thereto, document D7 in the appeal proceedings. In particular, the appellant submitted that they were surprised by the opposition division's conclusion in the decision under appeal that the optical variable layer disclosed in document D3 did not constitute an optically variable color-shifting coating as defined in feature 1.7 of claim 1, and that document D7 was filed in reaction thereto. However, as acknowledged by the appellant in the statement of grounds of appeal (sentence bridging pages 3 and 4), feature 1.7 of claim 1 already turned out to be essential during the first-instance opposition proceedings and, therefore, the appellant, during the first-instance proceedings, already had the opportunity to comment on - and, in particular, to file new evidence in respect of - the technical significance of



the feature under consideration. It follows that document D7 could - and should - already have been presented during the first-instance proceedings within the meaning of Article 12(4) RPBA 2007 (which applies in the present case according to Article 25(2) RPBA 2020).

As regards decision T 1641/11 referred to by the appellant, the board notes that this decision concerned an *ex parte* case in which the applicant, with the statement of grounds of appeal, filed two documents as evidence of common general knowledge and that these two documents were admitted into the proceedings by the board deciding on the case (see decision T 1641/11, point 3.6 of the reasons, second and third paragraphs, together with point III of the summary of facts). However, the board admitted the documents in the exercise of its discretion and, contrary to the appellant's submissions, there is no support in the mentioned decision that evidence of common general knowledge submitted by a party at any time shall be admitted into the proceedings - let alone into contentious *inter partes* appeal proceedings. In addition, as submitted by the respondent with reference to decision T 85/93 (point 1.1 of the reason), evidence of common general knowledge, like any other evidence in support of a party's case, should be filed at an early stage of the proceedings before the opposition division, and may be rejected as inadmissible in the board's discretion if filed for the first time during appeal proceedings.

3.3 In view of these considerations, and since according to Article 12(4) RPBA 2007 the board has discretion not to admit facts and evidence which could have been presented in the first instance proceedings and, in

addition, according to Article 12(2) RPBA 2020 (which applies in the present case according to Article 25 RPBA 2020) "a party's appeal case shall be directed to the requests, facts, objections, arguments and evidence on which the decision under appeal was based", the board decided, in the absence of reasons for doing otherwise, not to admit document D7 into the proceedings.

4. *Main request - Novelty over document D3*

4.1 The appellant submitted that the subject-matter of independent claims 1 and 15 of the main request was, contrary to the opposition division's view, not new in view of document D3. The appellant submitted, in particular, that the embodiment disclosed in document D3 with reference to Fig. 7 and 14, in view of the disclosure relating to Fig. 37, 40 and 48 and the common general knowledge, anticipated the claimed subject-matter.

4.2 The board notes that, while the combination of features 1.1 to 1.4 of claim 1 is derivable from the disclosure of document D3 relating to Fig. 7a and 7b, together with Fig. 14 to 16, and involving a device comprising a substrate having an array of pyramidal structures (see, in particular, page 27, lines 5 to 21) as defined in features 1.1 to 1.4 of claim 1, the disclosure of document D3 relating to Fig. 37 and 40 referred to by the appellant (page 38, second paragraph, and paragraph bridging pages 38 and 39) pertains to a different series of embodiments all of them involving a substrate having an array of structures shaped in the form of a spherical dome (see page 37, lines 22 to 28, and Fig. 48) and having color varying properties. Therefore,

already for this reason, the appellant's submissions that the combination of features 1.1 to 1.4 and features 1.5 and 1.6 of claim 1 is disclosed in document D3 is not persuasive.

It is also noted in respect of features 1.5 and 1.6 of claim 1 that in document D3 there are color effects upon a rotation of the substrate of 180 degrees about an axis orthogonal to the substrate and that the color effects involve a variation of one color upon the mentioned rotation (page 7, second paragraph; page 8, lines 26 to 29; page 10, lines 9 to 13; and page 27, lines 18 to 21), but that, contrary to the appellant's submissions, there is no direct and unambiguous disclosure of a variation of "more than one color" upon a rotation of the substrate as required by feature 1.5 of claim 1.

- 4.2.1 As regards the question of whether the color variation upon a rotation of the substrate of 180 degrees disclosed in document D3 corresponds to a color variation "as the substrate is rotated at least 30 degrees about an axis orthogonal to the substrate" as required by feature 1.6 of claim 1, the board notes that this claimed feature is interpreted
- by the appellant and by the opposition division in the sense that the color variation takes place upon a rotation of the substrate of "at least 30 degrees", i.e. after rotating the substrate an angle equal to, or bigger than, 30 degrees, with the consequence that the color variation after a rotation of 180 degrees disclosed in document D8 would also take place "as the substrate is rotated at least 30 degrees" as claimed, and
  - by the respondent in the sense that the color variation takes place as the substrate is being

rotated, whereby a color variation has taken place when the substrate has been rotated by "at least 30 degrees" or, as submitted by the respondent, "by as little as 30 degrees" (patent specification, paragraph [0012], together with Fig. 2 to 5, 7 and 9 and the corresponding description), therefore implying, contrary to document D3, that a color variation already takes place at least in a rotation range between 0 to 30 degrees.

As will be apparent below (see points 4 and 5), however, in the board's opinion the subject-matter of the claims of the main request is new and involves an inventive step over the documents considered by the appellant irrespective of whether feature 1.6 of claim 1 is construed as suggested by the appellant and held by the opposition division, or as suggested by the respondent. For this reason, there is no need for the board to take a decision on this issue.

4.2.2 The appellant also submitted that feature 1.6 was arbitrary and non-essential, and that for this reason the feature should not be considered in the assessment of novelty. The board, however, cannot follow this argument, especially in view of the possible technical significance of the feature in respect of the main technical effect of the claimed device relating to the variation of more than one color upon a rotation of the substrate about an axis orthogonal to the substrate.

4.2.3 Furthermore, the appellant submitted that the combination of feature 1.7 with the remaining claimed features was also disclosed in document D3 in view of claim 25 and the the portion of the description of D3 relating to Fig. 48.

However, the disclosure of document D3 on page 43, first paragraph, relates to the embodiment of Fig. 48 also involving a substrate having an array of structures shaped in the form of a spherical dome (Fig. 48, together with page 42, lines 15 to 28), and not to a substrate having an array of pyramidal structures as it is the case with the embodiment disclosed by reference to Fig. 7a, 7b and 14 to 16. In addition, there is no indication in document D3 that the disclosure on page 43, first paragraph, is also to be applied to a substrate having an array of pyramidal structures.

In addition, the disclosure in the paragraph bridging pages 12 and 13 and in dependent claim 25 of document D3 also referred to by the appellant only includes in general terms the additional provision of a metallic layer or of a translucent optical variable layer, without further details of the specific characteristics of these layers, and in particular of the "optical variable" characteristics of the translucent optical variable layer. It is noted in this respect that the "optical variable" characteristics of a layer may refer to the variable color characteristics of the layer but also to other optical variable characteristics such as reflectivity, light polarization properties, light scattering, etc., and that there is no disclosure in the paragraph bridging pages 12 and 13 and in dependent claim 25 of document D3 that the metallic layer or the translucent optical variable layer specifically had color variable properties.

For these reasons, document D3 does not disclose the combination of features 1.1 to 1.4 with feature 1.7 of claim 1.

4.2.4 During the oral proceedings the appellant submitted that the color effects of the claimed device resulted from the arrangement constituted by the pyramids and the layer applied thereon (patent specification, paragraphs [0011] and [0012]), that document D3 already disclosed an arrangement constituted by an optical variable layer on an array of pyramids, that the document specifically considered the color-varying properties of the optical variable layer (page 7, second paragraph), and that for these reasons the color effects of the claimed device were already implicitly present in the device of document D2.

However, as already noted above (see, in particular, points 4.2 and 4.2.3 above) there is no disclosure in document D3 that the optical variable layer formed on the pyramids is specifically of the variable color-shifting type (feature 1.7 of claim 1), let alone that the layer is designed such that more than one color varies upon rotation of the substrate about an axis orthogonal to the substrate as claimed (feature 1.5 of claim 1), and for these reasons the color effects of the claimed device are not - in any case, not directly and unambiguously - derivable from the disclosure of document D3.

4.2.5 In view of these considerations, the board is of the opinion that - independently of the issue relating to the interpretation of feature 1.6 of claim 1, see point 4.2.1 above - the device defined in claim 1 is new over the disclosure of document D3 involving pyramidal structures at least in that document D3 fails to disclose features 1.5 and 1.7.

4.3 As regards independent claim 15 amended according to the present main request, the board notes that, as

submitted by the respondent, the submissions of the appellant during the appeal proceedings related not to independent claim 15 amended according to the present main request, but only to the corresponding unamended independent claim 15 as granted, which is not the subject of the present appeal proceedings. In addition, it follows from the considerations in points 4.2 to 4.2.5 above that the method of independent claim 15 of the main request is new over the disclosure of document D3 involving a substrate having an array of pyramidal structures at least in the features of the method corresponding to features 1.5 and 1.7 of claim 1.

4.4 The board concludes that the subject matter of independent claims 1 and 15, and therefore also that of dependent claims 2 to 14, is new over the disclosure of document D3 (Articles 52(1) and 54(1) EPC).

5. *Main request - Inventive step*

5.1 Claim 1 - Document D3 as closest state of the art

5.1.1 As already concluded in point 4.2.5 above, the device of claim 1 differs from the device disclosed in document D3 and involving a substrate having an array of pyramidal structures at least in features 1.5 and 1.7.

The objective problem solved by the mentioned distinguishing features resides in the improvement of the variable color optical effect of the device of document D3 (see patent specification, paragraph [0012]).

5.1.2 The appellant submitted that the claimed subject-matter resulted in an obvious way from the disclosure of document D3 relating to Fig. 48, together with claim 25 and the paragraph bridging pages 12 and 13, under consideration of the common general knowledge.

However, as already noted in point 4.2.3 above, second paragraph, the embodiment of Fig. 48 of document D3 and the corresponding disclosure on page 43, first paragraph, specifically involve an array of structures shaped in the form of a spherical dome, and not an array of pyramidal structures, and there is no reason why the skilled person would have considered applying the disclosure on page 43, first paragraph, to a substrate having an array of pyramidal structures. The board notes in this respect that the pyramidal and the spherical dome structures are not disclosed in document D3 as technically equivalent or interchangeable, but as generally having different technical effects (see, for instance, page 41, lines 14 to 29), and that, consequently, the skilled person would not have read the disclosure of document D3 relating to Fig. 48 as being applicable to the pyramidal structures.

Furthermore, as also already noted in point 4.2.3 above, third paragraph, claim 25 and the paragraph bridging pages 12 and 13 of document D3 only disclose in general terms the provision of a metallic layer or of a translucent optical variable layer, and there is no reason why the skilled person would have contemplated forming the metallic layer or the translucent optical variable layer mentioned in document D3 in the specific form of an optically variable color-shifting coating, let alone in the form of an optically variable color-shifting coating such that, upon rotation of the substrate about an axis



orthogonal to the substrate, more than one color seen when viewing the pyramids would vary as required by claim 1.

5.1.3 For these reasons, the board is of the opinion that, independently of the issue relating to the interpretation of feature 1.6 of claim 1 (see point 4.2.1 above), the device defined in claim 1 does not result in an obvious way from the disclosure of document D3 under consideration of the common general knowledge.

5.2 Claim 1 - Document D4 as closest state of the art

5.2.1 The appellant has referred to the device disclosed in document D4 and involving a substrate having pyramidal structures formed thereon (claims 1 and 15, together with Fig. 5g and page 4, lines 18 to 23, page 7, lines 18 to 28, page 8, first paragraph, and page 15, lines 9 to 13) as closest state of the art. It was undisputed that this device comprises features 1.1 to 1.4 of claim 1.

Document D4 discloses not only pyramidal structures formed on the substrate, but also other geometrical structures (see, for instance, page 3, last paragraph, and page 4, last paragraph), and during the appeal proceedings the question arose whether the combination of features 1.1 to 1.4 with feature 1.7 of claim 1 was directly and unambiguously derivable from the disclosure of document D4 relating to the substrate comprising structures having, among other possible variants, a pyramidal shape and the further disclosure relating to the provision, among other variants, of an optically variable color-shifting layer (reflective layer elements with "Farbkippeffekt", see page 4, first

paragraph, the paragraph bridging pages 6 and 7, and dependent claims 8 and 34). However, as will be apparent below, even assuming that the pyramidal structures of document D4 comprise an optically variable color-shifting coating having the color-shifting effect ("Farbkippeffekt") disclosed in the document, the claimed subject-matter is, in the board's opinion, inventive over the disclosure of document D4, and for this reason there is no need for the board to deal in detail with, and to decide on, this question.

It follows from these considerations that the claimed device differs - independently of the issue addressed in the former paragraph and of the issue relating to the interpretation of the claimed feature 1.6 noted in point 4.2.1 above - from the device disclosed in document D4 in at least feature 1.5.

- 5.2.2 The objective problem considered by the opposition division in its decision and formulated by the respondent related to a variation of more than one color upon rotation of the substrate. This formulation of the objective problem already contains elements of the claimed solution (see feature 1.5) and for this reason the board considers it as inappropriate for an objective application of the problem-solution approach. In the view of the board, at least the distinguishing feature 1.5 solves the problem of improving the visually variable optical properties of the device disclosed in document D4.
- 5.2.3 The respondent submitted that the claimed subject-matter was obvious in view of the whole disclosure of document D4 because the functional features defined in claim 1 were implicit in the device disclosed in the document, and also in view of document

D4 and the teaching of document D3 relating to the varying color effects by rotation or tilting of the device disclosed in the document.

The board first notes that there is no direct and unambiguous disclosure in document D4 that the reflective layer elements with color-shifting effect disclosed in the document and referred to in point 5.2.1 above, second paragraph, necessarily had color-shifting characteristics upon a rotation of the substrate about an axis orthogonal to the substrate as claimed.

In addition, document D4 consistently refers to the achromatic reflective characteristics of the mosaic structure elements forming a predetermined motif in the device (abstract, claim 1, and the paragraph bridging pages 2 and 3), in particular without disturbing color effects (page 3, third paragraph), and the document is silent as to the specific effect that the optically variable color-shifting material might have on the device. In this context, there is no reason - and none has been submitted by the appellant - why the skilled person would consider the specific provision in the device of document D4 involving mosaic elements with achromatic reflective characteristics of color-shifting characteristics upon a rotation of the substrate as claimed. In particular, the mere fact that document D3 discloses specific structures with optically variable characteristics when the structure is rotated and/or tilted (page 7, last paragraph, sentence bridging pages 8 and 9, etc.) does not constitute a sufficient incentive for the skilled person to consider departing from the specific disclosure of document D4 and to contemplate the introduction into document D4 of color-

shifting characteristics upon a rotation of the substrate about an axis orthogonal to the substrate.

For these reasons, the board is of the opinion that, as submitted by the respondent, neither document D4 alone, nor document D4 under consideration of the teaching of document D3, suggest to the skilled person considering a structure of pyramids having an optically variable color-shifting coating formed thereon specifically designed so that more than one color seen when viewing the pyramids would vary upon a rotation of the substrate about an axis orthogonal to the substrate as claimed.

5.2.4 In view of these considerations, the board is of the opinion that the subject-matter of claim 1 is not obvious in view of document D4, either alone or in combination with document D3.

5.3 Claim 1 - Document D5 as closest state of the art

5.3.1 The appellant submitted that the device disclosed in document D5 (page 1, first paragraph) with reference to Fig. 9, 11, 12, 14, 24, 27 and 35 comprised features 1.1 to 1.5 and 1.7 of claim 1, and that feature 1.6 was obvious in view of document D3.

However, the structures of the device of document D5 referred to by the appellant have an elongated pyramidoidal roof-like shape with four slanted faces (page 30, third paragraph, together with Fig. 9, 11, 12, 14, 24 and 27), but not a pyramidal shape as required by the claimed subject-matter, and therefore feature 1.3, and also feature 1.4 insofar as it relates to pyramidal structures, are new over the disclosure of document D5.

In addition, the disclosure of document D5 relating to Fig. 36b (page 46, lines 19 to 24) also referred to by the appellant does not relate to the device mentioned above, but to a different device having structures shaped in the form of a spherical dome (see Fig. 36b). In any case, the document does not disclose in a direct and unambiguous way an optically variable color-shifting coating as claimed (feature 1.7), let alone - as submitted by the respondent and as also held by the opposition division in its decision - a coating such that the device would satisfy feature 1.5 of claim 1. Therefore, document D5 fails to disclose features 1.5 and 1.7 of claim 1.

As regards feature 1.6, the appellant submitted that this feature constituted an arbitrary and non-essential feature and that, therefore, the feature should not be considered in the assessment of novelty and inventive step. The board, however, cannot follow the appellant in this respect for the reasons already given in point 4.2.2 above.

As a consequence - and independently of the issue of the interpretation of feature 1.6 addressed in point 4.2.1 above -, the device of claim 1 is new over the embodiment of document D5 referred to by the appellant at least in feature 1.3, feature 1.4 insofar as it relates to pyramidal structures, and features 1.5 and 1.7.

5.3.2 The appellant submitted that the claimed variation of color upon a rotation of the structure was obvious starting from document D5 in combination with document D3. This argument, however, cannot be followed by the board in view of the considerations in points 4.2 and

4.2.3 above, according to which document D3 does not disclose at least features 1.5 and 1.7; see in this respect also the considerations in point 5.2.3 above, third paragraph, last sentence.

5.3.3 For these reasons, the board is of the opinion that, independently of the issue of the interpretation of feature 1.6 (see point 4.2.1 above), the device of claim 1 does not result in an obvious way from document D5 in combination with the teaching of document D3.

5.4 Claim 1 - Document D6 as closest state of the art

5.4.1 The appellant submitted that the subject-matter of claim 1 was obvious starting from document D6 in combination with the teaching of document D3.

5.4.2 Document D6 discloses an optical variable device (claim 1 and Fig. 3, together with page 11, line 5, to page 12, line 3) comprising a substrate having a first region 32 with an array of saw-tooth structures formed thereon and a second planar region 34 (page 11, lines 8 to 10), the saw-tooth structured surface and the surface of the second planar region both having a thin film the optical properties of which in a predetermined viewing direction are different in the first and the second regions due to the different inclination of the saw-tooth structures relative to the second planar region (page 11, lines 10 to 23; see also Fig. 1 and 2 and the corresponding description). As a consequence of the different optical properties in the viewing direction, the observable color of the first region in the viewing direction is different from that of the second region and, in addition, the colors of the first and the second regions vary when the substrate is tilted about an axis parallel to the plane of the

substrate (page 11, line 25, to page 12, line 3), so that the respective thin films constitute optically variable color-shifting films.

The board notes that document D6 discloses the variation of the observable color of the thin films when the device is tilted about an axis parallel to the plane of the substrate (Fig. 1 and 2 and the corresponding description) and when it is rotated or tilted (page 3, lines 16 to 19), but that - as held by the opposition division in its decision - a variation of color when the substrate is specifically rotated about an axis orthogonal to the substrate is not directly and unambiguously derivable from the disclosure of the document.

Therefore, independently of the issue of the interpretation of feature 1.6 of claim 1 addressed in point 4.2.1 above, the device of claim 1 differs from the device disclosed in document D6 at least in features 1.3 and 1.4, and also in feature 1.5 insofar as it relates to more than one color seen when viewing the pyramids.

- 5.4.3 According to the appellant the objective technical problem solved by the claimed subject-matter is to extend the color effect of the array of saw-tooth structures of document D6 each having a linearly extending side orthogonal to the substrate to non-linearly extending sides with an improved color effect.

This formulation of the objective problem, however, already contains pointers to the claimed solution, i.e. the consideration of structures having a non-linearly extending side configuration, and for this reason the

board cannot follow this formulation of the objective problem. In the board's opinion, the distinguishing features identified above solve the problem of improving the variable color effect of the device of document D6 (patent specification, paragraph [0012]).

- 5.4.4 The appellant submitted that feature 1.6 constituted an arbitrary and non-essential feature, and that features 1.3 and 1.4 were obvious to the skilled person wishing to improve the color effect of the device of document D6 in view of the teaching of document D3 relating to the use of pyramidal structures in an optically variable device.

However, feature 1.6 constitutes one of the essential technical features of the claimed invention and there is no reason that would justify ignoring this feature - or, in view of the issue of the interpretation of the feature (see point 4.2.1 above), at least the reference to the rotation about an axis orthogonal to the substrate - in the assessment of the patentability of the claimed subject-matter; see in this respect point 4.2.2 above.

In addition, the skilled person, confronted with the problem of improving the variable color effect of the device of document D6, would not consider the replacement of the saw-tooth structures by the pyramidal structures of document D3 because these structures are specifically disclosed in document D3 for the purpose of providing a color effect by the interplay between the respective colors of opposite faces of each of the pyramidal structures as the angle of observation changes (Fig. 14 to 16 and the corresponding description), and not by a relative variation of the colors of two different regions of the



surface of a substrate when the substrate is tilted as it is the case in document D6. In addition, assuming that the skilled person would consider the replacement of the saw-tooth structures of document D6, each having one single surface, by pyramidal structures, it is not apparent that the skilled person would consider the formation of the thin film on only one, or on plural ones, or on all of the faces of the pyramidal structures, and it is also not apparent why the skilled person would consider the formation of the thin film in such a way that the resulting device would, in addition, satisfy the claimed feature 1.5.

It is also noted that the structures 32 of document D6 have a saw-tooth shape giving rise to only one varying color and the region 34 has only a planar shape giving rise to another varying color (Fig. 3, together with the paragraph bridging pages 11 and 12). The skilled person would therefore consider, at the most, replacing the saw-tooth structures 32 by pyramidal structures, and in this case only one, and not "more than one color" as claimed, would then be seen as varying when viewing the pyramids as claimed - i.e. when viewing in the device 26 of Fig. 3 of document D6 the area 28 or 30 comprising the mentioned structures.

5.4.5 In view of these considerations, the board is of the opinion that - independently of the interpretation of feature 1.6, see point 4.2.1 above - the device of claim 1 does not result in an obvious way from the combination of document D6 with document D3.

5.5 Independent claim 15 - Inventive step

The features of the device of claim 1 are, in substance, contained in the method defined in

independent claim 15 and, therefore, the claimed method does not result in an obvious way from the documents considered by the appellant for reasons analogous to those given in points 5.1 to 5.4 above in respect of the device defined in claim 1.

5.6 The board concludes that the subject-matter of independent claims 1 and 15, and therefore also that of dependent claims 2 to 14, involves an inventive step (Articles 52(1) and 56 EPC).

## Order

### For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



L. Gabor

B. Müller

Decision electronically authenticated