Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 7 July 2015

Case Number: T 0308/13 - 3.3.09

Application Number: 04813632.9

Publication Number: 1694795

IPC: C09J175/04, C08G18/10, B32B17/10, C03C27/04

Language of the proceedings: EN

Title of invention:
SYSTEM FOR BONDING GLASS INTO A STRUCTURE

Patent Proprietor:
Dow Global Technologies LLC

Opponent:
Sika Technology AG

Headword:

Relevant legal provisions:
EPC Art. 123(2), 56

Keyword:
Amendments - added subject-matter (no)
Inventive step - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0308/13 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 7 July 2015

Appellant: (Opponent)	Sika Technology AG Zugerstrasse 50 6340 Baar (CH)
Representative:	Sika Technology AG Sika Patent Attorneys Geschäftsstelle Zürich Tüffenwies 16, Postfach 8048 Zürich (CH)
Respondent: (Patent Proprietor)	Dow Global Technologies LLC 2040 Dow Center Midland, MI 48674 (US)
Representative:	Beck Greener Fulwood House 12 Fulwood Place London WC1V 6HR (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 3 December 2012 maintaining European patent No. 1694795 in amended form.**

Composition of the Board:

Chairman	W. Sieber
Members:	J. Jardón Álvarez
	E. Kossonakou

Summary of Facts and Submissions

I. This decision concerns the appeal filed by the opponent against the interlocutory decision of the opposition division that European patent No. 1 694 795 granted to Dow Global Technologies Inc. (now Dow Global Technologies LLC), as amended, meets the requirements of the EPC.

II. The opponent, Sika Technology AG, had requested revocation of the patent in its entirety on the grounds that the claimed subject-matter lacked novelty and inventive step (Article 100(a) EPC).

The documents cited during the opposition proceedings included:

D1: English translation of JP 59-152961 A;

D3: US 2001/0032568 A1; and

D6: US 6 048 579 A.

III. The set of claims maintained by the opposition division included ten claims. Claim 1 read as follows:

"1. A composition comprising
a) one or more organotitanates having four ligands wherein the ligands are hydrocarbyl, optionally containing one or more functional groups having one or more heteroatoms selected from the group comprising oxygen, nitrogen, phosphorus and sulfur wherein two or more of the ligands may form a cyclic structure;
b) one or more mercaptosilanes;
c) one or more polyaminosilanes;

d) additionally one or more secondary aminosilanes which contain one or more secondary amino groups and one or more silane groups but no primary amino group; and
e) one or more solvents which dissolve the components of the composition."

Claims 2 to 10 were directly or indirectly dependent on claim 1.

IV. The opposition division's decision can be summarised as follows:

- the amendment made satisfied the requirements of Article 123(2) EPC;

- the disclosure of D3 did not anticipate the claimed subject-matter (multiple selection); and

- the claimed subject-matter involved an inventive step starting from D1 as closest prior-art document (unexpected improved adhesion).

V. On 1 February 2013 the opponent (in the following: the appellant) lodged an appeal and paid the prescribed fee. The statement setting out the grounds of appeal was filed on 3 April 2013 and included an experimental report. The appellant requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

VI. With its reply dated 31 July 2013 the patent proprietor (in the following: the respondent) disputed the arguments submitted by the appellant and requested that the appeal be dismissed. The respondent also filed four auxiliary requests.

VII. In the communication attached to the summons to oral proceedings of 30 January 2015 the board indicated the points to be discussed during the oral proceedings.

VIII. Replies to this communication were filed by the respondent with letter of 10 March 2015 and by the appellant with letter of 5 June 2015. The reply of the appellant included the following documents:

D8: Technical Data Sheet Sikaflex®-552, Version 08/2002;

D9: Product Data Sheet Sikaflex®-552, Version 2 (06/2012);

D10: Product Data Sheet Sikaflex®-250 PC-T, Version 2 (07/2009);

D11: Product Data Sheet SikaTack® MOVE^{IT}, Version 1 (11/2010); and

D12: Product Data Sheet Sikaflex®-250 SV-3, Version 05/2013.

IX. Oral proceedings before the board were held on 7 July 2015. The claims discussed during the oral proceedings and relevant to this decision are the claims maintained by the opposition division (see point III above).

X. The arguments of the appellant, insofar as they are relevant for the present decision, may be summarised as follows:

- The further definition of the secondary aminosilanes in claim 1 violated the requirements

of Article 123(2) EPC. From the relevant passage in the description as filed, which defined the secondary aminosilanes in both structural and functional terms, only the structural definition had been incorporated into claim 1. However, the functional definition as expressed in the subordinate clause "and which enhance the bond of isocyanate adhesive to the substrate surface" could not be separated from the structural definition.

- The claimed subject-matter lacked inventive step starting from D1 as closest prior-art document. The newly filed experimental data showed that no technical effect resulted from the use of an additional secondary aminosilane. Consequently, the problem to be solved by the patent had to be seen merely in the provision of alternative compositions to those known from D1. The addition of a secondary aminosilane having no effect in the compositions was obvious for the skilled person because such silanes were already used in the prior-art documents D3 and D6 in closely related compositions for the same purpose.

XI. The relevant arguments of the respondent may be summarised as follows:

- The appellant's objection to the amendment was purely linguistic. The passage in the description cited by the appellant would be understood by the skilled person as first setting out the structural requirements of the secondary aminosilane (namely the secondary amino group and the silane group) and then stating its preferred purpose as a separate phrase in the sentence. Therefore the

amendment met the requirements of Article 123(2) EPC.

- The experimental report of the appellant should be disregarded as it did not show a genuine "like for like" comparison. In fact, the comparisons of the appellant were flawed because they used more aminosilane (in mol amount) in the comparative example than in the inventive example. Furthermore, the adhesive compositions used were not available at the time of the invention. The evidence filed by the respondent during the opposition proceedings did indeed show a technical effect. The problem to be solved was the provision of an improved system for durably bonding glass or abrasion-resistant coated plastic to a substrate. The claimed solution was not obvious in view of the cited prior art.

- Even if the board were to follow the appellant and define the problem as being the provision of alternative compositions, the claimed solution would still be not obvious in view of D3 or D6. Nothing in these documents taught the skilled person to modify the compositions of D1 in the way suggested by the invention.

XII. The appellant requested that the decision under appeal be set aside and that European patent No. 1 694 795 be revoked.

The respondent requested that the appeal be dismissed (main request), and subsidiarily that the patent be maintained on the basis of one of auxiliary requests 1 to 4 filed with the letter dated 31 July 2013.

Reasons for the Decision

1. Amendments (Article 123(2) EPC)

1.1 Claim 1 is based on granted claim 1 and specifies component d) as being "additionally one or more secondary aminosilanes which contain one or more secondary amino groups and one or more silane groups but no primary amino group" (amendment underlined).

1.2 It is not disputed that there is specific support for the amendment on page 9, lines 19 to 23 of the application as filed which reads: "The compositions of the invention further contain secondary amino silanes, which are compounds which contain one or more, more preferably one, secondary amino groups and one or more silane groups and which enhance the bond of the isocyanate adhesive to the substrate surface. Preferably, the secondary amino silanes do not contain primary amino groups."

1.3 However, the appellant took the view that the whole phrase, including "and which enhance the bond of the isocyanate adhesive to the substrate surface", was necessarily part of the definition for secondary aminosilanes. This second part of the phrase provided in its opinion an inseparable further functional limitation of the secondary aminosilanes. The skilled person would understand that some secondary aminosilanes do not act to enhance the bond and the invention was limited only to those that did. Since the functional definition had not been incorporated into the claim, claim 1 now embraced secondary aminosilanes which did not enhance the bond of the isocyanate

adhesive, subject-matter not disclosed in the application as filed.

1.4 The board does not agree with the appellant's construction of the relevant sentence quoted in point 1.2 above. The skilled person reading the application as a whole would understand that the relevant sentence provides a structural definition of the secondary aminosilanes (cf. "compounds which contain one or more secondary amino groups and one or more silane groups"), but that the further subordinate clause addresses the intended purpose rather than a further functional definition of the aminosilanes.

1.5 This view is firstly corroborated by the fact that there is no indication whatsoever in the application as filed that some of the aminosilanes would enhance the bond and others wouldn't. Secondly, similar language is used to indicate the purpose of mercaptosilanes and polyaminosilanes in the specification as filed:

"Mercaptosilanes as used herein refer to any molecule having both a mercapto and a silane group which enhances the adhesion of an isocyanate functional adhesive to a glass or coated plastic surface" (see page 7, lines 6 to 8).

"Polyamino silanes useful in the invention include any silane containing two or more primary and/or secondary amino groups, which polyamino silanes enhance the adhesion of the isocyanate functional material to a substrate surface wherein the adhesion is durable" (see page 8, lines 24 to 26).

1.6 In view of the above, the board comes to the same conclusion as the opposition division, namely that the

subject-mater of claim 1 fulfils the requirements of Article 123(2) EPC.

2. Inventive step

2.1 The invention relates to (primer) compositions used to prepare glass or plastic coated with an abrasion-resistant coating for bonding to a polyurethane adhesive. In particular, claim 1 is directed to a composition comprising:

a) one or more organotitanates;
b) one or more mercaptosilanes;
c) one or more polyaminosilanes;
d) additionally one or more secondary aminosilanes which contain one or more secondary amino groups and one or more silane groups but no primary amino group; and
e) one or more solvents which dissolve the components of the composition.

2.2 Closest prior art

2.2.1 The board agrees with the parties that D1 represents the closest prior-art document. It discloses primer compositions comprising "organosilane compound, organotitanate compound and volatile organic solvent" (see claim 1), which are useful for sealing or bonding materials where adhesion is difficult to achieve using wet-curing urethane-based single-liquid-type sealing materials and adhesives (see paragraph bridging pages 3 and 4). Applications of the primer composition include the bonding and sealing of automobile windscreen and sunroof surrounds (page 8, lines 1 to 3).

2.2.2 The organosilane compounds used are "of one type, or of two or more types, selected from among the mercaptoalkoxysilanes, aminoalkoxysilanes and vinylalkoxysilanes" (see claim 2). The specified aminoalkoxysilanes listed on page 4, lines 11 to 17 do not include any secondary aminosilane as defined in feature d) of claim 1, namely one secondary aminosilane which contains one or more secondary amino groups and one or more silane groups but no primary amino group.

2.2.3 The parties also agreed, and the board shares this opinion, that the most relevant embodiments in D1 are examples 1 to 4 disclosing primer compositions consisting of:

- an organotitanate (feature a) of claim 1),
- two different organosilane compounds, namely
  - γ-mercaptopropyltrimethoxysilane (feature b)), and
  - N-(β-aminoethyl)-γ-aminopropyltrimethoxysilane (feature c)), and
- one or more organic solvents (feature e)).

These primer compositions show good adhesion properties (see table 2).

2.3 Problem to be solved and its solution

2.3.1 According to the respondent, the technical problem underlying the patent in view of D1 is the provision of an improved system for durably bonding glass or abrasion-resistant coated plastic to a substrate.

2.3.2 As a solution to this problem the patent proposes the compositions of claim 1, essentially characterised by the addition of a further silane compound, namely a

secondary aminosilane as defined in feature d) of claim 1.

2.3.3 There is however contradictory evidence on file as to whether or not the claimed compositions provide improved adhesion over the compositions known from D1.

On the one hand, the respondent had already provided during the opposition proceedings experimental data in order to demonstrate such an improvement. Table A filed on 9 December 2009 compares the performance of the composition of example 23 of the patent with corresponding compositions in which there is no secondary aminosilane (composition A, a composition close to those of examples 1 to 4 of D1), or no polyaminosilane (composition B), or no mercaptosilane (composition C) or no organotitanate (composition D). The results in table A show that all the tested compositions do provide strong initial adhesion. However, the inventive composition of example 23 having all four components provides a significant increase in durability performance, as indicated by days to adhesion loss in 90°C water.

On the other hand, the relevance of these results was questioned by the experimental evidence filed by the appellant with its statement of grounds of appeal. The appellant compared the composition of example 23 of the patent with a primer composition with the same components as composition A of the respondent, but wherein the amount of polyaminosilane was increased to compensate for the absence of the secondary aminosilane present in example 23. The results of the appellant show that the adhesion performance of both compositions are very similar; no improvement of adhesion was obtained.

2.3.4 Each party criticised the experiments of the other party. The appellant argued that the experiments of the respondent should not be taken into account because any improvement in properties could be ascribed only to an increase in the amount of silane by the addition of the secondary aminosilane. The respondent criticised the appellant's comparison because, by simply basing the comparison on weight, significantly more aminosilane molecules had been included in the comparative example (thereby unjustifiably improving the properties of the comparative example).

2.3.5 In the end, none of the experiments appears to be a genuine "like for like" comparison, so that the board is not in a position to decide whether the claimed composition provides improved properties over the closest prior art due to the distinguishing feature.

2.4 Reformulation of the problem and its solution

2.4.1 As a consequence, the problem has to be reformulated in a less ambitious manner, not involving any improvement of the compositions over those disclosed in D1. Hence, the objective technical problem has to be seen in the provision of an alternative system/composition for durably bonding glass or abrasion-resistant coated plastic to a substrate.

2.4.2 The examples in the patent show that this less ambitious problem is solved by the compositions of claim 1. This conclusion was not contested by the appellant, and the board too is satisfied that this problem is credibly solved.

2.5 Obviousness

2.5.1 It remains to be decided whether, in view of the available prior art, it would have been obvious for the skilled person to solve this technical problem by the means claimed, namely by adding to the compositions of D1 one or more secondary aminosilanes which contain one or more secondary amino groups and one or more silane groups but no primary amino group.

2.5.2 D1 itself gives no hint. As stated in point 2.2.2 above, the organosilanes used therein are selected from among mercaptoalkoxysilanes, aminoalkoxysilanes and vinylalkoxysilanes, and no organosilane falling within the disclosure of feature d) is mentioned in D1.

2.5.3 The appellant combined D1 with D3 and D6 because these documents disclose secondary aminosilanes as defined in feature d) of claim 1. However, these documents give no hint to the claimed solution for the following reasons:

2.5.4 D3 relates preferably to aqueous silane-containing coating compositions providing durable, corrosion-resistant coatings on metal and non-metal surfaces. The compositions comprise various combinations of a silane (A) with one or more of a base component (B), an acidic component (C), water (D), epoxysilane (E), alkali metal silicate (F), mono-lower alkyl ether of ethylene glycol (G), lower alcohol (H), UV light absorber (I), colloidal aluminum hydroxide (Ji), metal alcoholate (Jii), and colour-forming silane hydrolysis catalyst (K) (see paragraphs [0040] to [0049]).

In the context of the aqueous composition disclosed in paragraphs [0060] to [0066], N-phenylaminopropyltri-methoxy silane is mentioned as an example for

silane (A) (see paragraph [0067]), a compound which is a secondary aminosilane meeting the definition of feature d) of claim 1. Furthermore, the aqueous composition may additionally include a basic catalyst, for example bis(trimethoxypropylsilane) amine (see paragraph [0074]), again a compound which meets the definition of feature d) of claim 1.

D3 does indeed disclose secondary aminosilanes as defined in feature d), but in the context of aqueous primer compositions. On the other hand, the primer compositions of D1 are solvent-based, so the skilled person would have no incentive to add particular compounds of D3 to the compositions of D1.

2.5.5 D6 relates to primer compositions comprising a silane-modified polyester polymer, an adhesion promoter and an anhydrous solvent (claim 1). In a preferred embodiment the adhesion promoter is the reaction product of a multifunctional isocyanate and at least one organosilane containing an NCO-reacting hydrogen (see claim 3), which could be N-phenyl-gamma-aminopropyl-trimethoxysilane (see column 5, line 48), a compound according to feature d) of claim 1. As pointed out by the respondent, the reaction product is not a secondary amine. Thus, it cannot be correct that a skilled person following this teaching would add a secondary aminosilane (rather than the reaction product) to the primer composition of D1. Moreover the primer of D6 does not contain organotitanates, one of the essential components of the primers of D1. There is simply no incentive for the skilled person to add the secondary aminosilane mentioned in D6 to the primer composition of D1.

2.5.6 In summary, the fact that the secondary aminosilanes used as component d) in the patent are already known from D3 and D6 for use in primer compositions is not equivalent to a hint to use them in the compositions of D1. The secondary aminosilanes are disclosed in D3 and D6 in a different context. It appears therefore that the arguments of the opponent in this context can only be made *a posteriori*, in the knowledge of the invention.

2.6 In view of the above, the board concludes that the person skilled in the art would not have arrived in an obvious manner at the subject-matter of claim 1. The subject-matter of claim 1, as well as the subject-matter of claims 2 to 10 which are directly or indirectly dependent on claim 1, thus involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Hampe W. Sieber

Decision electronically authenticated