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**Datasheet for the decision  
of 28 June 2013**

**Case Number:** T 1192/09 - 3.4.02  
**Application Number:** 02719839.9  
**Publication Number:** 1366380  
**IPC:** G02B5/22, C09C1/00, B42D15/00  
**Language of the proceedings:** EN

**Title of invention:**

MAGNETIC THIN FILM INTERFERENCE DEVICE OR PIGMENT AND METHOD  
OF MAKING IT, PRINTING INK OR COATING COMPOSITION, SECURITY  
DOCUMENT AND USE OF SUCH A MAGNETIC THIN FILM INTERFERENCE  
DEVICE

**Patent Proprietor:**

SICPA HOLDING SA

**Opponent:**

**Headword:**

**Relevant legal provisions:**

EPC 1973 Art. 56

**Keyword:**

Inventive step - after amendment

**Decisions cited:**

T 1019/99

**Catchword:**

The skilled person would not have readily envisaged the claimed modification of the closest prior art, because he would not have realised that it would be beneficial in terms of a technical effect mentioned in none of the available prior art (see point 3, in particular points 3.4 to 3.7).

Additional support in favour of an inventive step provided by the actual developments in the relevant technical field (see point 3.9)



**Beschwerdekammern  
Boards of Appeal  
Chambres de recours**

European Patent Office  
D-80298 MUNICH  
GERMANY  
Tel. +49 (0) 89 2399-0  
Fax +49 (0) 89 2399-4465

Case Number: T 1192/09 - 3.4.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.02**  
**of 28 June 2013**

**Appellant:** SICPA HOLDING SA  
(Patent Proprietor) Avenue de Florissant 41  
1008 Prilly (CH)

**Representative:** Dossmann, Gérard  
Casalonga & Partners  
Bayerstraße 71-73  
80335 München (DE)

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted on 30 March 2009  
revoking European patent No. 1366380 pursuant to  
Article 101(3) (b) EPC.

**Composition of the Board:**

**Chairman:** A.G. Klein  
**Members:** A. Hornung  
B. Müller

## Summary of Facts and Submissions

- I. The patentee has appealed against the decision of the opposition division revoking European patent No. 1366380 on the basis of Article 54(1) and (2) EPC (main request) and Article 56 EPC (auxiliary request).
- II. The patentee (appellant) requests that the decision of the opposition division be set aside and a patent granted on the basis of a main request or any of auxiliary requests 1 to 3, all filed with a letter of 3 May 2011, or on the basis of auxiliary request 4 filed with a letter of 11 October 2011.
- III. The opponent responded to the main request and auxiliary requests 1 to 3. On 6 December 2011 the opponent withdrew the opposition.
- IV. The following documents relied on in the opposition proceedings will be referred to in the present decision:  
D1: WO 01/03945  
D6: US 6,157,489  
D8: US 4,838,648
- In addition, the board, of its own motion, introduces the following document into the proceedings:  
D10: EP 1412432.
- V. Independent claims 1, 5, and 10 according to the patentee's main request read as follows:

Claim 1. "Magnetic thin film interference device, showing a viewing-angle dependent color appearance, comprising a multi-layer stack including at least one light-reflecting reflector layer (3, 3') selected from

the group consisting of aluminum, aluminum alloy, chromium, silver and gold, at least one light-transmitting dielectric layer (2, 2'), at least one light absorbing absorber layer (1, 1') and one magnetic layer (4) of magnetic material, said magnetic layer being separated from a dielectric layer by a reflector layer, wherein one of said dielectric layer being deposited on one side of said absorber layer, one of said reflector layer selected from the group consisting of aluminum, aluminum alloy, chromium, silver and gold being deposited on said dielectric layer, and said magnetic layer being deposited on said reflector layer."

Claim 5. "Method for producing a magnetic thin-film interference device according to claim 1, made of optically variable pigments, the method comprising the steps of:

- a) depositing a dielectric layer (2,2') on one side of an absorber layer (1,1')
- b) depositing a reflector layer (3, 3') selected from the group consisting of aluminum, aluminum alloy, chromium, silver and gold on said dielectric layer (2, 2') and
- c) depositing a magnetic layer (4) of magnetic material on said reflector layer (3, 3')."

Claim 10. "Use of the thin film interference device according to one of the claims 1 to 4, or 7 for authenticating an item by its optical interference properties and by its magnetic properties."

The remaining claims depend on the above independent claims.

## Reasons for the Decision

### 1. Amendments

#### 1.1 Claim 1

1.1.1 Claim 1 of the present main request has been restricted, with respect to claim 1 as granted, to a reflector layer *selected from the group consisting of aluminum, aluminum alloy, chromium, silver and gold*. The basis can be found in original claim 5.

1.1.2 Moreover, present claim 1 has been restricted to one *magnetic layer of magnetic material*. The basis can be found on page 7, lines 9-10 of the third paragraph. This feature means that the claimed magnetic layer does not comprise any non-magnetic material.

1.1.1 Finally, the claimed magnetic thin film interference device has been limited by a product-by-process feature, with *one of said dielectric layer [sic] being deposited on one side of said absorber layer, one of said reflector layer [sic] selected from the group consisting of aluminum, aluminum alloy, chromium, silver and gold being deposited on said dielectric layer, and said magnetic layer being deposited on said reflector layer*. The basis can be found in original claim 8. This feature means that the claimed magnetic layer is deposited directly on the reflective layer.

1.1.2 In the light of the foregoing, the amendments of present claim 1 of the main request fulfil the requirements of Article 123(2) and (3) EPC.

## 1.2 Further amendments

Dependent claim 2 has been amended in order to bring it into line with present claim 1. The basis can be found in original claims 5 and 9.

Independent method claim 5 and dependent method claim 6 have been amended in accordance with claims 1 and 2, respectively.

Dependent claims 6 and 7 as granted have been deleted.

Paragraphs [0028] and [0032] of the description have been adapted to the amended set of claims.

## 2. Novelty

The subject-matter of claim 1 of the main request is novel (Article 54(1) and (2) EPC 1973) in view of the available prior art.

The subject-matter of claim 1 comprises a magnetic layer *of magnetic material*, i.e. the magnetic layer does not comprise any non-magnetic material. Moreover, according to the product-by-process feature of claim 1, this magnetic layer of magnetic material is *deposited on the reflector layer*, i.e. with no other layer between the magnetic layer and the reflector layer.

D8, figure 2, and D1, figure 1A, disclose a magnetic thin film interference device comprising a layer of cobalt nickel alloy deposited on a dielectric layer. The cobalt nickel layer fulfils reflective and magnetic functions.

D6, figure 1, discloses a magnetic thin film interference device comprising a reflector layer of nickel or cobalt, an inherently magnetic material, deposited on a dielectric layer. Only the reflective properties of the reflector layer are mentioned in D6.

The remaining prior-art documents on file do not disclose any more relevant devices.

It follows that none of the prior-art documents discloses a magnetic thin film interference device comprising a magnetic layer and a reflective layer as two separate layers in contact with each other.

As a consequence, the claimed magnetic thin film interference device is novel.

### 3. Inventive step

- 3.1 The board agrees with the opposition division that the magnetic thin film interference device of D8 represents the closest prior art available.

The starting point for the development described in D8 is a thin film structure having only optical properties, e.g. chromaticity and angular colour shifting effects. It essentially comprises a semi-transparent first layer, an intermediate and transparent dielectric layer and a highly reflecting non-magnetic metal layer such as aluminium. In order to improve the security of the device, D8 proposes to add magnetic properties to the conventional thin film structure by exchanging the highly reflecting non-magnetic metal layer for a metal layer having magnetic and reflecting properties (see claim 1 and figures of D8).



3.2 The claimed device differs from the thin film interference device of D8 in that

(i) a magnetic layer of magnetic material is deposited on a reflector layer and

(ii) the reflector layer is selected from the group consisting of aluminum, aluminum alloy, chromium, silver and gold.

3.3 The technical effect of features (i) and (ii) is that, by virtue of the device comprising two distinct layers and of the reflector layer being made of one of the highly reflective materials set out in the claim, the device enables its magnetic and reflective properties to be adjusted independently of each other, without degrading its optical properties in comparison to devices having no magnetic feature (see the original description, page 4, fourth and fifth paragraphs; page 5, fourth and fifth paragraphs).

The invention thus solves the problem of improving the security level of the device known from D8 in that "different varieties of security-OVP [optically variable pigments] can be produced, all having exactly the same color appearance and color shifting properties, but different magnetic properties", as indicated in the original description, page 9, first paragraph, whilst simultaneously improving its optical properties.

3.4 The board in this respect first notes that neither D8 nor any other available prior art deals with the problem of raising the security level of thin film interference devices by hiding different magnetic

properties behind a same visual appearance of the devices. The achievement of this particular technical effect, as confirmed by experimental data filed by the patentee with a letter of 28 July 2011, and its importance for the claimed device have not been contested.

3.5 The board further notes that the solution as claimed, i.e. adding a reflective layer on top of the magnetic layer, goes against the general teaching in D8 for the following reasons:

- D8, column 2, lines 5-9, teaches the abandonment of the highly reflecting but non-magnetic aluminium layer. Re-introducing a highly reflecting metal layer which this time must be non-magnetic in order to solve the problem of decoupling magnetic and optical properties thus constitutes an exact reversal of the original teaching of D8, which the skilled person would not undertake without good reason or the expectation of substantial advantages, for which there is no evidence. On the contrary, the arrangement proposed in D8, a cobalt nickel alloy layer replacing an aluminium layer, was explicitly "found satisfactory" (see D8, column 3, lines 17 to 19) and said to achieve "highly reflecting properties" (see claim 8 of D8).

- An objective of the invention of D8 is to provide a device "which can be readily manufactured" (see D8, column 1, lines 19-21). Adding an additional layer to a device always increases manufacturing complexity and, hence, goes against the declared objective of straightforwardness.

3.6 Accordingly, in the board's view, the skilled person would not readily envisage the addition of a separate

reflecting layer to the structure of D8, because he would not realise that it would be beneficial in terms of the security level of the device.

3.7 For these reasons, the board cannot endorse the approach of the opposition division which also started from D8 as closest prior art and considered the claimed subject-matter to be an obvious solution to the more broadly formulated technical problem of optimising the optical properties of the known device, the resulting improvements in terms of security being considered as mere bonus effects which did not confer an inventive step on the claimed subject-matter (see point 15.16 of the reasons). Even though degraded optical performance is mentioned in the original application on page 4, second paragraph, as being one of two problems with the closest prior art of D8, this broad formulation of the objective technical problem, which in effect conceals the substantial contribution of increased security, is not considered appropriate in the present case. Indeed, the technical effect of the differing feature (i) goes beyond the mere improvement of the optical performance. The board concurs with the view expressed in T 1019/99, point 3.3 of the reasons, according to which "the correct procedure for formulating the problem is to choose a problem based on the technical effect of exactly those features distinguishing the claim from the prior art that is as specific as possible without containing elements or pointers to the solution". In this respect, the provision of two separate magnetic and reflecting layers makes it possible not only to enhance optical performance but also to achieve the more specific effect of enhancing optical properties independently of the magnetic properties.

3.8 In addition, even starting from this broader problem statement, in the board's view it would not be obvious to the skilled person to arrive at the claimed subject-matter, because, as convincingly submitted by the patentee, other ways of improving the optical performance of the device of D8 were available which would not go against the overall teaching of D8 (see point 3.5 above), such as optimising the materials, thicknesses or deposition conditions and/or techniques of the various layers of D8.

For instance, in his statement of grounds of appeal, the patentee demonstrated credibly that at least the two following additional approaches for increasing the reflectivity of the reflector layer were well known in the art:

- Approach A) Optimising the deposition conditions of the chosen magnetic material.
- Approach B) Choosing a different magnetic material with higher reflectivity.

Especially approach B) allows for a substantial increase of the reflectivity (0.3) of the magnetic material in D8, i.e. Ni-Co alloy, by replacing it, for instance, by an Ni-Fe alloy having a reflectivity of 0.6. Neither the former opponent nor the board sees any reason to challenge the technical sensibleness of the alternative approaches A) and B). Therefore, the board agrees with the patentee's statement in his notice of appeal that "the skilled person would have to choose from a variety of known approaches and the opposition division's assumption of a one-way street situation is not correct".

Furthermore, both approaches A) and B) have the advantage over the approach used in the patent that no additional layer is required, which is consistent with the declared goal of D8 of a straightforward manufacturing process. This advantage of ease of producibility is all the more relevant because the corresponding improvement of chromaticity appears to be limited. It is not evident that the mere increase of the initial reflectivity of 0.3 of the Ni-Co alloy layer would represent a sufficient incentive for the skilled person to increase the manufacturing costs by adding an additional, highly reflecting layer.

The board is of the view that only the awareness of the additional technical effect of increasing the security level by hiding magnetic properties behind the same visual appearance of the devices would have led the skilled person to consent to the higher manufacturing costs caused by the additional reflecting layer.

Thus, in order to arrive at the claimed additional reflector layer, the skilled person would have to select, out of at least three possible approaches, that particular approach which appears to be the one least consistent with the declared goal of ease of manufacturing.

3.9 In the board's view, the actual developments in the relevant technical field, as evidenced by the documents on file, provide additional support in favour of an inventive step.

It is noted in this respect that D8 was published about 12 years before the filing date of the present patent. The recommendation made therein to provide a layer having both highly reflective and magnetic properties

not only was not called into question until the effective filing date of the present patent but was even confirmed in document D1 published just two months before that date. Then, less than two months after the effective filing date of the present patent, an application was filed for a magnetic thin film interference device which gave rise to European patent D10, of which the designated inventors are in part the same as those of documents D8 and D1.

D10 discloses the same multilayer set-up as claimed (see e.g. figures 13 and 14 of D10) and acknowledges that it presents a significant improvement in terms of achieved chroma and brightness together with the provision of a covert magnetic security feature (see paragraph [0023] of D10).

The facts that the very inventors of D8 did not propose the claimed structure, with its uncontested advantages, until 12 years after the publication of D8, and that this structure was later praised in D10 and made the subject of a granted European patent is considered by the board as an additional indication of the non-obviousness of the concept which forms the basis of the claimed invention.

3.10 In view of the above findings, the board comes to the conclusion that the subject-matter of claim 1 according to the main request on file fulfils the requirements of Article 56 EPC 1973.

3.11 The same conclusion applies to the subject-matter of the remaining independent claims 5 and 10 for corresponding reasons and also to the dependent claims 2-4, 6-9 and 11 which recite the limitations of the claims on which they depend.

4. For the above reasons the board is satisfied that the patent as amended according to the present main request and the invention to which it relates meet the requirements of the EPC and gives a ruling pursuant to Article 101(3)(a) EPC.

## 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, 3, 3a and 4-7 as filed with letter of 14 June 2013;

Claims: 1-11 of the main request as filed with letter of 3 May 2011;

Drawings sheets: 1/3-3/3 of the patent specification.

The Registrar:

The Chairman:



M. Kiehl

A. Klein

Decision electronically authenticated