

A		B		C	X
---	--	---	--	---	---

File No.: T 0242/89 - 3.3.3
Application No.: 80 401 174.0
Publication No.: 0 024 245
Classification: C08L 67/02
Title of invention: Blends of polyarylates, polyesters and a thermoplastic polymer

D E C I S I O N
of 23 July 1993

Applicant: AMOCO CORPORATION
Proprietor of the patent:
Opponent: HOECHST AKTIENGESELLSCHAFT, Frankfurt

Headword:

EPC: Art. 56

Keyword: "Inventive step (yes, after amendment)"

Headnote
Catchwords



Case Number: T 242/89 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 23 July 1993

Appellant: HOECHST AKTIENGESELLSCHAFT, Frankfurt
(Opponent) -Ressortgruppe Patente, Marken und Lizenzen-
D - 6230 Frankfurt am Main (DE)

Representative:

Respondent: AMOCO CORPORATION
(Proprietor of the patent) 200 East Randolph Drive
Chicago
Illinois 60601 (US)

Representative: Rinuy, Santarelli
14, avenue de la Grande Armée
F - 75017 Paris (FR)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office dated 27 January 1989
rejecting the opposition filed against European
patent No. 0 024 245 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: F. Antony
Members: H.H.R. Fessel
S.C. Perryman

Summary of Facts and Submissions

- I. The mention of the grant of European patent No. 0 024 245 in respect of European patent application No. 80 401 174.0 filed on 8 August 1980 and claiming a US priority of 9 August 1979 (US 65 276) was announced on 17 July 1985 (cf. Bulletin 85/29).
- II. A notice of opposition was filed on 16 April 1986 by Hoechst AG alleging lack of inventive step (Article 100(a) in conjunction with Article 56 EPC).

The opposition was supported by

- (1) GB-A-1 002 545
- (2) DE-A-2 248 242
- (3) US-A-4 052 481 (cited after the expiry of the nine-month period).

- III. By a decision dated 27 January 1989 the Opposition Division rejected the opposition and maintained the patent as granted with 12 claims, of which the only independent Claim 1 reads as follows:

"A molding composition comprising a blend of:

(a) 4 to 80 weight percent of a polyarylate derived from at least one dihydric phenol and at least one aromatic dicarboxylic acid consisting from 95 to 0 mole percent of terephthalic acid and 5 to 100 moles percent of isophthalic acid;

(b) 4 to 60 weight percent of a polyester having an intrinsic viscosity of 0.04 to 0.2 m³/kg derived from an aliphatic or cycloaliphatic diol, or mixtures thereof containing from 2 to 10 carbon atoms; and at least one aromatic dicarboxylic acid; and

(c) 10 to 92 weight percent of at least one thermoplastic polymer selected from the group consisting of a polyurethane, a vinyl chloride polymer, a poly(aryl ether sulfone), a copolyetherester block copolymer, and a polyhydroxyether."

- IV. The Opposition Division held that considering (3) to be the closest prior art, the problem solved by the patent in suit could be seen in providing further polyarylate-containing moulding compositions having a good combination of properties.

This problem was effectively solved in that the polyamide in the blends of (3) has been replaced by a polyurethane, a vinyl chloride polymer, a poly(arylether sulphone) or a polyhydroxyether (component (c)), or by a polyester (component (b)). No incentive was provided by document (3) as such, or by either of documents (1) or (2) which would lead the skilled person to think that polyurethane, vinyl chloride polymer etc. would have had an effect equivalent to that of a polyamide.

- V. On 6 April 1989 an appeal was lodged by telefax, duly confirmed on 7 April 1989, against said decision together with payment of the prescribed fee. A Statement of Grounds was received by telefax on 6 June, duly confirmed by a letter received on 7 June 1989. In that statement the Appellant contested novelty and inventive step.

Novelty was attacked for the first time with a document cited for the first time, viz.

(7) DE-B-2 046 963.

It was said that this document had not been found earlier. As to inventive step the Appellant mainly

argued that a combination of the teachings given in (3) and (7) would directly lead to the claimed subject-matter, particularly since (2) disclosed polyamides and polysulphones as being alternative components.

VI. The Respondent argued that document (7), published on 22 April 1971 had been cited for the first time in the Statement of Appeal. Said citation was available to the public for more than 18 years and should thus not be admitted at this late stage of proceedings as being late and not more relevant than other prior art documents in the file.

As to the relevance of (7), he argued that this citation was directed to a two-component polymeric blend, wherein the flow properties of one polymeric component were improved by the other polymeric component and no hint was given as to the presence or the "interest" of a third polymeric component whereas the disputed patent concerned a three- component polymeric blend.

He contested the arguments provided by the Appellant and mainly argued that contrary to what was alleged a combination of polymers mostly lead to blends having not better but worse characteristics than the components *per se* due to incompatibility.

Citation (2) could not be used as a link between (3) and (7) since it was concerned with compositions which did not contain polyarylates but which had to contain a filler.

VII. With a communication pursuant to Article 11(2) of the Rules of Procedure of the Boards of Appeal the Board informed the parties of its decision to admit document (7) into the proceedings as being relevant with regard to the provisions of Article 56 EPC.

Furthermore the Board decided to summon the parties for oral proceedings.

In response to said communication the Respondent filed in addition to the request on file an auxiliary request. Said request differs from the set of 11 claims of the main request in that the poly(arylether sulphone), one of the components specified under (c) in Claim 1 of the main request, as well as Claim 8 have been deleted.

Pursuant to notifications from the parties that they would not attend oral proceedings, the Board cancelled said proceedings due to take place on 13 January 1993.

VIII. The Appellant requested that the decision under appeal be set aside and the patent be revoked. Moreover he requested that the decision be taken on the case as it stood.

The Respondent requested that the appeal be dismissed and the patent be maintained as granted (main request) or based on the patent specification received 10 December 1992 comprising a set of nine claims (auxiliary request).

Reasons for the Decision

1. The appeal is admissible (cf. paragraphs III and V).
2. The claims of the main request have not been amended during opposition and appeal proceedings and their subject-matter does not give rise to an objection under Article 123(2) EPC. Neither do those of the auxiliary request since only one of the components specified under

item (c) of Claim 1 of the granted version and the subject-matter of Claim 8 were deleted.

3. *Document newly admitted*

3.1 In the exercise of its discretionary power under Article 114(2) EPC, the Board admits document (7) into the proceedings, as, contrary to the arguments of the Respondent, it discloses not only a two-component blend of polymers but a multi-component blend of polymers, and in particular one containing more than one thermoplastic polyester in addition to poly(arylether sulphone), thus making it prior art that needs to be considered.

4. *Main request*

4.1 Novelty

4.1.1 Document (7) discloses (see column 1, line 48 to column 2, line 2) a blend of polymers comprising 99 to 1 per cent by weight of one or more aromatic polysulphones and 1 to 99 percent by weight of one or more thermoplastic polyesters obtained by polycondensation. The products are stated to be coherent and usually tough materials with better flow properties when molten than the polysulphones by themselves. These are indicated as desirable physical properties for moulding into shaped articles with good processability.

In (7), column 2, lines 25, 38 and 48 the exemplified polysulphones are poly(arylether sulphones). Examples 1, 2 and 3 describe mixtures of 80% poly(arylether sulphone) with 20% of polyethyleneterephthalate; these fulfil the requirements for components (b) and (c) of Claim 1 of the main request, but not for component (a). Example 6 of (7) describes mixtures of 90% poly(arylether sulphone) with 10% of a polyarylate; this

meets the requirements for components (a) and (c) of Claim 1 of the main request, but not for component (b).

4.1.2 Thus, document (7), though disclosing a wide range of polymer blend compositions, where component (c) is formed by a poly(arylether sulphone) and component (a) or (b) is also present, does not disclose any composition containing **all three** components (a), (b) and (c) and thereby falling within Claim 1 of the main request, nor does it disclose the precise limits on the weight compositions of the three components required by this Claim 1. Thus, (7) does not destroy the novelty of Claim 1 of the main request.

4.1.3 The novelty of the patent in suit has not been attacked on the basis of any of the other citations, nor does the Board see any reason for questioning this. Accordingly the Board is satisfied that there is no objection to the main request on the ground of lack of novelty.

4.2 Inventive step

4.2.1 The Board considers (7) to represent the closest prior art for the subject-matter of Claim 1 of the main request, because component (c) can be a poly(arylether sulphone).

In an implicit attempt to formulate the problem underlying the patent in suit, the Respondent has alleged improved weatherability, but no evidence has been produced that any improvement over the blends of (7) is achieved when component (c) in an example according to the present invention is a poly(arylether sulphone). In the absence of evidence, the Board cannot assume that any improvement would be achieved, let alone an unexpected improvement, particularly having regard to the fact that in (7), column 1, lines 22 to 38, it is

mentioned that aromatic polysulphones have considerable resistance against chemical deterioration even at high temperatures.

An effect, however, whose achievement has not been made plausible, cannot be relied on to establish inventive step on the basis of the problem-solution approach.

4.2.2 Compared with (7) a less ambitious problem to be solved may be seen in providing further compositions having a good balance of physical properties and good processability. On the basis of the disclosure given in the patent specification the Board is satisfied that this problem is effectively solved by the composition defined in Claim 1.

4.2.3 It has now to be considered whether the above-defined subject-matter involves an inventive step *vis-à-vis* the teaching given in (7).

As specified above (7) discloses blends of a poly-(arylether sulphone), of component (c) and of one or more polyesters which are exemplified as polyarylates (a) and polyesters (b). Moreover the influence of the amounts of said components as well as that of their molecular weight is disclosed in column 4, lines 45 to 66; column 5, lines 12 to 14 and column 14, lines 20 to 25 of (7).

In the light of said disclosure a man skilled in the art looking for new compositions with similar properties, i.e. seeking to solve the above-defined problem, would not hesitate to combine the poly(arylether sulphone) component (c) with two thermoplastic polyesters such as e.g. those specified in Examples 6 (component (a)) and 1 (component (b)) since there is nothing in (7) pointing to any incompatibility or other disadvantages caused by

such a combination. It was thus obvious to try whether the said blend would show the desired properties.

4.2.4 The main request is thus not allowable because Claim 1 fails to meet the criteria for inventive step of Article 56 EPC.

5. *Auxiliary request*

5.1 Novelty

5.1.1 Claim 1 of the auxiliary request differs from Claim 1 of the main request by being more restricted, in that the option of component (c) being poly(arylether sulphone) has been deleted. This is the only independent claim in the auxiliary request.

5.1.2 It follows that for the reasons given in paragraphs 4.1.1 to 4.1.3 for the main request there is no objection to the auxiliary request on the ground of lack of novelty.

5.2 Inventive step

5.2.1 The option of component (c) being absent from Claim 1 according to the auxiliary request, there is no basis for considering (7) to be the closest prior art with respect thereto. Instead, the Board regards (3) as representing such closest prior art for the purpose of considering whether an inventive step is present in the subject-matter of Claim 1 of the auxiliary request.

5.2.2 As to the components (a), (b) and (c) required by Claim 1, document (3) discloses:

- (i) blends of (a) + (b) + polyamide, and

(ii) blends of (a) + (c) + polyamide,

in each case within the proportions claimed in its Claim 1 (see for example Table 1 in column 12).

5.2.3 Again, the Board considers the problem to be solved with regard to said prior art document (3) to be providing a further polyarylate-containing moulding composition having a good combination of properties.

5.2.4 On the basis of the patent specification in suit the Board is satisfied that this problem is effectively solved in that a polyurethane, a vinyl chloride polymer, a copolyester block polymer or a polyhydroxyether is used as component (c) instead of polyamide in the blends of (a) + (b) + polyamide known from (3).

5.2.5 Like the patent in suit, (3) is concerned with obtaining high quality moulding compositions containing polyarylates and, like the patent in suit, seeks to overcome the disadvantages inherent in the high moulding temperatures for polyarylates. (3) teaches that said defects could be remedied by incorporating a polyamide into the blend of (a) and (b). The specific examples show that, in every case, the properties such as heat distortion temperature, chemical stability and impact strength are diminished if the polyamide is omitted. No other polymers than the polyamide are mentioned in combination with (a) + (b). There is thus no incentive for a person skilled in the art to experiment with blends which do not contain polyamides when looking for further compositions with the desired properties.

5.2.6 (3) thus provides no incentive or hint which would lead the skilled person to think that polyurethane and the other components specified under (c) in Claim 1 would

solve the above-identified problem if they were substituted for polyamide.

- 5.2.7 No hint leading towards such a solution is provided either by documents (1) or (2). While it is true that in (2) polyvinylchloride, polysulphones and polyamides are listed among other polymers, as alternative components (pages 12 to 13), this was in the context of compositions which did not contain polyarylates and which did have to contain fillers. No deduction would be permissible from this that these polymers would be equivalent in another context.

For this reason (2), even if combined with (7) or (3), would not hint at the solution of the above-defined problem.

As to (1), which disclosed that good moulding compositions could be obtained by blending a polyester (b) with a polyarylate (a), this document is less pertinent than the others as there is no suggestion in it of the addition of a component (c) as specified in Claim 1 of the auxiliary request.

- 5.2.8 For the reasons given above, the subject-matter of Claim 1 of the auxiliary request meets the requirements of Article 56 EPC on inventive step. Claims 2 to 10 are dependent on Claim 1, and accordingly the claims of the auxiliary request as a whole meet the requirement of Article 56 EPC.

6. The auxiliary request also includes a description properly adapted to the Claims 1 to 10, so that the Board holds that there are no objections under the EPC to the maintenance of a patent on the basis of the auxiliary request.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The main request of the Respondent is rejected.
3. The case is remitted to the first instance with the order to maintain the patent in suit on the basis of the Respondent's auxiliary request with the Claims 1 to 10 and the description filed 11 December 1992.

The Registrar:

The Chairman:

E. Görgamaier

F. Antony