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Datasheet for the decision of 26 November 2013

Case Number: T 1620/10 - 3.3.03

Application Number: 03023703.6

Publication Number: 1388545

IPC: C08F2/38, C08F220/12, C09D157/00

Language of the proceedings: EN

Title of invention:
Polymer composition

Patent Proprietor:
Lucite International UK Limited

Opponent:
BASF SE

Headword:

Relevant legal provisions:
EPC Art. 76(1), 114(2), 123(2)

Keyword:
Divisional application - subject-matter extends beyond content of earlier application (yes)
(Main request, first to fifth auxiliary requests)
Amendments - added subject-matter (yes)
(main request, first to fifth auxiliary requests)
Late-filed auxiliary requests - admitted (no)
(sixth, seventh auxiliary requests)

Decisions cited:

Catchword:

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Case Number: T 1620/10 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 26 November 2013

Appellant: (Patent Proprietor)	Lucite International UK Limited Queens Gate, 15-17 Queens Terrace Southampton, Hampshire SO14 3BP (GB)
Representative:	Walsh, David Patrick Appleyard Lees 15 Clare Road Halifax HX1 2HY (GB)
Respondent: (Opponent)	BASF SE 67056 Ludwigshafen (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 8 June 2010 revoking European patent No. 1388545 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	B. ter Laan
Members:	M. C. Gordon
	C. Brandt

Summary of Facts and Submissions

I. The appeal by the patent proprietor lies from the decision of the opposition division posted on 8 June 2010 revoking European patent number 1 388 545 (granted on European patent application number 03 023 703.6 which was a divisional application of European patent application number 99 907 726.6).
The revocation of patent 1 062 248 deriving from the parent application was confirmed by the Board of Appeal by decision T 1062/09.

II. The parent application as filed had 16 claims whereby claim 1 read as follows:

"A method of preparing a branched polymer comprising mixing together a monofunctional monomer having one polymerisable double bond per molecule with from 0.3 - 100% w/w (of the weight of the monofunctional monomer) of a polyfunctional monomer having at least two polymerisable double bonds per molecule and from 0.0001-50% w/w (of the weight of monofunctional monomer) of a chain transfer agent and optionally a free-radical polymerisation initiator and thereafter reacting said mixture to form a polymer."

The divisional application as filed, i.e. that on which the patent in suit is based, had 18 claims whereby claim 1 differed from claim 1 of the parent application by specifying a content of the polyfunctional monomer of:
"from 0.5 % w/w (of the weight of the monofunctional monomer".

The patent as granted had 16 claims, whereby claim 1 read as follows, amendments compared to the parent

application as filed being indicated in underline and amendments compared to the divisional application as filed being indicated in **bold**, differences over both being correspondingly indicated in **bold underline**:

"A method of preparing a **soluble** branched polymer comprising mixing together a monofunctional monomer having one polymerisable double bond per molecule with from 0.5% w/w (of the weight of the monofunctional monomer) of a polyfunctional monomer having at least two polymerisable double bonds per molecule and from 0.0001-50% w/w (of the weight of monofunctional monomer) of a chain transfer agent and optionally a free-radical polymerisation initiator and thereafter reacting said mixture to form a polymer **such that the conversion of monomer to polymer is >90%**."

III. A notice of opposition against the patent was filed in which revocation of the patent on the grounds of Art. 100(a) EPC (lack of novelty, lack of inventive step), Art. 100(b) EPC and Art. 100(c) EPC was requested.

IV. The decision of the opposition division was based on four sets of claims forming a main request and three auxiliary requests, all filed at the oral proceedings before the opposition division, the wordings of which are not relevant for the present decision.

The main request and first auxiliary request were found not to meet the requirements of Art. 123(2) EPC. The second auxiliary request was found not to meet the requirements of Art. 54 EPC. The third auxiliary request was found not to meet the requirements of Art. 56 EPC. Consequently the patent was revoked.

V. On 28 July 2010 the patent proprietor lodged an appeal against that decision, the prescribed fee being paid on the same day.

The statement of grounds of appeal was filed on 15 October 2010, accompanied by a single set of claims as main request.

With a letter of 15 July 2011 the appellant filed a set of claims forming a "corrected main request", the wording of which is not relevant for the present decision. A further written submission was made with a letter dated 8 March 2012.

VI. The opponent - now the respondent - replied with letters dated 28 February 2011 and 21 November 2011.

VII. On 22 March 2013 the Board issued a summons to attend oral proceedings. In a communication dated 11 April 2013 the Board set out its preliminary opinion. *Inter alia* matters pursuant to Art. 76(1), 123(2) and 84 EPC were addressed.

VIII. By letter dated 2 July 2013 the appellant submitted six sets of claims forming a main request and first to fifth auxiliary requests.

The main request consisted of 11 claims whereby claim 1 read as follows, differences compared to the parent and **divisional** applications as filed being indicated as noted above:

"A **non-solution** method of preparing a **soluble** branched polymer comprising mixing together a monofunctional monomer having one polymerisable double bond per molecule with from 0.5 w/w **up to 100%** w/w (of the

weight of the monofunctional monomer) of a polyfunctional monomer having at least two polymerisable double bonds per molecule and **wherein the polyfunctional monomer is not a reactive oligomer or polymer** and from 0.0001-50% w/w (of the weight of the monofunctional monomer) of a chain transfer agent and optionally a free-radical polymerisation initiator and thereafter reacting said mixture to form a polymer **such that the conversion of monomer to polymer >90%**."

Claim 11 was an independent method claim, the wording of which is not of significance for the present decision.

The first auxiliary request consisted of 10 claims identical to claims 1 to 10 of the main request.

The second auxiliary request consisted of 11 claims. Claim 1 thereof differed from claim 1 of the main request in that the final phrase read as follows (differences compared to the parent and **divisional** applications as filed being indicated as previously): "[thereafter reacting said mixture to form a polymer] , **wherein the polymerisation is performed in one-step in the absence of solvent and such that the conversion of monomer to polymer is >90%**."

The third auxiliary request consisted of 10 claims identical to claims 1 to 10 of the second auxiliary request.

The fourth auxiliary request consisted of 11 claims. Claim 1 thereof read as follows, differences compared to the original (parent and **divisional**) applications as filed being indicated as previously:

"**A suspension or bulk polymerisation** method of preparing a **soluble** branched polymer comprising mixing together a monofunctional monomer having one polymerisable soluble bond per molecule with from 0.5 w/w **up to 100** % w/w (of the weight of monofunctional monomer) of a polyfunctional monomer having at least two polymerisable double bonds per molecule and **wherein the polyfunctional monomer is not a reactive oligomer or polymer** and from 0.0001 - 50% w/w (of the weight of the monofunctional monomer) of a chain transfer agent and optionally a free-radical polymerisation initiator and thereafter reacting said mixture to form a polymer, **such that the conversion of monomer to polymer >90%**."

The fifth auxiliary request consisted of 10 claims identical to claims 1 to 10 of the fourth auxiliary request.

IX. The respondent made further submissions with letters dated 25 April 2013, 21 October 2013 and 15 November 2013.

X. Oral proceedings before the board were held on 26 November 2013.

During the oral proceedings the appellant filed two further sets of claims forming a sixth and seventh auxiliary request. These were based on the second and third auxiliary request respectively, but differed therefrom in that in claim 1 the amount of polyfunctional monomer was specified as being in the range of 0.5 % w/w to **10% w/w** (instead of 100 % w/w).

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

a) *Main request*

Art 76(1) EPC

The range for the content of polyfunctional monomer of 0.3-100% w/w found its basis in claim 1 of the parent application. The range now being claimed had been accepted in the proceedings relating to the parent case. The various ranges disclosed in the parent application were general and not restricted to any particular (sub-)class of monomers.

The restriction to soluble polymers and to a non-solution method was also founded on the parent application.

The parent application disclosed three features (one-step, absence of solvent, extent of conversion), each of which could apply independently of the others forming the basis for the feature relating to the extent of conversion (>90%). Alternatively, it followed from the examples that the reaction employed only a single polymerisation step, meaning that a process in one step in the absence of solvent was synonymous with "non-solution method". Hence it was not necessary to specify the "one-step" feature in the claim. The feature "non-solution method" was equivalent to "absence of solvent" so that, analogously, it was not necessary for this feature to be specified in the claim.

Art. 123(2) EPC

Claim 1 of the divisional application as filed specified an amount of polyfunctional monomer of "from 0.5 % w/w". The lower limit was coupled to any particular upper limit with the consequence that it could be freely combined with any (general) upper limit disclosed in the divisional application as filed, the description of which provided a basis for the claimed range.

The further arguments were analogous to those advanced pursuant in respect of Art. 76(1) EPC.

b) *Second-fifth auxiliary requests*

Art. 76(1) EPC, Art. 123(2) EPC

The arguments in respect of the range for the content of polyfunctional monomer were identical to those for the main request.

c) Sixth and seventh auxiliary requests

Art. 76(1) EPC, Art. 123(2) EPC

The range for the content of polyfunctional monomer had been restricted to a range explicitly disclosed in the application as filed (parent and divisional). The entirety of the features of the passage relating to extent of conversion, i.e. "one step" and "absence of solvent" was present. There could now be no question of multiple selections as the subject-matter was directly derivable from the disclosures of the parent and divisional applications as originally filed.

The term "solvent" in the context of "absence of solvent" would be understood in the light of the description to mean a solvent for the polymerisation only, but not as a solvent for some other (arbitrary) part of the reaction system or process. Furthermore the term "absence of solvent" did not imply a limitation to bulk polymerisation, as was confirmed by the fact that many examples of the patent demonstrated suspension polymerisation in which water was the continuous phase.

XII. The arguments of the opponent can be summarised as follows:

a) *Main request, first to fifth auxiliary requests*

Art. 76(1) EPC/Art. 123(2) EPC

The feature relating to the conversion >90% had only been disclosed in combination with two other features in the parent and divisional applications as originally filed. There were no other features in the claim that could be seen as providing an equivalent definition of the omitted features ("absence of solvent", "one step"). The term "non-solution method" of the claim was not synonymous with "absence of solvent" as was confirmed by the fact that a number of the monomers specified in claim 2 were entirely soluble in water, water being a preferred suspension agent. Similarly the wording of the claim did not inevitably mean that the reaction was carried out in one step.

b) *Sixth and seventh auxiliary requests*

Art. 84 EPC

The term "absence of solvent" introduced an unclarity since the designation of a substance as a "solvent" would differ depending on which other components of the system were considered. Furthermore "non-solution" method covered bulk polymerisation; the meaning of the term "absence of solvent" in that context was obscure.

XIII. The appellant (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the main request or on the basis of the first to fifth auxiliary requests as filed with the letter dated 2 July 2013 or on the basis of the sixth or seventh auxiliary request as filed during the oral proceedings on 26 November 2013.

The respondent (opponent) requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. Main request

2.1 Art. 76(1)

2.1.1 Claim 1 of the main request specifies that the process is a non-solution method of preparing a soluble

branched polymer, that the polyfunctional monomer is present in an amount of from 0.5% w/w up to 100 % w/w of the weight of monofunctional monomer, that the polyfunctional monomer is not a reactive oligomer or polymer and that the conversion of monomer to polymer >90% (Board's emphasis).

None of the features indicated in underline were specified in original claim 1 of the parent application.

2.1.2 "Non-solution method".

According to page 3 line 13-15 of the parent application any free-radical polymerisation method can be used whereby solution, suspension, emulsion and bulk polymerisation are explicitly mentioned. At page 3 line 22 it is stated that it "may be advantageous to produce the branched polymer by a non-solution method, e.g. suspension or bulk polymerisation.", indicating that said feature is preferred but not mandatory.

The specification of "non-solution method" thus represents a restriction compared to the parent application as originally filed. The restriction was disclosed in the parent application and consequently, in isolation, does not give rise to an objection pursuant to Art. 76(1) EPC.

2.1.3 "Soluble branched polymer"

At page 2 line 20-27 of the description of the parent application as originally filed in which the "first aspect" of the invention was discussed, (in effect the wording of originally filed claim 1), it is stated in the last sentence "In this way a soluble branched

polymer may be prepared by a simple one-step process". From the wording of the indicated paragraph it is ambiguous whether the features "soluble branched polymer" and "one-step process" are mandatory features or are merely presented as illustrating one combination of capabilities of the claimed process.

In contrast, in the presentation of the "second aspect" of the invention commencing at page 2 line 28, there is no mention of "soluble branched polymer", suggesting that this was indeed not a mandatory feature or outcome of the claimed method.

At page 3 lines 7-12 it is stated that "It is surprising that a soluble branched polymer..". Similarly to above, it is ambiguous from this paragraph whether the term feature "soluble branched polymer" is mandatory or merely one possible outcome of the process.

Consequently the specification of the polymer as "soluble" represents a further restriction compared to the disclosure of the parent application as filed, which alone does not give rise to an objection pursuant to Art. 76(1) EPC.

2.1.4 Amount of polyfunctional monomer

Regarding the specified amount of the polyfunctional monomer of 0.5-100% w/w, claim 1 of the parent application as filed discloses that the polyfunctional monomer is present in an amount of 0.3 - 100% w/w, however with no restriction as to the nature of the polyfunctional monomer.

According to page 6, lines 9 to 14: "The amount of polyfunctional monomer may be up to 100 wt% of the total initial monofunctional monomer concentration. Preferably, the amount of polyfunctional monomer present is 0.3 - 25%, e.g. 0.5-10% [...] when the polyfunctional monomer is a simple monomer, i.e. not a reactive oligomer or polymer."

The present lower limit of 0.5 % w/w is thus derived from the preferred lower limit for the class of monomers specified as being not a reactive monomer or oligomer. However, the value of 0.5 % w/w which had only been disclosed in combination with an upper limit of 10% w/w, is now combined with the general upper limit of 100% w/w. That upper limit had originally been disclosed with no restriction in respect of the monomer but according to operative claim 1 it is now combined with the restriction that the monomer should not be a reactive monomer or oligomer.

The amount and nature of the polyfunctional monomer specified in operative claim 1 thus is based on a plurality of selections of features from the parent application as filed, not all of which were even disclosed individually.

In the alternative the subject-matter of the operative claim could be seen as a generalisation of the specifically disclosed range of 0.5-10 % w/w, which was disclosed only in combination with a specific subset of (not reactive) monomers, to the range 0.5-100% w/w for which range there was no restriction of the monomers in the parent application as filed. For this generalisation there is no basis in the disclosure of the application as originally filed.

Consequently the specification of the range of content of the polyfunctional monomer extends beyond the content of the application as originally filed, giving rise to an objection pursuant to Art. 76(1) EPC.

2.1.5 Conversion of monomer to polymer >90%

According to page 3 lines 10-12 of the parent application "the polymerisation can be performed in one-step in the absence of solvent and taken to high conversion of monomer to polymer (>90%) to yield a soluble branched polymer."

Consequently in the parent application as originally filed the degree of conversion was disclosed mandatorily in combination with two other features, i.e. "one-step" and "absence of solvent".

There is no feature in the claim that has been demonstrated to be equivalent to the term "absence of solvent" or to render the specification thereof redundant. The feature "non-solution" method does not provide an unambiguous disclosure of the feature "absence of solvent" for the reason that there is no definition of which substances constitute a solvent. Specifically, the designation of a component as a solvent varies depending on which other components of the system are considered. In this respect the Board refers to section 5.2, in particular 5.2.3 of the reasons of decision T 1062/09 relating to the parent case.

With respect to the feature "one-step", operative claim 1 reads: "... thereafter reacting said mixture to form a polymer". That does not constitute a definition - even implicit - of polymerisation in a single step. On

the contrary, in view of the presence of the term "comprising" the claim explicitly encompasses a process in which the reaction that is "thereafter" carried out may be accomplished in a plurality of steps.

The conclusion is that the final feature of the claim is not as such disclosed in the parent application as originally filed, giving rise to an objection pursuant to Art. 76(1) EPC.

2.1.6 The four features discussed in sections 2.1.2 to 2.1.5 above, to the extent that they are even individually disclosed in the parent application as filed, are presented therein as independent alternatives. There is no indication of their combination, either in total or in part.

For example, regarding the terms "non-solution method" and "soluble" polymer, in the description of the method at page 3 line 22 where it is stated that "it may be advantageous to produce the branched polymer by a non-solution method", the feature "soluble" is not specified.

Consequently the subject-matter of operative claim 1 is the result of a plurality of selections from the original disclosure of the parent application, the combination of which was not disclosed.

2.1.7 From the above it appears that the combination in claim 1 of the features "non-solution method", "soluble polymer", the range defined for the content of the polyfunctional monomer (which range is itself not disclosed in the parent application as originally filed) and the degree of conversion (which has been isolated and extracted from the context in which it was

present in the original application) represents subject-matter extending beyond the content of the parent application as originally filed, contrary to Art. 76(1) EPC.

2.2 Art. 123(2) EPC

Claim 1 of the divisional application as filed specified the amount of polyfunctional monomer as being "from 0.5 % w/w".

Analogously to the discussion above, the introduction of an upper limit of 100 % w/w together with a restriction of the nature of the polyfunctional monomers represents two independent selections from the disclosure of the divisional application as filed. Although, in contrast to the situation with respect to Art. 76(1) EPC, each selection individually does not give rise to an objection pursuant to Art 123(2) EPC the presence of both selections in claim 1 gives rise to subject-matter extending beyond the content of the application as filed and thus contravenes the requirements of Art. 123(2) EPC.

The other objections indicated above with respect to Art. 76(1) EPC similarly give rise to objections pursuant to Art. 123(2) EPC.

2.3 Claim 1 of the main request does not meet the requirements of Art. 76(1) and 123(2) EPC and is therefore refused.

3. First to fifth auxiliary requests

3.1 Art. 76(1) EPC/Art. 123(2) EPC

The respective claims 1 of all of the first to fifth auxiliary requests retain the features relating to "soluble polymer" and the amount and nature of the polyfunctional monomer.

Consequently the defects identified pursuant to Art. 76(1) and 123(2) EPC in respect of the main request apply equally to claim 1 of the first to fifth auxiliary requests.

3.2 The first to fifth auxiliary requests are therefore refused.

4. Sixth and seventh auxiliary requests

4.1 Admissibility

The sixth and seventh auxiliary requests were filed during the oral proceedings. A criterion for admissibility to the procedure of late-filed requests is that they have to be clearly allowable. In the case of any element of doubt such requests are not to be admitted to the procedure (Case Law of the Boards of Appeal of the European Patent Office, 7th ed., IV.E.4.4).

4.2 Art. 76(1) EPC

The respective claims 1 of the sixth and seventh auxiliary requests differ from claim 1 of the main request in that:

- the content of polyfunctional monomer is restricted to 0.5 % w/w to 10 % w/w,
- the final phrase of the claim incorporates the entirety of the wording from page 3 lines 10-12 (one-step, absence of solvent, >90% conversion),

- the wording "non-solution method" is deleted.

4.2.1 The feature "soluble" polymer remains in the claim and represents a selection compared to the parent application as originally filed (see section 2.1.3 above).

4.2.2 The specified content of the polyfunctional monomer 0.5 % w/w up to 10 % w/w is disclosed on original page 6 line 11 of the parent application. However, as explained in section 2.1.4 above, the specified range is a preferred embodiment of the case where the polyfunctional monomer is selected from a restricted group, i.e. not a reactive monomer or oligomer.

4.2.3 The wording of the final phrase of the claim is taken from the paragraph at page 3 lines 7 to 12 of the parent application as filed. However the indicated paragraph relates to the preparation of a polymer from a mixture "containing a relatively large proportion of a polyfunctional monomer".

The specified amount of polyfunctional monomer in the claim - 0.5 % w/w up to 10% w/w - has as its upper limit the lowest amount disclosed as an upper limit in the parent application (compared to 100% w/w and 25 % w/w - see section 2.1.4, above). Consequently it cannot be concluded that the specified range corresponds, in the context of the disclosure of the parent application, to an embodiment containing a "relatively large proportion" of the polyfunctional monomer. There is therefore a doubt as to whether there is a basis for said feature in the parent application as filed.

4.2.4 In summary each claim 1 of the sixth and seventh auxiliary requests defines features that are taken from

different parts of the description and in some cases relate to different - or even incompatible - embodiments.

4.3 In view of the above identified defects with respect to Art. 76(1) EPC the Board cannot conclude that the late filed sixth and seventh auxiliary requests are clearly allowable.

Accordingly, in exercise of the discretion permitted pursuant to Art. 114(2) EPC and Art. 12(4) RPBA, the sixth and seventh auxiliary requests are not admitted to the proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman

E. Goergmaier B. ter Laan

Decision electronically authenticated