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**Datasheet for the decision
of 16 April 2008**

Case Number: T 1270/04 - 3.3.01

Application Number: 99923213.5

Publication Number: 1088040

IPC: C09D 133/04

Language of the proceedings: EN

Title of invention:

Polyacrylics containing pendant acetoacetate moieties

Applicant:

E.I. DU PONT DE NEMOURS AND COMPANY

Opponent:

-

Headword:

Polyacetoacetate based coatings/E.I. DU PONT DE NEMOURS

Relevant legal provisions (EPC 2000):

EPC Art. 54, 56, 84, 123(2)
EPC R. 139

Keyword:

"Novelty - yes"
"Inventive step - yes - non obvious solution"

Decisions cited:

T 0002/81, G 0003/89, G 0011/91

Catchword:

-



Case Number: T 1270/04 - 3.3.01

D E C I S I O N
of the Technical Board of Appeal 3.3.01
of 16 April 2008

Appellant: E.I. DU PONT DE NEMOURS AND COMPANY
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 14 June 2004
refusing European application No. 99923213.5
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: P. Ranguis
Members: J.-B. Ousset
D. S. Rogers

Summary of Facts and Submissions

- I. This appeal lies from the decision of the examining division to refuse the European patent application No. 99 923 213.5, on the ground that the then pending main and first auxiliary requests lacked clarity and lacked novelty (Articles 84 and 54 EPC).
- II. Claims 1 and 2 of the main request on which the refusal is based read as follows:

"1. A coating composition comprising:

a crosslinking component comprising a polyketimine having an average of at least two ketimine functionalities per polyketimine molecule; and

a binder component comprising:

a polyacetoacetate with a Tg in the range of 40°C to 150°C and having at least two acetoacetate functionalities, said polyacetoacetate being polymerized from a monomer mixture comprising an acetotacetate functionalized monomer and a methacrylate monomer, a styrene monomer, or a combination thereof, said methacrylate and styrene monomers each having a bulky pendant moiety, wherein a coating from said coating composition at a two-hour cure has a Persoz hardness of about greater than or equal to 60 for a dry film thickness of greater than or equal to 40 microns."

"2. A coating composition comprising:

a crosslinking component comprising a polyamine, a polyketimine, or a combination thereof, wherein said polyamine has an average of at least two amine functionalities per polyamine molecule and wherein said

polyketimine has an average of at least two ketimine functionalities per polyketimine molecule; and a binder component comprising: a polyacetoacetate with a Tg in the range of from 55°C to 150°C and having at least two acetoacetate functionalities, said polyacetoacetate being polymerized from a monomer mixture comprising an acetoacetate functionalized monomer and a methacrylate monomer, a styrene monomer, or a combination thereof, said methacrylate and styrene monomers each having a bulky pendant moiety, wherein a coating from said coating composition at a two-hour cure has a Persoz hardness of about greater than or equal to 60 for a dry film thickness of greater than or equal to 40 microns."

III. The following documents have been cited by the examining division in its grounds of refusal. They are renumbered as follows:

(1) US-A-5,288,804

(3) WO-A-97/43325

IV. In its decision, the examining division held that the word "bulky" found in claims 1 and 2 rendered the claims unclear and could not be used to distinguish the claimed subject-matter from the prior art. It was also emphasized that "bulky monomers" incorporated into the polymers could be directly linked to a significant increase of the Tg of this polymer. Example 9 of document (3) was cited in that respect.

Furthermore, the examining division found the claimed subject-matter not novel vis-à-vis example 25 of document (1) in conjunction with the general Tg range

of -10 to 100°C for the polyacetoacetate disclosed in the description (see column 3, lines 17-24 of document (1)). Novelty could not be based only on the presence of "bulky pendent moieties" in the acetoacetate polymer as distinguishing feature.

V. In a first communication, the board drew the appellant's attention to the lack of clarity of the set of claims submitted with the statement of grounds of appeal and more particularly on claims 1, 2 and 10. The appellant's attention was also drawn to the presence of two independent claims of the same category, which did not seem to be justified. Moreover, novelty of claims 1 and 2 was not acknowledged vis-à-vis document (1) and inventive step was also questioned.

VI. In response, the appellant filed a new main request and two auxiliary requests.

VII. In a second communication, the board considered that the three requests might contain subject-matter, which extended beyond the original disclosure. Novelty was acknowledged vis-à-vis document (1) but inventive step, in view of document (2), US-A-4,772,680, cited in the description of the present application and introduced by the board, was still at stake.

The appellant's attention was drawn to the specific examples 4 and 11 of document (2). In the absence of any evidence showing an improvement, the solution to the technical problem defined as the provision of further coating compositions might have been obvious.

VIII. With a further letter received on 5 November 2007, the appellant submitted a new main request.

IX. Oral Proceedings before the board took place on 16 April 2008. After discussion of the claimed subject-matter, the main request was withdrawn and the appellant filed a new main request containing eight claims and a new first auxiliary request containing eight claims.

The sole independent claim of the main request (claim 1) reads as follows:

"1. Use of

a crosslinking component comprising a polyamine, a polyketimine or a combination thereof, wherein said polyamine has an average of at least two amine functionalities per polyamine molecule and wherein said polyketimine has an average of at least two ketimine functionalities per polyketimine molecule; and

a binder component comprising:

a polyacetoacetate with a Tg in the range of from 55°C to 150°C having at least two acetoacetate functionalities, said polyacetoacetate being polymerized from a monomer mixture comprising 5 to 90 weight percent of an acetoacetate functionalized monomer, based on the total weight of the binder component, and a methacrylate monomer, a t-butyl styrene monomer, or a combination thereof, wherein said methacrylate monomer is selected from the group consisting of isobornyl methacrylate, cyclohexyl methacrylate, t-butylcyclohexyl methacrylate, trimethylcyclohexyl methacrylate, t-butylmethacrylate, or a combination thereof,

- for the preparation of coating composition that gives a coating having at a two-hour cure a Persoz hardness of about greater than or equal to 60 seconds for a dry film thickness of greater than or equal to 40 microns."
- X. The appellant submitted in essence that the combination of the specific methacrylate monomers with functionalized acetoacetate monomers to make a polyacetoacetate binder, the latter combined with a crosslinking agent, led to a coating composition having good early-hardness properties and low VOC (volatile organic compound). Document (2) did not contain any correlation between early-hardness and the nature of the polyacetoacetate. Document (2) could therefore not lead the person skilled in the art to the currently claimed invention in an obvious manner.
- XI. The appellant requested that the decision under appeal be set aside and that a patent be granted either on the basis of claims 1 to 8 of the main request or claims 1 to 8 of the first auxiliary request, both submitted during oral proceedings.
- XII. At the end of the oral proceedings, the decision of the board was announced.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. *Amendments*

2.1 claim 1

2.1.1 The word "seconds" as unit was introduced after the Persoz hardness value "60" in claim 1. The ASTM Test D4366 mentioned in the description on page 16, line 1 was cited to justify this amendment. A copy of the ASTM Test D4366 was submitted in support thereof.

Rule 139 EPC governs the present issue where the appellant submits that an error occurred in the claims and seeks correction of it. Such a correction can be allowable, when the following requirements are met:

- (a) an error must be present in the documents filed at the EPO, and
- (b) the correction must be obvious in the sense that it is immediately evident that nothing else would have been intended than what is offered as the correction.

In the application documents as originally filed, the value given for the Persoz hardness does not have any unit. To justify the presence of an error, the appellant referred to page 16, line 1 of the description, which mentions that the Persoz hardness is measured by a tested Model No. 5854 (under ASTM D4366 Test) and provided a copy of this ASTM norm. This document clearly shows that the hardness values obtained according to the Persoz method has time

expressed in seconds as the unit (see left-hand column, last line).

Hence, the requirement (a) is met.

From the same passage of this document concerning the ASTM D4366 Test, it is immediately evident for the person skilled in the art, that the values given in the present application for the measurement of hardness are a time unit expressed in seconds. Since the description refers to the above cited ASTM norm (see page 16, line 1), the only unit, which can be envisaged, is the second.

Therefore, the requirement (b) is also fulfilled.

The proposed correction has been made in accordance with the requirements of rule 139 EPC (former rule 88 EPC 1973) and does not offend Article 123(2) EPC (see G 3/89 and G 11/91, EPO 1993, 117 and 125 respectively, points 2, 5 and 6).

2.1.2 In addition, the subject-matter of claim 1 of the main request results from several amendments with respect to claim 1 as originally filed.

Claim 1 is now a "use-claim" whereas claim 1 as originally filed was a "compound-claim". The board considers that not only the content of the first paragraph of the description (see page 1, lines 4 to 6 and more particularly "...two-component compositions suited for.." but also claim 12 as originally filed relating to a method for producing a coating on a substrate represent a clear and an unambiguous

disclosure supporting the transformation of "compound-claim 1" into an "use-claim".

Furthermore, the expression "5 to 90 weight percent...the binder component" introduced into claim 1 is based on the wording of dependent claim 5 as originally filed.

Likewise, the replacement of the expression "styrene monomer having a bulky pendent moiety" by "t-butyl styrene monomer" is supported by the content of the description as filed (see page 11, line 31).

The replacement of the expression "said methacrylate ...bulky pendent moiety" by the list of specific methacrylate esters or a combination thereof is also supported by the content of the description as filed (see page 11, lines 26 to 29).

A specific range of T_g, i.e. 55°C to 150°C, for the polyacetoacetate has been introduced into claim 1. The appellant claimed that a basis for such an amendment is to be found on page 11, lines 10 to 12, which reads: "The polyacetoacetate has a T_g in the range of from 40°C to 150°C, preferably in the range of from 50°C to 100°C and more preferably in the range of from 55°C to 90°C". Although this specific range now defined is not mentioned per se, the value "55°C" as lower value of a preferred range is mentioned and the value "150°C" is also mentioned as the upper value of the general range. According to the established case law of the Boards of Appeal, in the case of a disclosure of a general range and a preferred range, a combination of the preferred narrower range and the part-range lying above the narrower range is unequivocally derivable from the

original disclosure of the application und thus supported by it (see T 2/81, OJ EPO 1982, 394). The above mentioned range now present in claim 1 is therefore considered as supported by the description as originally filed.

2.2 Dependent claims

2.2.1 The subject-matter of claim 2 remains unchanged.

2.2.2 The subject-matter of current claim 3 is based on the content of the description (see page 11, lines 16 to 20). The range "from 10 weight percent to 90 weight percent" does not add any new subject-matter (see T 2/81, above).

2.2.3 The subject-matter of claim 5 is also based on the description as originally filed (see page 11, lines 21 to 25).

2.2.4 The subject-matters of claims 4, 6, 7 and 8 correspond to the original subject-matters of respectively claims 3, 8, 9 and 10.

2.3 Since all the amendments carried out by the appellant are based on the content of the description as originally filed, the main request fulfils the requirements of Article 123(2) EPC.

3. *Clarity*

One ground used by the examining division to refuse the current application was the lack of clarity due to the presence of the word "bulky" in the wording of the

claims. Since this word has been replaced by the specific list of methacrylate derivatives (see claim 1), the board considers that the main request fulfils the requirements of clarity as set out in Article 84 EPC.

4. *Novelty*

4.1 *Vis-à-vis document (1)*

Document (1) discloses an ambient temperature curable coating composition comprising a first component including a compound comprising at least two acetoacetate groups and a second component including a compound comprising at least two groups which will react with an acetoacetate group, at least one of which is an aromatic aldimine (see column 2, lines 3 to 10). As comparative example, document (1) also includes example 25 (see column 17), which discloses a composition containing a polyacetoacetate and an aliphatic ketimine. Said polyacetoacetate is described in example 2 and results from the polymerization of acetoacetoxy ethyl methacrylate and glycidyl methacrylate, maleic anhydride, n-butyl acrylate and isobutyl methacrylate (see column 9).

The present claimed subject-matter differs, therefore, from the disclosure of document (1), except example 25, by the nature of the crosslinking agent (polyamine or polyketimine instead of aromatic aldimine) or with respect to example 25 due to the mandatory presence of the t-butyl styrene or the methacrylate monomer involved, i.e. isobornyl methacrylate, cyclohexyl methacrylate, t-butylcyclohexyl methacrylate,

trimethylcyclohexyl methacrylate, t-butyl methacrylate or a combination thereof.

Thus, novelty over the disclosure of document (1) is established.

4.2 Vis-à-vis document (2)

Document (2) discloses a liquid coating composition based on a polyacetoacetate, a polyamine having primary and/or secondary amino groups and blocked with a ketone or an aldehyde having not more than 18 carbon atoms (See column 1, lines 6 to 10). The polyacetoacetate is an acetoacetate groups-containing addition polymer having a number average molecular weight of 1000-100.000, a glass transition temperature of 250°-370°K, i.e. -23°C-97°C (see column 1, lines 23 to 27). The acetoacetate groups-containing addition polymer may also consist of an acrylic or methacrylic ester of a mono- or di- polyfunctional hydroxyl group having 1-18 carbon atoms (see column 1, lines 37 to 39) and/or copolymerizable monomers such as styrene, alpha-methyl styrene (see column 1, lines 42 to 43). The list of suitable acrylic or methacrylic esters given in column 2, lines 6 to 14 does not recite the methacrylate monomers set out in claim 1. Likewise the list of styrene monomers set out in document (2) does not disclose the t-butyl styrene monomer (see column 1, line 43).

Therefore, although the components used for the preparation of the coating composition as defined in claim 1, are encompassed in the disclosure of document (2), this document does not disclose unambiguously an

addition polymer formed from a mixture comprising the methacrylate esters monomers or the t-butyl styrene monomer defined in claim 1. Furthermore, the absence in document (2) of the specific value of hardness present in claim 1 renders the subject-matter of claim 1 also novel vis-à-vis document (2).

4.3 Therefore, the main request fulfils the requirements of Article 54 EPC.

5. *Inventive step*

5.1 The currently claimed subject-matter relates to the use of a crosslinking agent and a binder comprising a polyacetoacetate obtained by polymerization of an acetoacetate functionalized monomer and a methacrylate and/or styrene monomer for the preparation of a solid fast-drying coating composition having at a two-hour cure a Persoz hardness of about greater than 60 seconds. The compositions so obtained enable to reduce the time-to-sand, before the coating can be sanded without fouling the sand paper, thereby increasing the number of repairs that can be performed in a day (see page 3, lines 11 to 14).

5.2 According to the established jurisprudence of the boards of appeal, it is necessary, in order to assess inventive step, to identify the closest prior 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. This problem-solution approach ensures the assessment of

inventive step on an objective basis and avoids an ex post facto analysis.

5.3 The first step is thus to identify the closest prior art. According to the established jurisprudence of the boards of appeal, the closest prior art is a prior art document disclosing subject-matter aiming at the same objectives as the claimed invention and having the most relevant technical features in common, i.e. requiring the minimum of structural modifications (see Case Law of the Boards of Appeal of the EPO, 5th edition 2006, Section I.D.3.1., "Determination of the closest prior art in general", page 121).

5.3.1 Document (2) also discloses two-component coating compositions containing either polyamines (see column 2, line 55 to column 4, line 63) or polyketimines (see column 4, line 64 to column 5, line 10) and, as other component, a polyacetoacetate, which is an acetoacetate groups-containing addition polymer having a number average molecular weight of 1000-100.000 and a glass transition temperature of 250° to 370°K (-23°C to 97°C) (see column 1, lines 23 to 27). Furthermore, the two-component coating compositions of document (2) aim at overcoming the unsatisfactory resistance to water and acids and the unsatisfactory resistance to outdoor exposure of the compositions of the prior art (see column 1, lines 16 to 19). It is also mentioned that the compositions described in document (2) can be applied to substrates in any suitable manner (see column 5, lines 33 to 34).

5.3.2 Document (1) concerns also two-component coating compositions (see column 2, lines 15 to 17) but these

compositions contain as essential feature an aromatic aldimine. Only example 25 of document (1) mentions two-component coating compositions containing a ketimine but with different methacrylate monomers (see point 4.1 above), which is used as comparative example to show the advantages of the aldimine containing compositions.

5.3.3 The board concurs with the appellant, that document (2) represents the closest prior art, since it also discloses two-component coating compositions containing a ketimine and a polyacetoacetate, said compositions encompassing those set out in claim 1 of the current application and their use on substrates.

5.4 Thus, the technical problem that the claimed invention addresses and successfully solves is to be defined in the light of document (2).

5.4.1 The appellant submitted that starting from document (2), the technical problem underlying the present application could be seen in the use of a crosslinking component and a binder component to prepare coating compositions having early-hardness properties and a low viscosity.

5.4.2 Since the structural definition of the coating composition obtained by the use of the crosslinking agent and the binder defined in claim 1 is within the general disclosure of document (2), the board has no doubt that those compositions exhibit the same properties, namely resistance to water and acids and to outdoor exposure (see point 5.3.1 above). However, in addition to those properties which must remain in the long run once the coating is dry, the claimed subject-

matter is also characterized by a functional feature defining the effect to be achieved, namely the use of a crosslinking agent and a binder, which leads to a fast-drying coating composition having at a two-hour cure a Persoz hardness of about greater than 60 seconds. The compositions so obtained enable to reduce the time-to-sand, before the coating can be sanded without fouling the sand paper, thereby increasing the number of repairs that can be performed in a day.

Therefore, the technical problem to be solved can be seen in the use of a crosslinking agent and a binder for the preparation of coating compositions, which, in addition to good properties in the long run (see previous paragraph), have at a two-hour cure a Persoz hardness of about greater than 60 seconds.

In this context, the board sees no need to follow the appellant's suggestion that the problem to be solved includes the feature that the coatings also have a low viscosity, since it is not necessary in the present case to formulate a more ambitious problem.

5.4.3 The solution proposed by the appellant is thus defined by the use of the specific components described in claim 1.

5.4.4 In view of the description, in particular the examples, the board considers it plausible that the technical problem has indeed been solved.

5.5 It remains to be decided, whether the claimed solution is or not obvious in view of the cited prior art.

5.5.1 During oral proceedings, the appellant put forward that the person skilled in the art would not have concluded from the disclosure of document (2), that the specific monomers used for the making of the polyacetoacetate polymers used as binder in compositions used in claim 1 could lead to compositions having the early hardness value mentioned in claim 1, since from document (2), no correlation could be made between the hardness value in conjunction with the nature of the polyacetoacetate and the early-hardness value with the late-hardness value.

5.5.2 As pointed out by the appellant, document (2) contains no information regarding the possibility of obtaining coating compositions having an early hardness. Example 4 describes a coating composition having a Tg of 56°C and which has a hardness of 260 seconds after one day of drying but in the absence of any correlation between the hardness after two hours and after one day, this example does not give any hint towards the solution of the technical problem defined above.

Nor can the board find anything in the teaching of document (1) that undermines such a conclusion. Indeed, while being silent regarding the early hardness of the coating compositions, this document would deter the person skilled in the art from using a ketimine as cross-linking agent, since in view of example 25, the aromatic aldimines of document (1) outperform the ketimines as cross-linking agents at room temperature.

5.5.3 In view of the above, the person skilled in the art looking for a solution to the technical problem defined above would not have used, in view of the cited prior art, cross-linking components and binders as defined in

claim 1 for preparing coating compositions having a two-hour cure Persoz hardness of about greater than 60 seconds. For this reason, claim 1 of the main request involves an inventive step in the sense of Article 56 EPC. For the same reasons, the dependent claims representing specific embodiments of claim 1 also involve an inventive step.

First auxiliary request

6. Since the main request is allowable, there is no need for the board to decide on this lower ranking request.

Article 111(1) EPC - Remittal to the first instance

7. Although the board has come to the conclusion that the main request was to be allowed, it is noted that the description has still to be brought into conformity with the claims of the present request. Therefore, having regard to the fact that the function of the boards of appeal is primarily to give a judicial decision upon the correctness of the decision of the first instance, the board exercises its discretion under Article 111(1) EPC to remit the case to the first instance in order for the description to be adapted to the main request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of the first instance with the order to grant a patent with claims 1 to 8 of the main request submitted during oral proceedings and a description to be adapted.

The registrar

The Chairman

M. Schalow

P. Ranguis