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Case Number: T 0849/11 - 3.3.05

Application Number: 03731456.4

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Title of invention:
ARTICLE HAVING AN AESTHETIC COATING

Applicant:
PPG Industries Ohio, Inc.

Headword:

Relevant legal provisions:
EPC Art. 84

Keyword:
Claims - unclear characterization by parameters

Decisions cited:
T 1156/01, T 0412/02, T 0908/04, T 0555/05, T 1497/08

Catchword:

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Case Number: T 0849/11 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 6 March 2015

Appellant: (Applicant)	PPG Industries Ohio, Inc. 3800 West 143rd Street Cleveland, OH 44111 (US)
Representative:	f & e patent Fleischer, Engels & Partner mbB, Patentanwälte Braunsberger Feld 29 51429 Bergisch Gladbach (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 8 November 2010 refusing European patent application No. 03731456.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Raths
Members:	G. Glod
	P. Guntz

Summary of Facts and Submissions

I. The present appeal lies from the decision of the examining division to refuse European patent application No. EP 03 731 456 for lack of inventive step.

II. With the notice of appeal the appellant (patent applicant) filed a new main request and auxiliary requests 1 and 2.

III. In its communication under Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA), the Board expressed its preliminary non-binding opinion and raised objections under Articles 123(2), 84, 83 and 56 EPC. In particular, it was indicated that claim 1 contained several parameters and that no measurement method was present in claim 1, so that the requirements of Article 84 EPC were not met.

IV. By letter of 4 February 2015, the appellant filed a new main request and auxiliary requests 1 to 3.

Claim 1 of the **main request** reads as follows:

"*1. A coated article comprising:*
a first substrate selected from glass or polymeric material; and a multi-layer coating stack consisting of one aesthetic coating having a thickness of up to 1000 Å and consisting of at least one zinc stannate layer having a thickness in the range of 100 Å to 300 Å and at least one titania layer having a thickness in the range of 100 Å to 300 Å deposited over at least a portion of the substrate, the aesthetic coating providing the article with a reflected color due to an interference effect and with a visible light

reflectance in the range of 8% to 30%, wherein the coated article has a luminous transmittance (Lta) of greater than or equal to 70 % determined using C.I.E. (1976) standard illuminant "A" with a 2° observer over the wavelength range of 380 nm to 770 nm using a Lambda 9 spectrophotometer commercially available from Perkin Elmer or a BYK-Gardner TCS spectrophotometer commercially available from BYK-Gardner and the reflected color is defined by -10 ≤ a ≤ 0 and -15 ≤ b* ≤ 5 using the CIELAB system and being determined using an illuminant "D65" with a 10° observer.*"

As compared to the main request, Claim 1 of the **first auxiliary request** has been amended as follows:

"*1. A coated article [...] one aesthetic coating ~~having a thickness of up to 1000 Å and~~ consisting of ~~at least one~~ a first zinc stannate layer having a thickness in the range of 100 Å to 300 Å and ~~at least one~~ a second titania layer having a thickness in the range of 100 Å to 300 Å deposited [...] with a 10° observer.*"

As compared to the main request, Claim 1 of the **second auxiliary request** has been amended as follows:

"*1. A coated article ~~comprising~~ consisting of:*
a first substrate selected from glass or polymeric material; and ~~a multi-layer coating stack consisting of~~ one aesthetic coating having a thickness of up to 1000 Å [...] with a 10° observer."

As compared to the main request, Claim 1 of the **third auxiliary request** has the following amendments:

"*1. A coated article ~~comprising~~ consisting of:*
a first substrate selected from glass or polymeric material; and ~~a multi-layer coating stack consisting of~~ one aesthetic coating ~~having a thickness of up to 1000 Å and~~ consisting of ~~at least one zinc~~ a first stannate layer having a thickness in the range of 100 Å to 300 Å and ~~at least one~~ a second titania layer [...] with a 10° observer."

V. Oral proceedings took place on 6 March 2015.

VI. The appellant's arguments that are relevant to the present decision can be summarised as follows:

The "visible light reflectance" was closely related to the luminous transmittance and it was a matter of course for the skilled person that the measurement of the visible light reflectance was performed under the same conditions as for luminous transmittance. The skilled person knew that the calculation shown in Table 1 for the reflectance was not standard and was not to be used for the reflectance value given in the claim.

Since the prior art indicated on which side the reflectance was measured, it was evident that where no indication of the measurement side was given, the values determined on both sides were meant. These values had to be within the range given in claim 1. This applied to both the determination of the colour and the reflectance and was evident from the description (page 5, line 8 from the bottom) where R1 and R2 were indicated together.

In view of the Lta values and the L* values of samples A, B and E, the reflectance of said samples had to be within the range of 8% to 30%. Said samples would show that a coating consisting of titania and zinc stannate would inevitably lead to a reflectance in the range of 8% to 30%. The fact that the aesthetic coating consisted of titania and zinc stannate within a certain thickness range and that the luminous transmittance was greater than or equal to 70% implied that the visible light reflectance was always within the range of 8% to 30%, independently of the method of measurement.

There were only a few parameters to be varied in order to produce a coated article meeting the optical requirements set forth in the claims. Considering the three examples within the scope of the claims and the general teaching given in the description, the skilled person would only need to conduct a very limited number of experiments to obtain further embodiments within the whole scope of the claims.

None of the documents D1 to D6 disclosed high transmission glasses having a transmission of greater than or equal to 70%. D7 to D11 and D13 all included metallic layers and D12 described an ultraviolet ray absorbent film and an intermediate film. D14 to D16 related to low emissivity coatings and not to aesthetic coatings.

VII. Requests

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims according to the main request or one of

the auxiliary requests 1 to 3, all requests submitted with letter of 4 February 2015.

Reasons for the Decision

Article 84 EPC

1. Main request

1.1 Statutory law

(A) Article 84 EPC requires that the claims define the matter for which protection is sought.

This means that

(1) the claims must be clear in themselves when read by the skilled person.

(2) the method for measuring a parameter (or at least a reference thereto) must appear completely in the claim itself, if the invention is characterised by a parameter to clearly define the scope of the claims. This is set out in numerous decisions (e.g. T 1156/01 (reasons 2.2 and 2.3), T 412/02 (reasons 5.6 to 5.9), T 908/04 (reasons 3.1 to 3.8), T 555/05 (reasons 3.2.7) and T 1497/08 (reasons 2.2 to 2.6)).

(3) the applicant who chooses to define the scope of the claim by parameters should ensure that a skilled person can easily and unambiguously verify whether he is working inside or outside the scope of the claim.

(B) the requirements of Article 84 EPC would still be met if it could be convincingly shown that

(i) the method to be employed belongs to the skilled person's common general knowledge, or

(ii) all the methodologies known in the relevant technical field for determining this parameter yield the same result within the appropriate limit of measurement accuracy (see e.g. T 1156/01 (reasons 2.3)).

1.2 The present case

In the present case, claim 1 contains several parameters, namely
(a) the "visible light reflectance",
(b) "reflected color" and
(c) the "luminous transmittance".

As to (c), a measurement method is given in claim 1 for the luminous transmittance (Lta) and it is accepted that said method makes it possible to provide reproducible data for the Lta.

As to (b), a measurement method is given for the reflected color. However, this indication is incomplete, since it is not specified on which side of the article the measurement is to be taken.

As to (a), no measurement method at all is contained in claim 1 for the visible light reflectance.

As far as the reflected color (b) and the visible light reflectance (a) are concerned, the board will therefore verify whether conditions (i) and (ii) (see 1.1. (B)) are fulfilled.

1.3 Reflected color / visible light reflectance

Condition (ii) [result is the same, irrespective of the methodology]

As is apparent from Table 1 of the application as filed, the reflected colour was determined on the coated side and on the non-coated side.

The visible light reflectance values were calculated accordingly (R1 and R2) from the L* values obtained. There are considerable differences between the values L*, a* and b* obtained when measured on one side of the article compared to the values obtained from the measurements on the other side. This is also true for the calculated visible light reflectance values (divergence of up to 20%).

Therefore condition (ii) cannot be considered to be fulfilled.

Condition (i) [method is part of common general knowledge]

Furthermore, it cannot be argued that it was either known to the skilled person or evident in view of the disclosure on page 5, line 28 ("*whether R1 or R2*") that the reflected colour of the article is always determined on both sides of the article, since in samples A to E of example 1 only one value is given for L*, a* and b*, respectively.

It has not been specified on which side this value was obtained. This finding is also in line with the prior art, in which it is specified on which side the reflected colour was determined (see for example D3:

claim 1: glass side reflectance vs. coated side reflectance; D4: column 5, lines 56 and 57, column 6, lines 12 and 13: "*from the uncoated glass surface*"; D10 and D11: claim 1: "*reflected color when viewed from the glass side*"; D15: column 5, lines 65 to 67 and D16: column 5, lines 62 to 64: "*luminous reflectance [...] from the coated side [...] from the uncoated side of the glass*").

Therefore condition (i) is considered not to be fulfilled either.

1.4 Visible light reflectance

1.4.1 Condition (i)[method is part of common general knowledge]

The "visible light reflectance" is a parameter for which no generally accepted measuring method exists. At the priority date of the patent application, several methods, such as ASTM 308-85 (see D11: column 9, lines 24 to 30) and JIS R3106, existed. They made it possible to determine simultaneously transmission, visible light reflectance and colour values.

Therefore, in a first approach it could be accepted that visible light reflectance (a) and luminous transmission (c) are obtained under the same conditions.

However, a closer look shows that this is not in line with the disclosure of the present patent application. As is apparent from Table 1 ("*A 2°*") and indicated in claim 1, the luminous transmittance (parameter (c)) was determined using C.I.E. (1976) standard illuminant "A" with a **2°** observer over the wavelength range of 380 nm

to 770 nm using a Lambda 9 spectrophotometer commercially available from Perkin Elmer or a BYK-Gardner TCS spectrophotometer commercially available from BYK-Gardner (see also page 23, lines 13 to 16 of the application). However, the reflected colour values (parameter (b)) L*, a* and b* shown in Table 1 were determined using an illuminant "D65" with a **10°** observer. The visible light reflectance values (parameter (a)) R1 and R2 were apparently calculated from L* as indicated in the last column of Table 1.

Therefore, the luminous transmittance (parameter (c)) and the visible light reflectance (parameter (a)) values presented in Table 1 were not obtained under the same measurement conditions. The skilled person would not know which conditions to employ for measuring the visible light reflectance (parameter (a)) indicated in claim 1.

Condition (i) mentioned above (point 1.1 (B)) cannot be considered to be fulfilled.

1.4.2 Condition (ii) [result is the same, irrespective of the methodology]

It is known that the values obtained with a 10° observer are not identical to the values obtained with a 2° observer. No data are available to prove the contrary or to prove that the values obtained by the different methods are within the appropriate limit of measurement accuracy.

Condition (ii) cannot be considered to be fulfilled either.

1.4.3 Disclosure of the description

According to the description (page 5, lines 27 to 29), the reflected colour (parameter (b)) is determined with a 10° observer, as is conventional in the automotive field. This does not mean that the skilled person would have recognised from this that the visible light reflectance (parameter (a)) was also always determined with a 10° observer, since this indication related to the reflected colour value only.

In addition, it has not been indicated there how the visible light reflectance values R1 and R2 (parameter (a)) presented in Table 1 are calculated from L*. Furthermore, claim 1 is not really limited to the automotive field, so it cannot be argued that it was implied that all the parameters (a), (b) and (c) present in claim 1 had to be regarded as known to the skilled person of the automotive field. As indicated above (point 1.4.1), it rather seems that the skilled person would have expected all the parameters to be determined under the same conditions in view of the standard methods known to him.

1.4.4 Parameter ranges

A coated article according to claim 1 comprises
- a first substrate selected from glass or polymeric material; and
- a multi-layer coating stack consisting of one aesthetic coating having a thickness of up to 1000 Å and consisting of at least one zinc stannate layer having a thickness in the range of 100 Å to 300 Å and at least one titania layer having a thickness in the range of 100 Å to 300 Å deposited over at least a portion of the substrate.

The appellant alleged that such a coated article will always have the parameters within the ranges given in claim 1.

This is neither plausible nor corroborated by data.

Although claim 1 has been considerably restricted with respect to claim 1 as originally filed, there are still many embodiments falling within the scope of claim 1 that can vary substantially depending on the type of polymer or type of glass and thickness of the first substrate, and depending on the thickness and crystal structures of the zinc stannate and titania to be deposited on the substrate.

There is not a single example or sample falling within claim 1 and that would support said allegation.

This is also in line with the argument brought forward by the appellant with respect to Article 83 EPC that the skilled person would only need to conduct a very limited number of experiments to obtain further embodiments within the whole scope of the claims. If the allegation discussed above was correct, no experiments at all would be necessary.

The board cannot accept this line of argument.

1.5 Conclusion

Neither the measuring method of the reflected colour (parameter (b)) nor that of the visible light reflectance (parameter (a)) has been clearly defined, so that the scope of claim 1 is not known.

Claim 1 does not fulfil the requirements of Article 84 EPC.

2. First to third auxiliary requests

The limitations introduced in the auxiliary requests do not overcome the objections raised to claim 1 of the main request.

It is true that claim 1 of the third auxiliary request, which is the most limited claim 1 of all the requests, is now limited to a coated article consisting of a first substrate selected from glass or polymeric material; and one aesthetic coating consisting of a first stannate layer having a thickness in the range of 100 Å to 300 Å and a second titania layer.

However, the allegation that such an article will inevitably have the parameters within the range claimed can still not be followed, for the same reasons as given in 1.4.4 above. The type of substrate and the thickness and crystal structure of stannate and titania have a considerable influence on luminous transmittance (parameter (c)) and visible light reflectance (parameter (a)) so that this allegation does not appear plausible.

Therefore, the objection raised to the main request also applies to the claims of the auxiliary requests, and these requests must also fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Vodz G. Raths

Decision electronically authenticated