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**Datasheet for the decision
of 13 September 2006**

Case Number: T 1238/03 - 3.3.03

Application Number: 94903366.6

Publication Number: 0672084

IPC: C08L 29/04

Language of the proceedings: EN

Title of invention:

A method and composition for treating metal surfaces

Patentee:

BULK CHEMICALS, INC.

Opponent:

HENKEL KGaA

Headword:

-

Relevant legal provisions:

EPC Art. 83, 56

Keyword:

"Interpretation of claim wording"
"Disclosure - sufficiency (yes)"
"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 1238/03 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 13 September 2006

Appellant: HENKEL KGaA
(Opponent) VTP (Patente)
D-40191 Düsseldorf (DE)

Representative: -

Respondent: BULK CHEMICALS, INC.
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office dated
30 September 2003 and posted 21 October 2003
concerning maintenance of European patent
No. 0672084 in amended form.

Composition of the Board:

Chairman: R. Young
Members: W. Sieber
E. Dufrasne

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 672 084, in respect of European patent application no. 94 903 366.6, based on International application PCT/US93/11627, in the name of Bulk Chemicals, Inc., filed on 30 November 1993 and claiming US priorities of 30 November 1992 (US 982874) and of 27 August 1993 (US 112890), was published on 11 April 2001 (Bulletin 2001/15). The granted patent contained 20 claims, whereby Claims 1 and 14 read as follows:

"1. An aqueous, chromium-free composition for treating a metal surface to improve paint adhesion and corrosion resistance, said composition comprising ammonia in an amount up to 53.70 grams/litre, a compound of Group IV-B element in an amount of from 0.7 to 73.45 grams/litre, and an aqueous ester cross-linked polymer system of polyvinyl alcohol in an amount of from 0.01 to 14.52 grams/litre and a polymer in an amount of from 0.03 to 22.68 grams/litre, said polymer having carboxylic functional groups, and being selected from the group consisting of polyacrylic acid and polymethylvinylmaleic anhydride, wherein the ratio of equivalents of carboxylic functional groups to hydroxyl groups of said polyvinyl alcohol is 0.3:1.0 to 3.5:1.0.

14. A method for treating a metal surface to improve paint adhesion and corrosion resistance comprising contacting the metal surface with an aqueous, chromium-free composition comprising ammonia in an amount up to 53.70 grams/litre, a compound of a Group IV-B element added in an amount of from 0.7 to 73.45 grams/litre, and an aqueous ester cross-linked polymer system of

polyvinyl alcohol added in an amount from 0.01 to 14.52 grams/litre and a polymer added in an amount from 0.03 to 22.68 grams/litre, having carboxylic functional groups, and selected from the group consisting of polyacrylic acid and polymethylvinylmaleic anhydride, wherein the ratio of equivalents of carboxylic functional groups to hydroxyl groups of said polyvinyl alcohol is from 0.3:1 to 3.5:10."

Claims 2-13 and 15-20 were dependent claims directed to elaborations of the composition according to Claim 1 and the method according to Claim 14, respectively.

II. A notice of opposition was filed by Henkel KGaA on 8 January 2002 on the grounds of Article 100(a) EPC (lack of inventive step) and Article 100(b) EPC.

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

D1: US-A-3 912 548;

D2: JP-A-59 225 951 (including an English translation thereof);

D3: Amchem, "Report to Management", U.S.D.C., Docket #88-7996; and

D5: US-A-4 191 596 (cited by the proprietor).

III. During prosecution of the case before the opposition division the proprietor filed on 28 August 2002 an amended set of claims which corresponded to the granted claims except that (i) in Claim 14 the ratio of

equivalents of carboxylic functional groups to hydroxyl groups of the polyvinyl alcohol was amended to 0.3:1 to 3.5:1 and (ii) in Claim 16 the wording "The method in accordance with either one of Claims 14 or 15" was amended to "The method in accordance with any one of Claims 14 or 15". The amendment of the ratio in Claim 14 was requested under Rule 88 EPC.

IV. By an interlocutory decision which was announced orally on 30 September 2003 and issued in writing on 21 October 2003, the opposition division decided to maintain the patent based on the amended set of claims filed on 2 September 2002.

- (a) The opposition division accepted the requested correction of Claim 14.

- (b) As regards the objection raised under Article 100(b) EPC, the opposition division held that the term "ester cross-linked polymer system" as used in the claims meant that as soon as any degree of ester formation could be detected with any conceivable analytical method this feature was met. In contrast, a polymer system of polyacrylic acid (PAA) and polyvinyl alcohol (PVA) having no detectable ester cross-linking would not fall within the terms of the claims of the patent in suit (eg point 2.2 of the decision under appeal). Since, furthermore, the essentials of an esterification reaction were known and an expert knew many ways of analyzing the presence of ester cross-linking, the opposition division considered that the patent disclosed the invention in a

manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

- (c) According to the decision, document D3 represented the closest prior art. D3 disclosed in the last paragraph on page 3 the attempt of cross-linking PAA with PVA by esterification in order to produce insoluble films. The opposition division was of the opinion that it could be reasonably assumed from the information on the following pages that the ester cross-linked PAA/PVA system did not contain a compound of a Group IV-B element. There was no suggestion in D3 that a composition including an ester cross-linked PAA/PVA system and a compound of a Group IV-B element would solve the problem underlying the present invention. The reader of D3 would even be dissuaded from pursuing the experiments with an ester cross-linked PAA/PVA system since wet adhesion and detergent tests thereof were unsatisfactory.

- V. On 11 December 2003, the appellant (opponent) filed a notice of appeal against the above decision with simultaneous payment of the prescribed fee.

The appellant's arguments filed with the statement of grounds of appeal (annexed to the notice of appeal) and with the letter dated 24 July 2004 may be summarized as follows:

- (a) The term "ester cross-linked polymer system" as used in the claims required the presence of ester bonds in the polymer system. Since, however, the patent in suit did not indicate the method for

determining the ester bonds, a person skilled in the art would not be able to ascertain when he was not working within the scope of the patent in suit. If, for instance, a NMR spectrum did not indicate the presence of ester bonds, this did not definitively indicate that ester bonds had not been formed. The absence of signals relating to ester bonds might indicate that the method of measurement employed was of insufficient sensitivity to detect the presence of low levels of ester formation. To try out every conceivable analytical method amounted to an undue burden. Consequently, the patent in suit did not meet the requirements of Article 100(b) and Article 83 EPC, respectively.

- (b) As regards inventive step, the appellant argued that a certain minimum level of ester cross-linking must be met in order for the invention to operate. Without defining that value it was simply not plausible that the technical problem was solved over the whole range claimed.

The opposition division misread the disclosure of D3 which clearly disclosed a composition comprising PAA cross-linked with PVA, ammonium ions and a zirconium compound. If D3 was considered to be the closest prior art as done by the opposition division and the problem-solution approach were to be applied correctly, compositions comprising PAA cross-linked with PVA, ammonium ions and a zirconium compound were the starting point for assessing inventive step. The problem to be solved had then to be seen in

further improving these compositions. Finding appropriate concentrations for the formulations suggested in D3 was routine work for a person skilled in the art involving no inventive activity.

Furthermore, the opposition division erred in not properly considering the possible combination of D1 or D2 (as an alternative closest state of the art) with D3 to arrive at a finding of non-inventiveness. D1 and D2 disclosed all elements of the claimed subject-matter apart from the ester cross-linking of PAA. The problem to be solved over the closest prior art was to improve the paint adhesion and corrosion resistance. D3 provided the suggestion to perform ester cross-linking in order to solve the stated problem. Thus, the claimed subject-matter was also obvious over a combination of D1 (or D2) with D3.

VI. The arguments of the respondent (proprietor) presented in its counterstatements dated 24 May 2004 and 20 May 2005 may be summarized as follows:

- (a) The details of an esterification reaction between PAA and PVA were well-known and set forth in paragraphs [0022] to [0028] of the patent specification. Methods of detecting ester cross-linking were well-known in the art, and appeared in standard textbooks. A person skilled in the art would be able to conduct such analysis without undue burden. The patent disclosure did not specify any particular steps (beyond meeting the other compositional limitations) as necessary to achieving the proper level of ester cross-linking,

because no such steps were necessary. The proper level of cross-linking was automatic, inevitable, and inherent, and required no additional knowledge or interaction on the part of the person preparing or using the formulation. This fact was certainly apparent to the person of ordinary skill in the art reading the patent, and it was difficult to see an opportunity for confusion on this topic. Therefore, in every possible situation the skilled artisan could tell unambiguously whether or not infringement was occurring.

- (b) The respondent disputed the appellant's interpretation of D3. D3 firstly disclosed a composition comprising acrylic resin and ammonium zirconium carbonate (AL 834/835 bath). There was no suggestion that the acrylic resin was PAA and one skilled in the art would not assume that an acrylic resin contained PAA. D3 secondly - and quite separately - disclosed an ester cross-linked PAA/PVA system. There was no suggestion in D3 that the two separated compositions might be combined and certainly no suggestion that these compositions were combined. Furthermore, the ester cross-linking in D3 gave unpromising results, so that D3 taught away from the use of ester cross-linked compositions. The unpromising results led the D3 authors apparently, as far as that reference disclosed, to abandon this approach.

As regards the possible combination of D1 (or D2) with D3 to arrive at a finding of non-inventiveness, this line of argument was again undermined by the fatal flaw that D3 simply did

not provide or suggest pursuing ester cross-linking.

VII. In the letter dated 18 August 2005, the appellant reiterated its arguments concerning sufficiency of disclosure and inventive step. In particular, the appellant disagreed with the respondent's argument that ester formation between PAA and PVA would be automatic, once the blend was assembled, and there would be no need to analyze the ester bonds. This argumentation led to an extension of the scope of protection, because it effectively included blends of PAA and PVA, regardless whether or not an ester bond could be determined. This argumentation was also in contrast with the decision under appeal which stated that a polymer system having no detectable ester cross-linking would not fall within the terms of the patent in suit.

VIII. With the letter dated 4 October 2005, the appellant filed experimental data (hereinafter referred to as D6) in order to demonstrate that the ester formation between PAA and PVA was not automatic and that ester bonds were not detectable by NMR.

D6: Experimental data for an aqueous formulation comprising PAA and PVA.

IX. Following the summons to oral proceedings, the respondent filed on 11 August 2006 a first auxiliary claim set (Claims 1-16). However, this first auxiliary claim set is not of importance for this decision and consequently will not be discussed in further detail.

X. On 13 September 2006, oral proceedings were held before the board.

- (a) As regards sufficiency of disclosure, both parties basically relied upon their written submissions. In addition, the respondent pointed out the experiments filed as D6 were not relevant because they did not describe a composition according the patent in suit. These compositions did not contain a compound of a Group IV-B element.
- (b) Following a discussion of the meaning of the term "ester cross-linked polymer system", the chairman expressed the preliminary opinion of the board that this term, when properly read in the light of the patent specification, referred both to a polymer system where the ester formation had been taken place to some real extent and to a polymer system where the cross-linking had not yet taken place but where the cross-linking was an incipient and inevitable ability of the polymer system. The respondent agreed with this interpretation.
- (c) According to the appellant, D1 represented the closest prior art, in particular because this document reflected the prior art acknowledged in paragraph [0008] of the patent specification. The problem to be solved had to be seen in improving the salt spray corrosion of the compositions of the closest prior art (paragraph [0009] of the patent specification). D3 provided the suggestion to perform ester cross-linking in order to solve the stated problem. The relevant paragraph on page 3 of D3 clearly dealt with a composition

containing PAA cross-linked with PVA and ammonium zirconium carbonate. Thus, the claimed subject-matter was obvious over a combination of D1 with D3.

The actual composition of the formulations LFN 76M-20 and 76M-21 mentioned in the relevant passage on page 3 was not of importance for the assessment of inventive step.

- (d) The respondent pointed out that D3 was difficult to analyse and to get a coherent message out of the relevant passage. In particular, there was no reference in the passage on page 3 that PAA was cross-linked with PVA in the presence of ammonium zirconium carbonate. In any case, since the experiments with cross-linking failed in D3, D3 provided no suggestion to use cross-linking in order to solve the problem stated in the patent in suit.

XI. The appellant requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

The respondent requested:

- that the appeal be dismissed (main request), or, in the alternative,
- that the decision under appeal be set aside and that the patent be maintained on the basis of the set of claims (Claims 1-16) filed on 11 August 2006 as first auxiliary claim set.

Reasons for the Decision

1. The appeal complies with Articles 106 and 108 EPC and Rule 64 EPC and is therefore admissible.

Main request

2. *Amendments/Corrections (Claim 14)*

The opposition division has allowed the requested correction of the ratio in Claim 14 as granted (points III and IV(a), above). The appellant raised no objection in this respect. Nor does the board see any reason to raise an objection of its own.

3. *Interpretation of Claim Wording*

- 3.1 Claims 1 and 14 refer to an aqueous ester cross-linked system of polyvinyl alcohol (PVA) and a specific polymer having carboxylic functional groups. According to the decision under appeal (point IV(b), above) and the appellant, the term "ester cross-linked" implies that some degree of ester formation must have been taken place. Consequently, a polymer system having no detectable ester cross-linking would not fall within the scope of Claim 1.

- 3.2 It is, however, conspicuous to the board that the patent specification associates the term "ester cross-linked polymer system" not only with a polymer system that is a **reaction product** of PVA and a polymer having carboxylic functional groups but also with a **polymeric**

blend. The relevant passages in the patent specification read as follows:

"[0016] According to a more specific preferred embodiment of the present invention, the ester cross-linked polymer system includes the reaction product, or polymeric blend, ...".

"[0020] ... In order to obtain the reaction product, or polymeric blend, of the present invention, the two polymers are reacted."

"[0028] For the metal samples tested to date, it has been determined that the polymeric blend alone is not the most effective embodiment of the present invention to improve paint adhesion and corrosion resistance. It appears that there is not as much interaction with the metal surface for the polymeric blend alone to be as effective as the preferred embodiment. In addition, the degree of cross-linking appears to be too low. The degree of cross-linking can be increased, however, by adding heat to drive off water during the reaction. Therefore, in some conditions, the polymeric blend alone may be sufficient. Nevertheless, the preferred embodiment is the polymeric blend combined with an additional reactant, which increases the degree of cross-linking and which causes increased interaction between the composition and the metal surface."

- 3.3 It is apparent from the above passages that already the polymeric blend alone is considered to be part of the present invention even if it is, as stated in paragraph [0028], "not the most effective embodiment of the present invention". Thus, although the use of the past participle "ester cross-linked" at first sight appears to refer to a chemical reaction that has taken place to some real extent, ie ester formation, the patent specification seems to equate the term "ester cross-linked" also with a polymer blend where the ester formation has not yet started. Nevertheless, this blend (or mixture) of a PVA and a polymer having carboxylic

functional groups has, once it is assembled, the incipient ability to form the ester bonds. In other words, the ester formation is either happening or about to happen.

3.4 Although the use of the past participle for something that has not yet happened but will happen might be grammatically incorrect, it is conspicuous to the board that such a "slovenly" use of the past participle occurs in the patent in suit not only in the context of "ester cross-linked". In the discussion of the background of the invention on page 2 of the patent specification, reference is made to "dried-in-place class" materials (page 2, line 34). Although the chemicals are not yet dried-in-place (this will happen only in the process where the chemicals are used), the past participle is used to describe a function of the chemicals which will happen.

3.5 In view of the above, the board comes to the conclusion that the term "ester cross-linked polymer system" as used in the patent in suit refers **both** to a polymer system where the ester formation (ie cross-linking) has been taken place to some real extent **and** to a polymer system where the cross-linking has not yet taken place but where the cross-linking is an incipient and inevitable ability of the polymer system. This interpretation is also in line with the respondents argument that the cross-linking in the polymer system will be automatic, inevitable and inherent.

4. *Sufficiency of Disclosure*

4.1 The appellant's objection under Article 100(b) EPC is linked to its interpretation of the term "ester cross-linked" appearing in the claims. As set out in point 3.1, above, the appellant interpreted that term as requiring the presence of ester bonds in the polymer system. Since, however, the patent in suit did not indicate the method for determining the ester bonds, a person skilled in the art would not be able to ascertain when he was not working within the scope of the claims. If, for example, a particular method of measurement did not indicate the presence of ester bonds, this did not definitely indicate that ester bonds had not been formed. It might be that the method of measurement was of insufficient sensitivity to detect the presence of low levels of ester formation. To try out every conceivable analytical method amounted to an undue burden. Consequently, the patent in suit did not meet the requirements of Article 100(b) and Article 83 EPC, respectively.

4.2 However, taking into account the board's interpretation of the term "ester cross-linked polymer system", the method of measurement of the ester bonds is not relevant for deciding the issue of sufficiency. As set out in point 3, above, the factual ester formation is not a requirement of the claims, so that there is no need to start an investigation as to whether or not ester bonds are detectable by an analytical method in the polymer system. A person skilled in the art would understand from the patent in suit that upon mixing of the two types of polymers the ability to form the ester bonds is inherently present in the blend and ester

formation is either happening or about to happen. Therefore, the appellant's objected lack of information concerning the method of measurement is not relevant for the issue of sufficiency of disclosure.

- 4.3 Since, furthermore, there can be no doubt that a person skilled in the art can assemble a polymer system as required in the claims (including a blend) and the details of an esterification reaction between an alcohol and a carboxylic acid are well known and set forth in paragraphs [0022] to [0028] of the patent specification, the board comes to the conclusion that the patent in suit discloses the invention in a manner sufficiently clear and complete to be carried out by a person skilled in the art.

5. *Problem and Solution*

- 5.1 Claim 1 of the patent in suit is directed in general terms to an aqueous, chromium-free composition for treating a metal surface to improve both corrosion resistance and paint adhesion by employing the three step dried-in-place method (paragraphs [0002], [0011] and [0014] of the patent specification). The composition comprises ammonia, a Group IV-B compound and an ester cross-linked polymer system in specified amounts.
- 5.2 D1 discloses a chrome-free method of improving the corrosion resistance and siccative finish bonding characteristics of a metal surface by contacting the surface with an aqueous composition consisting of a soluble zirconium compound and a polymer material (column 2, lines 4-10). Examples of the polymeric material that can be utilized in D1 are - *inter alia* -

polyacrylic acid (PAA) and PVA. These two types of polymers are clearly listed (column 2, lines 30-34) and used (eg Table 9) as alternatives. A blend of PAA and PVA is neither disclosed nor suggested in D1.

Apart from disclosing technical effects, purpose and intended use most similar to the claimed subject-matter, D1 reflects also the state of the art as presented in paragraph [0008] of the patent in suit. This paragraph refers to a chromium-free dried-in-place coating accomplished by use of hydrofluozirconic acid and PAA which is similar to the compositions described in D1, and in particular similar to the compositions of PAA and ammonium zirconium carbonate in Table 9 of D1.

5.3 The decision under appeal and the respondent considered document D3 as representing the closest prior art. D3 is a report to management of Amchem reviewing various stages of the development of a non-chrome, non-phosphate process as a prepaint for aluminium extrusions prior to painting. D3 firstly discloses on page 2 under "Prior History" the bath AL 834/835. According to pages 3 and 4, AL 834 is an acrylic resin and the principal component of AL 835 is ammonium zirconium carbonate, ie a compound of a Group IV-B element. Since, however, the exact nature of the acrylic resin in AL 834 is not clear (is it PAA or not?), this document does, in the board's view, not qualify as the closest prior art.

5.4 D2, referred to by the appellant as an alternative closest prior art, relates to an aluminium material for caps with painted underlayer films. It discloses in Working Example 1 a composition (aqueous solution) of

PAA and ammonium zirconium carbonate. Thus, this document is not more relevant than D1. Furthermore, the appellant did not pursue an inventive step objection based on the disclosure of D2.

5.5 In view of the above, the board considers a composition containing PAA or a PVA and a compound of a Group IV-B element as described in D1 and in paragraph [0008] of the patent in suit as representing the closest prior art.

5.6 According to paragraph [0009] of the patent in suit, aluminium samples treated by the compositions of the above described prior art have acceptable paint adhesive properties but the salt spray corrosion resistance is not good. Consequently, the objective technical problem to be solved can be seen in the provision of aqueous, chromium-free compositions for treating a metal surface which yield improved balance of paint adhesion and corrosion resistance properties, in particular with respect to corrosion under salt spray conditions.

5.7 The patent in suit suggests, as a solution to this problem, an aqueous, chromium-free composition having the features of Claim 1. It is evident from the examples in the patent in suit that the samples treated by a composition according to Claim 1 perform very well in a wide variety of tests including a 5% salt spray test. The board has no reason to doubt these results which have never been challenged by the appellant, and is, therefore, satisfied that the above stated technical problem is plausibly solved.

LFN's 76M-20 and 76M-21 incorporating the above, were prepared after numerous tests at Amchem with various cleaners and variations in dip and spray times. Most results were superior to 834/835 types of baths."

- 6.3.1 The above referenced passage does not explicitly state which components were actually combined, and in particular it does not mention whether or not ammonium zirconium carbonate, ie AL 835, was present in the attempt to cross-link the acrysol. The parties took different positions as to how a person skilled in the art would read the relevant passage.
- 6.3.2 According to the appellant, it would have been evident to a person skilled in the art that the cited cross-linking of PAA with PVA had to be read in the context of the previously mentioned AL 834/835 bath. Knowing that the AL 834/835 bath failed the salt spray and detergent tests, a person skilled in the art would understand that this bath had to be improved. The skilled person would not omit one of the essential components of that bath, namely the ammonium zirconium carbonate, but would rather stay within the system.
- 6.3.3 The respondent, on the other hand, was of the opinion that this passage referred to a system that did not contain an ammonium zirconium carbonate because, first of all, the referenced passage did not state that AL 834/835 were combined with PVA. Rather the passage suggested that "a more insoluble film" than that provided by AL 834/835 was needed. The authors of D3 attempted to achieve this by cross-linking acrysol (a PAA) with PVA. No mention was made of the just

discredited AL 834/835 bath in connection with this cross-linking attempt. There was no teaching in D3 as to the components of the formulations apparently attempting the cross-linking, namely LFN 76M-20 and 76M-21, and the skilled person would be unaware of these components. Secondly, it was stated in the relevant paragraph that "We attempted to cross-link the acrysol ..." (see point 6.3, above). Acrysol was a PAA but D3 did not identify AL 834 as containing PAA. Alodine 834 was instead identified as containing an "acrylic resin" in the same relevant passage. The reader of D3 might speculate that AL 834 was a PAA, as assumed by the appellant, but there was no teaching or suggestion of this anywhere in D3 itself. Finally, D3 taught that LFN 76M-20 and 76M-21 formulations had unsatisfactory properties. These formulations were particularly unacceptable with respect to wet adhesion and detergent tests, as well as foam problems (page 4, first paragraph). According to the respondent, this was indirect evidence that ammonium zirconium carbonate was not present in LFN 76M-20 and 76M-21. A system containing cross-linked PAA/PVA and a Group IV-B element would have had good properties as could be seen from the examples in the patent in suit.

- 6.3.4 Although coming exactly to the opposite conclusions, the versions of both parties could be read onto the relevant passage on page 3 of D3. The reason for this controversial interpretation is the lack of accuracy in that passage itself. In the board's view, the true intentions of the authors of D3 remain unknown. The only way to resolve this uncertainty would have been to find out the actual composition of LFN 76M-20 and 76M-21. These experiments were apparently carried out

in view of ideas expressed in the previous passage ("*LFN's 76M-20 and 76M-21 incorporating the above, ...*") and, as a logical consequence, LFN 76M-20 and 76M-21 should either contain ammonium zirconium carbonate (if the appellant's interpretation were correct) or not contain ammonium zirconium carbonate (if the respondent's interpretation were correct). However, neither the appellant nor the respondent provided any evidence in this respect.

- 6.4 If one followed the respondent's interpretation that the relevant passage in D3 is directed to the cross-linking of PAA and PVA **in the absence** of a compound of a ammonium zirconium carbonate, then LFN 76M-20 and 76M-21 would not contain ammonium zirconium carbonate. A person skilled in the art would learn from D3 that, although most results with LFN 76M-20 and 76M-21 were superior to 834/835 types of baths, even the superior LFN 76M-20 and 76M-21 had unsatisfactory properties. These formulations were particularly unacceptable with respect to wet adhesion and detergent tests, as well as foam problems (page 4, first paragraph). Apparently, the authors of D3 even abandoned ester cross-linking (page 4, fourth paragraph). Thus, a person skilled in the art, reading document D3, would conclude that cross-linking of PAA and PVA failed. There is no incentive in D3 for a person skilled in the art to apply this unsuccessful attempt to a different system, namely the composition of the closest prior art containing PAA and a compound of a Group IV-B element, in order to solve the posed problem (improved balance of paint adhesion and corrosion resistance properties). The authors failure to follow up does not in itself impart inventiveness to the claimed subject-matter.

Rather, the significance of that failure is that it refutes the proposition that D3 "suggests" ester cross-linking in order to solve the posed problem, a line repeatedly asserted by the appellant.

Hence, following the respondent's interpretation of D3, the subject-matter of Claim 1 is not obvious from a combination of the closest prior art and D3.

6.5 But even if one accepted the appellant's interpretation of the relevant passage on page 3 of D3, no other conclusion with regard to inventive step can be reached.

6.5.1 If one followed the appellant's interpretation that the relevant passage of D3 suggested the cross-linking of PAA with PVA in an AL 834/835 bath, ie **in the presence** of ammonium zirconium carbonate, the first consequence of this interpretation is that the formulations LFN 76M-20 and 76M-21 contained cross-linked PAA/PVA and ammonium zirconium carbonate. The second consequence of the appellant's line of argumentation is that the formulations LFN 76M-20 and 76M-21 containing cross-linked PAA/PVA and ammonium zirconium carbonate become the closest prior art, because these formulations are structurally much closer than the compositions identified in point 5.5, above. In view of the altered closest prior art, the problem to be solved would be to further improve these formulations.

6.5.2 However, as pointed out in point 6.4, above, the formulations LFN 76M-20 and 76M-21 had unsatisfactory properties and the authors of D3 even abandoned ester cross-linking (page 4, fourth paragraph). Thus, a person skilled in the art, reading document D3, would

conclude that the properties of LFN 76M-20 and 76M-21 were unsatisfactory, and would be discouraged from using these compositions, let alone find an incentive in D3 to optimize the conditions for formulations which were not successful. The person skilled in the art would also conclude that something other than trivial issues must have dissuaded the authors of D3 from further pursuing their goal. Rather, the fact that they summarily abandoned ester cross-linking clearly suggests to the skilled reader that the authors perceived problems more intractable than might be solved by simple optimization. As pointed out in the decision under appeal, the discouraging results might also have been the reason for the fact that these cross-linking experiments carried out in 1980 (or earlier) did not mature into a patent whereas the use of compositions comprising fluoroacids of Group IV-B elements and polyacrylic acid led to a patent (D5). Hence a person skilled in the art would not get any incentive from D3 to optimize the conditions of the attempts described in D3 to be unsuccessful in order to solve the above identified technical problem.

6.5.3 In view of the above, the claimed subject-matter is also not obvious from D3 if one follows the appellant's interpretation of the relevant passage in D3.

6.6 At the oral proceedings, the appellant adhered to its interpretation of the relevant passage of D3, namely that it disclosed the cross-linking of PAA and PVA in the presence of ammonium zirconium carbonate, but considered a composition as disclosed in D1 as the closest prior art. The paragraph in D3 above the statement concerning LFN 76M-20 and 76M-21 provided the

incentive for the skilled person to apply cross-linking to the composition of the closest prior thereby arriving at something falling within the scope of Claim 1. Consequently, the actual composition of LFN 76M-20 and 76M-21 was irrelevant for the assessment of inventive step.

It appears, however, that this argument is based on hindsight. Whatever the passage on page 3 of D3 may actually disclose, it is evident from this paragraph that the authors of D3 tried out their ideas concerning the cross-linking ("*LFN's 76M-20 and 76M-21 incorporating the above, ...*"), be it in the presence or in the absence of ammonium zirconium carbonate. If one interpreted the passage on page 3 as referring to cross-linking in the presence of ammonium zirconium carbonate (as done by the appellant), the logical consequence must be that this idea has been put into practice in LFN 76M-20 and 76M-21. To adhere to D1 as the closest prior (and not redefining the closest prior art as set out in point 6.5.1, above) and to combine D1 with an isolated teaching of D3 thereby effectively ignoring the context in which that teaching is given, is, in the board's view, a clear indication of *ex post fact* analysis. Without the patent in mind, a skilled person had no reason to focus on part of the information of D3, and to ignore the context in which that teaching was given, in particular the part where the lab ideas were put into practice. Therefore, this argument being based on hindsight cannot succeed.

6.7 In summary, whatever interpretation a person skilled in the art would give of the passage at page 3 of D3, the claimed solution to the stated problem does not arise

in an obvious way from a combination of D1 and D3 or from D3 alone. Consequently, the subject-matter of Claim 1 of the main request, and, by the same token, the subject-matter of Claims 2-20 meets the requirements of Article 56 EPC.

7. Because the respondent succeeded on the main request, there was no need to consider its auxiliary request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young