Internal distribution code:

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

Datasheet for the decision of 28 July 2015

Case Number: T 0042/13 - 3.3.05

Application Number: 04716160.9

Publication Number: 1615860

IPC: C04B28/14

Language of the proceedings: EN

Title of invention:
SOLID SUPPORTED COMB-BRANCHED COPOLYMERS AS AN ADDITIVE FOR GYPSUM COMPOSITIONS

Patent Proprietor:
COATEX S.A.S.

Opponents:
Huntsman International LLC
Renken, Joachim
BASF Construction Polymers GmbH

Headword:
GYPSUM DISPERSANT/COATEX

Relevant legal provisions:
EPC Art. 54(1), 54(2), 56, 123(2)

Keyword:

Novelty - main request (yes) -
multiple selections to arrive at the claimed subject-matter
Inventive step -
main and first to fifth auxiliary request (no)
Inventive step - obvious alternative
Amendments - sixth auxiliary request -
extension beyond the content of the application as filed
Inventive step - seventh auxiliary request (yes)
Inventive step - improvement over closest state of the art

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 0042/13 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 28 July 2015

Appellant I: (Patent Proprietor)	COATEX S.A.S. 35, rue Ampère 69730 Genay (FR)
Representative:	Regimbeau 139, rue Vendôme 69477 Lyon Cedex 06 (FR)
Appellant II: (Opponent 2)	Renken, Joachim Hoffmann Eitle Patent- und Rechtsanwälte Arabellastrasse 4 81925 München (DE)
Appellant III: (Opponent 3)	BASF Construction Polymers GmbH Dr.-Albert-Frank-Straße 32 83308 Trostberg (DE)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Party as of right: (Opponent 1)	Huntsman International LLC 500 Huntsman Way Salt Lake City, Utah 84108 (US)
Representative:	Swinnen, Anne-Marie Intellectual Property Department Huntsman Polyurethanes Everslaan 45 3078 Everberg (BE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 6 November 2012 maintaining the European Patent No. 1615860 in amended form.**

Composition of the Board:

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

Summary of Facts and Submissions

I. The present appeals lie from the interlocutory decision of the opposition division to maintain European patent No. 1 615 860 in amended form on the basis of auxiliary request 1 filed during oral proceedings on 25 October 2012, independent claims 1 and 2 thereof reading:

"1. A gypsum composition suitable for use in the manufacture of gypsum products, said gypsum composition comprising:
a) gypsum;
b) water; and
c) a solid dispersant comprising a fully neutralized acrylic/polyether comb-branched copolymer supported on a solid particulate support material."

"2. A method of making a gypsum composition suitable for use in the manufacture of gypsum products, said method comprising mixing together, in any combination:
a) gypsum;
b) water; and
c) a solid dispersant comprising a fully neutralized acrylic/polyether comb-branched copolymer supported on a support material."

II. The following documents cited in the opposition proceedings are relevant for the present decision:

A1: EP 1 209 133 A2

A2: CA 2 362 378 A1

A3: Translation into English of JP 2002-193648

A5: Translation into English of JP 2002-167256

A7: US 2003/0019401

III. In the contested decision, the opposition division held dependent claims 2 to 12 and 14 to 25 of the main request dated 23 October 2012 to infringe the requirements of Article 123(2) EPC, because the back-references to independent claims 1 and 13 (these claims corresponding to claims 1 and 2 as maintained by the opposition division) defined new combinations of features which had no basis in the application as filed.

IV. With its grounds of appeal dated 14 March 2013, the proprietor ("appellant I") contested the decision and filed four sets of claims as a main and auxiliary requests 1 to 3.

The main request corresponds to the main request dated 23 October 2012 and underlying the contested decision. It consists of 25 claims, with the subject-matter of independent claims 1 and 13 being identical to the subject-matter of claims 1 and 2 in point I above.

Auxiliary request 1 corresponds to the main request, but with dependent claims 7, 9 and 23 deleted.

Auxiliary request 2 corresponds to the main request, but with dependent claims 7, 9 and 14 to 25 deleted.

Auxiliary request 3 corresponds to the request as maintained by the opposition division (see point I above).

V. With its grounds of appeal dated 18 March 2013, opponent II (also "appellant II") argued that the claims as maintained by the opposition division lacked novelty and inventive step.

VI. With its grounds of appeal, also dated 18 March 2013, opponent III (also "appellant III") filed an experimental report (hereinafter referred to as A21) and argued that the subject-matter of claim 1 as maintained did not meet the requirements of Articles 54, 56 and 123(2) EPC.

VII. With letter dated 7 June 2013, appellant III asked the not to admit the main request, because this request had been formally withdrawn during the oral proceedings before the opposition division, and so its reinstatement in the opposition proceedings before the end of the oral proceedings as well as in the present appeal proceedings was not admissible.

Furthermore, claims 1 and 13 of the new requests filed with letter of 14 March 2013 extended beyond the content of the application as filed under Article 123(2) EPC.

VIII. With letter dated 30 September 2013, appellant II also raised objections under Article 123(2) EPC against the requests of 14 March 2013.

IX. By letter of 4 October 2013, appellant I submitted an experimental report (hereinafter referred as document A22) along with four new sets of amended claims as auxiliary requests 4, 4bis, 5 and 5bis.

Independent claims 1 and 11 of auxiliary request 4 read as follows (features added with respect to claim 1 of the main request in bold):

"1. A gypsum composition suitable for use in the manufacture of gypsum products, said gypsum composition comprising:
a) gypsum;
b) water; and
c) a solid dispersant comprising a fully neutralized acrylic/polyether comb-branched copolymer supported on a solid particulate support material, ***wherein said acrylic/polyether comb-branched copolymer is obtained by reacting a polyether macromonomer with a polyacrylic acid polymer or acrylic monomer, said polyether macromonomer comprising ethylene oxide and propylene oxide and has a molecular weight of 300 grams per mole to 100000 grams per mole."***

"11. A method of making a gypsum composition suitable for use in the manufacture of gypsum products, said method comprising mixing together, in any combination:
a) gypsum;
b) water; and
c) a solid dispersant comprising a fully neutralized acrylic/polyether comb-branched copolymer supported on a support material, ***wherein said acrylic/polyether comb-branched copolymer is obtained by reacting a polyether macromonomer with a polyacrylic acid polymer or acrylic monomer, said polyether macromonomer comprising ethylene oxide and propylene oxide and has a molecular weight of 300 grams per mole to 100000 grams per mole."***

Claims 1 and 2 of auxiliary request 4bis correspond to claims 1 and 11 of auxiliary request 4.

Independent claims 1 and 8 of auxiliary request 5 read as follows (features added with respect to claim 1 of auxiliary request 4 in bold):

"1. A gypsum composition suitable for use in the manufacture of gypsum products, said gypsum composition comprising:
a) gypsum;
b) water; and
c) a solid dispersant comprising a fully neutralized acrylic/polyether comb-branched copolymer supported on a solid particulate support material ***comprising silica fume,*** *wherein said acrylic/polyether comb-branched copolymer is obtained by reacting a polyether macromonomer with a polyacrylic acid polymer or acrylic monomer, said polyether macromonomer comprising ethylene oxide and propylene oxide and has a molecular weight of 300 grams per mole to 100000 grams per mole."*

"8. A method of making a gypsum composition suitable for use in the manufacture of gypsum products, said method comprising mixing together, in any combination:
a) gypsum;
b) water; and
c) a solid dispersant comprising a fully neutralized acrylic/polyether comb-branched copolymer supported on a support material ***comprising silica fume,*** *wherein said acrylic/polyether comb-branched copolymer is obtained by reacting a polyether macromonomer with a polyacrylic acid polymer or acrylic monomer, said polyether macromonomer comprising ethylene oxide and propylene oxide and has a molecular weight of 300 grams per mole to 100000 grams per mole."*

Claims 1 and 2 of auxiliary request 5bis correspond to claims 1 and 8 of auxiliary request 5.

X. With letter of 2 July 2015, Opponent I informed the board that it would not be attending the oral proceedings.

XI. At the oral proceedings, which took place on 28 July 2015, appellant I changed the order of the requests. Auxiliary request 4 became the new main request, and auxiliary request 4bis the new auxiliary request 1; the other requests on file became auxiliary request 2 (formerly main request) to auxiliary request 7 (formerly auxiliary request 5bis) respectively. The discussion focused mainly on novelty with respect to document A1, inventive step starting from document A7 as the closest state of the art, and Article 123(2) EPC issues. Regarding auxiliary request 7, appellants II and III contested its validity under Articles 123(2) and 56 EPC.

XII. After closing the debate, the chairman summarised the parties' requests as follows:

Appellant I requested that the appeals of opponents II and III be dismissed, that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the set of claims dated 23 October 2012 (main request) or, alternatively, of the sets of claims according to one of auxiliary requests 1 to 3 dated 14 March 2013, or of auxiliary requests 4, 4bis, 5 or 5bis dated 10 October 2013.

Appellants II and III requested that the appeal of the proprietor be dismissed, that the decision under appeal be set aside and that the patent be revoked.

Reasons for the Decision

1. Main request (formerly auxiliary request 4 in point IX above)

1.1 Novelty

Document A1, that appellant II held to anticipate the subject-matter of claim 1 at issue, does not disclose a comb-branched copolymer in the powder dispersant. Furthermore, five selections among several lists disclosed in A1 have to be made to arrive at the composition according to claim 1 at issue:

- First selection: "gypsum" in the list comprising "Portland cement, blast furnace cement, silica cement, fly ash cement, alumina cement, natural gypsum, gypsum by-products, etc." with "Portland cement and alumina cement" being the most preferred (see A1, paragraph [0042]), and "cement" being used in the examples.

- Second and third selections: "copolymer of a macromonomer of ethylene oxide and propylene oxide and of acrylic monomer or polyacrylic acid polymer" to be selected within a first list of monomers (A), which includes "adducts having ethylene oxide or propylene oxide added to (meth)acrylic acid, maleic acid, 3-methyl-3-butenyl alcohol or (meth)allyl alcohol" (see A1, paragraph [0019]) and a second list of monomers (B) which includes "meth(acrylic acid)" (see A1, paragraph [0020]).

- Fourth selection: "fully neutralised" to be selected from degrees of neutralisation of "40 to 100%", preferably "50 to 90%", most preferably "50 to 80%" (see A1, paragraph [0027])

- Fifth selection: "supported on a solid particulate support" or not, bearing in mind that A1 (see the sentence bridging pages 5 and 6) discloses that "carriers are preferably not used".

It follows from the above considerations that the board cannot accept appellant II's conclusion that claim 1 at issue would lack novelty in view of the disclosure of A1.

1.2 Inventive step

Applying the problem-solution approach, the board came to the conclusion that the subject-matter of claim 1 of this request does not involve an inventive step for the following reasons:

1.2.1 Invention

The claimed invention is concerned with a gypsum composition and its preparation (see claims 1 and 13).

1.2.2 Closest state of the art

As to the closest state of the art, the parties agreed that document A7 was the most suitable starting point to assess the inventive step of the subject-matter of claim 1 at issue, as it discloses (claim 1) a gypsum composition suitable for use in the manufacture of construction materials, said gypsum composition comprising:

a) gypsum;
b) water; and
c) a dispersant formulation comprising an acrylic/ polyether comb-branched copolymer,
with the copolymer being preferably formed by reacting a polyether polymer or macromonomer with a polyacrylic acid polymer or acrylic monomer (A7, paragraph [0040]), and the preferred polyether macromonomer comprising preferably ethylene oxide and propylene oxide and having a molecular weight of about 300 to about 100,000 grams per mole (A7, paragraph [0042]). Preferably, the comb-branched copolymer is fully or partially neutralised so that the pH of the dispersant formulation is between about 2.0 and 14, most preferably between about 9 and 12 (A7, paragraph [0037]).

A7 does not disclose that the comb-branched copolymer can be supported.

1.2.3 Problem

The problem underlying the claimed invention is described at paragraphs [0016] and [0017] of the patent as consisting in the provision of a gypsum composition having a decreased consistency during its manufacturing and improved setting characteristics.

1.2.4 Solution

As a solution to this problem, the contested patent proposes the composition according to claim 1 at issue, which is in particular characterised in that the copolymer is supported on a solid particulate support material.

1.2.5 Success of the solution

As to the question whether the proposed solution solves the problem identified in point 1.2.3, the board notes that the patent gives evidence (see table 1) for an improvement - at least when the copolymer is supported on silica fume - over the gypsum composition known from document A7, which comprised the same copolymer, but without any supporting material. Table 1 of the patent shows in this respect that a lower consistency (as measured by the larger patty diameter) is obtained during the manufacturing of the gypsum composition when a silica fume-supported copolymer is used as the dispersant.

Appellant III acknowledged this improvement (see A21, page 2, last paragraph), but, based on the further experimental data in A21, it contested that an improvement would be observed over the whole scope of protection of claim 1 at issue.

The board concurs with the view of appellant III. Table 6 of A21 shows in this respect that certain dispersants the formula of which fall under the wording of claim 1 can lead to gypsum compositions which are sticky ("pastös"), i.e. which do not flow as required by the invention, in particular when the supporting material is different from the silica fume used in the examples of the patent. In this context, the problem as defined in point 1.2.3 cannot be held as having been solved over the whole claimed range, with the consequence that the problem has to be reformulated in less ambitious terms, namely in the provision of an alternative gypsum composition.

1.2.6 Obviousness

As to the question of obviousness, the board is of the opinion that the solution proposed in claim 1 at issue derives from document A2 for the following reasons:

A2 discloses (claim 1) a pulverulent polyether carboxylate composition suitable for fluidising building materials (A2, page 2, line 14) and comprising:
a) from 5 to 95% by weight of a water-soluble polymer made up of polyoxyalkylene-containing structural units and at least one monomer selected from the group of carboxylic acid and carboxylic anhydride monomers, and

b) from 5 to 95% by weight of a finely divided mineral support material,
with said pulverulent composition being obtained by spraying the molten polyether carboxylate onto said mineral support material.

In the specific embodiments of claims 2 and 3, A2 discloses the water-soluble polymer as containing polyethylene or polypropylene glycol groups in the main or in the side chain, and the carboxylic monomer as being selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, maleic anhydride, fumaric acid, itaconic acid and itaconic anhydride.

In claim 14, A2 discloses the building material as being *inter alia* gypsum, and at page 2, lines 14 to 18, it discloses the interaction between the supported polymer and the building material as giving rise to improved flow and processing properties.

The skilled person thus understands from A2 that a polyether carboxylate supported on a mineral support material can successfully be used as a dispersant for improving the flow properties of hydraulic binders, such as gypsum.

1.2.7 Conclusion

It follows that the skilled person looking for an alternative to the gypsum composition of document A7 gets a strong incentive from A2 to support the polyether carboxylate known from A7 onto a solid mineral particulate material, in expectation of a gypsum composition having good flow properties. So, he would arrive without inventive merit at the subject-matter of claim 1 at issue.

Therefore, claim 1 does not involve an inventive step within the meaning of Article 56 EPC.

2. First auxiliary request (formerly auxiliary request 4bis in point IX above) - Inventive step

As claim 1 of this request is identical to claim 1 of the main request, which lacks an inventive step, for the same reasons as those indicated in points 1.2.1 to 1.2.6 above, this claim does not meet the requirements of Article 56 EPC either.

3. Admissibility of the second auxiliary request (formerly main request in point IV above)

During the oral proceedings before the opposition division, the former main request - now second auxiliary request - was readmitted into the opposition proceedings after having been abandoned during the same

oral proceedings. So, the board does not see any reason to dismiss this request from the appeal proceedings, since the opposition division validly exercised its power of discretion to reinstate this request into the opposition proceedings. This request having moreover been filed with the grounds of appeal, it can also not be held as having been late-filed.

4. Second to fifth auxiliary request (formerly main request and auxiliary requests 1 to 3, respectively, in point IV above) - inventive step

The subject-matter of the respective claim 1 in each these four requests is identical and differs from the subject-matter of claim 1 of the main request in that the copolymer is defined in a **generic way**, namely as being an "acrylic/polyether comb-branched copolymer".

As this generic copolymer encompasses completely the more specific one defined in the non-inventive subject-matter of claim 1 of the main request, for the same reasons as those indicated in points 1.2.1 to 1.2.6 above, the subject-matter of claim 1 of these four requests lacks inventive step under Article 56 EPC.

5. Sixth auxiliary request (formerly auxiliary request 5 in point IX above) - amendments

For the board, dependent claim 7 of this request does not meet the requirements of Article 123(2) EPC for the following reasons.

Claim 7 reads: "The gypsum composition of claim 1 wherein the pH of the copolymer is between about 4 and 12". So, it is dependent on claim 1, which defines a

gypsum composition based on a **fully** neutralized acrylic comb-branched copolymer.

But neither in the description, nor in the claims is the combination of the features "fully neutralized acrylic comb-branched copolymer" having a "pH between about 4 and 12" directly and unambiguously disclosed. It follows that the subject-matter of claim 7, in combination with the subject-matter of claim 1, on which it is dependent, extends beyond the content of the application as filed.

Since claim 7 of this request does not meet the requirements of the EPC, the sixth auxiliary request as a whole cannot be allowed.

6. Seventh auxiliary request (formerly auxiliary request 5bis in point IX above)

6.1 Amendments

6.1.1 For the board, the subject-matter of claim 2 meets the requirements of Article 123(2) EPC in the following respects.

Claim 18 as filed discloses in a generic way a "*method of making a gypsum composition suitable for use in the manufacture of gypsum products, said method comprising mixing together, in any combination,: a) gypsum; b) water; and c) a solid dispersant comprising a acrylic/ polyether comb-branched copolymer supported on a support material.*"

Examples 1, 2 and 4 disclose the best mode of carrying out the invention, namely a specific gypsum slurry composition having **a decreased consistency** (table 1)

containing as a solid dispersant a **"fully neutralised polyether macromonomer** that is an **acryl**ate of oxyethylene/oxypropylene random copolymer having **oxyethylene/oxypropylene** ratio 70/30 by weight and a number average molecular weight **M_n of 3000"** (page 17, lines 8 to 10) **supported on fume silica.**

The "polyether macromonomer" disclosed in the examples is described in a more generic way at page 10, lines 13 to 15 as comprising "ethylene oxide and propylene oxide and **having a molecular weight of about 300 grams per mole to about 100,000 grams per mole"**. So, it can be combined with the disclosure of examples 1, 2 and 3, with the consequence that the dispersant defined in claims 1 and 2 at issue thus derives directly and unambiguously from the disclosure in examples 1,2 and 4 and from the above passage of the application as filed, and the subject-matter of claim 2 derives directly and unambiguously from the combination of claim 18, examples 1,2 and 4, and the passage at page 10, lines 13 to 15 of the application as filed.

6.1.2 The board considers that claim 1 at issue derives directly and unambiguously from the application as filed, because it defines the product directly obtained by the process according to claim 2 at issue, and so the reasons in point 6.1.1 above apply mutatis mutandis to the subject-matter of this claim, which therefore meets the requirements of Article 123(2) EPC.

6.2 Inventive step

6.2.1 Invention

The claimed invention is concerned with a gypsum composition and its preparation (see claims 1 and 2).

Claims 1 and 2 of this request differ from claims 1 and 2 of the main request, which is held to lack inventive step (see point 1.2 above), in that the solid particulate support is further specified as "comprising silica fume".

For the board, this restriction of the claimed subject-matter involves an inventive step for the following reasons:

6.2.2 Closest state of the art

The closest state of the art is represented by document A7 (for the details see point 1.2.2 above).

6.2.3 Problem

The problem underlying the claimed invention is described at paragraphs [0016] and [0017] of the patent as consisting in the provision of a gypsum composition having a decreased consistency during its manufacturing.

6.2.4 Solution

As a solution to this problem, the contested patent proposes the composition according to claim 1 at issue, which is in particular characterised **in that the copolymer is supported on a solid particulate support material comprising silica fume.**

6.2.5 Success of the solution

As to the question whether the proposed solution solves the problem underlying the contested patent as identified in point 6.2.3, the board notes - as

explained in point 1.2.5 above - that the use of silica fume as supporting material for the copolymer defined in claim 1 at issue gives rise to an improvement in the flow properties of a gypsum composition in comparison with a gypsum composition in which the copolymer is not supported, as in the closest state of the art A7.

The further experimental data provided by appellant I (document A22, in particular tables 3, 4.1, 4.2 and 4.3), confirm that the improvement underlying the invention is achieved not only with the specific copolymer used in the examples in the patent, but also with an acrylic/polyether copolymer in which the acrylic acid of the examples was replaced by methacrylic acid, or with one having a higher molecular weight (up to 121600 (table 1, n°3) instead of a molecular weight of 3000 as in the examples of the patent in suit [0074, page 8, line 44]) or when the copolymer is neutralised with NaOH (instead of KOH as in the examples). For the board, these experimental data show that an improvement in terms of flow properties over the dispersant disclosed in A7 can be recognised over the whole claimed subject-matter.

Appellant III contested the existence of an improvement over the whole scope of protection of the claims on the basis of sample 7 in table 4 of document A21. According to this sample 7, a gypsum composition having a copolymer falling within the wording of claim 1 and neutralised with NaOH had a higher consistency (a patty diameter of 100 mm was measured) than a composition having the same copolymer neutralised with KOH (a patty diameter of 150 mm).

The board is not convinced by this argument, because the data in table 4 of A21 are not directly comparable

with those in A22. Indeed, the conditions of testing were different in the two experiments. In particular, the amounts of polymer and water were different. Therefore, no conclusion can be drawn as to whether or not the results obtained with sample 7 in table 4 of A21 are worse than those of the samples tested in A22.

The present context is, moreover, different from the one in point 1.2.5, where the board concluded a lack of inventive step of the main request on the basis of samples which were sticky ("pastös") - i.e. not flowing - while sample 7 in table 4 is not sticky, but flowing.

It follows from the above considerations that the board holds the problem underlying the contested patent as having been solved on the whole claimed range.

6.2.6 Obviousness

As to the question of obviousness, the board is of the opinion that the proposed solution is not obvious from the state of the art, in particular from document A2. Although A2 gives an incentive to support a polyether carboxylate onto a solid mineral particulate material, it does not disclose the use of silica fume, nor does it disclose or suggest that silica fume would lead to better flow properties than those of other solid particulate materials, as evidenced e.g. by table 6 of A21.

For the board, the other documents in the proceedings do not disclose or suggest the solution as defined in claim 1 at issue to the problem underlying the patent either. In particular, documents A3 and A5, which disclose the use of silica fume as a support material for a copolymer, make use of another type of copolymer,

namely a Ca-polystyrene sulfonate. A3 or A5 do not disclose either that silica fume as a supporting material would lead to better flow properties in comparison with other solid particulate materials.

6.2.7 Conclusion

It follows from the above considerations that the subject-matter of claim 1 at issue, and by the same token that of independent claim 2, which relates to a method for producing the composition of claim 1, involves an inventive step within the meaning of Articles 52(1) and 56 EPC.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The case is remitted to the opposition division with the order to maintain the patent in amended form on the basis of the claims of auxiliary request 7 and a description to be adapted.

The Registrar: The Chairman:

C. Vodz G. Raths

Decision electronically authenticated