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Datasheet for the decision of 15 June 2016

Case Number: T 0422/13 - 3.3.03

Application Number: 02777112.0

Publication Number: 1432762

IPC: C08L67/02, C08J5/18

Language of the proceedings: EN

Title of invention:
TRANSPARENT POLYESTER RESINS AND ARTICLES THEREFROM

Patent Proprietor:
COBARR S.p.A.

Opponents:
Invista Technologies S.à r.l.
Mitsubishi Gas Chemical Company, Inc.

Headword:

Relevant legal provisions:
EPC Art. 83, 84, 111(1), 123(2)

Keyword:
Amendments - extension beyond the content of the application as filed - main request (no)
Claims - clarity - main request (yes)
Sufficiency of disclosure - main request (yes)
Appeal decision - remittal to the department of first instance (yes)

Decisions cited:

Catchword:

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Case Number: T 0422/13 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 15 June 2016

Appellant: (Patent Proprietor)	COBARR S.p.A. Località Ribrocca s.n.c. 15057 Tortona (AL) (IT)
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Respondent: (Opponent 1)	Invista Technologies S.à r.l. Zweigniederlassung St. Gallen Flurhofstrasse 160 9000 St. Gallen (CH)
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Respondent: (Opponent 2)	Mitsubishi Gas Chemical Company, Inc. 5-2, Marunouchi 2-chome Chiyoda-ku, Tokyo 100-8324 (JP)
Representative:	Plassmann, Clemens Hogan Lovells International LLP Kennedydamm 24 40476 Düsseldorf (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 December 2012 revoking European patent No. 1432762 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	M. C. Gordon
Members:	O. Dury
	C. Brandt

Summary of Facts and Submissions

I. The appeal by the patent proprietor lies against the decision of the opposition division revoking European patent No. EP 1 432 762, based on application No. 02 777 112.0 corresponding to the international application No. WO 2003/029349.

II. The application as filed contained 12 claims, of which the claims relevant to the present decision read as follows:

"1. Compositions usable for preparing articles having high trasparency (sic) comprising an aromatic polyester resin and a polyxylylene amide, in which the polyester resin is selected from the copolyalkylene terephthalates containing from 3 to 15% by mols of units derived from isophthalic acid and/or napthalene (sic) dicarboxylic acids and the polyamide is dispersed in the polyester resin matrix as domains having average numeral size from 30 to 200 nm."

"2. Compositions according to Claim 1, in which the melt viscosity ratio between the polyester resin and the polyamide is higher than 1.5 : 1."

"4. Compositions according to Claim 1 or 2, in which the polyxylylene amide is poly (m. xylylene adipamide) used in amount of 1 to 15% by weight relative to the polyester resin."

"5. Compositions according to Claim 1 to 4, wherein the polyxylylene amide domains have an average numeral size of 80 to lOOnm and more than 80% of the domains have size of 80 to 110 nm."

"7. Compositions according to claim 1 to 6 obtained by pre-melt mixing the polyester resin with a dianhydride of a tetracarboxylic acid and subsequently adding and mixing the polyxylylene amid (sic) under shear conditions suitable to obtain a fine and stable dispersion of the polyamide in the polyester matrix."

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

IV. The decision under appeal was based on a main request and two auxiliary requests. Claim 1 of auxiliary request 2 read as follows:

"1. Compositions usable for preparing articles having high transparency comprising an aromatic polyester resin and a polyxylylene amide, in which the polyester resin is selected from the copolyalkylene terephthalates containing from 3 to 15 % by mols of units derived from isophthalic acid and/or napthalene (sic) dicarboxylic acids, the melt viscosity ratio between the copolyalkylene terephthalate and the polyamide is higher than 1.5:1, and the polyamide is dispersed in the polyester resin matrix as domains having average numeral size from 30 to less than 100 nm, and wherein the polyxylylene amide is poly (m. xylylene adipamide) used in amount of 1 to 15% by weight relative to the polyester resin, and wherein the compositions are obtainable by pre-melt mixing the polyester resin with a dianhydride of a tetracarboxylic acid and subsequently adding and mixing the polyxylylene amide under shear conditions suitable to

obtain a fine and **stable dispersion** of the polyamide in the polyester matrix." (emphasis by the Board).

According to that decision, auxiliary request 2 did not fulfil the requirements of Art. 84 EPC, in particular because the term "stable dispersion" was vague and ill-defined. The following document was in particular cited:

D27: Maruhashi Y., Iida, S, "Transparency of Polymer Blends", Polymer Engineering and Science, Vol. 41, No. 11, pages 1987-1995

V. The patent proprietor (appellant) appealed the above decision. With the statement setting out the grounds for the appeal, the appellant requested that the opposition division's decision be set aside and the patent be maintained in amended form according to either the main request or any of auxiliary requests 1-4 filed therewith. Also, remittal to the first instance to deal with the issue of novelty and inventive step was requested.

VI. With their rejoinders dated 26 and 19 August 2013 opponents 1 and 2 (respondents 1 and 2) both requested that the appeal be dismissed. Opponent 1 further requested that, should any of the appellant's requests be held to fulfill the requirements of Art. 123(2), 83 and 84 EPC, the case be remitted to the first instance to deal with the issue of novelty and inventive step.

VII. With a communication accompanying the summons to oral proceedings dated 1 December 2015, the Board set out its preliminary view of the case. Concerns were in particular identified in respect of Art. 83, 84 and/or

123(2) EPC regarding each of the pending requests.

VIII. With a letter of 18 April 2016 the appellant filed additional auxiliary requests 5A (7 claims) and 5B.

Claim 1 of auxiliary request 5A read as follows (additions as compared to claim 1 of the application as filed are indicated in **bold**, deletions in ~~strikethrough~~):

"1. Compositions usable for preparing articles having high tra**n**sparency comprising an aromatic polyester resin and a polyxylylene amide, in which the polyester resin is selected from the copolyalkylene terephthalates containing from 3 to 15 % by mols of units derived from isophthalic acid and/or nap**h**thalene dicarboxylic acids, **the melt viscosity ratio between the copolyalkylene terephthalate and the polyamide is higher than 1.5:1**, and the polyamide is dispersed in the polyester resin matrix as domains having average numeral size from ~~30~~ **80 to** ~~200~~ **100 nm and wherein the polyxylylene amide is poly (m. xylylene adipamide) used in amount of 1 to 15% by weight relative to the polyester resin and wherein the compositions are obtainable by pre-melt mixing the polyester resin with a dianhydride of a tetracarboxylic acid and subsequently adding and mixing the polyxylylene amide under shear conditions suitable to obtain a fine and stable dispersion of the polyamide in the polyester matrix, wherein the mixing of the polyester resin, pre melt-mixed with the dianhydride, and the polyxylelene amide is carried out in an extruder by melt-mixing at shear rates higher than** 100 s^{-1}**, and wherein more than 80% of the domains have size of 80 to 110 nm**".

Claim 2 was directed to a preferred embodiment of

claim 1. Claims 3 and 4 were directed to articles, films and containers having haze less than 3% and obtained from compositions according to anyone of claims 1 to 2.

IX. With telefaxes of 13 May 2016 and 10 May 2016, opponents 1 and 2, respectively, submitted further arguments.

X. With letter of 2 June 2016 the patent proprietor made further submissions, whereby the following documents were *inter alia* referred to:

D6: Polymer blends, Vol. 1, pages 509-516, 1999
HE3: Declaration of Dr. G. Elliott dated 31 May 2016

XI. Towards the end of the oral proceedings before the Board, which were held on 15 June 2016 in the presence of all parties, the patent proprietor withdrew the then pending main request and auxiliary requests 1-4. A new auxiliary request 5A, the four claims of which were identical to claims 1-4 of auxiliary request 5A filed with letter of 18 April 2016, was filed replacing the earlier filed auxiliary request 5A. As a consequence, the sole operative requests remaining at the end of the oral proceedings were the main request filed at the oral proceedings containing four claims corresponding to claims 1 to 4 of auxiliary request 5A filed with letter of 18 April 2016 and auxiliary request 5B filed with letter of 18 April 2016.

During the oral proceedings it was clarified by the Board that no objection pursuant to Art. 83 EPC were maintained by the opponents in respect of the main request (4 claims) filed as amended auxiliary request 5A

during the oral proceedings on 15 June 2016.

At the end of the oral proceedings the Board announced its decision.

XII. The appellant's arguments, insofar as relevant to the operative main request, may be summarised as follows:

(a) Art. 123(2) EPC

The subject-matter of claim 1 was derivable from the combination of claims 1, 2, 4, 5 and 7 together with paragraphs 3 and 4 on page 3 of the application as originally filed. The shear rate defined in said fourth paragraph was related to the preceding paragraph at page 3 and, taking into account the application as filed in its entirety, was also disclosed in the case that a dianhydride of a tetracarboxylic acid was pre melt-mixed with the polyester resin as now defined in claim 1. It was further derivable from D6 and HE3 that shear forces and shear rates were interrelated.

(b) Art. 84 EPC

The "fine and stable" dispersion mentioned in claim 1 was the direct and inevitable result of the extrusion process also defined in claim 1. Also, claim 1 was directed to the compositions obtained directly from the extruder and in which the polyamide domains where frozen in the matrix of the polyester that had been pre melt-mixed with a dianhydride of a tetracarboxylic acid. In the context of claim 1, both the polyamide domains and the modified-polyester matrix were solids.

D27 illustrated the impact of stretching on haze properties but was not related to the stability of the

dispersions in the sense of claim 1.

(c) Art. 83 EPC

As a consequence of the amendments made, claim 1 required the pre melt-mixing of the polyester resin with a dianhydride of a tetracarboxylic acid. Therefore, the opponents' objections submitted in writing and the concerns identified in the Board's communication were addressed by the amendments made.

XIII. The respondents' arguments, insofar as relevant to the operative main request, may be summarised as follows:

(a) Art. 123(2) EPC

The third and fourth paragraphs on page 3 of the application as filed were to be read independently of each other. Therefore, the subject-matter of the product-by-process step now defined in claim 1 ("obtainable by ... 100 s^{-1}") amounted to the combination of two different process steps, which were not defined in the same manner in the application as filed and could have different meanings, potentially to the extent of not being compatible. Also, the fourth paragraph on page 3 of the application as filed could be read as relating a way of obtaining the dispersion defined in claim 1 without using the pre melt-mixing with a dianhydride of a tetracarboxylic acid, i.e. as a different embodiment which was not related to the melt-mixing process mentioned in paragraph 3 on page 3 of the application as filed.

The wording "melt mixing at shear rates higher than 100 s^{-1}" of the inserted product-by-process feature was not equivalent to the wording "under conditions of

temperature and shear forces" indicated in paragraph 3 of page 3 of the application as filed. Besides, said amendment did not reflect the feature "under conditions of temperature" also mentioned in said paragraph 3, also not when taking into account that the amendment was directed to a melt-mixing step.

In order to arrive at the subject-matter of claim 1, said product-by-process feature further had to be combined with a plurality of claims of the application as filed.

For those reasons, claim 1 did not satisfy the requirements of Art. 123(2) EPC.

(b) Art. 84 EPC

The term "stable dispersion" had no accepted definition and was not defined in any manner in the patent in suit. D27 showed that an otherwise transparent polyester/polyamide composition could be rendered hazy upon stretching due to the deformation of the polyamide domains. Such compositions could on one interpretation be considered as stable, since they were transparent, but they could equally be considered as not being stable, since they became hazy upon stretching. Under those circumstances, the subject-matter of claim 1 did not meet the requirements of Art. 84 EPC.

(c) Art. 83 EPC

No objections pursuant to Art. 83 EPC were maintained by the opponents during the oral proceedings before the Board (see minutes).

XIV. The appellant (patent proprietor) requested that the decision under appeal be set aside and that the case be remitted to the opposition division for dealing with the requirements according to Art. 54 and 56 EPC on the basis of the new main request, filed as amended auxiliary request 5A during the oral proceedings on 15 June 2016 or, alternatively, on the basis of auxiliary request 5B filed with letter dated 18 April 2016.

Respondents 1 and 2 (opponents 1 and 2) requested that the appeal be dismissed.

Reasons for the Decision

Main request

1. Art. 123(2) EPC

1.1 Claim 1 of the main request differs from claim 1 as originally filed in that

(a) the melt viscosity ratio between the polyester resin and the polyamide was specified to be "higher than 1.5:1";

(b) the range of the average numeral size of the polyamide domains was modified from "30 to 200 nm" to "80 to 100 nm" and it was added at the end of the claim that "more than 80% … to 110 nm";

(c) the polyamide was specified to be "poly (m. xylylene adipamide)" and it was indicated that it is to be used in amount of 1-15 wt.%;

(d) the product-by-process feature "and wherein the compositions are obtainable by … 100 s^{-1}" was added.

1.2 Amendments (a), (b) and (c) are based on claims 2, 5 and 4, respectively, of the application as filed.

1.3 Regarding the basis in the application as filed for amendment (d), the patent proprietor made reference to original claim 7 (see section II, above) and paragraphs 3 and 4 on page 3 of the application as filed, which paragraphs read as follows:

"The mixing of the polyester resin, (pre melt-mixed with the dianhydride), and the polyxylylene amide is carried out in extruder under conditions of temperature and shear forces such as to ensure a fine and stable dispersion of the polyamide in the polyester matrix. Preferably, the extruded pellets are reextruded."

"Shear rates higher than 100 $s^{-1}$are (sic) used when melt-mixing the polyamide."

1.3.1 In view of the above, original claim 7 is directed to the mixing of a polyester that was pre melt-mixed with a dianhydride of a tetracarboxylic acid with a polyxylylene amide. The third paragraph on page 3 of the application as filed is directed to a similar process of mixing a polyester resin and a polyxylylene amide. The step of the pre melt-mixing is however given in brackets which indicates that it is optional.

1.3.2 It is further noted that both mixing steps defined in either original claim 7 or in paragraph 3 on page 3 of the application as filed are explicitly disclosed as being performed "to obtain" or "to ensure" "a fine and stable dispersion".

1.3.3 However, whereas it is indicated in original claim 7, (as in amendment (d)) that the extruder is used “under

shear suitable to obtain a fine and stable dispersion", it is specified in the third paragraph on page 3 of the application as filed that the extruder is used "under conditions of temperature and shear forces such as to ensure a fine and stable dispersion". In the Board's view, although those wordings are not identical, they are both related to a process step performed in an extruder, which necessarily means that specific shear (depending e.g. on the extruder screw dimensions, extrusion speed) and temperature (depending on the melting point of the polymers to be melt-mixed) conditions are required. In that respect, it is irrelevant whether reference is made either to shear forces or shear rates, because these parameters are physically and mathematically interrelated as shown in D6 (page 515, section D) and as argued in section 9 of HE3. Under such circumstances, it is concluded that the wording of original claim 7 "under shear conditions" and of the third paragraph on page 3 of the application as filed "under conditions of temperature and shear forces" are, in the specific circumstances of the case, equivalent, contrary to the opponents' argument.

1.3.4 In paragraph 4 on page 3 of the application as filed, reference is explicitly made to the "melt-mixing" of the polyamide. Considering that the sole other passage of the application as filed dealing with such a step is the preceding paragraph 3 on page 3, there is no reason to consider that paragraphs 3 and 4 of the application as filed are directed to distinct and unconnected embodiments. Therefore, it cannot be agreed with the opponents that paragraphs 3 and 4 on page 3 of the application as filed are to be read independently of each other. On the contrary, taking the application as filed as a whole, paragraph 4 on page 3 of the application as filed is considered to provide

information as to how to perform the process described in a more generic manner ("under conditions of ... shear forces") in the preceding paragraph.

1.3.5 As a consequence, it is concluded that the definitions of both melt-mixing steps according to either original claim 7 or according to paragraphs 3 and 4 on page 3 of the application as filed are compatible with each other. Insofar as use is made of a pre melt-mixing step, the content of said paragraphs 3 and 4 can also be seen as illustrating a more specific embodiment of original claim 7.

1.3.6 For those reasons, in the present circumstances of the case, it is considered that although no literal support for amendment (d) may be found in the application as filed, that amendment is nevertheless directly and unambiguously derivable from the combination of original claim 7 with the third and fourth paragraphs on page 3 of the application as filed.

1.4 Although not specifically disclosed as such in the application as filed, the combination of amendments (a) to (c) is derivable from the claim dependency of the application as filed. The further combination with amendment (d) is considered to be derivable from the fact that paragraphs 3 and 4 on page 3 of the application as filed, which constitute part of the support for said amendment (see section 1.3), provide the sole specific disclosure of the extrusion process contained in the application as filed. Therefore, its content would have been considered as applying to any embodiment of the application as filed, in particular to the embodiments defined in the original set of claims.

1.5 For those reasons, the opponents' objections according to which claim 1 did not meet the requirements of Art. 123(2) EPC is rejected.

2. Art. 84 EPC

2.1 The opponents argued that the term "stable dispersion" employed in claim 1 is vague.

2.1.1 The compositions defined in claim 1 are defined both in terms of features related to the (starting) components used to prepare the compositions (polyester; polyxylylene amide) and to the (end) composition prepared therefrom (characterised in terms of domain sizes of the polyamide dispersed in the pre melt-mixed polyester resin matrix). Those compositions are further defined as being "usable for preparing articles having high transparency" and in terms of a product-by-process feature ("obtainable by") directed to an extrusion process (see amendment (d) in section 1.1). Therefore, the compositions being claimed can only be directed to the products in a solid state such as those obtained at the exit of the extruder and consisting of a solid (modified)-polyester matrix containing dispersed polyamide domains also in a solid form. In the Board's view, the stability feature mentioned in claim 1 is the direct and inevitable consequence of the matrix and the dispersed phases being in the solid state i.e. it is an inherent feature of the compositions as defined in claim 1.

2.1.2 In the context of claim 1, the stability of the - solid - dispersions mentioned in claim 1 cannot be equated with the stability of a dispersion in terms of resistance of the dispersed phase against coalescence and the time needed for phase separation, which rather

concern multiphasic systems in which - in contrast to the present subject-matter - not all phases are solids. Therefore, the arguments invoked by the opposition division to refuse the then pending auxiliary request 2 (which however did not contain the same product-by-process formulation as the present main request), are not considered to be relevant to present claim 1. In that respect, it was neither shown nor argued by the opponents that such a phase morphology and/or coalescence could arise in compositions as now defined in claim 1.

2.1.3 The fact that D27 (see e.g. abstract) discloses that an otherwise transparent polyester/polyamide composition could be rendered hazy upon stretching is related to the post-treatment/transformation of polyester/polyamide dispersions. However, the wording "fine and stable dispersion" of claim 1 cannot be equated with the requirement that said dispersions would not undergo any alteration under any kind of post-treatment. Such an interpretation makes no sense, in particular from a technical point of view. In such a case the compositions would not be susceptible of further processing, e.g. moulding and hence would have no technical or commercial use. Rather, the stability requirement is, as explained above, read as the consequence of the product-by-process step specified in claim 1. For that reason, the opponents' objection based on D27 did not convince.

2.1.4 In section 11.2 of the Board's communication, it was questioned whether the wording of claim 1 clearly indicates whether the “neat” copolyester or its reaction product with a dianhydride of a tetracarboxylic acid was to be considered for defining the melt viscosity ratio specified in claim 1.

In the present case it was not shown that there would be any reason to deviate from the literal wording of claim 1 according to which said ratio is defined using the "neat copolyester". In particular, said reading is in line with the description of the application as filed (page 2, last sentence of the last paragraph/ paragraph 8 of the patent in suit). In that respect, it is further noted that the patent proprietor's arguments in support of that reading (see letter of 18 April 2016: page 2, second and third paragraphs) were not contested by the opponents.

2.2 The objection advanced in writing by opponent 1 in its letter of 13 May 2016, according to which claim 1 would lack clarity because of the product-by-process feature of claim 1, was not pursued during the oral proceedings before the Board. The Board sees also no reason to deviate from that view.

2.3 For those reasons, the opponents' clarity objections raised against claim 1 are rejected.

3. Art. 83 EPC

3.1 Both opponents confirmed during the oral proceedings that they had no objection pursuant to Art. 83 EPC in respect of the operative main request.

3.2 In section 7.2 of the Board's communication the question had been raised whether the patent in suit provides sufficient information in order to prepare with a good chance of success and without undue burden a composition as claimed in the then pending requests but without using a dianhydride of a tetracarboxylic acid on the basis of the information provided in the

patent in suit as a whole and, if necessary, common general knowledge (section 7.2).

The Board is satisfied that those concerns were removed by the amendments made, in particular as a consequence of amendment (d) identified in section 1.1 above.

3.3 In the absence of any arguments advanced by the opponents in that respect, either in writing or during the oral proceedings, the Board can identify no reason to deviate from its preliminary opinion that the opponents' objections pursuant to Art. 83 EPC submitted in writing were not convincing (see section 7.3 of the Board's communication).

3.4 For those reasons, the requirements of Art. 83 EPC are met.

4. Remittal

Considering that the issues of novelty and inventive step were neither addressed in the contested decision nor discussed in the present appeal proceedings, the Board finds it appropriate to remit the case to the department of first instance for further prosecution (Art. 111(1) EPC).

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 for further prosecution on the basis of the main request - set of claims designated auxiliary request 5A - filed during the oral proceedings on 15 June 2016.

The Registrar: The Chairman:

B. ter Heijden M. C. Gordon

Decision electronically authenticated