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D E C I S I O N
of 18 August 1999

Case Number: T 0893/96 - 3.3.3

Application Number: 88100856.9

Publication Number: 0283654

IPC: C08L 69/00

Language of the proceedings: EN

Title of invention:
Polymer mixture comprising an aromatic polycarbonate and an aromatic polyester

Patentee:
General Electric Company

Opponent:
Bayer AG, Leverkusen Konzernverwaltung RP Patente Konzern

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 123(2), (3)

Keyword:
"Amendments - reformatio in peius (no)"
"Novelty (use claim) - functional feature not made available"
"Inventive step - unexpected effect of a known additive in a specific composition"

Decisions cited:
G 0002/88; G 0010/91; G 0009/92; G 0004/93; T 0004/80; T 1002/92; T 0315/97

Catchword:

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Case Number: T 0893/96 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 18 August 1999

Appellant: (Opponent)
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-

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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office dated 8 August 1996 concerning maintenance of European patent No. 0 283 654 in amended form.**

Composition of the Board:

Chairman: C. Gérardin
Members: R. Young
J. A. Stephens-Ofner

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 283 654, with five claims, in respect of European patent application No. 88 100 856.9, filed on 21 January 1988 and claiming a NL priority of 23 March 1987 (NL 8700669) was published on 29 September 1993 (Bulletin 93/39). Claim 1 read as follows:

"A polymer mixture which comprises the following constituents:

A. 1-98.9% by weight of an aromatic polycarbonate,

B. 98.9-1% by weight of an aromatic polyester, consisting of a polyalkylene terephthalate derived from a glycol with 2-10 carbon atoms and terephthalic acid, in which not more than 30 mol% of the glycol and/or terephtalic [sic] acid is replaced by other comonomers,

C. 0.1-5% by weight of one or more esters of one or more trifunctional to hexafunctional alcohols and one or more saturated aliphatic C_5-C_{34} mono- or dicarboxylic acids,

D. 0-25% by weight of one or more agents to improve the impact strength, and

E. 0-50% by weight of conventional additives, in which the sum of the constituents A, B, C, D and E is 100% by weight,

with the exception of polymer mixtures comprising glass fibres, and not comprising a low molecular weight compound with up to 70 C-atoms and with $(-SO_3)-_m$ Q groups, in which Q represents hydrogen, NH_4+, an alkali or earth alkaline metal and m is a whole number which is equal to the value of the valence of Q, and not comprising with a polymeric substance with

sulphonic acid groups."

Claims 2 to 5 were dependent claims directed to elaborations of the polymer mixture according to Claim 1.

II. A Notice of Opposition was filed on 22 June 1994, on the grounds of Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC (insufficient disclosure). The opposition was supported *inter alia* by the following documents:

D1: EP-A-0 166 187;

D2: DE-A-2 729 485;

D3: US-A-3 516 957;

D6: US-A-4 521 562 and

D7: US-A-3 953 539 (equivalent to GB-A-1 466 154, acknowledged in the patent in suit).

III. By an interlocutory decision which was issued on 8 August 1996, the Opposition Division held that the patent could be maintained in an amended form, in which Claim 1 differed from the form as granted, by minor amendments of an editorial nature and by the addition, at the end of the claim, of a disclaimer (after the words "... a polymeric substance with sulphonic acid groups"), the disclaimer being worded as follows:

"..., and not comprising a terpolymer of ethylene,

acrylic acid and t.-butylacrylate."

Claims 2 to 5 remained unamended.

IV. According to the decision, the claimed subject-matter was novel, being distinguished from the relevant comparative example of D1 by the disclaimer.

As to inventive step, the closest state of the art was considered to be D7, and not D1 as canvassed by the Opponent, since the skilled person would not choose a comparative example hidden in a document which did not relate to the art of polycarbonate-polyester blends as a starting point. The technical problem with respect to D7 was to provide aromatic polycarbonate-polyalkylene terephthalate blends stabilised against deterioration at elevated temperatures. This problem was solved by the presence of 0.1 to 5 wt% of the ester C in the blends. Whilst the prior art showed the use of esters corresponding to the esters C according to the patent in suit as **mould release agents** for aromatic polycarbonates (D2), for polyalkylene terephthalates (D3) and even for mixtures of aromatic polycarbonates and polyalkylene terephthalates (Example 2 of D1), it did not suggest that the esters C would act as **stabilisers** in blends of polycarbonate and polyalkylene terephthalates. Rather, D6 taught that these esters were ineffective as thermal stabilisers, since PETS (pentaerythritol tetrastearate), a typical ester C, was unable to stabilise polycarbonate at elevated temperature. Consequently, an inventive step had to be acknowledged.

Finally, the objections under Article 100(b) and 83 EPC, concerning the references in Claim 1 to an "agent to improve impact strength", and "conventional additives", were unfounded, since it was not the function of the claim alone to supply the relevant technical teaching, but rather of the disclosure as a whole, and these additives had either been sufficiently elaborated in the description or they were known and their addition standard practice.

V. On 4 October 1996, a Notice of Appeal against the above decision was filed, the prescribed fee being recorded as paid on 7 October 1996.

In the Statement of Grounds of Appeal, filed on 10 December 1996, the Appellant (Opponent) cited a further document, which was filed in the form of its English translation:

D8: Japanese Laid-Open Patent Publication (Kokai) No. 110263/79, laid open on 29 August 1979;

and argued in substance as follows:

(a) Document D8, which disclosed mixtures of polybutylene terephthalate, brominated polycarbonate and a higher fatty acid ester of 12 to 32 carbon atoms, for instance of monocarboxylic acids with mono-, di- and polyvalent alcohols, such as glycerol, pentaerythritol and sorbitol, was novelty destroying for the claimed subject-matter. Even if novelty could be established in the claimed subject-matter, it would not be inventive,

because the problem of providing a moulding composition with the relevant properties was also solved by D8.

(b) The formulation, in the decision under appeal, of the technical problem in terms of stabilising polycarbonate/polyalkylene terephthalate blends against decomposition at elevated temperatures was unjustified, since the most that could be said was that the blend containing ester C showed less decomposition under extremely difficult injection moulding conditions (hold-up at 285°C for a time of 6 minutes) than without ester C. These conditions were unusual. Under more usual conditions (2 minutes hold-up at 260°C or 280°C), there was no difference worth mentioning in the relevant parameter of delta Vicat B. Consequently, the only problem which was associated with an effect was an artificial one which had no significance in practice, and there could be no inventive step, since the addition of fatty acid esters *inter alia* to polycarbonate and to polyester was already known.

(c) Whilst it had been alleged that PETS suppressed transesterification, this effect was inherently present, for instance in Example 2 of D1.

(d) The argument in the decision under appeal, that esters C were taught in D6 to be ineffective as thermal stabilisers, was incorrect, since it had been shown in the examples of D6 that the reduction in impact strength on thermal aging of

polycarbonate with polyethylene alone was greater than when PETS was added to the combination.

(e) On the contrary, it was generally known to the skilled person that coloration of thermoplastic moulding compositions was a result of transesterification and the resulting deterioration of the polymer properties. It was furthermore known from D7 to use phosphorus compounds to prevent such coloration. Finally, in relation to the addition of esters C, it was stated in D2 that there was no visible deterioration of the polycarbonate properties, and in D3 that the esters C had to be stable under the processing conditions to avoid decomposition of the polybutylene terephthalate. In view of this, it did not involve an inventive step for the skilled person to use esters C also for polycarbonate/polyalkylene terephthalate mixtures to obtain the effects referred to in the state of the art. Thus, there was a "one-way street" leading to the solution of the technical problem.

(f) The objections under Article 100(b) EPC were repeated, reference being made to the lack of characterisation of the agent to improve impact strength (0 to 25 wt%) or of the "conventional additive" (0 to 50 wt%), and in particular, to the fact that the only illustrative example failed to specify the nature of the additive "TS". The definitions of the same additives were also objected to under Article 84 EPC.

The submission was accompanied by an experimental report relating to the change of "delta Vicat B" of moulding compositions under injection moulding conditions corresponding to normal practice. This was supplemented by a completed report filed on 24 April 1997.

VI. The Respondent (Patentee) filed, with a submission received on 30 April 1997, a new Claim 1 and amended pages 2, 3 and 4 of the description of the patent in suit. New Claim 1 read as follows:

"A polymer mixture which comprises the following constituents:

A. 1-98.9% by weight of an aromatic polycarbonate,

B. 98.9-1% by weight of an aromatic polyester, consisting of a polyalkylene terephthalate derived from a glycol with 2-10 carbon atoms and terephthalic acid, in which not more than 30 mol% of the glycol and/or terephtalic acid is replaced by other comonomers,

C. 0.1-5% by weight of one or more esters of one or more trifunctional to hexafunctional alcohols and one or more saturated aliphatic C_5-C_{34} mono- or dicarboxylic acids,

D. a conventional stabilizer to prevent transesterification,

E. 0-25% by weight of one or more agents to improve the impact strength, and

F. 0-50% by weight of conventional additives, in which the sum of the constituents A, B, C, D and E is 100% by weight,

with the exception of polymer mixtures comprising

glass fibres, and not comprising a low molecular weight compound with up to 70 C-atoms and with $(-SO_3)-_m$ Q groups, in which Q represents hydrogen, NH_4+, an alkali or earth alkaline metal and m is a whole number which is equal to the value of the valence of Q, and not comprising a polymeric substance with sulphonic acid groups."

Claims 2 to 5 remained unchanged.

It was argued, by the Respondent, that this subject-matter was novel over D8 and D1 since neither disclosed such a conventional stabiliser. Consequently, the disclaimer was no longer necessary. In relation to inventive step, none of the prior art cited dealt with the suppression of transesterification between an aromatic polycarbonate and a polyester. With regard to the issues under Article 100(b) and 84 EPC, the Respondent relied on the reasoning in the decision under appeal.

VII. A communication was issued by the Board on 7 June 1999, raising certain objections to these claims, in particular: (i) that the claim, although requiring the presence of a further consituent F, only demanded that the sum of the constituents A, B, C, D and E be 100%; (ii) that there was no basis for the case that both D and F were stabilisers against transesterification; and (iii) that the deletion of the disclaimer from Claim 1 represented a "reformatio in peius", which rendered the thus amended claim inadmissible.

VIII. Four further sets of claims forming a main and first, second and third auxiliary requests respectively were

filed by the Respondent with a letter dated 2 June 1999, which was received by the EPO on 4 June 1999 and by the Board on 9 June 1999, thus evidently crossing the communication of 7 June 1999 issued by the Board.

Claim 1 of the main request had been corrected to state that the sum of constituents A, B, C, D, E, and F was 100%, but still omitted the disclaimer (section III, above).

Claim 1 of the first auxiliary request differed from that of the main request in that the disclaimer had been restored.

Claim 1 of the second auxiliary request differed in that constituent D was defined as "a phosphite or phosphorous acid", and the disclaimer had again been omitted. Claims 2 to 5 of the main and first and second auxiliary requests corresponded to Claims 2 to 5 as granted.

Claim 1 of the third auxiliary request was directed to the use of 0.1-5% by weight of constituent C to suppress transesterification in a composition otherwise corresponding to that defined in Claim 1 of the patent in suit as granted. Claims 2 and 3 of this request were directed to elaborations of the use of constituent C in a polymer mixture according to Claim 1, and Claims 4 and 5 were directed to the use of constituent C to suppress transesterification in a polymer mixture forming a further elaboration of that defined in Claim 1.

IX. Objections were raised against these latter claims, in

a submission of the Appellant, filed on 7 July 1999.

X. Oral proceedings were held on 18 August 1999. During the oral proceedings, the Respondent submitted further amendments to the main, and first and second auxiliary requests of 4 June 1999, the amendments in each case being firstly to add, between line 2 and line 3 of the definition of constituent F (Claim 1), the following:

"and in which the sum of D and F is 0-50% by weight". Furthermore, Claims 4 and 5 were deleted from each of the requests. The main request thus amended was termed the "first main request".

The admissibility of document D8 into the proceedings was discussed, and so, thereafter, was the allowability of the "first main request" in relation to all other relevant issues arising under the EPC concerning this request.

After intermediate recess and deliberation, the Board decided to exclude document D8 from the proceedings, and also decided that the "first main request" was not allowable.

The Respondent thereupon submitted a new main request, termed the "second main request", corresponding to the amended form found allowable according to the decision under appeal. The Board again adjourned to decide upon the allowability of this "second main request", and found it to be unallowable.

The Respondent thereupon relied upon the third auxiliary request, filed on 4 June 1999, which, after

modification during the oral proceedings, became a set of three claims forming the sole request relied upon by the Respondent, and was termed the "first auxiliary request" filed during oral proceedings. Claim 1 of this request reads as follows:

"Use of 0.1-5% by weight of one or more esters of one or more trifunctional to hexafunctional alcohols and one or more saturated aliphatic C_5-C_{34} mono- or dicarboxylic acids (C) to suppress transesterification in a polymer mixture which comprises the following constituents:

A. 1-98.9% by weight of an aromatic polycarbonate,

B. 98.9-1% by weight of an aromatic polyester, consisting of a polyalkylene terephthalate derived from a glycol with 2-10 carbon atoms and terephthalic acid, in which not more than 30 mol% of the glycol and/or terephthalic acid is replaced by other comonomers,

D. 0-25% by weight of one or more agents to improve the impact strength, and

E. 0-50% by weight of conventional additives, in which the sum of the constituents A, B, C, D and E is 100% by weight,

with the exception of polymer mixtures comprising glass fibres, and not comprising a low molecular weight compound with up to 70 C-atoms and with $(-SO_3)-_m$ Q groups, in which Q represents hydrogen, NH_4+, an alkali or earth alkaline metal and m is a whole number which is equal to the value of the valence of Q, and not comprising a polymeric substance with sulphonic acid groups."

Claim 2 reads as follows:

"Use of 0.1-2% by weight of constituent C to suppress transesterification in a polymer mixture of claim 1"

Claim 3 reads as follows:

"Use of a tetrastearate of pentaerythritol as constituent C to suppress transesterification in claim 1 or 2."

The reason given, by the Respondent at the oral proceedings, for the deletion of Claims 4 and 5, originally present in the third auxiliary request filed on 4 June 1999, was solely to curtail discussion of the allowability of their wording.

XI. The Appellant requested that the decision under appeal be set aside, and the patent in suit revoked in its entirety.

The Respondent requested that the decision under appeal be set aside and the patent in suit be maintained on the basis of any of the three sets of claims labelled "first main request", "second main request" and "first auxiliary request", all submitted during oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. *Admissibility of amendments*

2.1 "First main request"

Claim 1 of the "first main request" differs from that of the set of claims underlying the decision under appeal in two respects, namely that:

(i) a requirement for the presence of a new component "D", defined as "a conventional stabilizer to prevent transesterification", has been introduced, with previous constituents D and E becoming E and F, respectively, and the percentages becoming subject to the further requirements:

(a) that the sum of the constituents A, B, C, D, E and F is 100%; and

(b) that the sum of D and F is 0 to 50%, and

(ii) the disclaimer "..., and not comprising a terpolymer of ethylene, acrylic acid and t.-butylacrylate." has been deleted.

2.1.1 As regards amendment (i), the constituent newly defined as "D", the "conventional stabilizer to prevent transesterification" was, in Claim 1 as granted, previously subsumed under constituent "E", "0-50% by weight of conventional additives...".

2.1.1.1 The relevant section of the description under: "E. Conventional additives" contains a statement according to which: "In addition to constituent C, the polymer mixture according to the invention may comprise by way of constituent E a conventional stabiliser to prevent transesterifications, for example, a phosphite or phosphorous acid." (page 4,

lines 30 to 32). The phrase "by way of", however, would be understood in its normal meaning to refer to the whole of constituent E. The phrase thus only provides a basis for the whole of this constituent to be such a stabiliser.

2.1.1.2 The statement earlier in the same section, that "The polymer mixture according to the invention may comprise as additives, for example, polyolefins, mould-release agents, agents to improve the flame-retarding properties, stabilisers, for example, thermal stabilisers, pigments, dyes.", whilst providing a basis for such various kinds of additives, does not refer specifically to stabilisers to prevent transesterification (page 4, lines 25 to 27). It consequently does not provide a basis for a combination of a conventional stabiliser to prevent transesterification with one of the above mentioned additives.

2.1.1.3 Even the statement immediately following, that "More in particular the polymer mixture according to the invention may also comprise a combination of several of the various additives mentioned hereinbefore.", only refers to the stabilisers listed at lines 25 to 27 (section 2.1.1.2, above). Consequently, it also does not provide a basis for a specific mixture of a stabiliser to prevent transesterification (which is not mentioned) with such an additive.

2.1.1.4 The argument of the Respondent at the oral proceedings, that a relevant basis was provided by the single example of the patent in suit, since this disclosed a composition having the both H_3PO_3, which is

a conventional stabiliser to prevent transesterification, and further (unspecified) stabilisers (TS), is not convincing, for the following reasons: whilst the example admittedly shows a specific example of a conventional stabiliser to prevent transesterification (H_3PO_3) and unspecified additives to provide thermal and UV stability ("TS"), these are present in extremely low percentages (0.027 and 0.9 wt%, respectively) whereas the generality claimed for these additives is up to 50%. A single example of such a stabiliser in such a low amount can hardly give the skilled person reason to understand a generalisation both to the choice of stabiliser to cover any conventional transesterification stabiliser, and to the amount of the latter, to be higher by a factor of nearly 200, as well as any further additive in an amount higher by a factor of up to 50. Nor was any other evidence adduced as to why the skilled person would understand such a generalisation of the single example to be valid. Consequently, the example does not form a basis for the generalisation claimed.

2.1.1.5 Even if a different view had been taken as to the generalisability of the single example, its suitability as a basis for the claimed subject-matter would have been clouded by the requirement that whereas, according to the generalisation in Claim 1, the relevant constituents A, B, C, D and E must add up to 100%. This does not, however, apply in the case of the example, since its constituents do not add up to 100%. Consequently, the example in any case does not provide a clear basis for such an amendment.

2.1.1.6 In summary, the disclosure does not provide a basis for component E comprising a combination of a stabiliser to prevent transesterification with another conventional additive, in the amounts now required.

2.1.1.7 The onus was, however, on the party proposing the amendment (here the Respondent), to show such a basis in the documents of the application as filed. This the Respondent has failed to do. Consequently, Claim 1 does not meet the requirements of Article 123(2) EPC.

2.1.2 Quite apart from the above, the feature that "the sum of D and F is 0-50% by weight" cannot be fulfilled at 0% by weight, because of the simultaneous requirement that D necessarily be present. Consequently, the amendment also leads to unclarity in the sense of Article 84 EPC.

2.1.3 Finally, since claims filed for the first time at an oral proceedings are generally required to be **clearly** allowable to be accepted by the Board, which is not the case here, it was necessary to refuse the request (T 153/85, OJ EPO 1988, 001).

2.1.4 In view of the above, the "first main request" is rejected.

2.2 "Second main request"

Claim 1 of this request, which corresponds to the version underlying the decision under appeal, differs from Claim 1 as granted only by the inclusion of the disclaimer, "..., and not comprising a terpolymer of ethylene, acrylic acid and t.-butylacrylate."

(Sections III, and 2.1(ii), above). There is no basis for such a disclaiming amendment in the documents of the application as filed themselves, however, as admitted by the Respondent at the oral proceedings before the Board. The amendment had only been allowed, according to the decision under appeal, by way of disclaimer of otherwise novelty destroying subject-matter in D1. It has first to be established by the Board, however, whether such a disclaimer is allowable.

2.2.1 In this connection, the disclaimer is drafted in terms broader than the relevant disclosure of D1, which consisted only of comparative Example 2 in that document. In particular, the relevant terpolymer is described in the example (page 19, component V.), not simply as a terpolymer of ethylene, acrylic acid and tert.-butyl acrylate, but rather as one having the components in a particular weight ratio (89/4/7), as having a particular melt index (6-8 g/10 min., measured at 190°C and 2.16 kp loading, according to DIN 53 735), and having a certain density (0.924 g/cm^3, measured according to DIN 53 479).

2.2.2 To the extent that the disclaimer goes beyond these essential features, it has no basis in the disclosure of the document to be disclaimed. Nor was the Respondent able to point to any other basis in D1 which might otherwise have justified a disclaimer drawn in these broad terms. Consequently, the disclaimer amounts to an amendment which does not meet the requirements of Article 123(2) EPC. Since, furthermore, the request itself had previously been abandoned (being superseded by the claims of 30 April

1997) and not referred to in the proceedings in the meantime, its unexpected re-introduction during the oral proceedings before the Board conferred upon it the status "late-filed", and thus the requirement that it be "clearly allowable" (cf. section 2.1.3, above). Thus it was necessary, for the reasons given, to reject the "second main request".

2.3 "First auxiliary request"

Claim 1 differs from Claim 1 in the form as maintained in the decision under appeal, by a change of category (from a product "per se" to a specific use of that product), and also by the omission of a disclaimer, as previously referred to (section 2.1(ii), above).

2.3.1 There is a basis, in the sense of Article 123(2) EPC, for the new use, in the description of the patent specification on page 2 at lines 9 to 11, which refers to the suitability of the esters C to suppress transesterification, which description is also to be found in the application as originally filed (page 1, fourth paragraph). Consequently, no objection arises under Article 123(2) EPC in this respect.

2.3.2 As regards the change of category, this falls squarely within the terms set out in the decision of the Enlarged Board of Appeal G 2/88, according to which such a change of category is not open to objection under Article 123(3) EPC (G 2/88, OJ EPO 1990, 093; Order, point (ii)).

2.3.3 As regards the absence of the disclaimer, there can be no objection under Article 123(3) EPC to this, since

it was not present in the relevant claim as granted.

2.3.4 Nor was any objection under Article 123 EPC raised by the Appellant against this claim.

2.3.5 In summary, Claim 1 meets the requirements of Article 123(2) and (3) EPC.

2.4 *Reformatio in peius*

To the extent that Claim 1 of the latter request omits a disclaimer which was present in Claim 1 underlying the decision under appeal, the question arises as to whether such absence results in a broadening of the scope of the claim which could amount to a "reformatio in peius", in the sense of the decisions of the Enlarged Board G 9/92 and G 4/93 (both OJ EPO 1994, 875, including footnote).

2.4.1 According to the relevant part of the Order of these decisions, "If the opponent is the sole appellant against an interlocutory decision maintaining the patent in amended form, the patent proprietor is primarily restricted during appeal proceedings to defending the patent in the form in which it was maintained by the Opposition Division in its interlocutory decision. Amendments proposed by the patent proprietor as a party to the proceedings as of right under Article 107, second sentence, EPC, may be rejected as inadmissible by the Board of Appeal if they are neither appropriate or necessary." (Order, point 2).

2.4.2 In the present case, the originally allowed disclaimer

on which the claim was maintained according to the decision under appeal was not allowable, because it was broader than the prior art it purported to overcome, so that it offended against the provisions of Article 123(2) EPC (section 2.2.2, above). Consequently, some form of further amendment to remove this objection was evidently necessary.

2.4.3 As to the propriety of the amendment, it is evident from the established case law of the Boards of Appeal that, whilst originally disclosed subject-matter, clearly defined by technical features, may, at the applicant's request, be excluded from a wider claim by a disclaimer, if the subject-matter remaining in the claim cannot technically be defined directly (positively) more clearly and concisely, nevertheless a positive restriction, properly based on the originally filed disclosure is preferable (cf, T 4/80, OJ EPO 1982, 149). The amendment in the present case involves the replacement of the disclaimer by precisely such an allowable, positive restriction (the change of category). Consequently, the amendment, taken as a whole, must be regarded as appropriate.

2.4.4 In summary, the amendment adopted in Claim 1 does not suffer from either of the deficiencies referred to in the relevant part of the Order of the decision of the Enlarged Board, since it is both necessary and appropriate.

2.4.5 As regards the change of position of the Appellant as a result of the amendment, the Board is aware that a related point of law has been referred to the Enlarged Board of Appeal, in the decision T 315/97 (OJ EPO

1999, 554), specifically, "Must an amended claim which would put the opponent and sole appellant in a worse situation than if he had not appealed - e.g. by deleting a limiting feature of the claim - be rejected?".

2.4.5.1 The situation in the present case is not, however, considered to be strictly comparable to that referred to the Enlarged Board, firstly because the deleted matter is not a limiting technical feature in the sense of the above decision, but rather a disclaimer which is non-allowable in law.

2.4.5.2 Secondly, and even if this had not been the case, the amendment does not consist in simply deleting the disclaimer, but instead involves replacing it by a technically more relevant direct limitation (the change of category). This in fact narrows the totality of the claims to such an extent as to exclude all uses of the composition except the one now claimed.

2.4.5.3 The remnant of use which was previously covered by disclaimer (the presence of certain terpolymers) evidently has no technical relevance to the remaining features of the claim, and is in any case vestigial in extent, compared with the major restriction represented by the change of category. It cannot, in the Board's view, support any reasonable assertion that the overall effect of the amendment was to put the Appellant "in a worse position", in the sense of the above decision, than if he had not appealed in the first place.

2.4.5.4 Nor did the Respondent submit any particular reason

why such an amendment should put him "in a worse position" in this sense.

2.4.5.5 Consequently, the amendment of Claim 1 of the sole "first auxiliary request" does not amount to a case of "reformatio in peius". It is thus admissible.

3. *Admissibility of late-filed document*

Document D8 was not cited during the nine month period allowed for opposition pursuant to Article 99(1) EPC and to this extent must be regarded as not submitted in due time under Article 114(2) EPC. Nevertheless, it is within the discretion of the Board under Article 114(1) EPC to admit and consider such a document in the proceedings in view of its relevance. As to the degree of relevance required for such a document to be admitted to the proceedings, another Board has found, following the principles laid down in the opinion of the Enlarged Board of Appeal G 10/91 (OJ EPO 1993, 420), that such material should be *prima facie* highly relevant in the sense that it can reasonably be expected to change the eventual result and is thus highly likely to prejudice the maintenance of the European patent (T 1002/92; OJ EPO 1995, 605; Reasons, point 3.4).

In the present case, D8 discloses a flame-retardant resin composition comprising, in addition to polybutylene terephthalate and a bromine-containing polycarbonate, a higher fatty acid ester having 12 to 32 carbon atoms, and even mentioning, in a list, "mono- or diester of neopentylene glycol with montanic acid" (page 6, lines 5 to 6). There is, however, no

disclosure of a specific ester falling within the terms of the definition of "ester C" in Claim 1 of the patent in suit, let alone an example utilising such a compound. To this extent D8 is more remote from the claimed subject-matter than, say D1, which does contain such an example, although admittedly comparative, of PETS, the preferred "ester C" according to the patent in suit. Furthermore, there is no suggestion in D8 of the use of the esters referred to for conferring flame retardancy. Consequently, D8 in essence does not represent a greater threat to the claimed subject-matter than the remaining documents in the case. Hence it does not meet the criterion of relevancy set out in the jurisprudence referred to. It was consequently excluded from the proceedings under Article 114(2) EPC.

4. *Sufficiency (Article 100(b) EPC)*

The Board concurs with the finding, in the decision under appeal, that there is no insufficiency arising from the definitions of the "agents to improve the impact strength" and the "conventional additives" (components "D" and "E" according to Claim 1, respectively), for the reasons given in that decision, namely that the skilled person would, in the light of the teaching already present in the patent in suit, not have any appreciable difficulty in finding and applying suitable such additives, which were in any case only optional features.

As regards the absence of a specific designation, in Comparative Example A and illustrative Example I of the patent in suit, of the identity of the additive

"TS", it should be assumed, firstly that the same additive is used in each case, and secondly that the additive was a mixture of conventional stabilisers to improve the thermal and UV stability (page 4, lines 23 and 50). For reasons analogous to those given in the decision under appeal in relation to the other additives, the Board sees no reason why the skilled person should find himself under an excessive burden to find and apply, from his general knowledge, a suitable mixture of such additives.

Nor was any reason offered by the Appellant, beyond those already dealt with in the decision under appeal, why the choice of such additives should represent an excessive burden for the skilled person.

Consequently, the Board confirms the finding of the decision under appeal that the requirements of Article 100(b) EPC are met.

5. *The patent in suit; the technical problem*

The patent in suit is concerned in general terms with polymer mixtures which comprise an aromatic polycarbonate and an aromatic polyester, and in particular with the suppression of a certain instability which such mixtures show, probably due to transesterification occuring in the polymer mixture (patent in suit, page 2, lines 3 to 6). The suppression of a colouring effect in such mixtures, which is attributable not to a phenomenon of degradation of the polyester, but to one which occurs as a result of the mixing of the two resins, is admittedly known from D7, which corresponds to the

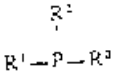
document GB-A-1 466 154, cited in the description of the patent in suit. This is considered by the Board, in line with the decision under appeal, to represent the closest state of the art.

5.1 According to D7, it was found that the colouring effect could be inhibited by incorporating in a blend of an aromatic polyester and a polycarbonate a specific phosphorus compound in an amount far smaller than that required for exhibiting a fire retardant effect (column 1, line 57 to column 2, line 5). The resulting composition thus comprised:

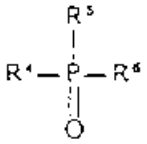
1. 100 parts by weight of an aromatic polyester resin derived from a glycol component at least 70 mole% of which consists of tetramethylene glycol and an acid component at least 70 mole% of which consists of an aromatic dicarboxylic acid which are polymerised with a titanium catalyst,

2. 5 to 100 parts by weight of a polycarbonate resin, and

3. 0.01 to 3 parts by weight per 100 parts by weight of the aromatic polyester resin of at least one phosphorus compound which is liquid or solid at room temperature selected from the group consisting of phosphorus compounds of the following formulae



or



wherein each of R^1, R^2 and R^3 and each of R^4, R^5 and R^6 represent a hydrogen atom, an alkyl group containing 1 to 20 carbon atoms, an aryl group containing 6 to 20 carbon atoms, an aralkyl group containing 7 to 20 carbon atoms, or -OR group in which R is a hydrogen atom, an alkyl group 1 to 20 carbon atoms, an aryl group containing 6 to 20 carbon atoms, an aralkyl group containing 7 to 20 carbon atoms; R^1, R^2 and R^3 or R^4, R^5 and R^6 may be different from each other, or at least two of R^1, R^2 and R^3 or R^4, R^5 and R^6 may be the same, or at least two of R^1, R^2 and R^3 or R^4, R^5 and R^6 may form a ring, and metal salts of these phosphorus compounds (Claim 6 in conjunction with Claim 1). Specific examples of the materials which may be added are mono-, di- or trisodium phosphate, calcium phosphite, potassium phosphonate and sodium diphenylphosphonite (column 4, lines 40 to 47).

5.2 The technical problem objectively arising may be seen in the search for aromatic polycarbonate/polyalkylene terephthalate compositions of improved thermal stability, particularly under severe conditions of injection moulding corresponding to long hold-up times at high temperatures.

5.3 The solution proposed according to Claim 1 of the patent in suit is to suppress transesterification in the mixture by using 0.1 to 5% by weight of "ester C".

5.4 The results are given, in Table I of the patent in suit, of the change in Vicat B values (delta Vicat B), which is a measure of the change in softening point and thus of extent of transesterification, between test pieces injection moulded under normal conditions (255°C, residence time 2 min) and under extra heavy conditions (285°C, 6 min), as between a polycarbonate/polybutylene terephthalate composition additionally containing 0.3% by weight PETS as "ester C" (illustrative Example I) and a similar composition containing no "ester C" (comparative Example A). It can be seen from these results, that the delta Vicat B of the former, at 17°C, is appreciably lower than that of the latter, at 25°C. In other words, the addition of PETS leads to a lower degree of transesterification, corresponding to a further improved thermal stabilisation (page 5, lines 1 to 37).

5.4.1 Whilst it is true that the formulation of the technical problem in the decision under appeal, in contrast to that in the present decision (section 4.2, above) makes no explicit reference to more severe moulding conditions (hold-up at 285°C for a time of 6 minutes), the relevant results were nevertheless taken into account in that decision. Consequently, the decision under appeal assessed correctly, in the Board's view, the effect obtained according to the patent in suit.

5.4.2 The criticism of the Appellant that the formulation of the technical problem in the decision under appeal was artificial and unjustified (Section V(b), above) goes to the relevance of the severe conditions themselves. It is not, however, convincing, since such conditions will, in the Board's view, inevitably be experienced sooner or later in the course of the normal practice of injection moulding. Nor was any reason given by the Appellant why such longer residence times and higher hold-up temperatures would never, in practice, be encountered with the claimed compositions. Consequently, the ability to avoid or reduce thermal deterioration of the moulding composition under such severe conditions is, in the Board's view, a relevant technical advantage.

5.4.3 In the light of the above, the experimental evidence filed by the Appellant to show that the alleged improved thermal stability was not obtained under "normal" moulding conditions (section V, last paragraph, above) is irrelevant, since it fails to demonstrate that the alleged advantage is not obtained by the claimed measures.

5.4.4 Furthermore, the compositions compared in Example I and comparative Example A according to the patent in suit differ only in the presence or absence of PETS. Consequently, the comparison shows convincingly that the improvement is due specifically to the presence of the characterising "ester C" ("PETS").

5.4.5 In summary, the Board finds it credible that the claimed measure provides an effective solution of the stated problem.

6. *Novelty*

Claim 1 is directed to "**Use** of 0.1-5% by weight of one or more esters of one or more trifunctional to hexafunctional alcohols and one or more saturated aliphatic C_5-C_{34} mono- or dicarboxylic acids (C) **to suppress transesterification** in a polymer mixture..." (as defined in the claim; emphasis by the Board). It has not been disputed that the esters (C) themselves belong to the state of the art, as evidenced by D1, D2, and D3, each of which discloses such a compound (decision under appeal; Reasons, point 8). Consequently, Claim 1 amounts to a claim to the use of a known compound for a particular purpose.

The issue of novelty in claims of this form has been adjudicated in the decision of the Enlarged Board of Appeal, G 2/88 (supra). According to the latter, "A claim to the use of a known compound for a particular purpose, which is based on a technical effect which is described in the patent, should be interpreted as including that technical effect as a functional feature, and is accordingly not open to objection under Article 54(1) EPC provided that such technical feature has not been made available to the public." (Order, point (iii)).

In the present case, the technical effect, of improving thermal stability of the relevant polymer mixture by suppressing transesterification under

severe conditions, has been found to be achieved by the claimed measures (section 5.4.5, above). Consequently, the claim may properly be interpreted as including this effect as a limiting functional feature.

6.1 Document D1 is concerned with the preparation of a dispersion of polytetrafluoroethylene (PTFE) in a thermoplastic resin and to the use of such dispersions as additives for thermoplastic resins to improve their anti-dripping properties. According to the relevant Comparative Example 2, a composition not containing the PTFE component, nevertheless comprises a polycarbonate (51.5 wt%), a polybutylene terephthalate (36 wt%); a cross-linked polybutadiene-methylmethacrylate graft polymer (10 wt%); a terpolymer of ethylene, acrylic acid and tert-butyl acrylate in a weight ratio of 89/4/7, having a melt index of 6-8 g/10 min and a density of 0.924 g/cm^3 (2 wt%) as well as PETS (0.5 wt%), the latter as a usual mould release agent. There is no disclosure of the "PETS" having any other function than that of a **mould release agent**. Consequently, the relevant functional feature is not disclosed in D1.

6.2 According to D2, there is provided a thermoplastic moulding composition containing an aromatic polycarbonate and 0.1 to 3.0 wt% of specific saturated carboxylic acid esters, preferably PETS (Claims 1, 2). The ester, which functions as a mould release agent, is not only compatible with the polycarbonate melt, but there is no visible deterioration of the polymer properties caused by the added ester and the additive furthermore acts synergistically with known UV

stabilisers for polycarbonates, to improve the UV stability (page 4, first complete paragraph). There is no mention of transesterification, let alone its suppression by the presence of the ester additive. Whilst the absence of visible deterioration of polymer properties might be taken to imply a thermal stabilising effect of some kind, this clearly cannot be attributable to suppression of transesterification, since the composition does not contain a combination of polycarbonate and polyester. Consequently, D2 also fails to disclose the relevant functional feature.

6.3 According to D3, a thermoplastic composition having good mould release properties and containing a mould release agent comprises a linear crystallisable polyester having a melting point above about 150°C, e.g. polyethylene terephthalate, 0.1 to 3 wt% of certain esters of carboxylic acids, e.g. PETS, and 0.1 to 3 wt% of a synergistic agent selected from (a) alkali and alkaline earth metal salts of certain organic acids; (b) talc; and (c) asbestos (Claims 1 and 3). There is no statement or suggestion that the ester, preferably PETS, functions other than as a mould release agent. Nor can it function as a transesterification suppressor, because there is no combination of polycarbonate and a polyester. Consequently, there is no anticipation, in D3, of the relevant functional feature.

6.4 According to D6, there is disclosed a polycarbonate composition of improved melt flow and impact strength after aging at elevated temperatures, comprising a major amount of a high molecular weight aromatic polycarbonate in admixture with a minor amount of a

polyolefin, and a paraffin derivative, preferably PETS (Claims 1 and 2; column 1, line 65 to column 2, line 7). There is no mention of transesterification. Nor would such an effect be possible, for reasons analogous to those given in relation to D2 and D3, above. Hence, the relevant functional feature is also absent from the disclosure of D6.

6.5 Indeed, the Appellant confirmed at the oral proceedings, that none of the cited documents dealt with the transesterification function of the compound "ester C".

6.6 Consequently, none of the disclosures of D1, D2, D3 or D6 is novelty destroying for the subject-matter of Claim 1.

6.7 Nor is there any mention, in D7, of compounds corresponding to "ester C". Consequently, the disclosure of D7 is also not novelty destroying for the subject-matter of Claim 1.

6.8 In summary, the subject-matter of Claim 1 is novel. In a similar manner, the subject-matter of Claims 2 and 3, which are respectively directed to a use falling within the scope of Claim 1, is also novel.

7. *Inventive step*

To assess the question of inventive step, it is necessary to consider whether the skilled person, starting from D7 and wishing to improve the thermal stability, especially at high temperatures and with long hold-up times during injection moulding, would

have expected that this could be achieved in that transesterification would be suppressed by adding an "ester C".

7.1 There is no suggestion to do this in D7, since the disclosure does not mention the use of such an ester.

7.2 Nor is there any suggestion to do this in the other documents, for the reasons already given in relation to novelty.

7.3 The argument of the Appellant, that the lack of deterioration of polymer properties observed in the case of the compositions according to D2 and D3 would lead the skilled person to apply PETS as a thermal stabiliser in view of his general knowledge that coloration problems were due to transesterification (section V(e), above) is not convincing, for two reasons:

7.3.1 Firstly, it was never shown by the Appellant that it belonged to the general knowledge of the skilled person that the coloration problems encountered in compositions of polycarbonate/polyalkylene terephthalate were due to transesterification. Such a phenomenon is not mentioned in D7, and is only hasarded, using the word "probably", in the patent in suit itself.

7.3.2 Secondly, even if it were accepted that the skilled person would have been aware of the role played by transesterification in the problem addressed by the patent in suit, none of the other documents considered, in particular D2 or D3, mention such a

phenomenon. On the contrary, the existence of a problem of transesterification is excluded in these compositions, for the reasons given in relation to novelty (sections 6.1 to 6.3, above). Consequently, the skilled person would disregard their teaching as irrelevant to the problem he faced.

7.3.3 Hence, there is no "one way street" leading to the claimed subject-matter in the light of these documents (section V(e), above). Indeed, there is no indication at all of the relevant capability of an "ester C" of suppressing transesterification in the relevant polymer mixtures.

7.3.4 The argument that the transesterification suppressing effect of PETS was inherently present, say in Example 2 of D1 (section V(c), above) is irrelevant, because, in the absence of this feature having been "made available" (section 6.1, above), the skilled person would not have been aware of the effect, nor, therefore, in a position to use it as a basis for initiating a relevant modification.

7.4 In other words, the solution to the stated problem does not arise in an obvious way from the state of the art. Consequently, the subject-matter of Claim 1 involves an inventive step (Article 56 EPC). The same conclusion applies also to the subject-matter of Claims 2 and 3, since these fall within the scope of Claim 1 (section 6.8, above).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Opposition Division with the order to maintain the patent with the claims labelled "first auxiliary request", submitted during oral proceedings and after any consequential amendment of the description.

The Registrar: The Chairman:

E. Görgmaier C. Gérardin