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Datasheet for the decision of 4 April 2008

Case Number: T 1394/05 - 3.3.05

Application Number: 97106427.4

Publication Number: 0803481

IPC: C03C 17/36

Language of the proceedings: EN

Title of invention:
High transmittance, low emissivity coated articles

Patentee:
PPG Industries Ohio, Inc.

Opponents:
I) SAINT-GOBAIN GLASS FRANCE
II) Interpane Entwicklungs- und Beratungsgesellschaft mbH & Co.

Headword:
Multilayered glass/PPG

Relevant legal provisions:
EPC Art. 56, 84
EPC R. 101(1)

Keyword:
"Inventive step (main and 1st to 9th auxiliary request) (no) - obvious alternative"
"Clarity (10th to 16th auxiliary request): no"

Decisions cited:
G 0004/95, T 0934/02, T 0123/85, T 0296/87

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1394/05 **-** 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 4 April 2008

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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 30 August 2005 concerning maintenance of European patent No. 0803481 in amended form.**

Composition of the Board:

Chairman: G. Raths
Members: J.-M. Schwaller
S. Hoffmann

Summary of Facts and Submissions

I. The present appeals were lodged against the interlocutory decision of the opposition division maintaining the patent in amended form on the basis of the 2nd auxiliary request as filed during the oral proceedings before the opposition division dated 31 May 2005 with an independent claim 1 reading as follows:

"1. A high transmittance, low emissivity coated article comprising:
a. a transparent, nonmetallic substrate,
b. a metallic film being silver and having a preferentially oriented growth of grains, and a dielectric, antireflective base film between the substrate and the metallic film, the base film consisting of
c. a crystalline metal-contact film-part of zinc oxide or zinc aluminium oxide and in contact with the metallic film, the crystalline film being coordinated with the metallic film, and
d. a support film-part being an amorphous oxide of zinc and tin and in contact with the substrate."

II. During the opposition procedure, the parties relied *inter alia* upon the documents:

E3: EP-A-0335309
E6: EP-A-0183052
E11: EP-A-0464789
E13: US-A-5110662
E18: DE-A-3941027
E23: N. Fujimura et al., *"Control of preferred orientation for ZnO_x films: control of self-*

texture", Journal of Crystal Growth, 130 (1993), pages 269 to 279.

III. In the contested decision, the opposition division considered that the subject-matter of above claim 1 involved an inventive step in particular for the following reasons:

- in order to grow a crystalline ZnO film in a particular direction and also in order to rule out the possibility of growing a predominantly amorphous layer, specific conditions would be required such as those disclosed in E23 or in paragraph [0042] of the patent in suit;

- none of the available documents suggested growing a crystalline ZnO film obtainable e.g. by the method of E23, in order to induce a preferentially oriented growth of grains in the metallic film to be deposited on it, and hence reduce electrical resistance thereof;

- none of the available documents mentioned or suggested that a layer of amorphous oxide of zinc and tin would be suitable for growing a crystalline zinc oxide or zinc aluminum oxide coordinated with a crystalline silver film having a preferred orientation of grains;

- none of the available documents alone or in combination mentioned or suggested that a multi-layer coating, as defined in claim 1 of the second auxiliary request, would provide improved transmittance together as improved resistance to

weathering and high temperature withstanding to a transparent nonmetallic substrate, as could be seen from Fig. 9 of the patent in suit.

IV. Two appeals dated respectively 28 October 2005 and 8 November 2005 were lodged against said interlocutory decision, on the one hand, by opponent I (appellant I) and on the other hand, by the patentee (appellant II). In its notice of appeal, the latter requested *inter alia* to maintain the patent as granted.

V. In a letter dated 12 December 2005, Opponent II (party as of right) requested that the patentee's appeal should not be admitted, because it did not request the maintenance of the patent as granted before the department of first instance.

Together with its grounds of appeal dated 02 January 2005, appellant I filed four new documents E25 to E29 and objected to claim 1 as maintained in the contested decision under Articles 100(a) and (b) EPC.

VI. With its grounds of appeal dated 9 January 2005, appellant II filed ten sets of claims as main and auxiliary requests 1 to 9, respectively.

Claim 1 of the main and 4th auxiliary request reads:

"1. A high transmittance, low emissivity coated article comprising:
a. a transparent, nonmetallic substrate,
b. a metallic film being silver and having a preferentially oriented growth of grains, and

a dielectric, antireflective base film between the substrate and the metallic film, the base film including
c. a crystalline metal-contact film-part selected from the group consisting of zinc oxide, zinc aluminium oxide and indium tin oxide and being in contact with the metallic film, the crystalline film being coordinated with the metallic film, and
d. a support film-part being an amorphous oxide of zinc and tin and in contact with the substrate."

Claim 1 of the 1st and 5th auxiliary request reads:

"1. A high transmittance, low emissivity coated article comprising:
a. a transparent, nonmetallic substrate,
b. a metallic film being silver and having a preferentially oriented growth of grains, and
a dielectric, antireflective base film between the substrate and the metallic film, the base film consisting of
c. a crystalline metal-contact film-part selected from the group consisting of zinc oxide, zinc aluminium oxide and indium tin oxide and being in contact with the metallic film, the crystalline film being coordinated with the metallic film, and
d. a support film-part being an amorphous oxide of zinc and tin and in contact with the substrate."

Claim 1 of the 2nd, 6th and 8th auxiliary request reads:

"1. A high transmittance, low emissivity coated article comprising:
a. a transparent, nonmetallic substrate,

b. a metallic film being silver and having a preferentially oriented growth of grains, and
a dielectric, antireflective base film between the substrate and the metallic film, the base film including
c. a crystalline metal-contact film-part of zinc oxide or zinc aluminium oxide and being in contact with the metallic film, the crystalline film being coordinated with the metallic film, and
d. a support film-part being an amorphous oxide of zinc and tin and in contact with the substrate."

Claim 1 of the 3rd, 7th and 9th auxiliary request reads:

"1. A high transmittance, low emissivity coated article comprising:
a. a transparent, nonmetallic substrate,
b. a metallic film being silver and having a preferentially oriented growth of grains, and
a dielectric, antireflective base film between the substrate and the metallic film, the base film consisting of
c. a crystalline metal-contact film-part of zinc oxide or zinc aluminium oxide and ***being*** *in contact with the metallic film, the crystalline film being coordinated with the metallic film, and*
d. a support film-part being an amorphous oxide of zinc and tin and in contact with the substrate." (emphasis added by the board to materialize the amendment in comparison to claim 1 as maintained by the contested decision).

VII. On 22 May 2006, opponent II/party as of right raised *inter alia* inventive step objections based on documents E3, E6, E11, E18.

VIII. With a letter dated 03 July 2006, opponent I/ appellant I submitted *inter alia* a new document: E29: EP-A-488048.

IX. On 22 August 2006, the patentee/appellant II submitted two new documents E30 and E31 along with seven sets of claims as the 10th to 16th auxiliary request, respectively.

Each one of these sets includes at least one claim reciting inter alia the feature "*a crystalline metal-contact film-part of zinc oxide, which was (is) sputtered from a cast zinc metal target in a preponderance of oxygen over argon*".

X. In response to the summons to oral proceedings, the patentee/appellant II requested in a letter dated 8 January 2008 that Dr. Mehran Arbab, one of the inventors of the contested patent, be admitted to comment on technical questions.

XI. Further comments from the parties were received with the following letters:
- patentee/appellant II, a letter dated 13 February 2008;
- opponent I/appellant I, three letters dated 4, 5 and 11 March 2008, respectively;
- opponent II/party as of right, a letter dated 3 March 2008.

At the oral proceedings, which took place on 4 April 2008, the patentee/appellant II *inter alia* reiterated its request that Mr Arbab be admitted to make an oral presentation, but opponent I/appellant I refused.

XII. As far as they concern the present decision, the arguments of the patentee/appellant II can be summarized as follows:

The feature "in a preponderance of oxygen over argon" means "in the presence of more oxygen than argon".

In the contested patent, the preferentially oriented growth of silver is confirmed by various diffraction spectra wherein the {220} peak rises above the {111} peak. Alternatively, the preferentially oriented growth of silver grains can be identified by means of the size of the silver grains.

E11 does not disclose the combination of a crystalline zinc oxide film in contact with a metallic silver film having a preferentially oriented growth of grains.

Starting from document E11 as the closest state of the art, the problem to be solved is to provide a high transmittance, low emissivity coated article having low electrical resistivity and high durability.

The skilled person would not combine E3 with E11 because on the one hand, E11 does not suggest splitting the lower oxide into two sublayers and on the other hand, E3 requires the presence of a primer interlayer between the first antireflective metal oxide film and the metallic silver layer.

XIII. The opponents (appellant I and party as of right) provided *inter alia* the following arguments:

- The feature "in a preponderance of oxygen over argon" is unclear, in the sense that it has several meanings.

- The subject-matter claimed is obvious in view of the combined teachings of E11 and E3 as the problem to be solved can only be seen in the provision of a coated article being an alternative to the one described in E11.

XIV. The patentee/appellant II requests that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of claims 1-17 according to the main request filed on 9 January 2005 or, alternatively, according to the 1st to 9th auxiliary request, also filed on 9 January 2005, or alternatively, on the basis of the claims according to the 10th to 16th auxiliary request filed on 22 August 2006.

Opponent I/appellant I requests that the appeal of the patentee/appellant II be rejected as inadmissible, that the decision under appeal be set aside and that the patent be revoked.

Reasons for the Decision

1. *Admissibility of patentee's appeal*

1.1 According to Article 107, sentence 1 EPC, any party to proceedings adversely affected by a decision may appeal and, according to established case law, a party is adversely affected if the decision does not accede to its main request or to auxiliary requests preceding the allowed auxiliary request. In the present case, although the opposition division held in its interlocutory decision that the claims according to auxiliary request 2 met the requirements of the EPC, it did not accede to patentee's preceding broader claims. Therefore, the patentee/appellant II is adversely affected by the impugned decision according to Article 107, sentence 1 EPC.

1.2 The reason put forward for not admitting the patentee's appeal was based on the fact that the patentee never requested the maintenance of the patent as granted in the first instance. According to opponent I/appellant I, the patentee went beyond the scope of the appeal frame set by the opposition proceedings.

1.3 The board does not agree for the following reasons:

According to the established jurisprudence of the Boards of Appeal (cf. T 934/02, reasons, point 3.2), *"the EPC makes no provision for a patent proprietor to surrender his patent in opposition proceedings. This means that (even where there has been an express declaration of surrender, which is not the*

case) he cannot surrender his patent either wholly or in part. The patent proprietor can only request that it be amended and, in principle, can withdraw or amend such a request at any time provided no abuse of procedural law is involved or unless in that particular case a prohibition on reformatio in peius applies. Accordingly a new version of the claim is to be regarded as a formulation attempt and not as a renunciation of more extensive protection (see i.a. T 123/85 OJ EPO 1989, 336, points 3.1.1 and 3.1.2 of the reasons and T 296/87 OJ EPO 1990, 196, point 2 of the reasons). In other words, even the patent proprietor which has defended his patent only to a limited extent in opposition proceedings is not a priori prohibited from returning during the appeal proceedings to a broader version, including the granted version, of its patent, since intervening limitations of the patent do not imply any renunciation of parts of the patent but are rather to be regarded merely as attempts to word the patent so as to delimit it against objections."

The same reasoning applies to the present case. The patentee/appellant II is not bound to its restricted requests before the first instance and is allowed to resume its former request for maintenance of the patent as granted. The legal question of whether this request could be refused by the Board as belated does not concern the admissibility of the appeal according to Article 107, sentence 1 EPC. Accordingly, the board concludes that the patentee's appeal is admissible.

2. *Admissibility of oral submissions by one of the inventors*

The board rejected at the oral proceedings the request of the patentee/appellant II to allow Dr. Mehran Arbab to make an oral presentation because the request as submitted in written form did not specify the subject-matter of the proposed oral submissions, so that at least criteria i) set out in item 3(b) of the Order of Enlarged Board of Appeal decision G 4/95 was not met. As opponent I/appellant I furthermore objected to such a presentation being made, and as the board did not see any exceptional circumstances (according to 3(b) (iii) of the said order) to allow such a presentation, the request was rejected.

3. *Interpretation of claim 1 - all requests*

3.1 As claim 1 of all the requests on file recites the feature "*a metallic film being silver and having a preferentially oriented growth of grains*" and as the parties had divergent opinions as to its meaning, this feature has to be interpreted in the light of the description of the contested patent.

3.2 Patentee/appellant II argued at the oral proceedings - by referring in particular to the paragraphs [0108] to [0110], [0118] and [0120] - that in the contested patent, the orientation of the silver film was corroborated by various diffraction spectra wherein the {220} peak rose above the {111} peak. It admitted that this definition corresponded substantially to the subject-matter of a dependent claim in all the requests (e.g. dependent claim 7 of the main request), but it

was not inclined to restrict the subject-matter claimed with such features because in its opinion the "preferentially oriented growth of silver" could also be interpreted in other ways, for instance by the size of the silver grains, which grains were viz. "larger" in the case of a "preferentially oriented growth" as compared to a non-oriented growth.

In its letter of 22 August 2006, patentee/appellant II further stated ***inter alia*** that "a diffraction pattern different from that of a powder, with some peaks rising, others diminishing" (page 4, lines 19 to 24), was an indication for a preferential crystallographic orientation of the respective layer. The board observes that this statement substantially reflects the content of paragraphs [0106] to [0111] and [0148] of the contested patent, wherein the allegedly inventive silver film with a preferentially oriented growth of grains is defined in contrast to a randomly oriented growth of crystal grains within the silver film or by opposition to a multigrained, or polycrystalline, film with a random orientation having a diffraction pattern or spectrum similar to that of a silver powder sample.

3.3 In view of these findings that the content of the contested patent allows for a very broad interpretation of the feature "***a metallic film being silver and having a preferentially oriented growth of grains***", it is the board's view that this feature is equivalent to a crystallized metallic silver film which is not polycrystalline, i.e. made up of grains of crystalline material where the grains are randomly oriented relative to each other.

4. *9th auxiliary request - Inventive step*

For reasons of procedural economy, the board decided at the oral proceedings to first analyse the issue of inventive step with respect to the subject-matter of claim 1 of the 9th auxiliary request, which corresponds in its essence to that of claim 1 maintained in the contested patent.

4.1 As indicated in paragraph [0007] of the contested patent, the alleged invention relates to a high transmittance, low emissivity coated article comprising
a) a transparent nonmetallic substrate,
b) a metallic film having a preferentially oriented growth of grains and
a dielectric antireflective base film comprising
c) a crystalline metal-contact film situated between the substrate and the metallic film [of a first material] (sic) and in contact with the metallic film, the crystalline film being coordinated with the metallic film.

In claim 1 of the present request, the metallic film b) is silver, the crystalline-metal contact film c) is of zinc oxide or zinc aluminum oxide and the antireflective base film consists of two film-parts, namely c) and d), the second film-part d) being an amorphous oxide of zinc and tin and being in contact with the substrate and supporting the crystalline-metal contact film c).

4.2 In accordance with the "problem-solution approach" applied by the boards of appeal to assess inventive step on an objective basis, it is in particular

necessary to establish the closest state of the art, to determine in the light thereof the technical problem which the invention addresses and successfully solves and to examine the obviousness of the claimed solution to this problem in view of the state of the art.

4.3 The board considers, in agreement with the parties, that document E11 represents the closest state of the art, and hence, the starting point in the assessment of inventive step.

Document E11 relates to a low emissivity film excellent in durability, especially in moisture resistance or in acid resistance (page 2, lines 1 and 2).

According to claims 1 to 5 of E11, the low emissivity film comprises:
a substrate; and
a coating of oxide and metallic films alternately formed on the substrate in a total of (2n+1) layers, where n is an integer equal to or more than 1, with the innermost layer being an oxide film,
wherein:
- the major component of the metallic film (A) is Ag,
- the oxide film (B) formed on the outer side of the metallic film (A) most apart from the substrate is composed of a single layer or a multi-layer having at least a layer of which major component is zinc oxide the crystal structure of which is hexagonal, and a value of a diffraction angle 2θ (center of gravity position) of (002) diffraction line of the hexagonal zinc oxide in X-ray diffraction method using CuK_α radiation, is preferably not smaller than 34.00° and not larger than 34.88° and wherein the oxide film (B)

has an internal stress which is equal to, or less than 1.1×10^{10} dyne/cm^2.

Such a low emissivity (Low-E) film is electrically conductive (E11, page 9, line 26) and a glass, in which such a low emissivity film is formed (also called low-E glass) is transparent and electrically conductive (E11, page 2, lines 2 to 11).

4.4 In the light of document E11, the patentee/appellant II was of the opinion that the **problem to be solved** was to provide a high transmittance, low emissivity coated article having low electrical resistivity and high durability.

4.4.1 The board does not agree for the following reasons:

E11 also relates to a low emissivity film excellent in durability (page 2, first two lines), further described as being electrically conductive (page 9, lines 36 and 27), i.e. as having a low resistivity. Glass articles coated with such a low emissivity film are furthermore described as having visible light transmittance (page 6, line 49 to page 7, line 1).

In this context and in the absence of comparative data between the claimed coated article and those of E11, it must be concluded that the latter exhibit - at least qualitatively - the same properties as the coated article presently claimed.

4.4.2 Accordingly, as no improvement over E11 can be acknowledged to the coated article defined in claim 1 of the 9th auxiliary request, the problem to be solved

has to be reformulated into a less ambiguous one, namely in the provision of an **alternative** coated article having the above properties.

4.4.3 As a solution to this problem, the patent in suit proposes an article as defined in claim 1 comprising in particular a second film-part d).

4.4.4 Although the parties unanimously conceded that E11 did not disclose a second film-part d) as defined in present claim 1, appellant II/patentee argued that in addition to this distinguishing feature, E11 did also not disclose the combination of a crystalline film of zinc oxide in contact with a metallic silver film having a preferentially oriented growth of grains.

This argument however fails for the following reasons:

(a) In Example 5 of E11, a glass/ZnO/Ag/ZnO multilayered coated article is prepared by successive deposition on a glass substrate of films with thicknesses of 450 Å, 100 Å and 450 Å, respectively, using an RF sputtering method. The materials of the targets used are ZnO and Ag, and the sputterings are performed in an argon gas atmosphere. The sputtering pressure is 1.8×10^{-3} Torr, the substrate temperature is room temperature and the power density is 3 W/cm^2. After deposition, the film is heat treated at 400°C in an N_2 atmosphere for 1 hour. After heat-treatment, the Low-E film is analyzed by an X-ray diffraction method and the diffraction angle 2θ (center of gravity position) of (002) diffraction line of ZnO is found to be 34.42°. As indicated in the passage

at page 4, lines 28 to 30 of E11, the crystal structure of such an oxide film - whose major component is zinc oxide - is hexagonal.

(b) E11 does not explicitly disclose the crystalline structure of the zinc oxide film below the silver layer. However, in the coated article prepared in Example 5, the zinc oxide film below the silver layer exhibits the same thickness and composition, and has been prepared under the same conditions, as the upper ZnO film. In this context, as same process conditions lead to the same product, the crystal structure of the lower zinc oxide film should thus be substantially identical with that of the upper ZnO film and exhibit as well the (002) diffraction line of crystalline hexagonal zinc oxide.

(c) In view of these findings and since it has furthermore been unanimously agreed by the parties that silver grows epitaxially on crystalline zinc oxide (i.e. with the same crystalline orientation as the substrate on which it is grown), such a growth also inevitably occurs in the coated glass of Example 5 at the interface with the lower crystalline zinc oxide film, and therefore the silver film in this Example cannot be polycrystalline, but necessarily has a "preferentially oriented growth of grains" in the sense of claim 1 of the present request.

(d) For these reasons, it is concluded that the subject-matter of claim 1 of the 9th auxiliary request can be distinguished from the disclosure

of document E11, in particular from the coated glass of Example 5, in that the antireflective base film consists of a metal-contact film-part and a support film-part, whereby the support film-part is an amorphous oxide of zinc and tin and in contact with the substrate.

4.4.5 Thus, the solution as proposed in claim 1 of the 9th auxiliary request to the problem defined under point 4.4.2 differs from the coated articles of E11, in particular those of Example 5, in that a dielectric, antireflective support film-part being an amorphous oxide of zinc and tin and in contact with the substrate is located below the lower crystalline zinc oxide film.

4.5 Although the board is satisfied that this solution successfully solves the problem defined above, the question arises whether or not the proposed solution is obvious in view of the cited state of the art.

4.5.1 In this respect, E3 discloses (column 3, lines 21 to 23) that ZnO films are insufficiently durable and that an improvement as regards this property can be observed with films of an oxide of zinc and tin (E3, column 4, lines 15 to 24).

E3 furthermore concerns high transmittance, low emissivity coated articles comprising a transparent nonmetallic substrate and a transparent infrared reflective metallic film sandwiched between two transparent antireflective metal oxide films (claim 1). In the paragraph headed "summary of the invention" (column 4, lines 15 to 27), E3 discloses such a coated article in which the substrate, the first

antireflective metal oxide film and the infrared reflective metallic film are respectively glass, silver and an oxide of zinc and tin.

Accordingly, E3 concerns coated glasses similar to those of the contested patent and in this context, the skilled person faced with the problem of providing an alternative to the coated article of Example 5 of E11 would consider the inclusion of the first transparent antireflective oxide film of an oxide of zinc and tin of E3 as a normal design option, insofar as the latter material was suggested in E3 as a substitute with higher durability for zinc oxide dielectric antireflective layers.

4.5.2 As E11 (page 6, lines 43 to 46) furthermore suggests that the material of the oxide film below silver may be composed of "a film in which at least two layers of ZnO, SnO_2, and $ZnO-SnO_2$ are alternatively laminated", the skilled person is not deterred from adding a further base film to the coated glasses known from E11.

The fact that claim 1 of E3 requires the presence of the layers c) and e), i.e. a transparent metal oxide/metal primer layer deposited on the first antireflective metal oxide film and a metal-containing primer layer be deposited on the infrared reflective metallic film, respectively, does also not deter the skilled person from combining the teaching of E3 with that of E11 because the "metal oxide/metal primer" of said transparent layer c) is not specified in claim 1 of E3, so that the lower zinc oxide layer of E11 can be such a "transparent metal oxide/metal primer layer". Furthermore, owing to the presence of the word

"comprising" in claim 1 of E11, further upper additional layers - such as the layer e) of E3 - are not excluded from E11. The teachings of E3 and E11 are therefore not incompatible and they can thus be combined.

4.5.3 After combination of the teachings of documents E11 and E3, one difference with respect to the subject-matter of claim 1 of the present request remains: the oxide of zinc and tin of the support film-part in contact with the substrate is amorphous.

As regards this specific feature, the board observes that there is no evidence neither in the contested patent nor in the file that the use of an amorphous oxide of zinc and tin would provide a particular effect over other types of an oxide of zinc and tin. On this basis, the choice by the skilled person of the specific "amorphous" oxide of zinc and tin among a limited number of possibilities of oxides of zinc and tin (amorphous, crystalline or semi-amorphous) lies within the routine activity of the skilled person faced with the problem of finding an alternative coated article. Such a choice can however not confer any inventive merit to the claimed coated article.

4.6 In view of the above findings, the board concludes that the subject-matter of claim 1 of the 9th auxiliary request is obvious to a person skilled in the art and therefore does not fulfil the requirements of Article 56 EPC.

5. *Higher ranking requests - Inventive step*

5.1 The subject-matter of claim 1 of the 3rd and 7th auxiliary requests being identical to that of the 9th auxiliary request, these requests are not allowed for the same reasons as the 9th auxiliary request.

5.2 The subject-matter of each claim 1 of the other higher ranking requests up to the 8th auxiliary request includes the same combination of features as claim 1 of the 9th auxiliary request, namely:
- "a *metallic film being silver and having a preferentially oriented growth of grains",*
- *"a crystalline metal-contact film of zinc oxide in contact with the metallic film, the crystalline film being coordinated with the metallic film",* and
- *"a support film-part being an amorphous oxide of zinc and tin and in contact with the substrate"*

The reasoning set out under points 3. and 4. *supra* applies thus *mutatis mutandis* to the subject-matter of the claims cited hereinabove, which therefore do also not meet the requirements of Article 56 EPC.

Consequently, the main request as well as the 1st, 2nd, 4th to 6th and 8th auxiliary requests cannot be allowed.

6. *10th auxiliary request - Clarity*

6.1 The subject-matter of claim 1 of this request contains the amendment that the zinc oxide is *"sputtered from a cast zinc metal target in a preponderance of oxygen over argon".*

6.2 This amendment being solely based on the description of the granted patent (page 5, lines 4 to 7), the subject-matter of claim 1 of the present request does not result from the combination of claims of the patent as granted and thus does not concern a specific object which as such was already claimed in the patent as granted.

Accordingly, the amended claim 1 must be examined for compliance with all requirements of the EPC, including clarity. In this respect, the question arose at the oral proceedings as to the meaning of the feature "*in a preponderance of oxygen over argon*".

6.3 The patentee/appellant II argued that the amendment at stake meant "in the presence of more oxygen than argon". In this respect, it referred to Figure 9 of the contested patent and indicated that by comparing the data of the samples G, H and J, it was clear for the skilled person reading the contested patent that said feature had the above meaning.

6.4 The board cannot accept these arguments for the following reasons.

6.4.1 The patent is totally silent as to the meaning of the feature "*in a preponderance of oxygen over argon*" and although Figure 9 describes that a zinc oxide sputtered in an atmosphere having an oxygen concentration of 80% generates a silver film having a lower resistance (samples H and J) than a silver film coated on a zinc oxide film similarly sputtered in an atmosphere containing 50% oxygen (sample G), the board does not accept that the teaching of these three specific

samples can be generalized so that the feature "*in a preponderance of oxygen over argon*" is to be considered as meaning "in the presence of more oxygen than argon", as argued by Appellant II.

6.4.2 The board is much more of the opinion that the expression "*in a preponderance of*" can be interpreted differently and for instance, as argued by the opposing parties, it can as well mean "with a superiority in power" or "with a superiority in reaction intensity".

6.4.3 In this context, as different interpretations are possible for the above feature, the board concludes that the subject-matter of claim 1 of the 10th auxiliary request is ambiguous and therefore not clear, contrary to the requirements of Article 84 EPC.

6.5 In view of the above findings, the 10th auxiliary request cannot be allowed.

7. *11th to 16th Auxiliary request - Clarity*

As at least one claim in each of the remaining requests contains the feature "in a preponderance of oxygen over argon" in the following respects:

- 11th auxiliary request: claim 13;
- 12th auxiliary request: claim 1;
- 13th auxiliary request: claim 13;
- 14th auxiliary request: claim 1;
- 15th auxiliary request: claim 12;
- 16th auxiliary request: claim 1,

the above reasons apply ***mutatis mutandis*** to the subject-matter of these claims, which therefore also do not meet the requirements of Article 84 EPC.

Consequently, the 11th to 16th auxiliary requests are also not allowed.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside

2. The patent is revoked

The Registrar: The Chairman:

D. Magliano G. Raths