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**Datasheet for the decision
of 11 February 2019**

Case Number: T 1600/17 - 3.3.05

Application Number: 10744633.8

Publication Number: 2467520

IPC: D04H1/64, C03C25/32, C08B37/00,
C08L5/00, C09J179/00, C08G69/50

Language of the proceedings: EN

Title of invention:
IMPROVED PERFORMANCE POLYMERIC FIBER WEBS

Patent Proprietor:
Johns Manville

Opponent:
Knauf Insulation SPRL

Headword:
Polymeric Fiber Webs/Johns Manville

Relevant legal provisions:
RPBA Art. 13(1)
EPC Art. 123(2), 123(3), 83, 54, 56

Keyword:

Late-filed request - request clearly allowable (yes)

Amendments - allowable (yes)

Sufficiency of disclosure - (yes)

Novelty - (yes)

Inventive step - (yes)

Decisions cited:

G 0004/93, G 0001/99

Catchword:



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Case Number: T 1600/17 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 11 February 2019

Appellant: Knauf Insulation SPRL
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
12 June 2017 concerning maintenance of the
European Patent No. 2467520 in amended form.**

Composition of the Board:

Chairman E. Bendl
Members: G. Glod
S. Fernández de Córdoba

Summary of Facts and Submissions

I. The present appeal from the opponent (appellant) lies from the decision of the opposition division finding that amended European patent No. EP 2 467 520 B1 based on the then main request met the requirements of the EPC.

The following documents cited in the decision are of relevance for the present decision:

D5: EP 1 510 607 A1
O1: WO 2011 022227 A1
O2: EP 1 382 642 A1
O3: EP 1 652 868 A1
O4: WO 2010 142568 A1
O5: WO 2010 108999 A1
O6: US 3 006 879 A
O7: US 5 539 077 A
O8: WO 98 39376 A1
O9: US 2002 0096281 A1
O10: US 2010 0029160 A1
O11: GB 928 451 A
O12: WO 2004 007615 A1
O13: US 3 513 001 A
O14: GB 2 451 719 A
O16: US 2008 0108741 A1

II. In its communication under Article 15(1) RPBA, the board was of the preliminary opinion that the sole request did not fulfil the requirements of Articles 123(2) EPC and 56 EPC.

III. By submission of 18 December 2018, the respondent (patent proprietor) filed auxiliary requests 1, 2, 3, 4a and 4b.

- IV. By letter of 24 January 2019, the appellant withdrew its request for oral proceedings and announced that it would not attend the scheduled oral proceedings.
- V. Oral proceedings took place on 11 February 2019 in the absence of the appellant. Therein the respondent filed a new sole request.

The independent claims of the request are as follows:

"1. A nonwoven web of polymeric fibers comprising a water-insoluble polymer obtainable upon curing a curable binder composition comprised of: (i) an aldehyde and (ii) an amino-amide which is a reaction product of an amine and a reactant, (iii) said aldehyde is a reducing sugar and is used with the amino-amide, (iv) said amine is a diamine having at least one primary amine group, (v) said reactant is an unsaturated reactant and is selected from the group consisting of unsaturated anhydrides, carboxylic acids, esters, and mixtures of these or a saturated reactant selected from the group consisting of succinic anhydride, succinic acid, mono and diesters of succinic acid, glutaric acid and anhydride, phthalic acid and anhydride, tetrahydro phthalic acid and anhydride, mono and diesters of acid anhydrides and their mono esters."

"9. A process for binding polymeric fibers of a web comprising applying to the fibers a binder comprised of an aldehyde and an amino-amide which is a reaction product of an amine and a reactant, said aldehyde is a reducing sugar and is used with the amino-amide, said amine is a diamine having at least one primary amine group, said reactant is an unsaturated reactant and is selected from the group consisting of unsaturated

anhydrides, carboxylic acids, esters, and mixtures of these or a saturated reactant selected from the group consisting of succinic anhydride, succinic acid, mono and diesters of succinic acid, glutaric acid and anhydride, phthalic acid and anhydride, tetrahydro phthalic acid and anhydride, mono and diesters of acid anhydrides and their mono esters and thereafter curing said composition while present on said polymeric fibers."

"14. Use of the nonwoven web of claim 1 in a roofing membrane."

Claims 2 to 8 and 10 to 13 refer to preferred embodiments of claim 1 or 9, respectively.

VI. The arguments of the appellant relevant to the present decision can be summarised as follows:

Claim 1 was not sufficiently disclosed in view of the term "amino-amide" that was not clearly defined.

The priority was not validly claimed, since D5 had to be considered as the first application. Consequently D5 was relevant for novelty. O1 disclosed a composition comprising an aldehyde or ketone and an amino amide. O2 and O12 disclosed a composition comprising the reaction product of an alkanolamine with a carboxylic anhydride and glucose. O3 disclosed a curable binder composition comprising dextrose, melamine and glyoxylic acid. O4 disclosed a process involving the preparation of a combination that might be used to bind nonwoven webs comprising a polysaccharide, an organic compound substituted at both ends with amino groups, and up to 10 wt % phosphoric or tetrafluoroboric acid. O5 disclosed a resin composition that could be used as a

binder for polyester fiber mats comprising a reaction product of formaldehyde, melamine and acids such as nitric, sulphuric, phosphoric or hydrochloric acid. O6 disclosed the condensation of amino compounds with aldehydes in the presence of strong acids. The compositions might be used to treat fibrous materials. O7 disclosed a resin composition useful as a binder for polyester nonwoven substrates or cellulose substrates comprising the reaction product of melamine with an aldehyde. The composition could further comprise dextrose and inorganic acid catalysts. O10 related to an aqueous binder composition comprising glucose and a copolymer of maleic anhydride or acid solubilised by using an amine, such as ethylenediamine.

Starting from D5 as closest prior art, the amino-amide crosslinker for the aldehyde in the binder system for nonwovens was no more than an obvious alternative crosslinker to those used in D5. When starting from O2 and based on the teaching of O11, O13 and O14, the binder used was an obvious alternative. The conclusion of an obvious alternative also applied when starting from O3 or O7 as closest prior art. It would be obvious to replace the epihalohydrin crosslinker in O8 or O9 by a carbohydrate crosslinker. No unexpected effect had been shown with respect to O16 that disclosed a curable composition comprising an adduct of carbohydrate polymer and polybasic acid, and an amine.

VII. The respondent refuted the arguments and indicated that the objection with respect to amino-amide was an objection of lack of clarity.

D5 did not disclose an amino-amide; the priority was validly claimed, so O1 and O10 were not prior art. O2 and O12 did not disclose any amino-amides. O3 was

silent about diamines. None of O4, O5, O6 and O7 disclosed a composition comprising an amino-amide.

O2, O3 and O7 did not teach diamines. Neither O8 nor O9 disclosed the reaction product of a reducing sugar with an amino-amide. O16 did not relate to diamines.

VIII. The appellant requested that the impugned decision be set aside and that the patent be revoked.

The respondent requested that the impugned decision be set aside and that the patent be maintained on the basis of the sole request submitted during oral proceedings.

Reasons for the Decision

1. Article 13(1) & (3) RPBA

The present request was submitted during the oral proceedings before the board. According to established jurisprudence (Case Law of the Boards of Appeal of the EPO, 8th edition 2016, IV.E.4.2.5, page 1133), a request filed after the grounds of appeal may be admitted and considered at the board's discretion if the amended request is clearly or obviously allowable.

In the present case the request is a further restriction of a previously filed request and was submitted to overcome an objection under Article 123(2) EPC. The request was considered clearly allowable (see below) and was therefore admitted into the proceedings.

2. Reformatio in peius

The opponent being the sole appellant, the patent proprietor is primarily restricted during the appeal proceedings to defending the patent in the form in which it was maintained by the opposition division in its interlocutory decision (G 04/93, Reasons 16) except for the circumstances defined in G 01/99 (Reasons 15).

In the case at hand, the amendment inserted into claim 1 led to the deletion of "derived from" which only required that during the whole reaction process the product of an amine and reactant (amino-amide intermediate) and an aldehyde or ketone were once present. Claim 1 is now restricted in that a water-insoluble polymer has to be present on the web and has to be obtainable by curing a curable binder composition that is much narrower than the composition present in claim 1 of the main request before the opposition division. Claim 12 (now claim 9) has been further restricted by specifying the components of the composition. As a consequence, the scope of the claim is limited compared to the scope of the independent claims 1 and 12 found allowable by the opposition division, so the principle established in G 04/93 is not contravened.

3. Article 123(2) EPC

The requirements of Article 123(2) EPC are fulfilled for the following reasons:

- 3.1 Claim 1 is directly and unambiguously derivable from claims 1, 6 and 7 in combination with page 4, lines 14 and 15; page 4, line 29 to page 5, line 3; and page 2, lines 25 to 35 of the application as filed.

- 3.2 Claim 2 is based on claim 3 as filed wherein the deletion of some of the amines brings the wording in line with what the skilled person would understand by "diamine" and guarantees that "diamine" is not given a different, unusual meaning in claim 1.
- 3.3 Claims 3 to 8 are based on claims 4, 5, 8 to 10 and 12 as filed.
- 3.4 Claim 9 is directly and unambiguously derivable from claim 13 in combination with page 4, lines 14 and 15; page 4, line 29 to page 5, lines 3 and 9 to 21; and page 2, lines 25 to 35 of the application as filed.
- 3.5 Claim 10 is based on claim 15 in combination with the comments made above (point 3.2).
- 3.6 Claims 11 to 14 are based on claims 16 to 18 and page 3, line 6 of the application as filed.
4. Article 123(3) EPC

The requirements of Article 123(3) EPC are fulfilled for the following reasons:

Claim 1 has now been restricted in that it is specified that the nonwoven web needs to contain a water-insoluble polymer that has to be obtainable by curing a composition wherein the components are more defined than in claim 1 as granted. Claim 1 now contains the information present in paragraphs [0011] and [0012] of the patent that had to be used to interpret the wording of claim 1 as granted.

Claim 12 as granted has been further restricted by specifying the components of the composition to provide current claim 9.

5. Article 83 EPC

The board sees no reason to diverge from the impugned decision for the following reasons:

Claim 1 relates to a non woven web of polymeric fibers comprising a water-insoluble polymer that is obtainable upon curing a curable binder composition as defined in claim 1. The patent contains sufficient information about representative diamines (paragraph [0021]), about the reactants (paragraph [0022]), and about how to obtain an amino-amide (paragraphs [0024] and [0038] to [0040]). Furthermore, reducing sugars are indicated in paragraph [0025] and in the examples, while the curing of the binder is described in paragraphs [0033] and [0034] and exemplified in examples 1 to 3. The application to the fibers is described in paragraph [0032].

The appellant, besides speculations, has not provided any evidence that the information given in the patent does not allow the obtention of the claimed non woven web of polymeric fibers. There is also no proof that it was an undue burden to find those components that allow the production of the water-insoluble polymer present on the web.

6. Article 54 EPC

The requirements of Article 54 EPC are met for the following reasons:

- 6.1 D5 does not disclose a reducing sugar or a diamine. D5 cannot be considered as the first application, so there is no reason for doubting that the priority is validly claimed.
- 6.2 Consequently, O1 is not prior art.
- 6.3 O2 discloses as binder component A1 in example 1 a reaction product of diethanolamine (DEA) with tetrahydrophthalic anhydride (THPA) and trimellitic anhydride (TMA). This product is cured with a binder component (B) that comprises glucose syrup (paragraphs [0051] to [0053]). O2 also discloses cellulosic fibers (page 5, line 49) which are a nonwoven web of polymeric fibers. However, O2 does not disclose a reaction product of a diamine with a reactant that is cured with a reducing sugar.
- 6.4 O3 does not disclose a reaction product of a diamine with a reactant that provides a product containing an amide and an amine. Further, the reaction products of the examples are not combined with a nonwoven web of polymeric fibers, but with filter paper.
- 6.5 O4 does not disclose the reaction product of an amine with a reactant that provides an amide and an amine.
- 6.6 The examples of O5 only disclose the reaction of formaldehyde with urea, which is not an amine. Claim 11 refers back to claims 1 to 5, but said claims do not disclose a reaction product of a diamine and a reactant. Further, this product is not necessarily reacted with a reducing sugar.
- 6.7 Example 8 of O6 discloses the application of methylol melamine on spun viscose fabric and subsequent curing.

A reaction product that leads to both an amine and an amide is not unambiguously derivable from O6. O6 also does not disclose a diamine.

6.8 O7 does not explicitly disclose that the reaction product of melamine with dialkoyethanal reacts with a reducing sugar and is put on a nonwoven web of polymeric fibers. Furthermore, O7 does not disclose a diamine.

6.9 O10 is not prior art.

6.10 O12 does not refer to diamines (see page 3, last three paragraphs).

7. Article 56 EPC

7.1 Claim 1

7.1.1 The invention relates to polymeric fiber webs.

7.1.2 It is established jurisprudence that the closest prior art is normally a prior-art document disclosing the same purpose or aiming at the same objective as the claimed invention and having the most features in common with the claimed subject-matter. In the case at hand, O2 is considered the closest prior art, since it discloses cellulosic fibers that are polymeric fibers and a formaldehyde-free binder that is obtained by curing a component B with a component A (see point 6.3 above).

7.1.3 The problem to be solved is the provision of an alternative nonwoven polymeric fiber web.

7.1.4 The solution proposed is a nonwoven web of polymeric fibers according to claim 1, characterised in that the curable binder composition comprises an amino-amide that is a reaction product of a diamine having at least one primary amine group and a reactant.

7.1.5 The solution is not obvious for the following reasons:

O2 also relates to a (formaldehyde-free) aqueous binder composition (paragraph [0007]) and discloses a binder as described above (point 6.3). It further discloses that these binders could be used for cellulosic fibers. However, O2 is completely silent about diamines, so there is no pointer towards such compounds. This also applies to O12.

D5 discloses neither a reducing sugar nor a diamine.

O3, O6 and O7 do not disclose a reaction product of a diamine with a reactant that provides a product containing an amide and an amine.

O4 and O5 are not prior art for the question of inventive step.

O8 and O9 do not relate to polymeric fibers of a web and do not disclose a reducing sugar. The skilled person starting from O2 and trying to solve the posed problem has no reason for turning to these documents.

O11 and O13 also do not disclose polymeric fibers of a web and do not disclose an amino-amide that is a reaction product of a diamine and a reactant. O11 and O13 are not relevant when looking for a solution to the posed problem.

O14 and O16 do not disclose the use of diamines for producing an amino-amide.

Thus, the combination of the cited documents with the closest prior art does not lead to the claimed invention either.

7.2 Claim 9

The arguments presented for claim 1 still apply, since the binder composition used in the process of claim 9 also comprises an amino-amide that is a reaction product of a diamine having at least one primary amine group and a reactant. As explained under point 7.1.5, this is not rendered obvious by the prior art.

7.3 Consequently, the subject-matter of independent claims 1 and 9 and of claims 2 to 8 and 10 to 14 depending directly or indirectly thereon involves an inventive step.

7.4 The requirements of Article 56 EPC are met.

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 the claims of the sole request as filed during the oral proceedings and a description to be adapted thereto.

The Registrar:

The Chairman:



A. Pinna

E. Bendl

Decision electronically authenticated