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**Datasheet for the decision
of 11 February 2021**

Case Number: T 1451/17 - 3.3.03

Application Number: 06726789.8

Publication Number: 1877486

IPC: C08L33/04

Language of the proceedings: EN

Title of invention:

ACRYLIC BLENDS

Patent Proprietor:

Lucite International UK Limited

Opponent:

ARKEMA FRANCE

Relevant legal provisions:

EPC Art. 56, 100(b), 123(2)

RPBA Art. 12(4), 13(1)

Keyword:

Amendment to case - amendment admitted (yes)

Amendments - allowable (yes)

Grounds for opposition - insufficiency of disclosure (no)

Inventive step - (yes)

Decisions cited:

G 0003/14



Beschwerdekammern

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Case Number: T 1451/17 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 11 February 2021

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
25 April 2017 concerning maintenance of the
European Patent No. 1877486 in amended form.**

Composition of the Board:

Chairman D. Semino
Members: O. Dury
W. Ungler

Summary of Facts and Submissions

I. The appeal of the opponent is against the interlocutory decision of the opposition division posted on 25 April 2017 concerning maintenance of European patent No. 1 877 486 in amended form according to the claims of the 2nd auxiliary request filed with letter of 3 February 2017 and an adapted description.

II. Claims 1 and 16 of said 2nd auxiliary request read as follows (whereby the features of claim 1 are presented separately by the Board to facilitate the reading):

"1. An acrylic polymeric composition

being free from impact strength modifier derived from cross-linked poly(meth)acrylates and

comprising a melt blend of a thermoplastic high molecular weight acrylic material (HMWA) and a thermoplastic low molecular weight acrylic material (LMWA),

at least 70% w/w, based on the total weight of the HMWA, of the said HMWA comprising an alkyl (alk)acrylate (co)polymer, the said (co)polymer comprising at least 80% w/w of a first polymer derived from C₁-C₁₂ alkyl (C₁-C₈ alk)acrylate monomer units and optionally, up to 20% w/w, based on the said alkyl (alk)acrylate (co)polymer of a first copolymer derived from C₁-C₁₂ alkyl (C₀-C₈ alk)acrylate and/or (C₀-C₈ alk)acrylic acid monomer units,

the said HMWA having a weight average molecular weight of between 40k Daltons and 1000k Daltons,

at least 70% w/w, based on the total weight of the LMWA, of the said LMWA comprising an alkyl(alk)acrylate (co)polymer, the said (co)polymer comprising at least 80% w/w of a second polymer derived from C₁-C₁₂ alkyl (C₁-C₈ alk)acrylate monomer units and optionally, up to 20% w/w, based on the said alkyl (alk)acrylate copolymer of a second (co)polymer derived from C₁-C₁₂ alkyl(C₀-C₈ alk)acrylate and/or (C₀-C₈ alk)acrylic acid monomer units,

the said LMWA having a weight average molecular weight of between the entanglement molecular weight (Me) (expressed in k Daltons) and 250k Daltons,

with the proviso that the HMWA has a higher Mw than the LMWA,

wherein the first polymer of the HMWA and the second polymer of the LMWA are the same, and

wherein the weight ratio of HMWA:LMWA in the composition is greater than 1:1, and

wherein the acrylic polymeric composition comprises, based on the weight of the acrylic polymeric composition, up to 55% w/w of LMWA and at least 40% w/w of HMWA."

"16. The use of an acrylic polymer composition as claimed in any of claims 1 to 15, to provide a high T_g melt blended composition or moulded polymer product."

The remaining claims of that request are not relevant to the present decision.

III. A notice of opposition had been filed against the patent, requesting the revocation of the patent in its entirety.

IV. The following documents were *inter alia* cited in the decision under appeal:

D3: EP 1 348 735

D9: WO 00/78863

V. In that decision, the opposition division held *inter alia* that:

(a) The amendment "being free from impact strength modifier derived from cross-linked poly(meth)acrylates" (which was present in claim 1 of all requests dealt with in the decision under appeal), did not constitute added-matter because the term "substantially free" was synonymous with or at least included "free" in the context of the application. The skilled person would immediately consider "substantially free" to include "free", i.e. the disputed composition was in substance free of impact modifier. Any other interpretation would not be reasonable (section 4.1 of the reasons, in respect of the then valid main request). Therefore, the requirements of Article 123(2) EPC were satisfied.

(b) Regarding sufficiency of disclosure (section 3 of the reasons, in respect of the then valid main request), the skilled person would understand from his technical knowledge and from the patent

specification, in particular the examples thereof, that the expression "the first polymer of the HMWA and the second polymer of the LMWA are the same" (which was present in claim 1 of the main request and of the 2nd auxiliary request) meant that the (co)polymers so defined were derived from identical monomer unit(s) and monomer ratios rather than identifying two polymers being identical in each and every polymer property. Therefore, the opponent's objections regarding lack of sufficiency of disclosure in respect of these features were rejected.

- (c) Claim 1 according to the then valid main request and 1st auxiliary request were not novel over D3.
- (d) The subject matter of claim 1 of the 2nd auxiliary request was rendered novel over D3 by the specification that the composition included at least 40% w/w of HMWA. It differed from the disclosure of D9 as closest prior art in that it was free from core-shell impact modifier derived from cross-linked poly(meth)acrylates. Considering that D9 concerned a modified impact resistant polymethacrylate moulding material having an impact strength modifier as an essential component, there could be no suggestion in D9 to omit said modifier. Nor could it predicted how the properties of the methacrylate blends disclosed in D9 would change in the absence of said modifier. For this reason, the skilled person would not be motivated to prepare the blends of D9 without said modifier, which would be required in order to arrive at a composition falling within the terms of claim 1 of the 2nd auxiliary request. Therefore, an inventive step was

acknowledged.

(e) In view of the above, the patent could be maintained in amended form on the basis of the 2nd auxiliary request.

VI. The opponent (appellant) appealed against the above decision. With the statement setting out the grounds of appeal the appellant requested that the decision of the opposition division be set aside and that the patent be revoked. Also, the following document was filed and its admittance into the proceedings was requested:

D13: Meriam Webster Thesaurus: definition of the term "substantially"

VII. With its response to the statement of grounds of appeal, the patent proprietor (respondent) requested that the appeal be dismissed (main request) or, in the alternative, that the patent be maintained in amended form according to any of the 1st to the 4th auxiliary requests filed therewith (which are not relevant to the present decision). It was further requested that D13 be not admitted into the proceedings.

VIII. With letter of 15 July 2019, the parties were summoned to oral proceedings. In a communication dated 19 September 2019, the Board then indicated specific issues to be discussed at the oral proceedings.

IX. With letter of 2 July 2020 the respondent filed the following document and requested its admittance into the proceedings:

D9a: AU 200066877 B2

- X. With the explicit agreement of both parties, oral proceedings were held on 11 February 2021 in the form of a videoconference (the Board was in a room at the premises in Haar and both parties were connected via video link).
- XI. The appellant's arguments, in so far as relevant to the present decision, may be summarised as follows:

Admittance of late filed documents

- (a) The appellant had no objection regarding the admittance of D9a into the proceedings.

D13 was filed in reaction to the contested decision, in support of the same line of argumentation than the one put forward during the opposition proceedings. Therefore, D13 should be admitted.

Main request - Article 123(2) EPC

- (b) The expression "being free from impact strength modifier derived from cross-linked poly(meth)acrylates" which was present in claim 1 of the main request was not supported by the application as filed. In particular, in view of the disclosure of the application as filed and/or of D13, the term "free" could not be equated with the originally disclosed term "substantially free".

Main request - Sufficiency of disclosure

- (c) The skilled person did not have sufficient information in order to choose appropriately the "same" first polymer of the HMWA and second polymer

of the LMWA as indicated in operative claim 1, in particular in view of the unclear definition of the wording "same polymer" and of the definition of base polymers 4 to 8 of the patent in suit, which could serve both as either HMWA or LMWA depending on the weight average molecular weight.

There was a further lack of sufficiency of disclosure related to the definition of the term "high Tg" mentioned in claim 15 [sic] of the main request.

For these reasons, the requirements of sufficiency of disclosure were not satisfied.

Main request - Inventive step

- (d) It was agreed that the disclosure of D9 could be read in the light of the one of D9a.

D9/D9a was the closest prior art.

The composition according to claim 1 of the main request differed from the compositions comprising 5 or 10 wt. % lower molecular weight methylmethacrylate copolymer prepared in the examples of D9/D9a in that it was free from impact strength modifier derived from cross-linked poly(meth)acrylates.

The technical problem effectively solved over D9/D9a resided in the provision of further acrylic polymeric compositions having good processability and heat resistance, in alternative to the ones according to the examples illustrative of the teaching of D9/D9a.

However, in order to provide a mere alternative to D9, the skilled person would not be hindered from removing the impact modifier if the same effects as in D9/D9a apart from impact strength were aimed at. Therefore, the subject-matter of claim 1 of the main request was not inventive. The same conclusion was valid for dependent claims 3 to 5 of the main request.

XII. The respondent's arguments, in so far as relevant to the present decision, may be summarised as follows:

Admittance of late filed documents

(a) D9a was a mere English equivalent to D9. For that reason, it should be admitted.

D13 could and should have been filed earlier if the appellant contemplated relying on it. There was no justification for such a late filing. In addition, D13 was *prima facie* not relevant since it was post published. Therefore, D13 should be not admitted.

Main request - Article 123(2) EPC

(b) It was agreed with the finding of the opposition division that the amendment related to the compositions being "free from impact strength modifier derived from cross-linked poly(meth)acrylates" in operative claim 1" satisfied the requirements of Article 123(2) EPC.

Main request - Sufficiency of disclosure

- (c) Regarding claim 1 of the main request, it was agreed with the opposition division that the skilled person would interpret "first polymer" to mean "first polymer unit" and "second polymer" to mean "second polymer unit" on the grounds that there could be no doubt based on the knowledge of the skilled person that only the monomer units of the polymer could be the same and not the polymer itself. That interpretation was further supported by the patent specification, in particular the examples.

The patent in suit provided in paragraph 75 a clear definition of "high Tg" as defined in claim 16 of the main request. Such "high Tgs" were further demonstrated in the examples of the patent specification.

For these reasons, the objections of the appellant regarding sufficiency of disclosure should be rejected.

Main request - Inventive step

- (d) It was agreed that the disclosure of D9, which constituted the closest prior art document, could be read in the light of the one of D9a.

It was further agreed that the subject-matter of claim 1 of the main request differed from the compositions of the examples of D9/D9a carried out with 5 wt.% or 10 wt.% low molecular weight component in that it was free from impact modifier as defined therein. However, in addition, no information was provided in the examples of D9/D9a carried out with 5 or 10 wt.% low molecular weight

acrylic polymer in respect of the molecular weight of the impact modified acrylic polymer and, in view of the information provided in D9/D9a in that respect, it could not be concluded that the requirements of claim 1 of the main request in respect of that feature were mandatorily met. Finally, no information was provided in D9/D9a or was provided by the appellant to show that the molecular weight of the low molecular weight acrylic polymer used in the examples of D9/D9a was effectively above Me, as requested by claim 1 of the main request.

During the oral proceedings before the Board, it was agreed that the problem effectively solved over the examples of D9/D9a resided in the provision of further acrylic polymeric compositions having good processability and heat resistance, in alternative to the ones according to the examples illustrative of the teaching of D9/D9a.

However, even when aiming at providing a mere alternative to D9/D9a, the skilled person would have no reason to deviate from the clear teaching of that document regarding the presence of an impact-modifier as an essential constituent of the compositions taught therein. In that respect, it was agreed with the opposition division that the skilled person could not predict how the properties of the methacrylate blends disclosed in D9 would be modified, should the impact modifier of D9/D9a be removed.

For these reasons, an inventive step starting from D9/D9a as closest prior art should be acknowledged for claim 1 of the main request. In addition, the

same conclusion was valid for dependent claims 3 to 5.

XIII. The appellant requested that the decision under appeal be set aside and the patent be revoked.

The respondent requested that the appeal be dismissed (main request) or, in the alternative, that the patent be maintained in amended form according to any of the 1st to 4th auxiliary requests filed with the rejoinder to the statement of grounds of appeal.

Reasons for the Decision

1. Admittance of documents D13 and D9a

1.1 The respondent requested that D13 be not admitted into the proceedings.

Although it makes no doubt that D13 could have been filed earlier, that document consists in the mere definition of the word "substantially" according to a well known dictionary (Websters Thesaurus). As such, D13 only reflects common general knowledge. Further considering that D13 was filed at the outset of the appeal proceedings and was used in support of the same line of argumentation as the one put forward during the opposition proceedings, but which did not convince the opposition division, the Board does not find it reasonable to hold D13 inadmissible pursuant to Article 12(4) RPBA 2007 (which applies in view of Article 25(2) RPBA 2020).

1.2 The appellant explicitly indicated at the oral proceedings before the Board that he had no objection against the admittance of D9a. Further considering that D9a was relied upon by both parties, in particular during the oral proceedings, whereby both parties indicated that the disclosure of D9a - in English - was equivalent to the one of D9 - in German -, D9a is also in the proceedings.

Main request

2. Article 123(2) EPC

2.1 The appellant's sole objection pursuant to Article 123(2) EPC in appeal is in respect of the introduction of the expression "being free from impact strength modifier derived from cross-linked poly(meth)acrylates" in operative claim 1, which was not considered to be supported by the application as filed (statement of grounds of appeal: page 4, section 4), contrary to the opposition division's view.

2.2 In that respect, it is understood that the opposition division's conclusion was reached considering that the amendment was allowable because the term "substantially free", at least included the term "free" in the context of the application as filed (reasons of the contested decision: section 4.1).

2.3 In the Board's view, the fact that the compositions being claimed should be "substantially free" from impact strength modifier derived from cross-linked poly(meth)acrylates is undoubtedly disclosed, in the same context as in operative claim 1, in a general manner in the first sentence of the second full paragraph on page 19 of the application as filed.

It is further derivable from the last sentence of the second full paragraph on page 19, in which it is specified that "substantially free" means "less than 1% w/w ..., more preferably less than 0.5% w/w ..., most preferably less than 0.1% w/w" and therefore encompasses "free from". That reading is further confirmed by the explicit indication in the third full paragraph on page 19 of the application as filed that said impact modifiers may be used or not (see in particular the wording "when used" at the second line of said third paragraph). In that respect, the appellant's argument that "substantially free" imposed the presence of at least some impact modifier is rejected (section 4.3 of the statement of grounds of appeal).

In addition, D13 does not provide a definition of the expression "substantially free from" but merely explains the meaning of the term "substantially" in a literary context. The "antonyms" (i.e. words of opposite meaning) such as "completely", "entirely" and "fully" specified in D13 are further only indicated as "near antonyms", which does not allow to conclude, as was done by the appellant (statement of grounds of appeal: section 4.4), that the skilled person would understand that "substantially free from" as disclosed in the second paragraph on page 19 of the application as filed would exclude "free from", in particular when considering the explicit contrary indications in the second and third paragraphs on page 19 of the application as filed. Therefore, the appellant's argument based on D13 is also rejected .

That reading of page 19 of the application as filed is further also supported by many examples of the

application as filed, which were carried out without such an impact modifier (only compounds 18 and 19, page 33, were carried out using an impact modifier, whereby the nature of the impact modifier is not indicated).

Under these circumstances the Board is satisfied that the introduction in e.g. claim 1 of the application as filed (which constitutes the main support for the subject-matter defined in claim 1 of the main request) of the expression "being free from impact strength modifier derived from cross-linked poly(meth)acrylates" is directly and unambiguously derivable from the application as filed.

2.4 In view of the above, the appellant's arguments provide no reason for the Board to overturn the opposition division's decision pursuant to Article 123(2) EPC.

3. Article 100(b) EPC

3.1 In order to meet the requirements of sufficiency of disclosure, an invention has to be disclosed in a manner sufficiently clear and complete for it to be carried out by the skilled person, without undue burden, on the basis of the information provided in the patent specification, if needed in combination with the skilled person's common general knowledge. This means in the present case that the skilled person should in particular be able to prepare a composition according to operative claim 1 or to use such a composition according to operative claim 16 (the latter being apparently erroneously referred to as claim 15 in section 5.7 of the statement of grounds of appeal), which is contested by the appellant.

3.2 The opposition division's conclusion according to which the requirements of sufficiency of disclosure were fulfilled (section 3 of the reasons) is contested by the appellant for the reason that the skilled person would not have sufficient information in order to choose appropriately the "same" first polymer of the HMWA and second polymer of the LMWA as indicated in operative claim 1, in particular in view of the unclear definition of the wording "same polymer" (sections 5.2 to 5.6 of the statement of grounds of appeal).

3.2.1 In that respect, sufficiency of disclosure is to be assessed in view of the patent specification as a whole and not on the basis of the wording of the claims only. In the present case, although the definition of the first polymer of the HMWA and/or of the second polymer of the LMWA as indicated in operative claim 1 (e.g. "said (co)polymer comprising ... a first polymer and, optionally, ... a first copolymer...") may be unclear, it may be agreed with the respondent that it is derivable from paragraph 18 and from the experimental part (paragraphs 96-99) of the patent specification that the skilled person wanting to prepare a composition according to operative claim 1 would understand the terms "first polymer" and "first copolymer", respectively "second polymer" and "second copolymer" indicated in operative claim 1 as meaning "first monomer" and "first comonomer", respectively "second monomer" and "second comonomer" (sections 3.2 to 3.4 of the rejoinder to the statement of grounds of appeal). Under these circumstances, it cannot be agreed with the appellant that the skilled person is not in the position to select appropriately the "same" first polymer of the HMWA and second polymer of the LMWA as indicated in operative claim 1 in order to prepare a composition according to operative claim 1.

3.2.2 For the sake of completeness, it is noted that it is not agreed with the opposition division that the term "the same" imposes that the HMWA and the LMWA contain (co)polymers derived from identical monomer and comonomer units and identical monomer ratios (section 3 of the reasons of the decision: third paragraph). Rather, as indicated above, the term "the same" only defines that the HMWA and LMWA must have the same main (co)monomer, without any further limitation regarding the nature of an optionally present comonomer(s) and/or the amount of such comonomer(s).

3.3 The appellant further argued that there was a lack of sufficiency of disclosure because no indication of the "high Tg" to be achieved was given in operative claim 16 (it was not contested at the oral proceedings before the Board that the claim was erroneously referred to as claim 15 in section 5.7 of the statement of grounds of appeal, as was indicated at the end of section 7.1 of the Board's communication).

However, said objection is only related to the definition of the scope of claim 16 and is therefore a matter of clarity pursuant to Article 84 EPC (which, in view of decision G 3/14, OJ EPO 2015, 102 cannot be assessed at this stage since the wording of operative claim 16 is identical to the one of granted claim 18) rather than a matter of sufficiency of disclosure.

3.4 In view of the above, the appellant's arguments provide no reason for the Board to overturn the opposition division's decision regarding the objections under Article 100(b) EPC.

4. Article 56 EPC

4.1 Closest prior art

4.1.1 During the current proceedings the arguments of the parties regarding inventive step were either based on document D9 (e.g. decision under appeal; statement of grounds of appeal; rejoinder to the statement of grounds of appeal) or D9a (oral proceedings before the Board). In the present decision, following the common position of the parties that D9 and D9a are equivalent documents and in the absence of any evidence to the contrary, the assessment of inventive step will be made in respect of document D9. However, the same conclusions would be reached considering D9a.

4.1.2 Both parties agreed with the opposition division's conclusion according to which D9 constitutes a suitable closest prior art document. There is no reason for the Board to deviate from that view.

In that respect, D9 (claim 1) deals with an impact-strength-modified polymethacrylate moulding compound, characterized by a Vicat softening temperature per ISO 306 (B 50) of at least 90°C, a notched impact strength (Charpy) per ISO 179/1eA of at least 3.0 kJ/m² at 23°C, and a melt volume-flow rate MVR (230°C/3.8 kg) per ISO 1133 of at least 11 cm³/10 min, obtained by mixing, in the melt,

a) 80 to 98 wt% of an impact-strength-modified polymethacrylate moulding compound with

b) 20 to 2 wt% of a low molecular weight polymethacrylate moulding compound,

the impact-resistant moulding compound comprising 70 to 99 wt.% of a matrix of 80 to 100 wt.% of radical-polymerized methyl methacrylate units and if necessary 0 to 20 wt.% of further comonomers that can undergo radical polymerization, and containing 1 to 30 wt.% of an impact-strength modifier,

and the low molecular weight polymethacrylate molding compound comprising 80 to 100 wt.% of radical-polymerised methyl methacrylate units and 0 to 20 wt.% of further comonomers that can undergo radical polymerisation, and having a viscosity number (η_{sp}/c) of 25 to 35 ml/g as measured in chloroform per ISO 1628 Part 6.

In particular, the examples of D9 (pages 9-11) disclose the preparation of samples by injection-moulding of a composition comprising:

- an impact-strength modified moulding composition comprising 92.5 wt.% of a matrix polymer and 7.5 wt.% of a core-shell impact modifier, whereby the matrix polymer is made of 91 wt.% methyl methacrylate and 9 wt.% methyl acrylate;
- an amount of either 0, 5 or 10 wt.% of a low molecular weight moulding compound comprising 85 wt.% methyl methacrylate and 15 wt.% methyl acrylate units with a weight average molecular weight of about 50,000 g/mol.

In view of the above, the examples of D9 carried out with 5 wt.% and 10 wt.% low molecular weight moulding compound constitute a particularly appropriate starting point for the analysis of the inventive step.

4.2 Distinguishing feature(s) over D9

4.2.1 It was undisputed by the parties that the subject-matter of operative claim 1 differs from the compositions prepared in the examples of D9 carried out with 5 wt.% and 10 wt.% low molecular weight moulding compound in that it should be free from impact-modifier as defined in operative claim 1 (which was not the case of the composition of the closest prior art).

4.2.2 However, the parties disagreed whether or not the following features specified in operative claim 1 were effectively satisfied by the examples of D9 carried out with either 5 wt.% or 10 wt.% of low molecular weight moulding compound:

(a) The requirement in terms of the molecular weight of the HMWA component, which should be between 40k Daltons and 1000k Daltons and above the one of the LMWA component;

(b) The requirement in terms of the molecular weight of the LMWA component, which should be between the entanglement molecular weight M_e and 250k Daltons.

4.2.3 Regarding above feature (a)

It is correct that no explicit disclosure in respect of the molecular weight of the matrix polymer used to prepare the impact-strength modified moulding composition is provided in D9.

However, in the Board's view, the skilled person would understand the disclosure of D9 as a whole as implying that the molecular weight of the impact modified polymer matrix should be higher than the one of the so-

called low molecular weight polymethacrylate moulding compound. Firstly, the terminology used in D9 to indicate the second component (low molecular weight) implies that it has a lower molecular weight than the matrix. Secondly, the only ranges of molecular weight for the matrix indicated in D9 (90.000 to 200.000 g/mol, preferred 100.000 to 150.000 g/mol, page 4, lines 9-11), albeit as a preferred feature, provide values which are all largely above the molecular weight of the low molecular weight component indicated in the general disclosure (30.000 to 70.000 g/mol, in particular 40.000 to 60.000 g/mol, page 7, lines 2-3) and in the examples of D9 (50 000 g/mol, i.e. 50k Daltons). On top of that, the fact that in the examples of D9 the addition of the low molecular weight component leads to an increase in the melt flow rate of the impact modified polymer composition (D9: table on page 11) confirms that the impact modified polymer matrix must have a higher weight average molecular weight than the low molecular weight component, as put forward by the appellant during the oral proceedings before the Board. Therefore, it is derivable from D9 as a whole that the polymethacrylate matrix used in the examples of D9 implicitly, but directly and unambiguously, has a weight average molecular weight higher than 50k Daltons, which is both above 40k Dalton and higher than the molecular weight of the low molecular weight polymer component used therein, as required by claim 1 of the main request.

In addition, it was not objected to by the respondent that the impact modified polymethacrylate matrix used in the examples of D9 could not have a weight average molecular weight above 1000k Daltons, as also specified in claim 1 of the main request. The Board has also no

reason to deviate from that view, in particular because there is no reason to expect that that requirement would not be met in view of the very high value of the higher limit of the range of molecular weight indicated in claim 1 (1000k Daltons) and taking into account the preferred values indicated in D9 (90.000 to 200.000 g/mol, preferred 100.000 to 150.000 g/mol, page 4, lines 9-11).

For these reasons, the requirement in terms of the molecular weight of the HMWA component specified in claim 1 of the main request does not constitute a distinguishing feature over the examples of D9 carried out with either 5 wt.% or 10 wt.% of the low molecular weight moulding compound.

4.2.4 Regarding above feature (b)

The component of D9 corresponding to the LMWA material defined in operative claim 1 is the low molecular weight polymethacrylate disclosed therein, which in the examples of D9 is a copolymer of 85 wt% methylmethacrylate and 15 wt.% methyl acrylate having a weight average molecular weight of 50 000 g/mol (D9: page 10, last paragraph). Although it is correct that there is no information in D9 if said molecular weight is above the entanglement molecular weight M_e , the question to be answered is if said requirement is implicitly satisfied, as put forward by the appellant in view of the information provided in the patent in suit in respect of said feature M_e (statement of grounds of appeal: sections 6.8-6.9). In this respect the molecular weight of the low molecular weight moulding compound disclosed in the examples of D9 (50 000 g/mol) is not only according to all preferred embodiments indicated in paragraph 46 of the patent in

suit, but also much higher than the molecular weight of the low molecular weight component used in the examples of the patent in suit (see "base polymer 3" in paragraph 106, with a weight average molecular weight of 22.1k Daltons). Taking into account in addition the similarity of the copolymers in the examples of D9 and of the patent in suit, the Board finds it not credible that the molecular weight of the low molecular weight component in the examples of D9 may be below the entanglement molecular weight M_e . Although that issue was mentioned in the Board's communication (section 7.5.3), no argument or evidence was provided by the respondent to show that there were any reason to consider that the low molecular weight component used in the examples of D9, in particular characterised in that it has a weight average molecular weight of 50 k Daltons, may not have satisfied the M_e requirement defined in claim 1 of the main request. Under these circumstances, the Board holds that the requirement in terms of the molecular weight of the LMWA component specified in operative claim 1 is implicitly satisfied in the examples of D9.

For these reasons, the requirement in terms of molecular weight of the LMWA component specified in claim 1 of the main request does not constitute a distinguishing feature over the examples of D9 carried out with either 5 wt.% or 10 wt.% of the low molecular weight moulding compound.

- 4.2.5 In view of sections 4.2.1, 4.2.3 and 4.2.4 above, the subject-matter of claim 1 of the main request differs from the examples of D9 carried out with either 5 wt.% or 10 wt.% of the low molecular weight moulding compound only in that it should be free from impact

modifier as defined therein.

4.3 Problem effectively solved over the closest prior art

During the oral proceedings before the Board, both parties agreed that the problem effectively solved over the examples of D9 carried out with either 5 wt.% or 10 wt.% of the low molecular weight moulding compound resided in the provision of an alternative impact-modified acrylic polymer composition with good processability, thermal resistance and impact properties. The Board has no reason to deviate from that view, in particular because there is no evidence on file in support of a fair comparison between the subject-matter being claimed and the above identified closest prior art, i.e. it was not shown that the above indicated distinguishing feature may be related to any technical effect. In that respect, it was in particular clarified at the oral proceedings that the improvement relied upon by the respondent in writing (letter of 2 July 2020: section 5.7; see in particular Figure 4 of the patent in suit) was based on the comparison of compositions as claimed with compositions which do not illustrate the teaching of the closest prior art D9/D9a and are not related to the above indicated distinguishing feature (absence of impact modifier). Rather, said examples 4 to 8 illustrate some improvements claimed to be achieved (both in the patent in suit and in the respondent's letter of 2 July 2020) by the compositions claimed as compared to compositions comprising only HMLWA copolymers having similar molecular weight but comprising higher levels of acrylate comonomers (as indicated in paragraph 74 of the patent in suit).

4.4 Obviousness

4.4.1 The question has to be answered if the skilled person, desiring to solve the problem(s) identified as indicated above, would, in view of the closest prior art, possibly in combination with other prior art or with common general knowledge, have modified the disclosure of the closest prior art in such a way as to arrive at the claimed subject matter.

4.4.2 In that respect, it is agreed with the respondent that the impact modifiers constitute an essential component of the compositions disclosed in D9. Indeed, D9 is directed to "impact-strength modified" polymethacrylate molding materials (claim 1, first paragraph on page 1 together with title and abstract). Already in view of this, the skilled person, even when aiming at providing a mere alternative to D9, would not remove the impact strength modifier, which is a constitutive component of the compositions disclosed therein as clear from their definition.

4.4.3 In addition, it is known in the art that such impact modifiers affect a whole range of other properties (in addition to impact strength) in a polymeric composition such as heat distortion and processability, i.e. glass transition temperature and melt flow. It is further concurred with the respondent that the compositions of D9 are in the form of a complex mixture, in which each component effectively contributes to the resulting properties of the composition. These arguments of the respondent, which are in the Board's view credible, were not contested by the appellant. Under these circumstances, it is agreed with the respondent and with the opposition division that the skilled person, even when aiming at providing a mere alternative to D9,

would not remove the impact strength modifier, which is an essential component of the compositions of D9. Therefore, the subject-matter of claim 1 of the main request is not obvious in view of D9 and may be acknowledged an inventive step.

4.4.4 The same conclusion applies to each of claims 3 to 5 of the main request, which are dependent on claim 1 and directed to preferred embodiments of the composition according to claim 1.

4.4.5 The objections of the appellant pursuant to Article 56 EPC which were substantiated in appeal were only directed to claim 1 of the main request (statement of grounds of appeal: sections 6.1 and 6.18) and claims 3 to 5 which are dependent on claim 1 (statement of grounds of appeal: section 7). No additional objections pursuant to Article 56 EPC were raised, either in writing or at the oral proceedings before the Board, against any other claims of the operative main request.

4.4.6 For these reasons, the arguments of the appellant provide no reason for the Board to overturn the findings of the opposition division in respect of inventive step.

5. Since none of the objections put forward by the appellant against the main request are successful, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



B. ter Heijden

D. Semino

Decision electronically authenticated