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**Datasheet for the decision
of 11 July 2014**

Case Number: T 0457/13 - 3.3.01

Application Number: 01974473.9

Publication Number: 1328594

IPC: C09D201/00

Language of the proceedings: EN

Title of invention:

AQUEOUS VINYL POLYMER COATING COMPOSITIONS

Patent Proprietor:

DSM IP Assets B.V.

Opponent:

Akzo Nobel Coatings International N.V.

Headword:

Aqueous vinyl polymers coating compositions/DSM

Relevant legal provisions:

EPC Art. 100(b), 54, 56
RPBA Art. 13(3)

Keyword:

Main request - novelty - (no)

Auxiliary request 1 - late-filed - admitted -

new argument submitted during oral proceedings

Reproducibility - (yes) - functional features - appellant-
opponent did not discharge itself from its onus of proof

Novelty - (yes) -

functional features not mentioned in the prior art

Inventive step - (yes) -

solution not obvious in view of the cited prior art

Decisions cited:

T 0971/92, T 0534/96

Catchword:



Beschwerdekammern
Boards of Appeal
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Case Number: T 0457/13 - 3.3.01

D E C I S I O N
of Technical Board of Appeal 3.3.01
of 11 July 2014

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 10 January 2013 rejecting the opposition filed against European patent No. 1328594 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman A. Lindner
Members: J. Ousset
O. Loizou

Summary of Facts and Submissions

I. The opposition filed against European patent No. 1 328 594 was rejected by the opposition division. The present appeal was filed against this decision.

II. The relevant prior art is represented by:

(1) English translation of Japanese patent application JP60-110765A

(2) WO-A-00/56827

III. The opposition division found that the claimed subject-matter was reproducible in view of the content of the disclosure of the patent in suit. Novelty was also acknowledged vis-à-vis the disclosures of documents (1) and (2). The closest prior art (1) either alone or in combination with the teaching of document (2) did not render the claimed subject-matter obvious.

IV. Claim 1 of the main request (granted claim 1) reads as follows:

"1. An aqueous coating composition comprising an ambient temperature crosslinkable water-dispersible vinyl oligomer(s) and optionally a dispersed polymer(s) where the ratio of crosslinkable vinyl oligomer(s) to the dispersed polymer(s) is in the range of from 100:0 to 10:90 and wherein said composition when drying to form a coating has the following properties :

- i) an open time of at least 20 minutes at $23\pm 2^{\circ}\text{C}$;
 - ii) a wet edge time of at least 10 minutes at $23\pm 2^{\circ}\text{C}$;
 - iii) a tack-free time of ≤ 20 hours at $23\pm 2^{\circ}$;
 - iv) 0 to 25% of co-solvent by weight of the composition;
- and

v) an equilibrium viscosity of $\leq 5,000$ Pa.s, at any solids content when drying in the range of from 20 to 55 % by weight of the composition, using any shear rate in the range of from 9 ± 0.5 to 90 ± 5 s⁻¹ and at $23\pm 2^\circ\text{C}$; and wherein the crosslinkable vinyl oligomer(s) is $\leq 60\%$ by weight soluble in water throughout a pH range of from 2 to 10."

Claim 4 of the main request (granted claim 4) reads as follows:

"4. An aqueous coating composition comprising an ambient temperature crosslinkable water-dispersible vinyl oligomer(s) and optionally a dispersed polymer(s) where the ratio of crosslinkable vinyl oligomer(s) to the dispersed polymer(s) is in the range from 100:0 to 10:90 and wherein said composition when drying to form a coating has the following properties:

- i) an open time of at least 20 minutes $23\pm 2^\circ\text{C}$;
- ii) a wet edge time of at least 10 minutes $23\pm 2^\circ\text{C}$;
- iii) a tack-free time of ≤ 20 hours $23\pm 2^\circ\text{C}$;
- iv) 0 to 25% of co-solvent by weight of the composition;
- v) an equilibrium viscosity of $\leq 5,000$ Pa.s. at any solids content when drying in the range of from 20 to 55 % by weight of the composition, using any shear rate in the range of from 9 ± 0.5 to 90 ± 5 s⁻¹ and at $23\pm 2^\circ\text{C}$; and
- vi) wherein said vinyl oligomer(s) has a solution viscosity ≤ 250 Pa.s, as determined from a 70% by weight solids solution of the crosslinkable vinyl oligomer(s) in a solvent mixture consisting of:
 - a) at least one of the solvents selected from the group consisting of N-methylpyrrolidone, n-butylglycol and mixtures thereof;
 - b) water and
 - c) N, N-dimethylethanolamine;

where a), b) and c) are in weight ratios of 20/7/3 respectively, using a shear rate of $90 \pm 5 \text{ s}^{-1}$ and at $23 \pm 2^\circ\text{C}$; and wherein the crosslinkable vinyl oligomer(s) is $\leq 60\%$ by weight soluble in water throughout a pH range of from 2 to 10."

Claim 27 of the main request reads as follows:

"27. A coating obtainable from an aqueous composition according to any one of the preceding claims."

Claim 28 of the main request reads as follows:

"28. Use of an aqueous coating composition according to any one of the preceding claims for coating a substrate."

In addition, the respondent filed a new auxiliary request 1 during the oral proceedings. This request corresponds to the main request, with claim 27 deleted and claim 28 renumbered as claim 27.

V. The appellant (opponent) mainly argued as follows:

- a) The claimed invention was largely defined by the result to be achieved and, in particular in view of the drying behaviour, the time to achieve drying stages and the viscosity of non-volatile compounds.
- b) No teaching was available in the patent in suit to achieve the wet edge time and the tack-free time for embodiments not described in the examples.
- c) This was also valid for the maximum equilibrium viscosity and the drying behaviour. Decision

T 534/96 was cited to support this argument.

- d) Nothing was said concerning the amount of crosslinkable functional groups and their specific disposition in the vinyl oligomer.
- e) A method of measurement of the equilibrium viscosity during drying in the defined range of solid content of 20 to 55% when the initial composition already contained more than 55% of solids was not disclosed.
- f) The starting material described in document (1) fell within the scope of claim 1 of the main request, and thus properties such as open time, wet edge time and equilibrium viscosity were inherent. The claimed matter was not novel.
- g) The distinguishing features between document (1), considered as the closest prior art, and the content of claim 1 of the patent in suit, namely the open time, the wet edge time and the equilibrium viscosity, were merely a rephrasing of the technical result to be achieved. Decision T 971/92 was cited to support this approach.

VI. The respondent (patent proprietor) argued mainly as follows:

- a) The appellant had the burden of proof to show that the requirements of the EPC were not fulfilled.
- b) In view of figures 1 to 4 in the patent in suit, the person skilled in the art would notice that a direct measurement of the equilibrium viscosity was not practical in all cases but could be

extrapolated for paints having a solid content varying from 20 to 50%, which would be a straight flat line and a substantially constant viscosity.

- c) Document (1) only mentioned the number average molecular weight of the polymers, and without the polydispersity the weight average molecular weight could not be determined without experimental data.
- d) The appellant's assertion, namely that the starting materials of document (1) fell within the limits defined in claim 1, implied that the open time, wet edge and equilibrium viscosity were the same. This was not supported by any evidence.
- e) Decision T 971/92 cited by the appellant was not relevant for the current case.
- f) Document (1) addressed the opposite problem to the problem of the patent in suit, since it required fast drying, whereas delayed drying was necessary in the patent in suit to allow a more workable coating.

During the oral proceedings the respondent withdrew all its auxiliary requests filed during the written procedure.

- VII. The appellant requested that the opposition division's decision be set aside and that European patent No. 1 328 594 be revoked.
- VIII. The respondent requested that the appeal be dismissed or, alternatively, that the decision under appeal be set aside and the patent maintained on the basis of auxiliary request 1, filed during oral proceedings.

IX. 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 - Claim 1

2. Article 100(b) EPC

2.1 In a European patent, the invention must be disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

2.2 The present invention relates to an aqueous coating composition containing a crosslinkable vinyl oligomer and defined by several functional features (see i) to v) in claim 1, point IV above). The method for determining

- the open time is defined in the application as filed (see page 27, lines 20 to 28),
- the wet edge time is defined in the application as filed (see page 27, lines 30 to 39),
- and the tack-free time is defined in the application as filed (see page 28, lines 14 to 19).

Moreover, feature iv) relates to the optional presence of a co-solvent in the claimed coating compositions. The application as originally filed mentions the preferred amounts of the said co-solvent (or mixture of co-solvents) (see page 23, lines 21 to 24). It also mentions the preferred evaporation rates and indicates

where these are disclosed (see page 23, lines 25 to 30). A preferred ratio of co-solvent is linked to the molecular weight of the crosslinkable vinyl oligomer used in the claimed compositions (see page 23, lines 31 to 37). Furthermore, there is a preferred relationship between the amount of co-solvent and the amount of binder solids (see page 23, line 38, to page 24, line 2). Finally, a reference is also given allowing the person skilled in the art to assess the solubility parameters of polymers (see page 24, lines 22 to 26). In view of these indications, the board considers that the person skilled in the art has at its disposal sufficient information to select the nature of the optional co-solvent and its amount depending upon the nature of the vinyl oligomer and the dispersed polymer.

The type of device used to measure the last functional feature, namely the equilibrium viscosity of the coating composition, was disclosed in the application as filed (see page 28, lines 27 to 31). Moreover, the manner in which this viscosity was measured is described on page 29, line 19, to page 30, line 6.

Consequently, the board regards functional features i) to v) present in claim 1 as sufficiently described to allow the person skilled in the art to put them into practice.

The making of the crosslinkable vinyl oligomer is described on page 7, line 23, to page 8, line 17, where the nature of the preferred groups allowing the crosslinking groups as well as the nature of the crosslinking reaction are given. Some suitable fatty acids which provide the fatty acid groups of the oligomer are mentioned in this passage (see page 8, lines 22 to 31). Furthermore, oligomers with low water-

solubility are preferred and are described in the application as filed. The meaning of the expression "low solubility" is also defined (see page 9, lines 13 to 18). This low solubility is obtained by the presence of a limited amount of hydrophilic groups attached to the oligomer, examples of these groups being given on page 9, line 24, to page 10, line 20. The application as filed also discloses the preferred molecular weights as well as the polydispersity (molecular weight distribution) of the oligomer (see page 10, lines 21 to 28, and page 11, lines 7 to 16). Finally, examples of the oligomer suitable for making the claimed coating compositions (see page 12, lines 3 to 6; page 12, line 26, to page 13, line 16) and the preferred acid values of this oligomer are given in the application as filed (see page 12, lines 21 to 24). The application as filed also indicates how the crosslinker groups (page 13, lines 17 to 36) and the hydrophilic water-dispersing groups (page 13, line 37 to page 14, line 16) can be introduced into the vinyl oligomer and how the oligomer can be obtained (see page 14, line 29, to page 16, line 37). Information as to the nature, the formation, the Tg, the average particle size and the water solubility of the optional dispersed polymer mentioned in claim 1 can be found on page 17, line 15, to page 20, line 36.

Finally, the application as originally filed discloses not only processes to prepare the vinyl oligomer and the dispersed polymer but also coating compositions having the functional features recited in claim 1.

In view thereof, the person skilled in the art, active in the field of polymers, is able to make the crosslinkable water-dispersible oligomer as well as the optional dispersed polymer contained in the claimed coating compositions and can also verify without undue

burden whether the obtained compositions fulfil functional features i) to v) .

2.3 The appellant pointed out that it was necessary that the crosslinking reaction does not take place until after the coating composition has been applied. Otherwise an unacceptable increase of the viscosity would occur at the early stage of the drying ([0068] of the patent in suit and page 10, last full paragraph). This showed the influence of the crosslinking reaction in the drying process, and since there was no information on this crosslinking process, the person skilled in the art was not able to reproduce the claimed coating compositions.

2.3.1 It is not disputed that the drying process is dependent on the crosslinking reaction. However, the information disclosed in the application as filed as to the nature of the oligomer (e.g. nature of the monomer, nature and number of the hydrophilic and/or acid groups attached to the said oligomer, possible presence of a catalyst) gives the person skilled in the art a clear indication of what they have to do in order to arrive at the oligomer allowing a drying time of the coating composition according to the functional features mentioned in claim 1. Hence the person skilled in the art is not left without any guidance for the making of the oligomer according to claim 1 of the patent in suit.

2.4 The appellant further argued that the equilibrium viscosity was measured in a defined range of solid contents of 20 to 55% by weight of solid content of the composition. However, the solid content of the claimed compositions was not limited to any percentage. It thus concluded that the claimed invention could not be reproducible, since functional feature v) could not be

measured for compositions having a solid content > 55% by weight.

2.4.1 The required equilibrium viscosity of $\leq 5,000$ Pa.s applies only to solids contents of from 20 to 55% by weight of the composition. This means that compositions outside this range must be adjusted accordingly to determine this parameter. The respondent did not contest that it is possible to determine the required equilibrium viscosity for compositions with a solids content of <20%, as the solids content will increase and inevitably reach the required range during the drying process. By analogy thereto, the skilled person faced with the problem of determining the equilibrium viscosity of compositions with a solids content above 55% will adjust the compositions by diluting it down to the required range.

2.5 Further, the appellant denied that in view of the numerous parameters involved the necessary information was available to reproduce the invention in its entire scope. In particular, no information was given in relation to the nature of the different crosslinkable functional groups having an impact on the drying time and thus on the viscosity of the coating compositions. It also added that the wording of claim 1 is very broad and open. In support of its argument, it cited decision T 534/96.

2.5.1 The board concedes that the wording of claim 1 is open and broad. However, this is not sufficient to conclude that the invention is not reproducible by the person skilled in the art. As mentioned above (see point 2.2), the patent in suit contains in addition to the specific examples (see pages 19 to 35), numerous information as

to the nature of the crosslinkable water-dispersible vinyl oligomer and the method for determining the different functional features i) to v). The board has therefore to decide whether this information allows the person skilled in the art to reproduce the claimed subject-matter without undue burden. However, in opposition proceedings, the onus of the proof lies on the opponent (here appellant) to convince the board that the content of the patent in suit does not allow the invention to be reproduced without undue burden (e. g. by providing counter-examples). In the present case, the appellant has provided an argument to this effect, but has not shown that the teaching provided in the patent in suit (see above point 2.2) does not lead to the broadly defined coating compositions as claimed. As to decision T 534/96, the board notes that the facts of that case differ, since in that case not all the conceivable chemical compounds complying with the structural definition given in claim 1 would satisfy the functional feature (gel time reduction) (see point 4.3). In the present case, the respondent did not argue in that direction.

2.6 The board thus concludes that Article 100(b) EPC does not prejudice the maintenance of the patent in suit.

3. Novelty

3.1 Claim 1

3.1.1 Document (1) discloses "room temperature curing aqueous covering compositions" containing a copolymer resin obtained by reacting a glycidyl ester of an unsaturated fatty acid with a resin consisting of an α,β -ethylenic unsaturated acid and another polymerizable unsaturated monomer (see paragraph bridging pages 1 and 2).

Moreover, example 1 (see Table 3 on page 19) has a "dry-to-touch time" (tack-free time) of 60 minutes. However, no mention at all is made in this document of features i), ii) and v) of the patent in suit.

3.1.2 The appellant submitted that from the acid value (page 4, second full paragraph) and from the fact that resin (B) is insoluble in water (see page 8, last two lines), it can be assumed that the water solubility of the compositions mentioned in document (1) must be below 60%. Moreover, the solvent can be partially or wholly removed (see page 7, last full paragraph). Hence the organic solvent content is below 25%. The coating of document (1) has a semi-curing state time of 6 hours, and thus it could be assumed that this semi-curing state corresponds to the tack-free time mentioned in the patent in suit. The open time, the wet-edge time and the equilibrium viscosity were not explicitly disclosed but, since the starting materials fall within the limits defined in claim 1, these properties were automatically obtained.

3.1.3 The appellant's arguments as to the water solubility, the ratio of solvent and the semi-curing time corresponding to the tack-free time are purely speculative and cannot be considered in the absence of any further evidence as disclosed in document (1). The argument based on the implicit disclosure of the open time, the wet-edge time and the equilibrium viscosity does not hold either. As already explained above (see 2.5.1), the opponent (here appellant) has to show that all the features of claim 1 of the patent in suit are disclosed in combination in the prior art. Mere assertions which are not supported by evidence (e.g. by showing that one of the examples of document (1) gives a coating composition having the same features as

described in claim 1 of the patent in suit) cannot discharge the appellant from its onus of proving that document (1) describes all the features of claim 1 of the patent in suit in combination.

3.1.4 Therefore, claim 1 of the main request fulfils the requirements of Article 54 EPC.

3.2 Since claim 4, although being drafted as an independent claim, contains all the features of claim 1, it is also regarded as novel vis-à-vis document (1). Claim 28 refers to the use of the aqueous compositions of the preceding claims and is thus regarded as novel, since the said aqueous compositions are novel.

3.3 Claim 27

3.3.1 The coating of claim 27 does not contain any more water and/or co-solvent. Therefore, features i) to v) which characterise the aqueous coating composition of claims 1 and 4 do not characterise the said coating. Hence, the coating of claim 27 is characterised only in that it contains a water-dispersible crosslinkable vinyl oligomer. Document (1) mentions in example 3 that a paint is obtained by mixing resin (A) and resin (B), the former being made starting from butyl methacrylate (see page 11, third line from the bottom of the page). Butyl methacrylate is mentioned in the patent in suit as monomer for making the vinyl oligomer (see page 8, line 34). The respondent did not contest this finding. Therefore, the coating of claim 27 cannot be distinguished from the paint disclosed in example 1 of document (1).

3.3.2 Claim 27 is thus not novel, and consequently the main request must be rejected for lack of novelty.

4. Auxiliary request 1

4.1 Admissibility

4.1.1 This set of claims was filed during the oral proceedings. The board has to decide upon its admissibility.

4.1.2 This request differs from the main request only in that claim 27 has been deleted and claim 28 renumbered as claim 27. This amendment resulted from the objection of lack of novelty of claim 27 of the main request presented for the first time during oral proceedings. It is therefore fair, in view of this new argument, to allow the respondent to react. Deleting a claim does not render the claimed matter more complex and does not require resumption of the discussion on reproducibility and novelty. Therefore, the board admits this request into the proceedings (Article 13(3) of the Rules of Procedure of the Boards of Appeal).

4.2 Novelty

In view of the deletion of claim 27 as granted, the subject-matter of auxiliary request 1 meets the requirements of Article 54 EPC (see points 3.1 and 3.2 above).

4.3 Inventive step

4.3.1 The patent in suit relates to aqueous coating compositions having a combination of properties allowing irregularities to be repaired, for example by re-brushing in the still-wet compositions.

- 4.3.2 The board and the parties concur that document (1), which also relates to aqueous coating compositions, is to be considered the closest prior art. The disclosure of document (1) differs from the content of the claimed subject-matter in that features i), ii) and v) are not mentioned in document (1) (see point 3.1.1 above).
- 4.3.3 The problem underlying the patent in suit can thus be regarded as the provision of aqueous coating compositions which allow irregularities to be repaired in the still-wet coating after some time has elapsed (see page, 2, lines 6 to 7, of the patent in suit).
- 4.3.4 The solution proposed in the patent in suit is represented by the compositions of claim 1.
- 4.3.5 The board considers that this problem has been solved in view of the examples in Table 6 of the patent in suit.
- 4.3.6 Document (1) is silent as to the distinguishing features, namely the open time, wet-edge time and equilibrium viscosity of the aqueous coating compositions. Moreover, the coating compositions disclosed in document (1) aim at overcoming the disadvantages of emulsion paints and water soluble paints (see page 3, second full paragraph), i.e. finding a compromise between the fast drying of emulsion paints and the slow drying of water-soluble paints and thereby avoiding sagging and flash rust. Hence, document (1) does not deal with the same problem as the patent in suit and therefore does not give the person skilled in the art any hint for arriving at the claimed subject-matter.
- 4.3.7 The appellant pointed out that the features listed in claim 1 are well-known shortcomings which can be

overcome by adding some more conventional ingredients to the aqueous compositions described in document (1). It also cited decision T 971/92 to support its argument.

4.3.8 The board considers that the decision cited cannot convincingly support the appellant's view. In the said decision, the cited prior-art document dealt with the same problem as the invention. This is not the case here (see point 4.3.6). In the present case, it cannot be deduced without inventive skills from the teaching of document (1) that the addition of conventional ingredients as suggested by the appellant would lead to the coating compositions of claim 1. The mere reference to overcoming shortcomings cannot hold. Even if these shortcomings were known by the person skilled in the art, their overcoming must either be obvious in view of prior art, which is not the case here, or must be obvious to the person skilled in the art on the basis of their common knowledge. In such a case, the appellant (opponent) has the onus of proving this said common knowledge. This it has not done.

4.3.9 Hence, claim 1 of auxiliary request 1 is inventive. Since, neither the board nor the appellant have any further comments in relation to the inventiveness of claims 4 and 27, the board concludes that auxiliary request 1 is inventive.

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 first instance with the order to maintain the patent on the

basis of auxiliary request 1 filed today during oral proceedings and a description to be adapted thereto.

The Registrar:

The Chairman:



M. Schalow

A. Lindner

Decision electronically authenticated