

Internal distribution code:

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

**Datasheet for the decision
of 8 March 2012**

Case Number: T 0686/09 - 3.3.05
Application Number: 98101836.9
Publication Number: 856494
IPC: C03C 25/26, C03C 25/34
Language of the proceedings: EN

Title of invention:

Binding agent for mineral wool and mineral wool product bonded therewith

Patent Proprietor:

SAINT-GOBAIN ISOVER

Opponent:

ROCKWOOL INTERNATIONAL A/S

Headword:

Bound wool/ISOVER

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (yes): problem not disclosed in any of the prior art documents - evidence for the success of the proposed solution (yes) - solution not derivable from prior art"

Decisions cited:

-

Catchword:

-



Case Number: T 0686/09 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 8 March 2012

Appellant:
(Opponent) ROCKWOOL INTERNATIONAL A/S
Hovedgaden 584
DK-2640 Hedehusene (DK)

Representative: Barz, Peter
Meissner Bolte
Widenmayerstraße 48
D-80538 München (DE)

Respondent:
(Patent Proprietor) SAINT-GOBAIN ISOVER
Les Miroirs
18, rue d'Alsace
F-92400 Courbevoie (FR)

Representative: Winter, Brandl, Fürniss, Hübner,
Röss, Kaiser, Polte - Partnerschaft
Alois-Steinecker-Straße 22
D-85354 Freising (DE)

Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
19 December 2008 concerning maintenance of
European patent No. 856494 in amended form.

Composition of the Board:

Chairman: G. Raths
Members: J.-M. Schwaller
C. Vallet

Summary of Facts and Submissions

- I. This appeal lies from the decision of the opposition division concerning maintenance of European patent No. 0 856 494 on the basis of the amended description and set of claims filed as main request during the oral proceedings of 28 November 2008.

Claim 1 of said request reads as follows:

*"1. A bound mineral wool product, characterized by being bonded with a binding agent containing, relative to its dry mass:
about 2.5 to 70% of at least one thermoplastic homo- or copolymer cross-linkable with phenolic resin,
about 10 to 95% of at least one phenolic resin,
about 2.5 to 70% of a flameproofing agent, wherein said flameproofing agent is selected from ammonium phosphates,
about 1 to 50% stabilizers."*

- II. In the contested decision, the opposition division held the subject-matter of above claim 1 to be novel over the disclosure of each one of documents:

D1: US 5 389 716

D2: US 5 484 653

because:

- the thermoplastic homo- or copolymer had to be selected out of a list of polymers (D1: column 7, lines 12 to 27; D2: column 7, line 66 to column 8,

line 34). Certain polymers of this list were furthermore not cross linkable with phenolic resins, such as e.g. vinyl chloride or vinylidene chloride;

- the phenolic resin had to be selected out of three groups of polymers, phenoplasts, aminoplasts and ketone-aldehyde polymers (D1: column 5, line 58 to column 6, line 30; D2: column 6, line 42 to column 7, line 65);
- ammonium phosphates had to be selected from a list of fire retardants (D1: column 9, lines 3 to 5; D2: column 9, lines 46 to 51) and the concentration range had to be found out, as D1 and D2 were silent on this issue.

The subject-matter of above claim 1 was further held to involve an inventive step because even if the problem to be solved could only be seen in the provision of a further bound mineral wool product, there was no specific teaching in the prior art to combine a cross-linkable thermoplastic homo- or copolymer with a phenolic resin and a specific amount of ammonium phosphates.

III. With its statement setting out the grounds of appeal, the opponent (hereinafter the "appellant") contested the above decision and argued that the subject-matter claimed lacked inventive step in view of the teaching of either D1 or D2, as these pieces of prior art provided all necessary elements to arrive at the claimed invention. The appellant further requested the reimbursement of the appeal fee and argued in this

respect that the decision was confusing, because on the one hand the opposition division indicated that the opposition was rejected, while on the other hand, it expressed its intention to maintain the patent in amended form.

- IV. In response to the grounds of appeal, the patent proprietor (hereinafter "the respondent") challenged the appellant's objections. Further, with letter dated 31 January 2012, he submitted two amended sets of claims as auxiliary requests I and II, respectively.
- V. On 16 February 2012, the appellant contested the auxiliary requests under Articles 84 and 123(2) EPC.
- VI. At the oral proceedings, which were held on 8 March 2012 in the presence of both parties, inventive step of the main request on file was extensively dealt with.
- VII. The parties' requests were established as follows:

The appellant requested that the decision be set aside and that the patent be revoked. Further, it requested the reimbursement of the appeal fee.

The respondent requested that the appeal be dismissed, or alternatively that the decision be set aside and that the patent be maintained on the basis of one of the sets of claims submitted as auxiliary requests I and II, respectively, with letter dated 31 January 2012.

Reasons for the Decision

1. *Preliminary remarks*

1.1 The appellant's argument that it was unclear from the contested decision whether the opposition was rejected or whether the patent was maintained in amended form is not accepted by the board. It is true that the front page of the decision dated 19 December 2008 reads: "Decision rejecting the opposition (Art. 101(2) EPC)". However, there is absolutely no doubt from the content of the decision, in particular from the "Reasons for the decision" and more particularly from items 3 to 6 that the opposition division concluded in favour of the maintenance of the patent in amended form. In particular in items 3 and 5 of the decision, the opposition division explained as to why the subject-matter of the amended claims of the main request was novel and inventive; so the sole logical conclusion in this context was the maintenance of the patent in amended form. It follows that the board cannot consider this obvious mistake to represent a substantial procedural violation.

1.2 The board is satisfied that the contested patent meets the requirements of Articles 83, 84 and 123 EPC. These issues have incidentally not been contested.

2. *Main request - Novelty*

Although this issue had also not been contested, the board holds the subject-matter claimed to be novel in the following respects:

2.1 Document D1 (column 3, line 44 to column 4, line 7) discloses a binder composition for fibrous mats, preferably inorganic fibrous mats, which is fire resistant when cured. The binder composition comprises a stable mixture of an aqueous aldehyde condensation polymer-based resin, a fire retardant latex - an aqueous emulsion of a thermoplastic polymer (latex), which is halogenated and preferably also carboxylated - and preferably an effective amount of an aqueous silica colloid, wherein the weight ratio of the latex to the resin is at least 1:1 on a non-volatile weight basis. Satisfactory proportions of the components of the binder composition, expressed as weight percentages of non-volatile materials, are as follows: about 5 to 50% aldehyde condensation polymer and 50 to about 95% fire resistant latex based on the weight of the polymer and latex.

Specifically, the aldehyde condensation polymer is selected from:

- (1) phenoplasts comprising the condensation polymers of an aldehyde such as formaldehyde with a phenolic type material having at least two positions ortho and/or para to the hydroxyl group open for reaction, such as phenol, phenol-resorcinol, xylenol, cresol, resorcinol, and their derivatives,
- (2) aminoplasts comprising the condensation polymers of an aldehyde such as formaldehyde with compounds such as benzoguanamine, dicyandiamide, urea, melamine-urea, melamine, and their derivatives, and
- (3) ketone-aldehyde condensation polymers such as acetone-formaldehyde, methyl ethyl ketone formaldehyde, methylisobutyl ketone formaldehyde (column 6, lines 5 to 18).

The thermoplastic polymer is specifically defined as including homopolymers of vinyl chloride and vinylidene chloride and copolymer of vinyl chloride and vinylidene chloride with each other or separately with comonomers such as olefins, vinyl acetate, vinyl esters such as vinyl propionate and vinyl butyrate, as well as alkyl-substituted vinyl esters. Additionally, copolymers of vinyl chloride or vinylidene chloride with acrylic comonomers such as acrylic acid, methacrylic acid, and the alkyl esters thereof, may be useful in the present invention. Examples of such latex polymers are carboxylated vinylidene chloride/butadiene emulsion polymers and ethylene/vinyl chloride emulsion polymers (column 7, lines 12 to 28).

D1 further discloses (column 8, line 57 to column 9, line 14) that it may be desirable to increase the fire resistance of the fibrous mats by incorporating fire-resistant pigments and salts and/or organic compounds having fire-resistant properties into the latex. Among a heteroclite list of products (pigments, salts and other organic compounds) known for imparting fire-resistance to flammable materials, D1 also discloses the potential use of ammonium, alkali metal, and alkaline earth metal phosphates and polyphosphates as fire retardants for increasing the fire resistance of the binder composition.

2.2 It follows that the subject-matter of claim 1 at issue (and of claims 2 to 15 which depend thereon) is novel over the disclosure of D1 because:

- in D1 certain polymers, e.g. the homopolymers of vinyl chloride or vinylidene chloride, from the above list of thermoplastic polymers are not cross-linkable with phenolic resins. It follows that the combination of i) a phenolic resin and of ii) a thermoplastic homo- or copolymer cross-linkable with such a resin is not directly and unambiguously derivable from the disclosure of D1;

- D1 is also silent as to the concentration range for ammonium phosphates as a flameproofing agent and to the combination of the latter with i) and ii) described above.

2.3 The appellant contested this conclusion, because in its opinion the subject-matter of claim 1 was distinguished from the disclosure of D1 by only one feature, namely the provision of an ammonium phosphate as a flameproofing agent. According to the appellant, the use of a vinyl chloride polymer (Airflex 4530) crosslinkable with phenolic resins was specifically disclosed in D1.

The board cannot accept this argument, because even if specific thermoplastic homo- or copolymer crosslinkable with phenolic resins are disclosed in D1, the specific combination of such a polymer with a phenolic resin is not disclosed therein. Furthermore, in the examples of D1, no use is made of a vinyl chloride polymer or of a phenolic resin. Therefore, the specific combination of i) an homo- or copolymer crosslinkable with a phenolic resin and of ii) a phenolic resin is not directly and unambiguously derivable from D1.

2.4 Document D2 (column 2, line 60 to column 3, line 42) discloses a non-woven fiber mat having improved fire resistant qualities and comprising a blend of mineral fibers and glass fibers wherein the mineral fibers comprise between 50 and 95 weight percent of the blend of fibers. The fibers are bonded together with a fire resistant binder system which comprises a stable mixture of a fire resistant latex, and an aqueous aldehyde condensation polymer-based thermosetting resin. The preferred weight ratio of the latex to the aldehyde condensation polymer is at least 1:1 on a non-volatile weight basis. The binder optionally further comprises an aqueous silica colloid. The binder composition of the present invention preferably contains from about 5 to about 50 percent of the aldehyde condensation polymer-based resin and correspondingly about 50 to about 95 percent by weight of a fire resistant latex. The cured binder composition has shown the ability to provide a bonded mineral wool/glass mat that passes the "Class B" ASTM rating (ASTM E84-87a) and is expected to provide a "Class A" ASTM rating with mineral fiber mats.

D2 describes the specific aldehyde condensation polymer-based resin (D2, column 6, line 56 to column 7, line 1) and fire resistant latex (D2, column 8, lines 1 to 13) exactly in the same way as D1. D2 (column 9, lines 37 to 60) furthermore discloses - also exactly in the same way as D1 - the option of adding of ammonium, alkali metal, and alkaline earth metal phosphates and polyphosphates as fire retardants for increasing the fire resistance of the binder composition.

2.5 It follows that the subject-matter of claims 1 to 15 is novel over the disclosure of document D2 for the same reasons as those indicated under item 2.2.

3. *Main request - Inventive step*

In accordance with the "problem-solution approach" developed by the boards of appeal, the board came to the conclusion that the claims at issue meet the requirements of Article 56 EPC for the following reasons:

3.1 The contested patent (paragraph [0001]; claim 1) relates to a mineral wool product bonded with a polymeric resin-based binding agent.

3.2 Documents D1 and D2 also relate to a bound mineral wool product and so belong to the same technical field as the contested patent. Among these documents, the content of which is very similar, the parties agreed at the oral proceedings to consider document D1 as representing the closest state of the art. So the starting point for assessing inventive step is document D1. For the specific disclosure of this document, reference is made to item 2.1.

3.3 According to the contested patent (paragraphs [0014]), the problem underlying the invention rests with the provision of insulating materials and fire-protection elements which meet the fire resistance requirements according to DIN 4102, part 5.

3.4 As a solution to this technical problem, the contested patent proposes the bound mineral wool product

according to claim 1 at issue, which is in particular characterised in that it is bonded with a binding agent containing a combination of

- at least one thermoplastic homo- or copolymer cross-linkable with phenolic resin,
- at least one phenolic resin,
- a flameproofing agent selected from ammonium phosphates.

3.5 As to the question whether the above problem has effectively been solved, the board answers positively for the following reasons:

3.5.1 The amended patent contains one example - the former Example 2 - in which mineral wool plates are bound with a binder comprising i) a copolymer based on acrylic ester and acrylonitrile as a thermoplastic polymer cross-linkable with phenolic resin, ii) an ammonium-polyphosphate flameproofing agent and iii) a phenolic resin. The thus bound mineral wool plates have been tested according to DIN 4102, part 5 and have shown a hold-up time (i.e. a fire resistance) of at least 90 minutes. As explained in paragraphs [0017] and [0040], using the binding agent claimed provides mineral wool products which endure temperatures above 1000°C without sintering or melting the fibers.

In the absence of evidence to the contrary, this example thus shows that the problem has been effectively solved.

3.5.2 The appellant contested this conclusion and argued, on the one hand, that no improvement could be recognised to the bound mineral wool product claimed in comparison

to those disclosed in D1 and D2, and, on the other hand, that the wording of claim 1 was so broad that the problem was not solved over the whole scope of protection sought.

3.5.3 The board cannot accept this argumentation because it is constant jurisprudence that any party's allegation should be substantiated and accompanied by the necessary evidence. In the present case, no evidence at all has been provided and no comparison has been made between the compositions claimed and those disclosed in documents D1 or D2. Thus the appellant's argumentation melts down to speculations and allegations. The argument directed to lack of improvement also does not succeed because it is not necessarily required that an improvement has to be achieved over the closest state of the art. In order to recognise an inventive step, it is sufficient that the claimed subject-matter is not obvious in view of the state of the art.

3.5.4 It follows from the above that in the absence of evidence to the contrary, the board is satisfied that the problem is solved, in particular on the whole breadth of claim 1.

3.6 As regards the obviousness of the proposed solution, it is observed that documents D1 and D2 both disclose the production of fire-resistant insulating material, none of them however discloses that the said fire resistant materials meet the fire resistance requirements according to DIN 4102, part 5, or that they can endure temperatures above 1000°C without sintering or melting.

It follows that in the absence of any hint in D1 or D2 of how the problem identified under item 3.3 may be solved, the skilled person starting from the disclosure of document D1 and faced with the resolution of said problem cannot arrive at the subject-matter of claim 1 at issue on the basis of the disclosure of these documents.

The remaining documents cited during the opposition proceedings were not relied upon by the appellant at the appeal stage. In the board's judgment none of these documents contain any information which would point towards the claimed solution of the problem stated above.

- 3.7 From the above considerations, the board judges that having regard to the state of the art, the subject-matter of claim 1 at issue is not obvious to a person skilled in the art.

It follows that claim 1 at issue involves an inventive step within the meaning of Articles 52(1) and 56 EPC.

Claims 2 to 15 derive their patentability from claim 1 on which they depend.

4. *Reimbursement of the appeal fee*

Pursuant to Rule 103(1)(a) EPC, the appeal fee shall be reimbursed where the Board of Appeal deems an appeal to be allowable and if such reimbursement is equitable by reason of a substantial procedural violation.

In the present case where the appeal is dismissed, the request for reimbursement of the appeal fee has to be rejected.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar:

The Chairman:

C. Vodz

G. Raths