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Datasheet for the decision of 8 July 2024

Case Number: T 2028/21 - 3.3.10

Application Number: 08767257.2

Publication Number: 2193177

IPC: C09J161/20, C09J161/24, C09J161/28

Language of the proceedings: EN

Title of invention:
HARDENER COMPOSITION, ADHESIVE SYSTEM AND METHOD OF GLUING

Patent Proprietor:
Akzo Nobel Coatings International B.V.

Opponent:
Dynea AS

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
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Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 2028/21 - 3.3.10

D E C I S I O N
of Technical Board of Appeal 3.3.10
of 8 July 2024

Appellant: (Patent Proprietor)	Akzo Nobel Coatings International B.V. Christian Neefestraat 2 1077 WW Amsterdam (NL)
Representative:	Akzo Nobel IP Department Christian Neefestraat 2 1077 WW Amsterdam (NL)
Respondent: (Opponent)	Dynea AS PO Box 160 2001 Lillestrom (NO)
Representative:	Zacco Norway AS P.O. Box 488 Skøyen 0213 Oslo (NO)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 22 September 2021 revoking European patent No. 2193177 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	P. Gryczka
Members:	A. Zellner
	F. Blumer

Summary of Facts and Submissions

I. The patent proprietor lodged an appeal against the decision of the opposition division to revoke the European patent No. 2 193 177 (Article 101(2) EPC).

II. Notice of opposition has been filed on the basis of Article 100(a) EPC for lack of inventive step (Article 56 EPC), Article 100(b) EPC for lack of sufficiency of disclosure and Article 100(c) EPC for added subject-matter.

III. In the appealed decision, the opposition division held that claims 8, 13, 17 and 18 of the patent as granted (main request before the opposition division) did not contain subject-matter which extended beyond the content of the application as filed (Article 100(c) EPC), and that the patent as granted disclosed the claimed subject-matter in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC). The opposition division concluded, however, that the claimed subject-matter was not based on an inventive step (Article 100(a) and 56 EPC).

IV. The following documents are referred to:

D1: WO 01/70898 A1
D2: WO 03/062340 A1
D3a: English abstract and machine translation of description and claims of JPH0841437 (A)
D4: WO 2007/040410 A1
D9: US 2003/0079832 A1

V. In support of its appeal, the appellant (patent proprietor) argued that the opposition division erred in their decision when holding the claimed subject-matter of the patent as granted not to be based on an inventive step (Article 56 EPC).

VI. With its reply to the appellant's statement setting out the grounds of appeal the respondent (opponent) submitted that the claimed subject-matter was, as concluded by the opposition division, not based on an inventive step.

VII. Both parties requested that oral proceedings be held in case their respective main requests were not allowable (Article 116 EPC).

VIII. The board summoned the parties on 30 October 2023 to attend oral proceedings scheduled to take place on 16 July 2024 (Rule 115(1) EPC).

IX. The respondent withdrew their request for oral proceedings on 5 April 2024. The appellant informed the board on 10 April 2024 of their intention not to attend the oral proceedings.

X. Oral proceedings were cancelled on 8 July 2024.

XI. The independent claims of the main and sole request (patent as granted) read as follows:

"1. Hardener composition for use in an amino resin based adhesive system, comprising from 1 to 50 weight-% of an aliphatic alpha hydroxy- mono-, or di-, carboxylic acid, and polyvinyl alcohol, wherein the acid belongs to the group of glycolic acid and malic acid."

"8. Adhesive system comprising a resin component which is an amino resin and a hardener component which is a hardener according to any one of the preceding claims."

"13. Method of gluing wooden materials comprising:

- *applying an adhesive system according to claims 8 to 12 onto at least one of two pieces of a wooden material,*
- *contacting the two pieces, thereby forming an assembly with the adhesive system situated between the pieces forming a glue line,*
- *pressing the assembly so that the pieces are joined."*

"16. Use of a hardener composition according to any one of claims 1 to 7 for curing an amino resin."

"17. Use of an adhesive system according to any one of claims 8 to 12 for gluing wooden materials."

"18. Glued product obtainable by the method according to any one of claims 13 to 15."

XII. The appellant argued essentially as follows:

The provision of a hardener composition for use in an amino resin based adhesive according to claim 1 of the patent as granted is based on an inventive step. Document D1 is closest prior art. The claimed composition differs from the disclosure of D1, in particular the examples thereof, in that it comprises glycolic acid and/or malic acid instead of formic acid. This leads to storage stable hardener compositions which provide good adhesive bonding, comparable with

compositions containing formic acid. The non-volatile acids in the claimed compositions will, however, not create problems to the working environment and with corrosion as volatile acids, such as formic acids, do. The cited prior art does not provide any suggestion to the selection of glycolic and/or malic acid in order to achieve the combination of these properties. Although the acids as such are known in this technical field, their use in polyvinyl alcohol containing hardener compositions is not suggested by the prior art, in particular for providing a composition having the shown combination of properties.

XIII. The respondent argued essentially as follows:

Document D1 is closet prior art for the claimed subject-matter. The claimed subject matter differs therefrom by the use of different acids in the claimed hardener composition. There is no evidence of any improvement compared to the closest prior art. The objective technical problem can thus only be seen in the provision of an alternative hardener composition. The use of glycolic acid or malic acid is known from documents D2 and D3a, and the skilled person would, in order to provide an alternative to the hardener composition disclosed in document D1, substitute formic acid by any other of the acids known in the field, such as glycolic acid or malic acid. The skilled person would thus arrive at the claimed subject-matter without any inventive activity.

XIV. The appellant (patent proprietor) requests that the decision under appeal be set aside and that the patent be maintained as granted.

XV. The respondent (opponent) requests that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

Decision without conduct of oral proceedings

2. The respondent withdrew their request for oral proceedings on 5 April 2024 and the appellant informed the board on 10 April 2024 of their intention not to attend oral proceedings. A decision can thus be issued without the conduct of oral proceedings.

Main request (patent as granted)

Inventive step (Articles 100(a) and 56 EPC)

3. In the contested decision, the opposition division came to the conclusion that the subject-matter of claims 1, 13, 16 and 17 of the patent as granted (main request) did not involve an inventive step, and that the request did thus not meet the requirements of Article 56 EPC. The opposition division considered document D1 to be the closest prior art. According to the opposition division, the subject-matter of the independent claims of the patent in suit differed from the disclosure of D1 in that the acid in the hardener composition was glycolic acid or malic acid, instead of formic acid. The technical problem was the provision of an alternative hardener to the one known from D1. The opposition division did not consider the solution provided in the patent as granted to be inventive, because the respective acids were known and the provision of the claimed subject-matter was to be

expected from the skilled person, who routinely sought to expand the prior art by finding and proposing alternatives to current knowledge.

4. The board comes to the conclusion that the claimed subject-matter is based on an inventive step and that the request thus meets the requirements of Article 56 EPC. The reasons are as follows:

The contested patent

4.1 The contested patent concerns hardener compositions and adhesive systems, in particular for gluing wooden materials, such as laminated beams. It addresses known negative effects of hardeners on the working environment, and corrosion on the gluing equipment, when formic acid or another volatile acid is a component of the hardener composition. It also addresses the problem of gluing quality in low temperature, low humidity environments (see paragraphs [0001] to [0004]). In order to solve these problems, the contested patent provides a hardener composition for use in an amino resin based adhesive system (claim 1), an adhesive system comprising the hardener composition (claim 8), a method of gluing wooden materials comprising applying the adhesive system (claim 13) and the glued product obtainable by this method (claim 18), the use of the hardener composition for curing an amino resin (claim 16), and the use of the adhesive system for gluing wooden materials (claim 17). The claimed hardener composition comprises a polyvinyl alcohol and from 1 to 50 weight-% of an acid which belongs to the group of glycolic acid and malic acid.

The closest prior art

4.2 The parties concur with the opposition division in that document D1 represents the closest prior art. The board sees no reason to differ. The document concerns adhesive systems and their use for gluing wood-based products, as well as hardener compositions for use in amino based gluing systems, for example in laminated beam industries (see page 1, lines 3 to 8 and line 17).

The differing feature

4.3 Document D1 discloses hardener compositions for amino resin based adhesive systems, comprising polyvinyl alcohol and a carboxylic acid, in particular formic acid or maleic acid (see claims 2 and 12). The compositions of the examples comprise formic acid. The differing feature between the hardener composition according to claim 1 of the main request and the disclosure of document D1 is that it comprises glycolic acid or malic acid as carboxylic acid, whereas D1 discloses the use of formic acid (see the examples). This was undisputed between the parties.

The technical problem

4.4 The parties disagreed on the technical effect caused by the different acid and how the objective technical problem had to be defined.

4.5 The appellant argued, by reference to table 1 of the patent in suit, that the replacement of formic acid in a hardener composition as disclosed in document D1 by the less volatile acids glycolic acid or malic acid had a positive effect on the working environment and on corrosion, whereas other properties, such as storage

stability of the composition, fibre tear and delamination of the laminated products, were comparable for all three acids. Due to these improvements the objective technical problem was the provision of a polyvinyl alcohol-containing hardener composition which was storage stable, which did not create the problems to the working environment and the problems with corrosion as volatile acids did, and which provided a strong adhesive bond when used in combination with an amino resin (see point 20 of the statement setting out the grounds of appeal).

4.6 The respondent, in accordance with the opposition division, did not recognise any particular technical effect, especially no improvement over hardener compositions comprising formic acid. According to the respondent, there was no evidence for the alleged improvements of the conditions at the working environment, or for a reduction of corrosion. The respondent considered the technical problem as the provision of an alternative hardener composition.

4.7 The board notes the following:

4.7.1 Table 1 of the patent in suit discloses a comparison of hardener compositions comprising various acids (see paragraph [0068]). It shows that compositions comprising glycolic acid or malic acid lead to an overall evaluation which is comparable to the composition comprising formic acid (*"very good"*; see the last column of table 1 for compositions 1, 2 and 9). Compositions comprising other acids show inferior results (*"good"* or *"bad"*, or no result at all; see the last column of the table for compositions 3 to 8), even if not all of the individual characteristics measured are the same for the three acids glycolic, malic and

formic acid, or are better for glycolic and malic acid, compared to the other acids tested (see the columns *"Stability of hardener"*, *"Fiber tear (%)"*, *"Demalination (%)"*, and *"EN391B test"*).

4.7.2 Document D1 does not disclose any advantage of maleic acid over formic acid, and considers them both preferable (see claim 12 and the lines 12 to 14 on page 5). Formic acid, however, is used in all of the examples. According to table 1 and paragraph [0064] of the contested patent, formic acid performs better than maleic acid (entries 9 and 7, respectively). According to paragraph [0064] of the contested patent, hardener compositions comprising maleic acid were much less storage stable than the ones using other acids. An advantage of glycolic acid, malic acid and formic acid over maleic acid is also disclosed in Table 1 (see the last columns for the respective compositions).

4.7.3 The data shows that glycolic and malic acid (claim 1 of the main request) in summary perform as well as - but not better than - formic acid (document D1), and that all three acids perform better than maleic acid (document D1).

4.8 Therefore, the objective technical problem is the provision of an alternative to the hardener composition disclosed in D1, comprising formic acid, for use in an amino based hardener system comprising polyvinyl alcohol, showing similar performance in a combination of properties.

The solution provided

4.9 In order to solve the technical problem, a hardener composition according to claim 1 of the main request is

provided, which comprises from 1 to 50 weight-% of an aliphatic alpha hydroxy- mono-, or di-, carboxylic acid, wherein the acid belongs to the group of glycolic acid and malic acid. The board is satisfied that the solution provided solves the technical problem.

The inventiveness of the claimed solution

4.10 The parties also disagreed whether the solution suggested according to claim 1 was obvious to the skilled person, or not.

4.11 According to the appellant, the use of glycolic acid or malic acid was not an arbitrary choice, as shown by table 1 of the contested patent. There was no suggestion in the prior art that the use of these acids would achieve the combination of technical effects. Furthermore, although glycolic acid and malic acid as such were disclosed as curing agents in documents D2 and D3a, respectively, these documents did not contain any pointer to the use of these acids in a hardener composition according to document D1, in particular no pointer to using them in polyvinyl alcohol-containing hardener compositions (D2), or in a separate hardener composition at all (D3a). Although documents D4 and D9 related to the problem of storage stability, they did not disclose glycolic acid or malic acid.

4.12 According to the respondent, several documents disclosed alternative acids, which could be used instead of formic acid in a hardener composition as disclosed in document D1. The respondent argued that the mere selection of glycolic acid or malic acid was not the result of an inventive activity. In particular, the selection of glycolic acid or malic acid out of a limited number of known acids, which were suitable as

components of hardener compositions, was merely a matter of routine experimentation.

4.13 The board notes the following:

4.13.1 Document D1 does not provide any teaching to replace formic acid with glycolic acid or malic acid. The only other acid disclosed therein, as an alternative to formic acid, is maleic acid (see claim 12 and lines 12 to 14 on page 5). As shown in table 1 of the patent in suit, maleic acid shows, however, inferior performance compared to formic acid (see also paragraph [0064] of the patent in suit). Selecting the only alternative acid disclosed in the closest prior art, D1, itself, would thus lead to an inferior hardener composition, but not to an alternative having similar properties.

4.13.2 Documents D2 and D3a are the only documents on file disclosing glycolic acid or malic acid in the context of hardening adhesive systems (D2: page 7, line 13 to 16, D3a: paragraph [0006]). These systems do not contain polyvinyl alcohol, D3a does furthermore not disclose the hardener as a separate composition. According to the appellant, systems without polyvinyl alcohol do not cause potential storage problems which are linked to that polymer. This has not been disputed by the respondent. Furthermore, document D2 discloses, as does the closest prior art (D1), maleic acid as alternative to formic acid and glycolic acid (see page 7, lines 13 to 16). However, as shown in table 1 of the contested patent, these acids do not perform the same way. Also, citric acid and tartaric acid are disclosed as alternatives to malic acid in document D3a (see paragraph [0005]), which has also been shown in table 1 of the contested patent not to be correct.

4.13.3 Thus, document D1 suggests the use of maleic acid as an alternative to formic acid. This approach, however, does not lead to an alternative, as shown in table 1 of the contested patent, since the performance is inferior. Documents D2 and D3a disclose glycolic acid and malic acid, respectively. These documents do not, however, suggest their use in polyvinyl alcohol containing hardener systems, such as the system disclosed in D1. They furthermore do not disclose that the selection of glycolic acid or malic acid rather than any of the other acids disclosed therein leads to hardener compositions with comparable properties to those containing formic acid, as shown by table 1 of the contested patent.

4.14 In summary, there is no suggestion in the cited prior art to select glycolic acid or malic acid as a replacement for formic acid in a hardener composition as disclosed in D1, when looking for an alternative hardener composition having comparable properties in terms of storage stability, fiber tear and delamination properties. Since the acids disclosed in the cited prior art are not equivalent, and the selection of glycolic acid and malic acid is not arbitrary, as shown in table 1 of the contested patent, the provision of a hardener composition according to claim 1 of the main request is based on an inventive step.

Independent claims 8, 13 and 16 to 18

5. All of independent claims 8, 13 and 16 to 18 *inter alia* refer back to claim 1 and the hardener composition claimed therein, and thus comprise the same differing features with respect to the disclosure of document D1. The provision of the subject-matter claimed therein is consequently also based on an inventive step for the

same reasons as claim 1. This was also not disputed.

6. The main request does, for the reasons outlined above, meet the requirements of Article 56 EPC.

7. The opposition division also came to the conclusion that the grounds of opposition based on Articles 100(b) and (c) EPC did not prejudice the maintenance of the patent as granted. This finding has not been challenged by the respondent during the appeal proceedings. The board has no reason to deviate in these points from the decision of the opposition division.

8. The appellant's appeal is thus successful.

Order

For these reasons it is decided that:

The contested decision is set aside.

The patent is maintained as granted.

The Registrar: The Chairman:

C. Rodríguez Rodríguez P. Gryczka

Decision electronically authenticated