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Datasheet for the decision of 2 February 2010

Case Number: T 1042/08 - 3.2.07

Application Number: 04100333.6

Publication Number: 1445035

IPC: B05D 3/02

Language of the proceedings: EN

Title of invention:
A photocurable composition and a method of applying same

Applicant:
Ford Global Technologies, LLC

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 84
EPC R. 115(2)
RPBA Art. 15(3)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Non attendance at oral proceedings, clarity (no), novelty (no)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1042/08 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 2 February 2010

Appellant: Ford Global Technologies, LLC
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 29 May 2007 refusing European application No. 04100333.6 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: H. Meinders
Members: H. Hahn
E. Dufrasne

Summary of Facts and Submissions

I. The applicant lodged an appeal against the decision of the Examining Division to refuse the European patent application No. 04 100 333.6.

The Examining Division held that the subject-matter of the independent claims 1 and 9 of the single request dated 19 October 2006 lacked novelty with respect to D1 (WO-A-00 67919), D2 (WO-A-02 053298) and D3 (WO-A-03 068878). Furthermore, as an *obiter dictum* the Examining Division considered that the feature a "reduced wavelengths range, consisting in the absorbed light wavelengths of the concerned photoinitiator" introduced into the subject-matter of claims 1 and 9 of that request extended beyond the content of the application as originally filed and thus did not comply with Article 123(2) EPC.

II. With its grounds of appeal the appellant requested to set aside the decision and to refer the application back to the Examining Division on the basis of the single set of claims 1-9, filed with said grounds of appeal. In case that the Board should consider a decision other than according to this request, an oral hearing was requested.

III. The independent claims 1 and 9 as submitted with the grounds of appeal read as follows:

"1. A dual-curable clearcoat composition comprising:
a photocurable composition comprising:
a polymer-forming component selected from the group consisting of photocurable oligomers, photocurable

monomers, and mixtures thereof;

a first photoinitiator that absorbs light in a first spectral region such that more photocuring of the photocurable composition occurs at a first position near a surface of the coating than at a second position further away from the surface of the coating; and

a second photoinitiator that absorbs light in a second spectral region such that photocuring of the photocurable composition occurs throughout the coating;

a thermally curable clearcoat composition that is curable by heat into a clear coating;

wherein the dual-curable composition is curable into a clearcoat on a substrate by:

applying the dual-curable composition to the substrate to form an uncured coated substrate;

illuminating the uncured coated substrate with light to form a photocured coated substrate; and heating the photocured substrate to form the clearcoat on the substrate, wherein the photocurable composition is from 1 % to 30% of the combined weight of the photocurable composition and the thermally curable clearcoat composition."

"9. A method of applying a clearcoat coating to a substrate, the method comprising:

combining a photocurable composition comprising:

a polymer-forming component selected from the group consisting of photocurable oligomers, photocurable monomers, and mixtures thereof;

a first photoinitiator that absorbs light in a first spectral region such that more photocuring of the photocurable composition occurs at a first position near a surface of the coating than at a second position further away from the surface of the coating; and

a second photoinitiator that absorbs light in a second spectral region such that photocuring of the photocurable composition occurs throughout the coating, with a thermally curable clearcoat composition to form a dual-curable composition, the durable curable composition is curable by both illumination with light and by exposure to heat;

applying the dual-curable composition to the substrate to form a coated substrate;

illuminating the coated substrate with light for a sufficient period of time to cure the coated substrate into a photocured coated substrate; and

applying heat to the photocured substrate for a sufficient time to cure the photocured coated substrate into a clearcoat-coated substrate."

IV. With a communication dated 28 September 2009 and annexed to the summons to oral proceedings the Board gave its preliminary opinion with respect to the claims of the single request as filed with the grounds of appeal, annexing photocopies of documents D4 (UV Curing Technical principle and mechanism, Ciba Speciality Chemicals Inc, Basel, Switzerland, April 2002, pages 1-8) and D5 (BASF Technical Information Lucirin^{R} TPO, June 2001, BASF Corporation, Charlotte, NC 28273, USA, pages 1-4).

First of all, the Board remarked that it had the power to examine whether or not the application and the invention to which it related met the requirements of the EPC and that this also held good for requirements the Examining Division had not considered in the examination proceedings or had regarded as fulfilled.

The Board stated amongst others that in the scheduled oral proceedings the questions of clarity (Article 84 EPC) and novelty of the composition claim 1 and process claim 9 with respect to D1 (Article 54 EPC) would be discussed. The Board then gave its preliminary opinion that the subject-matter of claims 1 and 9 was not clear and lacked novelty over D1 in the following terms:

"4. Clarity (Article 84 EPC)

With respect to the issue of clarity the Board makes the following remarks:

4.1 First of all, the dual-curable clear coat composition of independent claims 1 and 9 is defined as "comprising":

a) "a photocurable composition comprising: a polymer-forming component selected from the group consisting of photocurable oligomers, photocurable monomers and mixtures thereof";
b) "a thermally curable clearcoat composition that is curable by heat into a clearcoat coating.

However, the said definitions do **neither** exclude that the "photocurable composition" may be identical with the "thermally curable composition" **nor** that the "thermally curable composition" is also cured by illumination with light.

In such a case the feature of claim 1 "wherein the photocurable composition is from 1% to 30% of the combined weight of the photocurable composition and the thermally curable clearcoat composition" appears to

render claim 1 unclear since it does not restrict the composition *per se* but appears to represent only a limitation with respect to the intended application process and the curing mechanisms to be applied.

The Board also remarks that the subject-matter of claim 1 is interpreted as being directed to the **uncured** dual-curable clearcoat composition.

4.2 The relative terms "**spectral region**" - with respect to the definition of the two photoinitiators which absorb light in "a first **spectral region**" and "a second **spectral region**" - used in independent claims 1 and 9 have no well-recognised meaning and thereby appear to render claims 1 and 9 unclear.

Additionally, it appears to be very unlikely that two different photoinitiators having two different chemical formulas will absorb light in identical (same) wavelengths ranges, i.e. in the same "spectral region".

4.3 Furthermore, it seems that the features "**such that more photocuring … occurs** at a first position near a surface of the coating than at a second position further away from the surface of the coating" and "**such that photocuring … occurs** throughout the coating" attempt to define the result to be achieved. It appears, however, to be possible to define the subject-matter in more concrete terms, i.e. how this effect is to be achieved by actual technical features of the composition.

It appears also to be questionable as to whether these features are suitable to characterise the claimed uncured composition.

4.4 Likewise it appears to be questionable as to whether the process features in composition claim 1 "**wherein the dual-curable composition is curable … by**: **applying** the dual-curable composition to the substrate … **illuminating** … and **heating** …" are necessary, as they do not seem to characterise the **uncured** composition *per se*.

5. Novelty (Article 54 EPC)

Concerning the issue of novelty the Board makes the following remarks.

5.1 It appears that example 1 of D1 is actually novelty destroying. D1 discloses a coating composition and a method for producing a coated substrate; said coating composition comprises a binder component which may be a polymer or oligomer and examples of suitable binders include (meth)acryloyl-functional (meth)acrylic copolymers, polyether acrylates, polyester acrylates, ethylenically unsaturated polyester, polyesters, epoxy acrylates, urethane acrylates, aminoalkyl acrylates, melamine acrylates, silicone acrylates and phosphazene acrylates, and the corresponding methacrylates (see page 22, line 7 to 12). The composition can comprise at least one photoinitiator, e.g. commercial ones such as Irgacure^{R} 184, Irgacure^{R} 1800, Irgacure^{R} 500, or Genocure^{R} MBF or Lucirin^{R} TPO (see page 25, lines 22 to page 26, line 10) and may comprise an initiator for thermal curing (see page 26, lines 16 to 26). Said

coating composition can be a clearcoat (see claims 1 and 5).

According to example 1 a clearcoat composition I comprising (in parts by weight) 100 Ebecryl^{R} 5129 urethane (meth) acrylate, 100 Desmophen^{R} polyester polyol, 2.5 of a commercial photoinitiator (Irgacure^{R} 819 and Lucirin^{R} TPO), 0.6 of a commercial UV absorber (mixture of Tinuvin^{R} 400 and Neutral-HALS and a sterically hindered phenol) and 50 of a commercial oligomeric acrylate Roskydal^{R} 2545 was made and applied by spray coating and thereafter partially cured. On this first coating composition I a second coating composition II comprising 30 Ebecryl^{R} IRR 351 (meth)acrylate oligomer, 10 Servocure^{R} RTT 192 reactive diluent, 10 of a commercial dispersion of nanoparticles of a multifunctional monomer (High Link OG 103-31), 2 of a commercial photoinitiator (Lucirin^{R} TPO), 1 of a commercial UV absorber (Cyagard 1164L) and 0.05 of a commercial wetting agent on siloxane basis were mixed and applied by spray coating onto the partially cured first layer and then both layers were cured by UV radiation and thermal curing (see page 42, line 30 to page 45, line 28).

Clear coat composition I thus comprised in total 253.1 parts by weight including 50 parts by weight of the oligomeric acrylate Roskydal^{R} 2545 (50/253.1 = 19.75 % by weight) and it was partially cured by UV light and then fully cured by thermal curing through heating which implies that all other components of said composition I were thermally curable. Said oligomeric Roskydal^{R} 2545 having free isocyanate groups and acrylate groups represents an urethane acrylate which

is covered by the preferred "acrylated urethane oligomers" as specified in claim 8 of the single request as the polymer-forming component of the photocurable composition.

As derivable from D4 (= UV Curing Technical principle and mechanism, Ciba Speciality Chemicals Inc, Basel, Switzerland, April 2002, pages 1-8), Irgacure^{R} 819 absorbs at wave lengths of 295 and 370 nm while Lucirin^{R} TPO (= 2,4,6-trimethylbenzoyldiphenylphosphine oxide which corresponds to the commercial product sold as Darocur^{R} TPO which is also available from CIBA) absorbs at 295, 368, 380 and 393 nm (compare D4, page 7, first diagram showing the UV absorption spectra of Irgacure 819, Irgacure 2020, Darocur TPO and Darocur 4265; and D5 (=BASF Technical Information Lucirin^{R} TPO, June 2001, BASF Corporation, Charlotte, NC 28273, USA, pages 1-4), page 2, UV absorption spectrum of Lucirin). Copies of D4 and D5 are annexed to the communication.

Hence the composition according to said example 1 represents a clearcoat composition comprising 19.75 wt.% of a photocurable oligomer and the remainder of a thermally curable clearcoat composition which implicitly - due to the disclosed two photinitiators (compare present application as originally filed, page 20, lines 6 to 12 and examples 1, 3, 5, 8, 9 and 11 which comprised as photoinitiators Irgacure^{R} 819 and Darocur 4265 which comprises said Darocur TPO, i.e. 2,4,6-trimethylbenzoyldiphenylphosphine oxide) - appears to meet the requirement of promoting curing of the coating composition at the surface by said Irgacure^{R} 819 and providing through curing thereof by said Lucirin^{R} TPO. Therefore the clearcoat composition of

example 1 appears to be novelty destroying for the subject-matter of claim 1 while the described process of example 1 appears to be novelty destroying for the subject-matter of independent method claim 9."

and

"5.4 Hence the single request appears not to be allowable under Article 54 EPC."

The appellant was given the opportunity to file observations to the communication.

V. With letter dated 8 January 2010 the appellant submitted, as response to the Board's communication, a single set of claims 1-8 in combination with arguments concerning the allowability under Article 123(2) EPC of the amendments made therein. Furthermore, it considered that the claims satisfy Article 52 EPC since D1-D3 do not disclose the features of the amended claims and therefore it requested to remit the case to the Examining Division for further examination.

VI. Oral proceedings before the Board were held on 2 February 2010 in the absence of the appellant since, although the representative had not informed the Board that he would not attend the oral proceedings, no one appeared. The Board's registrar has called the representative's office without reaching anyone. The Board waited 30 minutes before starting with oral proceedings.

The appellant had requested in the written procedure that the decision under appeal be set aside and that

the application be returned to the Examining Division for further examination on the basis of the novelty of claims 1 to 8 filed with letter dated 8 January 2010.

At the end of the oral proceedings the Board announced its decision.

VII. Claims 1 and 8 of the single request under consideration read as follows (additions with respect to claims 1 and 9 underlying the communication of the Board of 28 September 2009 are in bold type):

"1. A dual-curable clearcoat composition comprising:
a photocurable composition comprising:

a polymer-forming component selected from the group consisting of photocurable oligomers, photocurable monomers, and mixtures thereof;

a first photoinitiator that absorbs light in a first spectral region such that more photocuring of the photocurable composition occurs at a first position near a surface of the coating than at a second position further away from the surface of the coating; and

a second photoinitiator that absorbs light in a second spectral region such that photocuring of the photocurable composition occurs throughout the coating;

a thermally curable clearcoat composition that is curable by heat into a clear coating;

wherein the dual-curable composition is curable into a clearcoat on a substrate by:

applying the dual-curable composition to the substrate to form an uncured coated substrate;

illuminating the uncured coated substrate with light to form a photocured coated substrate; and heating the photocured substrate to form the clearcoat on the

substrate,
wherein the photocurable composition is from 1 % to 30% of the combined weight of the photocurable composition and the thermally curable clearcoat composition;
wherein the first photoinitiator is characterized by one or more of the following: an extinction coefficient at a light wavelength of about 302 nm that is less than about 1.0 x 10^4 ml /(g-cm), an extinction coefficient at a light wavelength of about 313 nm that is less than about 1.0 x 10^4 ml / (g-cm), and an extinction coefficient at a light wavelength of about 365 nm that is less than about 1.0 x 10^3 ml / (g-cm) and the second photoinitiator is characterized by one or more of the following: an extinction coefficient at a light wavelength of about 302 nm that is greater than about 1.0 x 10^4 ml / (g-cm), an extinction coefficient at a light wavelength of about 313 nm that is greater than about 1.0 x 10^4 ml /(g-cm), and an extinction coefficient at a light wavelength of about 365 nm that is greater than about 1.0 x 10^3 ml / (g-cm)."

"8. A method of applying a clearcoat coating to a substrate, the method comprising:

combining a photocurable composition comprising:

a polymer-forming component selected from the group consisting of photocurable oligomers, photocurable monomers, and mixtures thereof;

a first photoinitiator that absorbs light in a first spectral region such that more photocuring of the photocurable composition occurs at a first position near a surface of the coating than at a second position further away from the surface of the coating; and

a second photoinitiator that absorbs light in a second spectral region such that photocuring of the

photocurable composition occurs throughout the coating, with a thermally curable clearcoat composition to form a dual-curable composition, the durable curable composition is curable by both illumination with light and by exposure to heat;

applying the dual-curable composition to the substrate to form a coated substrate;

illuminating the coated substrate with light for a sufficient period of time to cure the coated substrate into a photocured coated substrate; and

applying heat to the photocured substrate for a sufficient time to cure the photocured coated substrate into a clearcoat-coated substrate;

wherein the first photoinitiator is characterized by one or more of the following:

an extinction coefficient at a light wavelength of about 302 nm that is less than about 1.0×10^4 ml / (g-cm), an extinction coefficient at a light wavelength of about 313 nm that is less than about 1.0×10^4 ml / (g-cm), and an extinction coefficient at a light wavelength of about 365 nm that is less than about 1.0×10^3 ml / (g-cm) and the second photoinitiator is characterized by one or more of the following: an extinction coefficient at a light wavelength of about 302 nm that is greater than about 1.0×10^4 ml / (g-cm), an extinction coefficient at a light wavelength of about 313 nm that is greater than about 1.0×10^4 ml / (g-cm), and an extinction coefficient at a light wavelength of about 365 nm that is greater than about 1.0×10^3 ml / (g-cm)."

VIII. The appellant argued in its letter dated 8 January 2010 as follows:

The amendments have been submitted late since they were only recently approved by the applicant. Claim 1 has been amended by incorporation of the content of claim 3 which has been deleted. Claim 8 has been amended by incorporation of the content of claim 10. Claim numbering and dependency have been amended to be consistent with these amendments. As the amendments are based on the application as filed they do not offend Article 123(2) EPC.

D1 to D3 do not disclose the features of the amended claims 1 and 8 (see point 1.2 for the exact wording). Therefore it is requested to remit the case to the Examining Division for further examination as stated in the summons to the oral proceedings.

Reasons for the Decision

1. On considering the case at the oral proceedings, duly held pursuant to Rule 115(2) EPC without the appellant, the Board came to the conclusion that the subject-matter of claims 1 and 8 - which differ from claims 1 and 9 dealt with in the Board's communication annexed to the summons only in that additional features concerning the extinction coefficients of the first and second photoinitiator have been incorporated (see the parts in bold type in point VII) - lacked clarity and novelty for the reasons already set out in the Board's communication. Thus there existed no need to verify

whether or not the amendments complied with Article 123(2) EPC.

1.1 In the communication accompanying the summons for oral proceedings the Board raised objections under Articles 84 and 54 EPC, explaining why in the Board's opinion the subject-matter claimed in claims 1 and 9 of the single request as filed with the grounds of appeal was held to lack clarity and novelty over the disclosure of D1.

1.1.1 Claims 1 and 8 of the present amended single request still comprise **all** the features objected to in the Board's communication under Article 84 EPC (see point VII above) and the appellant's reply is absolutely silent with respect to said clarity objections.

1.1.2 The additions (see the text in bold type in point VII) do not address these clarity issues either, in particular not those of points 4.1, 4.3 and 4.4 of the Board's communication.

1.2 With respect to the novelty objection in its reply to the Board's communication the appellant only made the statement "*D1-D3 does not disclose the features of amended claims 1 and 9 [sic] and we therefore consider amended claims 1-9 [sic] satisfy Article 52 EPC*". It did not go into any of the Board's objections supported by calculations made in that communication, with respect to the disclosure of example 1 of D1 in the light of documents D4 and D5.

Particularly, it has **not substantiated** that the first photoinitiator according to example 1 of D1 (i.e. the

commercial BASF product Lucirin TPO^R corresponding to the CIBA product Darocur TPO^R) in the light of D4 and/or D5 does not fulfil that "the first photoinitiator is characterized by one or more of the following …" extinction coefficient requirements as defined in (now) claims 1 and 8. However, it would have been possible to verify whether or not this is the case taking account of Lambert-Beer's Law and the absorption spectra of either Lucirin TPO^R disclosed in D5 (see page 2, absorption spectrum) or that of Darocur TPO^R given in D4 (see page 7, first absorption spectrum). The second photoinitiator according to said example 1 of D1 - Irgacure^R 819 - represents one preferred embodiment of the present application (see e.g. page 14, lines 9 and 10; page 20, lines 9 to 12; Table 1) and thus will fulfil said extinction requirements according to claims 1 and 8.

1.3 The appellant did **not** attend the oral proceedings which were scheduled for and held on 2 February 2010.

Article 15(3) RPBA stipulates that the Board shall not be obliged to delay any step in the proceedings, including its decision, by reason only of the absence at the oral proceedings of any party duly summoned who may then be treated as relying on its written case.

1.4 Since the mere additions to the claims, without supporting arguments on the part of the appellant, cannot refute or overcome the objections raised by the Board in its communication, the Board has **no** reason to depart from its preliminary opinion expressed therein.

2. With regard to the above, the Board concludes - for the reasons set out in the communication (see point IV above) - that claims 1 and 8 are not allowable under Article 84 EPC and that the subject-matter of claims 1 and 8 lacks novelty over example 1 of D1 (Article 54 EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Nachtigall H. Meinders