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**Datasheet for the decision
of 26 April 2023**

Case Number: T 0802/20 - 3.3.03

Application Number: 08797021.6

Publication Number: 2183298

IPC: C08G75/04, C09D181/02

Language of the proceedings: EN

Title of invention:

PROCESS FOR FORMING MULTILAYER COATING WITH RADIATION CURABLE
POLYENE/POLYTHIOL COATING COMPOSITIONS

Patent Proprietor:

PPG Industries Ohio, Inc.

Opponents:

isarpatent - Patent- und Rechtsanwälte Behnisch
Barth Charles Hassa Peckmann und Partner mbB
BASF Coatings GmbH

Relevant legal provisions:

RPBA 2020 Art. 12(4)
EPC Art. 56

Keyword:

Amendment to case - exercise of discretion
Inventive step - (yes)



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Case Number: T 0802/20 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 26 April 2023

Appellant: PPG Industries Ohio, Inc.
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Respondent: BASF Coatings GmbH
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 10 February
2020 revoking European patent No. 2183298
pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman D. Semino
Members: D. Marquis
W. Ungler

Summary of Facts and Submissions

- I. The appeal lies against the decision of the opposition division revoking European patent No. 2 183 298.
- II. Claim 1 of auxiliary request 2 (filed during the oral proceedings on 15 January 2020) on which the contested decision was based read as follows:

"1. A process for forming a multilayer coating on a substrate comprising:

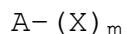
(a) forming a basecoat layer on the substrate, wherein the basecoat layer is deposited from a waterborne composition or an organic solventborne composition;

(b) forming a clear topcoat layer on the basecoat layer by depositing a radiation curable topcoat composition onto the basecoat layer in which the topcoat composition comprises:

(i) a polyene,

(ii) a polythiol;

(c) exposing the topcoat composition to radiation to cure the topcoat, wherein the polyene has the structural formula



where A is an organic moiety, X is an olefinically unsaturated moiety and m is at least 2 and $A-(X)_m$ is a polyurethane (meth)acrylate, wherein the polyurethane (meth)acrylate is the reaction product of polyisocyanates with hydroxyalkyl (meth)acrylates in a NCO/OH equivalent ratio greater than 1 to form a NCO-containing reaction product that then is chain extended with a polyol."

III. The following documents were *inter alia* cited in the opposition procedure:

D4: Charles E. Hoyle, Tai Yeon Lee, Todd Roper: "Thiol-
enes: Chemistry of the past with promise for the
future", Journal of Polymer Science: Part A: Polymer
Chemistry, vol. 42, 2004, pages 5301-5338

D8: US 4 234 676

D15: US 6 639 046 B1

IV. As far as it is relevant to the present case, the decision under appeal considered that document D15 was the closest prior art and that the subject-matter of claim 1 of auxiliary request 2 lacked an inventive step over D15 in combination with D4 and D8.

V. The patent proprietor (appellant) lodged an appeal against the decision of the opposition division and submitted an experimental report (D22) with their statement setting out the grounds of appeal together with a main request and five auxiliary requests. The main request corresponded to auxiliary request 2 in opposition.

VI. Respondent I (opponent 1) provided a reply to the statement setting out the grounds of appeal. Respondent II (opponent 2) did not submit any reply to such a statement, nor filed any request in appeal.

VII. The parties were summoned to oral proceedings and a communication pursuant to Article 15(1) RPBA 2020 indicating specific issues to be discussed at the oral proceedings was sent to the parties.

VIII. Oral proceedings were held on 26 April 2023 by videoconference in the presence of the appellant and

Respondent I, Respondent II having indicated by letter of 2 March 2023 that they would not take part at the oral proceedings.

IX. The final requests of the parties were as follows:

(a) The appellant requested that the decision under appeal be set aside and the patent be maintained on the basis of the main request or of any of the first to fifth auxiliary requests, all submitted with the statement setting out the grounds of appeal.

(b) Respondent I (opponent 1) requested that the appeal be dismissed.

X. The appellant's arguments, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They are essentially as follows:

- The experimental report D22 was relevant to the question of inventive step of the main request and should be admitted into the proceedings.
- Example 21 of D15 was the most relevant starting point for the assessment of inventive step. Claim 1 of the main request differed from that example in that (i) the topcoat was cured by exposure to radiation and (ii) the polyene was a urethane acrylate. D22 showed the presence of an effect. The problem was to improve gloss, distinctness of image (DOI), König hardness and adhesion. The solution to that problem was not rendered obvious by the cited prior art. Claim 1 of the main request involved

therefore an inventive step over D15.

XI. Respondent's I arguments, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They are essentially as follows:

- D22 was filed late and should not be admitted into the proceedings on that basis.
- Starting from the closest prior art D15, neither the patent in suit nor D22 showed an effect of the distinguishing features. One could therefore formulate partial problems associated to each of these features. The first problem was to modify the process of D15 for faster curing of the topcoat. The use of radiation as a solution was disclosed in D4. The use of urethane acrylates was instead an obvious solution to the problem of finding an alternative process as shown by D8. Claim 1 of the main request lacked therefore an inventive step over D15.

Reasons for the Decision

1. Admittance

1.1 D22 is an experimental report filed with the statement of grounds of appeal in order to show the presence of an effect over the closest prior art D15 (statement of grounds of appeal, point 2.3.3). As such, D22 is an amendment of the appellant's case according to Article 12(4) RPBA 2020 and its admittance into the appeal proceedings is subject to the discretion of the Board. That discretion is exercised in view of, inter alia, the complexity of the amendment, the suitability

of the amendment to address the issues which led to the decision under appeal, and the need for procedural economy taking into account also the provisions of Article 12(6) RPBA 2020, second sentence.

- 1.2 Claim 1 of auxiliary request 2 on which the decision is based (main request in appeal) corresponds to claim 1 of the second auxiliary request filed by the appellant by letter of 4 November 2019 before the opposition division. Section 5.3 of that letter also provided some arguments in favour of inventive step of the claims of the second auxiliary request in view of D15 as the closest prior art.
- 1.3 On 27 December 2019, in reply to these submissions, respondent I raised a corresponding objection of lack of inventive step (last but one paragraph on page 3 which can be seen as being implicitly based on D15) aimed at the distinguishing features (the topcoat cured by exposure to radiation and the polyene being a polyurethane acrylate).
- 1.4 Due to the oral proceedings having been held before the opposition division shortly after the letter of respondent I, namely on 15 January 2020, it is reasonable to consider that the appellant was not in a position to timely react to the objection of lack of inventive step before the oral proceedings.
- 1.5 The filing of D22 with the statement setting out the grounds of appeal can therefore be seen as having been made at the earliest opportunity. It cannot therefore be considered that D22 should have been submitted in opposition proceedings, so that Article 12(6) RPBA 2020, second paragraph does not apply.

1.6 D22 contains a comparison of properties (gloss, distinctness of image (DOI), König hardness and adhesion) also discussed in the examples of the patent in suit. D22 only describes two compositions that are clearly identified in the table of page 1 (Example G representing operative claim 1 and Example H representing the closest prior art) and concerns the question of whether an effect can be acknowledged for claim 1 of the main request (auxiliary request 2 on which the decision is based) which therefore directly addresses the issue which led to the decision under appeal (section 5.3). The complexity of D22 is also not such that it would compromise the need for procedural economy of the present case. Under these circumstances, the Board finds it appropriate to exercise its discretion by admitting D22 into the appeal proceedings.

Main request

2. Inventive step

2.1 The main request of the present appeal corresponds to auxiliary request 2 filed during the opposition proceedings. The decision under appeal concluded that claim 1 of that request lacked an inventive step over D15 as the closest prior art. Claim 1 of auxiliary request 2 was found to differ from D15 in that (i) the topcoat was cured by exposure to radiation and (ii) the polyene was a urethane acrylate having the claimed structure.

2.2 Both parties in appeal considered D15 as the closest prior art. The Board does not see a reason to depart from D15 as closest prior art. Within D15, example 21 discloses a process by which a topcoat was deposited on

commercial basecoats such as Autobase® (a solvent-borne basecoat) and Autowave® (a waterborne basecoat) (Table in column 7) before being cured at room temperature (column 13, line 3). In a first difference with the process of claim 1 of the main request, curing was not performed by radiation in example 21. The topcoat composition of example 21 comprises pentaerythritol tetrakis(3-mercaptopropionate) (PTMP), which is a polythiol according to claim 1 of the main request, and trimethylol propane triacrylate (TMPTA), which is not a polyurethane (meth)acrylate polyene as defined in claim 1 of the main request. It can therefore be acknowledged that the process defined in claim 1 of the main request differs from the process of example 21 in that (i) the topcoat is cured by exposure to radiation and (ii) the polyene is a urethane acrylate having the claimed structure.

2.3 The process of example 21 is more relevant than the process described in example 15 also cited in the proceedings which, on top of the distinguishing features identified above, does not disclose the application of a topcoat to a basecoat as required in operative claim 1. Example 21 is therefore the most relevant starting point within D15. In any case, an analysis of inventive step starting from example 15 cannot lead to a different conclusion as the one below in view of the two distinguishing features identified above.

2.4 According to the opposition division there was no evidence that the two distinguishing features of claim 1 of auxiliary request 2 resulted in an effect over the closest prior art and on that basis the problem was formulated as the provision of an alternative process to that of D15 (section 5.3.3-5.3.6 of the decision

under appeal). The appellant contested that conclusion in appeal and submitted that the experimental report D22 provided evidence that the process according to claim 1 of auxiliary request 2 provided non-obvious improvements over the closest prior art.

2.5 Example G shown in D22 provides a process making use of a clearcoat topcoat composition comprising a urethane acrylate (the polyurethane acrylate disclosed in example A of the patent in suit) and the polythiol of example B of the patent in suit (pentaerythritol tetrakis(3-mercaptopropionate)) together with further additives. The topcoat was applied to the basecoat of example C of the patent in suit (a solvent based basecoat) and was cured by exposing it to a UV lamp for 300 seconds. The topcoat composition of example G was used in example H except that trimethylolpropane triacrylate (TMPTA) was used instead of the urethane acrylate. The topcoat of example H was then applied in the same manner as in example G and cured under the same conditions.

2.6 Selected properties of these two coatings, namely gloss, distinctness of image (DOI), König hardness and adhesion are reported in table 2 on page 2 of D22. These coating properties are also the properties that are discussed in the examples of the patent in suit.

2.7 Since the processes of example G and H of D22 only differ in the type of polyene used, it is apparent that D22 shows the direct effect of the distinguishing feature (ii) relating to the polyene being a urethane acrylate having the claimed structure. Moreover, as Example H of D22 uses the same polyene (TMPTA) as the one was used in the topcoat composition of example 21 of D15, the comparison of the results reported in table

2 of D22 is a valid comparison with example 21 of D15 as the closest prior art.

- 2.8 Table 2 of D22 shows that the topcoat according to example G has an improved gloss (84.6 over 73.8), DOI (76.0 over 69.9), König hardness (35 over 31) and adhesion (0 over 1, a lower classification showing better adhesion) over the topcoat of example H.
- 2.9 Respondent I argued that D22 did not show a valid comparison since the curing conditions used in D22 ("exposure to the Clearstone CF1000 395nm UV lamp with the lamp 3.75 inches from the panels", last paragraph, page 1 of D22) were different from the conditions used in the patent in suit ("UV radiation for five (5) minutes with a 415 W Autoshot lamp, clear filter, 25 centimeters from the coating surface", paragraph 46).
- 2.10 Since the same curing conditions were used for the topcoats of example G and H in D22, the Board does not see how the curing conditions used in the patent in suit could be relevant to the data provided in D22 which is the sole evidence relied upon by the appellant to establish the presence of an effect over D15. The argument of respondent I was also first presented at the oral proceedings before the Board and it was not corroborated by any tangible evidence showing how the different curing conditions used in D22 and in the patent in suit could be seen as being relevant. Under these circumstances the argument raised by respondent I can only be seen as an allegation and it does not successfully challenge the validity of the comparison made in D22.
- 2.11 The problem solved over the closest prior art was formulated by the appellant as the provision of a

process for improving the gloss, DOI, König hardness, and adhesion of multilayer coatings. The Board finds that D22 supports that problem over the closest prior art. No evidence of an effect having been provided for the curing by radiation (distinguishing feature (i)) over D15, the problem formulated above is linked to the selection of the polyene as defined in claim 1 of the main request.

- 2.12 Respondent I argued that the use of a polyene of the class of urethane acrylates as defined in claim 1 of the main request would have been obvious to the skilled person in view of D8 (reply to the statement of grounds of appeal, point 4 on pages 5 and 6).
- 2.13 D8 concerns a method of forming a coating on a substrate for printing purposes (column 2, lines 20-24). D8 discloses a radiation curable composition comprising (1) an unsaturated acrylonitrile resin being a polyene, (2) a polyethylenically unsaturated acrylic or methacrylic acid ester, (3) a photoinitiator and (4) a polythiol (claim 1).
- 2.14 D8 indeed discloses the use of acrylurethane resins (column 5, lines 18-68). However, that disclosure is made in the context of printing plates and D8 does not give any indication that these polyenes would result in an improvement of the properties identified in the problem posed which concerns gloss, DOI, König hardness and adhesion. There would have therefore been no reason for the skilled person starting from D15, which does not concern printing plates, to consider urethane acrylates as suitable polyenes to solve the problem posed.

- 2.15 Respondent I also made reference to D4 (page 5320, right column, first paragraph; page 5329, left column, second paragraph) pertaining to radiation curing of thiol-acrylate systems. D4 however does not concern the use of urethane acrylates as defined in claim 1 of the main request and the document does also not teach the use of these polyenes to improve the properties mentioned in the posed problem. D4 therefore does not teach the solution of claim 1 of the main request.
- 2.16 On that basis, the Board arrives at the conclusion that claim 1 of the main request involves an inventive step over D15.
3. As no other objection is present, there is no further point to be decided by the Board and the decision is to be set aside.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the claims of the main request filed with the statement setting out the grounds of appeal and after any necessary amendments of the description.

The Registrar:

The Chairman:



D. Hampe

D. Semino

Decision electronically authenticated