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# D E C I S I O N
# of 18 November 2004

**Case Number:** T 0717/99 - 3.3.3

**Application Number:** 89115458.5

**Publication Number:** 0358038

**IPC:** C08L 77/00

**Language of the proceedings**: EN

**Title of invention:**
Amorphous nylon copolymer and copolyamide films and blends

**Patentee:**
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**Opponent:**
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EMS-INVENTA AG

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 54, 56, 100, 112(1), 123(2)

**Keyword:**
"Amendments - added subject-matter (main request, auxiliary requests I-IV: yes)"
"Opposition grounds"
"Allowability of a disclaimer (auxiliary request V: yes)"
"Formulation attempt, not partial surrender"
"Enlarged Board - referral (no)"
"Novelty (auxiliary request V: yes)"
"Inventive step - problem and solution (auxiliary request V: yes)"

**Decisions cited:**
G 0009/92, G 0004/93, G 0001/03, G 0002/03, T 0123/85, T 0296/87, T 0301/87, T 0686/91, T 0325/93, T 0367/96, T 0564/98, T 0381/02

**Catchword:**
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Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 0717/99 - 3.3.3

# D E C I S I O N
## of the Technical Board of Appeal 3.3.3
## of 18 November 2004

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**Decision under appeal:** **Decision of the Opposition Division of the European Patent Office dated 21 April 1999 and issued in writing on 10 May 1999 revoking European patent No. 0358038 pursuant to Article 102(1) EPC.**

**Composition of the Board:**

**Chairman:** R. Young
**Members:** A. Däweritz
J. Van Moer

## Summary of Facts and Submissions

I. The grant of European patent No. 0 358 038 in respect of European patent application No. 89 115 458.5, filed on 22 August 1989 and claiming priority of 23 August 1988 of an earlier application in the United States of America (235258), was announced on 10 May 1995 (Bulletin 1995/19) on the basis of two sets of claims. The first set for the designated Contracting States BE, DE, FR, GB, IT, NL and SE will be referred to herein as "Set A", the second set for the designated Contracting State AT will be referred to as "Set B". Each of these sets comprised 58 claims and differed only from one another in the wording of their respective Claim 1.

Independent Claim 1 of Set A as granted read as follows:

"A nylon resin blend containing 10 to 70 weight percent of an amorphous nylon copolymer and 10 to 90 weight percent relative to the total weight of the blend of a copolyamide which copolyamide has a melting point of at least 145 °C provided said amorphous copolymer is not present in an amount of from 60 to 90 weight percent of said blend wherein said copolyamide comprises a copolymer of nylon 6 and nylon 12 or a copolymer of nylon 6 and nylon 66, or mixtures of said copolymers and further provided that said blend is not a thermoplastic molding resin blend comprising

a) 5 to 98 percent by weight of a thermoplastic semicrystalline polyamide of film-forming molecular weight, and complementally,

b) 95 to 2 percent by weight of a thermoplastic amorphous copolyamide consisting essentially of

i) 40 - 98 mole percent units of isophthalic acid based on total acids present,
ii) 2 - 60 mole percent units of terephthalic acid based on total acids present,
iii) 50 - 98 mole percent units of hexamethylene diamine based on total amines present; and
iv) 2 - 50 mole percent units, based on total amines present, of at least one aliphatic diamine containing between 8 and 20 carbon atoms and containing at least one cyclo hexane nucleus,

wherein in the amorphous copolyamide the mole percent phthalic acids present totals 100 percent and the mole percent diamines present totals 100 percent, and wherein up to 40 percent of the amorphous copolyamide may consist of units of a lactam, or an ω-aminoacid of 4 - 12 carbon atoms, or units derived from a 4 - 12 carbon atom aliphatic dicarboxylic acid and a 2 - 12 carbon atom aliphatic diamine.".

Claim 1 of Set B differed therefrom by the absence of the above disclaimer "provided said amorphous copolymer is not present in an amount of from 60 to 90 weight percent of said blend" and the words "and further" before the second occurrence of "provided" in Claim 1 of Set A as quoted above.

The further independent claims of both Sets A and B had the following wording:

"10. A thermoplastic flexible film comprising a nylon resin blend according to any of claims 1 to 9.".

"23. An oriented multilayer film comprising a first outer layer, a second outer layer, and at least one intermediate layer between said first outer layer and said second outer layer, said intermediate layer comprising a blend of an amorphous nylon copolymer and a copolyamide having a melting point of at least 145 °C, as claimed in claim 10.".

"48. An oriented heat-shrinkable multilayer film comprising:

(i) at least one nylon containing layer having a blend of (a) an amorphous nylon and (b) a copolyamide having a melting point of at least 145 °C, as claimed in claim 10; and

(ii) at least one other thermoplastic layer adjacent to said nylon-containing layer;

wherein said multilayer film has a shrinkage value in at least one direction of at least 5 % at 90 °C.".

"58. A biaxially oriented multilayer film having at least one layer which comprises a blend of (a) an amorphous nylon 6I/6T, (b) a nylon 6/12 having a melting point between 195 °C and 200 °C, and (c) a nylon 6/12 having a melting point less than 145 °C, and at least one other thermoplastic layer.".

The remaining dependent claims 2 to 9, 11 to 22, 24 to 47 and 49 to 57, respectively, concerned specific elaborations of the subject-matter according to the respective preceding independent claim.

The application from which the above patent was derived had originally been filed with one set of claims including the following independent claims:

"1. A nylon resin blend comprising an amorphous nylon copolymer and a copolyamide having a melting point of at least 145°C.

13. A thermoplastic flexible film comprising a blend of an amorphous nylon copolymer and a copolyamide having a melting point of at least 145°C.

35. A thermoplastic flexible film, comprising a blend of a polyamide known as Selar PA 3426 and a copolyamide having a melting point between about 145°C and 215°C.

36. An oriented multilayer film comprising a first outer layer, a second outer layer, and at least one intermediate layer between said first outer layer and said second outer layer, said intermediate layer comprising a blend of an amorphous nylon copolymer and a copolyamide having a melting point of at least 145°C.

67. An oriented multilayer film comprising at least one layer having a blend of a polyamide known as Selar PA 3426 and a copolyamide having a melting point between about 145°C and 215°C.".

Further dependent Claims 2 to 12 concerned elaborations of the above nylon resin blend, Claims 14 to 34 and 66 related to elaborations of the thermoplastic flexible film, and Claims 37 to 65 concerned elaborations of the oriented multilayer film. Thus, Claims 63 and 65 had the following wording:

"63. An oriented multilayer film, as defined in claim 36, wherein said first outer layer comprises ethylene vinyl acetate copolymer, very low density polyethylene or mixtures thereof.

65. An oriented multilayer film, as defined in claim 63, wherein said second outer layer comprises ethylene vinyl acetate copolymer, very low density polyethylene or mixtures thereof.".

For reasons of simplicity, abbreviations of the chemical names of individual polyamides will be used in this decision, where appropriate, eg PA 6I for poly-(hexamethylene isophthalate) and PA 6T for poly(hexa-methylene terephthalate) wherein I and T represent the two acid constituents; PA 6 for poly-ε-caprolactam, PA 66 for poly(hexamethylene adipamide); PA 6/66 for poly-ε-caprolactam-*co*-poly(hexamethylene adipamide), PA 6/12 for poly-ε-caprolactam-*co*-polylaurolactam and PA 6I/6T for poly(hexamethylene isophthalate)-*co*-poly(hexamethylene terephthalate). A "copolyamide of more than 90 weight percent of ε-caprolactam, 3-amino-methyl-3,5,5-trimethylcyclohexylamine and isophthalic acid, the latter two monomers totalling less than 10 weight percent" will be referred to herein as "PA 6/AI". In this context, "polyamide", "PA" and "nylon" are used

synonymously and should be construed also to include copolyamides, where applicable (eg in nylon or PA 6/66). "EVA" refers to ethylene-vinyl acetate copolymer and VLDPE to very low density polyethylene having a density of from 0.86 to 0.91 g/cm$^3$ (patent in suit: page 7, lines 22 to 24).

II. On 31 January 1996, 8, 8, 9 and 12 February 1996, respectively, five Notices of Opposition were filed in which revocation of the patent in its entirety was requested. According to the Notice of Opposition of Opponent 1, the claimed subject-matter was not patentable on the grounds set out in Article 100(a) and (c) EPC, since it met neither the requirements of Articles 54 and 56 EPC nor those of Article 123(2) EPC. In the Notice of Opposition of Opponent 2, reference was made to the grounds for opposition of Article 100(a) EPC, in conjunction with those of Articles 54 and 56 EPC. The grounds for opposition cited by Opponent 3 were based on Article 100 EPC, paragraphs (a), (b) and (c), in conjunction with Articles 54, 56, 83 and 123(2) EPC. Opponent 4 relied on grounds for opposition according to Article 100 EPC. These grounds were further substantiated with respect to the requirements of Articles 54 and 56 EPC. In the Notice of Opposition of Opponent 5, reference was made to Articles 100(a), 54, 56 and 100(b) EPC. In order to support the objections under Article 100(a) EPC, documents D1 to D14 and D16 to D38 were cited (cf. Annex B to the decision under appeal) including:

D1: EP-A-0 070 001;
D6: EP-A-0 236 099;
D7: EP-A-0 073 036;

D14: JP-A-53-006355;
D16: EP-A-0 287 839 (published on 26 October 1988);
D17: US-A-4 486 507, cognate to
D27: EP-B-0 065 278; and
D29: EP-A-0 104 436.

Additionally, the parties provided English translations of cited documents in Japanese language including:

D15: an excerpt translation of D14 and
D15a and 15b: full translations of D14.

In the course of the opposition proceedings, the above sets of claims were replaced by one set for all designated Contracting States, comprising 34 claims (dated 12 January 1998 and received on 17 January 1998), Claim 1 of which read as follows:

"A thermoplastic flexible film comprising a nylon resin blend containing

(a) 10 to 70 weight percent of an amorphous nylon copolymer having no measurable melting point or no heat of fusion (less than 2.1 J/g (0.5 cal/g)) as measured by differential scanning calorimetry (DSC) using ASTM 3417-83, said amorphous nylon copolymer comprising hexamethyleneisophthalamide/hexamethy-leneterephthalamide copolymer provided that said amorphous copolymer is not present in an amount of from 60 to 90 weight percent of said blend; and

(b) 10 to 90 weight percent relative to the total weight of the blend of a copolyamide having a melting point within a range of from 145 °C to

215 °C, said copolyamide comprising a copolymer of nylon 6 and nylon 12 or a copolymer of nylon 6 and nylon 66 or mixtures of said copolymers.".

Further independent Claims 16 and 30 were directed, respectively, to an oriented and an oriented heat-shrinkable multilayer film analogously to Claims 23 and 48 as granted (section I, above), wherein the definition of the nylon-containing layer was in each case replaced by a reference to the blend as defined in Claim 1, quoted above. The further dependent Claims 2 to 15, 17 to 29 and 31 to 33 were directed to specific elaborations of the above thermoplastic flexible film and of the above oriented and oriented heat-shrinkable multilayer films, respectively, and Claim 34 had the wording of Claim 58 as granted (section I, above).

Oral proceedings were held on 21 April 1999, in which objections under Articles 83, 84, 123(2) and 123(3) EPC were not further pursued by the opponents, apart from Opponent 3, who requested that objections under Articles 83 and 123(3) EPC be suspended until appeal proceedings, should they then be necessary (decision under appeal: section I.9).

III. In the decision orally announced at the end of those oral proceedings and issued in writing on 10 May 1999, the Opposition Division revoked the patent in suit pursuant to Article 102(1) EPC.

Whilst acknowledging the amended claims to be admissible in respect of Article 123(2) and (3) EPC and the patent in suit to disclose the invention in a manner sufficiently clear and complete as required in

Article 83 EPC and acknowledging novelty over each of D7, D14/D15b, D17/D27 and D29, the decision under appeal held that the claimed subject-matter did not involve an inventive step with respect to D15b.

The technical problem to be solved was seen in the provision of further polyamide films having similar good overall properties as those known from D15b (decision under appeal: page 8, paragraphs 3 and 2 from below).

According to the patent in suit, this problem was solved by polyamide films requiring the presence of PA 6/66 or PA 6/12. However, D15b clearly disclosed that PA 6 in the compositions of the known films could be replaced by PA 6/66. Moreover, unexpected or surprising properties in comparison to the films known from D15b had not been shown, which would have been necessary for justifying the acknowledgement of an inventive step. The description of the patent in suit appeared to lack any convincing indication of such properties (decision under appeal: page 9, paragraph 2).

Differences in the haze of films in Table 2 of the patent in suit and of films in the Table on page 10 of D15b, asserted by the Patent Proprietor, were not accepted as a proof for any surprising or unexpected effect, because they were considered, in agreement with Opponents 1 and 5, as not being comparable to each other due to different ratios of the two polyamides and due to lack of a definition of the film thickness.

Consequently, no inventive step was seen by the Opposition Division.

IV. On 9 July 1999, Notice of Appeal was given by the Patent Proprietor/Appellant against this decision with simultaneous payment of the prescribed fee, requesting that the decision under appeal be set aside and the patent be maintained in its full scope. The Statement of Grounds of Appeal was received on 16 September 1999 together with a new set of 11 claims replacing all the previous claims, and including the statement: "Das Patent wird nur noch im Umfang der beigefügten Ansprüche 1 bis 11 verteidigt." (the patent will be defended only within the scope of claims 1 to 11 as enclosed). Independent Claim 1 read as follows:

"A thermoplastic flexible film coextruded biaxially oriented heat shrinkable multilayer film comprising

at least one layer comprising a nylon blend containing

(a) 10 to 70 weight percent of an amorphous nylon copolymer having no measurable melting point or no heat of fusion (less than 2.1 J/g (0.5 cal/g)) as measured by differential scanning calorimetry (DSC) using ASTM 3417-83, said amorphous nylon copolymer comprising hexamethyleneisophthalamide/hexamethy-leneterephthalamide copolymer provided that said amorphous copolymer is not present in an amount of from 60 to 90 weight percent of said blend; and

(b) 10 to 90 weight percent relative to the total weight of the blend of a copolyamide having a melting point within a range of from 145 °C to 215 °C, said copolyamide comprising a copolymer of

nylon 6 and nylon 12 or a copolymer of nylon 6 and nylon 66 or mixtures of said copolymers,

and at least one other thermoplastic layer comprising ethylene vinyl acetate copolymer, very low density polyethylene or mixtures thereof, adjacent to said nylon containing layer."

The Appellant referred to the technical problem to be solved by the claimed subject-matter as being manifold and complex, as set out in the patent in suit, reciting the negative influence of the moisture content of the surroundings, in which nylon films were used or stored, on their oxygen barrier properties and the possibility of protecting them e.g. by placement between layers having relatively low permeability to moisture. Mention was, however, also made of the difficulties caused by processing constraints during orientation of coextruded multilayer blown films having nylon as a protected core layer (patent in suit: page 3, lines 28 to 39).

Examples 7 to 13 and 14 to 24, and in particular Table 5, of the patent in suit would sufficiently demonstrate the advantages of claimed biaxially oriented multilayer films as encompassed by the claims.

A multilayer (three-layer) film had only been disclosed in Example 19 of D15b. This film was made of two outer layers of a polyolefin modified by maleic acid anhydride ("Admer®") and an intermediate layer of a blend of polyamides (a) PA 6I/6T and (b) PA 6. In the decision under appeal, it had, however, been assumed wrongly that the PA 6I/6T copolymers used in D15b had been amorphous. Moreover, the Appellant disputed the

findings in the decision under appeal concerning the assumed obviousness of the replacement of PA 6 by PA 6/66 or PA 6/12 (section III, above).

Due to the new amendments in the claims, the claimed subject-matter would be even further remote from D15b, and the skilled person could arrive at the claimed subject-matter only with hind-sight.

V. In letters dated 25 November 1999, 27 December 1999 and 9 February 2000, respectively, Respondents/Opponents 2, 5 and 3 contested the appeal, and in letters dated 24 March 2000, 28 March 2000 and 18 April 2000, respectively, Respondents 3, 5 and 4 disputed the arguments of the Appellant, namely the admissibility of the amendments in the claims and inventive step.

(a) Thus, with regard to the first of these two aspects, Respondents 3 and 4 argued essentially along the same lines. They disputed that there was a basis and support in the application as originally filed for a two layer oriented film with one layer being a polyamide blend and one layer being EVA and/or VLDPE. The EVA and/or VLDPE layers were disclosed in the application as filed only with regard to a multilayer film comprising two outer layers and at least one intermediate layer therebetween comprising a nylon blend. Furthermore, the examples in the patent in suit relating to such three-layer films would require the presence of an adhesive resin (the above letters of Respondent 3, items 2 to 2.12, and of Respondent 4, part A) (Article 123(2) EPC).

(b) Like the decision under appeal, Respondents 4 and 5 based their arguments with regard to inventive step on D15b as the closest state of the art.

According to Respondent 4, D15b addressed essentially the same problem as the patent in suit, ie that of providing films having a low oxygen permeability, which had been solved in D15b by the use of a polyamide blend containing an aliphatic polyamide, preferably PA 6, PA 12 or PA 6/66, and an aromatic polyamide. The two components were allegedly used in amounts largely overlapping with those in Claim 1 of the patent in suit. Moreover, Example 19 disclosed the use of a PA 6I/6T (60:40 ratio of the two constituents) as the aromatic polyamide component, which according to D7 (page 5, lines 1 to 7) was amorphous. The Respondent further argued that the Appellant had failed to provide evidence for the assertion that the replacement of the Admer® layers in Example 19 by EVA or VLDPE layers would have required an inventive step. Moreover, reference had been made in D15b to layers of polyolefins, such as poly-ethylene or polypropylene or "denatured" (D15a: "modified") polyolefins covering both EVA and VLDPE. Furthermore, no particular technical effect was seen to be related to the selection of components made in the patent in suit. Consequently, the claimed subject-matter did not involve an inventive step.

Respondent 5 based its arguments mainly on an analysis of features of the films of D15b and compared these features with those of the claimed

subject-matter. It argued that the films of D15b could also be multilayer films of nylon blends, such as PA 6I/6T, and eg polyolefin layers, and that, due to the same composition, the properties of the basic polyamide films in D15b and in the patent in suit were the same. Therefore, the only difference that could be seen was in the selection of VLDPE and/or EVA for the other thermoplastic layer of the claimed films. However, neither the patent in suit nor the Appellant had provided any information about any advantageous properties of the films based on this difference. Nor had it been shown that the asserted technical problem of providing improved nylon blends and of avoiding the problems of the films previously known had been solved.

Moreover, as regards the above technical problem, the skilled person would additionally have taken "D1 (Feldmühle AG)" into account (letter dated 28 March 2000, bottom of pages 1 and 8).

Unlike the decision under appeal, D17 was considered by Respondent 3 as the most relevant state of the art, because it taught, in the Respondent's view, coextruded biaxially oriented heat shrinkable multilayer films comprising a nylon blend layer and at least on other thermoplastic layer, which was preferably made of polyolefin (claim 11), especially polyethylene and its copolymers including VLDPE and EVA. Moreover, LDPE was specifically identified as a suitable polyolefin layer (column 8, lines 20 to 26). With regard to the nylon layer, the Respondent quoted

passages from column 2, line 62 to column 3, line 2, column 3, lines 26 to 28 and column 3, lines 57 to 66 of D17, wherein reference was made to the linear polyamide constituents of the nylon blend, specifically to PA 6/66 and PA 6/12, and wherein the partially aromatic polyamides of the blend were discussed in general terms.

The properties as referred to in the Statement of Grounds of Appeal and as defined on page 8 of the patent in suit would, according to Respondent 3, be "really not more than the properties that are promised by D17 for a transparent shrinkable film composed of a polyamide layer in accordance with D17 in combination with a polyethylene layer, preferably formed by co-extrusion" (items 3 to 4.7). Since Claim 1 was "really just directed to a range of examples of the film disclosed in D17 having the properties which the skilled man would expect from reading D17", and a commercial PA 6I/6T ("Selar PA 3426") recently approved for food use was available, it "would be entirely obvious for the skilled reader to make use of this commercially available product ... in the invention described in D17." (item 5).

VI. On 29 November 2001, a communication was issued by the Board addressing the objections of the Respondents under Article 123(2) EPC and requiring clarifications of the amended claims under Article 84 EPC.

VII. In reply to this communication, the Appellant submitted a new Main Request and Auxiliary Requests I to VIII (letter dated 29 May 2002).

Claim 1 according to the new Main Request differed from the previous version (section IV, above) only in that the fourth word in line 1 (first occurrence of "film") had been deleted. The further dependent claims 2 to 10 concerned elaborations of this film.

Claim 1 of each of the Auxiliary Requests I to IV differed from the above Claim 1 in the definition of composition of the nylon blend. Thus, in Auxiliary Requests I and IV, the percentage of 6I-units in the amorphous nylon copolymer component (a) was limited to from 65 to 80%. In Auxiliary Request II, III and IV, the additional presence of a polyamide homopolymer was required.

Claim 1 of Auxiliary Request V read as follows:

"A thermoplastic flexible coextruded biaxially oriented heat shrinkable multilayer film comprising a first outer layer, a second outer layer, and at least one intermediate layer between said first outer layer and said second outer layer, said intermediate layer comprising a nylon blend containing

(a) 10 to 70 weight percent of an amorphous nylon copolymer having no measurable melting point or no heat of fusion (less than 2.1 J/g (0.5 cal/g)) as measured by differential scanning calorimetry (DSC) using ASTM 3417-83, said amorphous nylon copolymer comprising hexamethyleneisophthalamide/hexamethy-leneterephthalamide copolymer provided that said amorphous copolymer is not present in an amount of from 60 to 90 weight percent of said blend; and

(b) 10 to 90 weight percent relative to the total weight of the blend of a copolyamide having a melting point within a range of from 145 °C to 215 °C, said copolyamide comprising a copolymer of nylon 6 and nylon 12 or a copolymer of nylon 6 and nylon 66 or mixtures of said copolymers,

and said first and/or said second outer layer comprising ethylene vinyl acetate copolymer, very low density polyethylene or mixtures thereof.".

The remaining dependent claims 2 to 9 related to elaborations of this oriented multilayer film.

In Auxiliary Requests VI, VII and VIII, further limitations of the nylon blend in Claim 1 corresponded to those referred to above with respect to Auxiliary Requests I, II and IV.

As regards the requirements of Article 123(2) EPC, the Appellant argued that neither the "two-layer films" of the Main Request and Auxiliary Requests I to IV nor the "three-layer films" of Auxiliary requests V to VIII extended beyond the content of the original application text, and, in support of this position, it referred to some passages in the patent in suit: page 2, lines 35 to 38; page 4, lines 40/41; page 7, lines 6 to 26, especially from line 6 or 8 to line 14; and page 13, lines 53/54. On the basis of these passages, the skilled practitioner would, without any problems, apply the teaching of the patent in suit to the claimed two-layer films, because the disclosure of the patent in suit had to be seen in a coherent context. Furthermore,

the amended claims would not violate Article 123(3) EPC either, since granted claims 1 to 58 had encompassed the nylon blend *per se*, a thermoplastic film comprising a nylon blend, a multilayer film comprising a nylon core layer and two outer layers and, finally, multilayer films comprising at least two layers, one of which was a nylon blend-containing layer (item II of the letter: pages 2 to 4).

The claimed coextruded multilayer films which could be distinguished from laminated films without problems would "show a better adhesiveness of the single layers attached to each other and do not tend to delamination, since the layer interfaces (...) are melted together with each other; besides, no additional adhesives are needed." (item III of the letter: page 5, last paragraph, to page 6, first paragraph).

With regard to the requirements to be met by films for packaging food products and to the problems and disadvantages occurring in the use of prior art nylon films (patent in suit: page 2, lines 25 to 28 and lines 29 to 40; and page 3, line 28 to page 4, line 10, respectively), the problem to be solved was to provide a nylon layer containing, oriented multilayer film having good oxygen and moisture barrier properties that can be produced by a coextrusion process, thereby ameliorating many problems associated with prior art nylon multilayer films (patent in suit: page 4, lines 6 to 14; item IV of the letter: pages 7 to 9).

Since mention was made in D15b of "the vicinity of the melting point of aromatic polyamide (B)", the Appellant explicitly contested that the skilled person could have

derived from the document that the PA 6I/6T aromatic polyamide in D15b had been amorphous. Moreover, only Example 19 of this document referred to a multilayer film which comprised a core layer made from a blend of PA 6I/6T (6I/6T ratio: 60/40) and PA 6, but neither PA 6/66 nor PA 6/12, and outer layers made of a modified "Admer®" polyolefin, ie a maleic anhydride-modified LLDPE. And the example was completely silent as to important film properties of the film.

VIII. In a further letter dated 12 February 2003, Respondent 5 contended that the disclaimer in Claim 1 had obviously been inserted in Claim 1 in order to delimit its subject-matter from D14/D15b. This assertion was, however, disputed by the Appellant (letter dated 20 May 2003).

IX. In summons dated 9 July 2004, oral proceedings were appointed by the Board for 18 November 2004.

In reply to the summons, Respondent 3 informed the Board, in a letter dated 16 September 2004, that it would not attend the hearing. Furthermore, it reiterated the previous arguments of the Respondents with regard to the new requests of the Appellant. Due to the omission of "adjacent to said nylon containing layer", Auxiliary requests V to VIII were considered broader than the Main Request, on which the appeal had been based and, therefore, not permissible.

In letters dated 18 October 2004 and 13 November 2004, Respondent 2 filed a new experimental report, a further translation D15c of D14, a Japanese brochure relating to "Tafmer" and its translation into English, and

commented on the new sets of claims (section VII, above) on the basis of an analysis of features in D15c in comparison with the features defined in the patent in suit. Thus, since nylons 6I/6T of different 6I/6T molar ratios were used in a number of examples of the document, these materials were, according to the Respondent, suggested to a skilled person "as best suitable". Although in Example 19 a blend of PA 6I/6T and of an aliphatic polyamide had been used in a weight ratio of 85:15, the skilled person would additionally have found the reverse weight ratio in the document (80 % of the aliphatic polyamide and 20 % of PA 6I/6T). The replacement of aliphatic PA 6 as used in the above Example 19 was suggested, if not recommended, to be tested in view of the large number of aliphatic polyamides standing in a row with the above nylon as disclosed altogether in the document. Therefore, the document suggested that a polyamide film comprising eg PA 6I/6T and eg PA 6/66 was suitable. Each of these materials would actually have the physical properties addressed in the claims of the patent in suit, so that there was no need for a selection of materials with regard to such properties. Furthermore, the known films might be stretched biaxially, heat-treated and coextruded or extrusion-laminated with another polymer or copolymer, eg a polyolefin, layer. Therefore D15c suggested a polyamide-based film laminate having all properties/ features of the film claimed with the only exception of EVA and/or VLDPE being used in the non-nylon layer(s) of the film. The "Tafmer" brochure would demonstrate the densities of those polymers to be in the range of VLDPE.

By letter dated 8 November 2004, the Appellant requested that the latest submissions of Respondents 2 and 3 be disregarded by the Board, in particular the late filed document D15c and the experimental report, because of the long time passed since the filing of the requests under consideration (filed with its letter of 29 May 2002). Moreover, neither D15c nor the additional experimental data would be highly relevant or pertinent. Nor was the Appellant in a position to verify these experimental results in due time. Furthermore, the Appellant disputed that the claims of any one of the requests on file violated Article 123(2) and (3) EPC. Namely, the disclaimer would be allowable in accordance with the latest jurisprudence in G 1/03 and G 2/03 (OJ EPO 2004, 413 and 448, respectively), since it delimited the claim from D16.

The Appellant denied that it had abandoned subject-matter when suggesting the claims submitted with the Statement of Grounds of Appeal (item II.5). Those claims had been mere attempts of formulating new claims, "on the basis of which the opposed patent is to be defended. However, there does not exist any procedural rule or any EPC regulation which would prevent patentee from amending his claims when he realizes deficiencies in the claims - especially after the preliminary assessment by the Board of Appeal. Even if such amendment would be broader than the first formulation attempt during the appeal proceedings, this would be allowable." (page 7, fourth paragraph of the letter). In case that the Board should come to an opposite assessment in this respect, the Appellant requested that the following question be referred to the Enlarged Board of Appeal:

"If patentee defends the opposed patent during opposition appeal proceedings by filing an amended set of claims having a limited scope over the granted version and also over the version of claims with which patentee defended the opposed patent in the first instance, does this hinder him in filing newly formulated claims at a larger stage of the appeal proceedings (especially as a consequence of a preliminary objection by the Board of Appeal) as long as the requirements of the EPC are fulfilled, especially those of Articles 84 and 123(2) and (3) EPC, and as long as the scope of the newly formulated claims is even narrower than that of the claims with which patentee defended the opposed patent in the first instance or, put in other words, is the first formulation attempt for amended claims during appeal proceedings binding to patentee in a legal sense although he did not make any legal renunciation, neither explicitly nor implicitly?"

With respect to previous arguments of the Respondents on the basis of D17, the Appellant added that whilst it was true that PA 6I was amorphous and the measurement in D17 was related to a change in physical status rather than to the melting point, PA 6I and PA 6I/6T had different properties, in particular PA 6 was shrinkable, whilst PA 6I/6T was not. Moreover, D17 did not contain any indication, suggestion or motivation towards a selection of the blend according to the patent in suit comprising (a) an amorphous polyamide and (b) a copolyamide having a melting point of at least 145°C. With regard to the alleged failure of the Patent Proprietor to demonstrate any advantages of the

claimed subject-matter over the prior art, the Appellant emphasised that, in opposition proceedings, the burden of proof was on the opponents to demonstrate that patentability was not given.

X. Oral proceedings were held on 18 November 2004 in the presence of the Appellant and Respondents 2, 4 and 5. At the beginning of the oral proceedings, the Board was informed by two employees of Respondent 1 who were present, that this party would not be officially represented in these proceedings.

(a) In view of the other translations previously on file, Respondent 2 who had filed D15c on 18 October 2004 agreed that there was no need to take this new translation into consideration.

(b) The parties addressed the same topics and argued along the same lines as previously in writing. As regards inventive step, the Respondents relied specifically on D15b and D17. Additional reference was made to D6 and D7. In the discussion, the experimental report of Respondent 2 (section IX, above) was referred to shortly in the context of D15b. Moreover, the shrinkability of the film in Example 1 of D15b was discussed, and the argument of the Respondents that Tafmer®, mentioned on page 9 of D15b, was VLDPE, because it fulfilled the density requirement in the patent in suit, was disputed by the Appellant.

(c) Furthermore, an objection of lack of clarity was raised by the Respondents under Article 84 EPC against the definition of the copolyamide component (b) in Claim 1.

(d) At the end of the discussion, the objection under Article 100(b) EPC (last paragraph of section II, above,) was resumed, because, without an adhesive, a stable multilayer film could not be prepared due to delamination of the layers. As generally known in the art, polyolefin would not stick to polyamide and, therefore, in Table 5 all the examples in accordance with the claims included such a component. The Appellant disputed these assertions. The EPC would not require the claims to be limited to the best mode known to the proprietor. The skilled reader would know what to do.

XI. The Appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of Claims 1 to 10 according to the Main Request or, in the alternative, on the basis of the claims according to one of the Auxiliary Requests I to VIII, all as submitted with the letter dated 29 May 2002, additionally as an Auxiliary Request, it requested referral to the Enlarged Board of Appeal of the question formulated in the letter dated 8 November 2004, page 8 (cf. section IX, above).

The Respondents requested that the appeal be dismissed.

## Reasons for the Decision

1. The appeal is admissible.

2. Since all parties had duly been summoned to the oral proceedings, these proceedings were continued in accordance with Rule 71(2) EPC in the absence of Respondents 1 and 3.

*Main Request and Auxiliary Requests I to IV*

3. Claim 1 according to each of the Main Request and Auxiliary Requests I to IV is directed to a multilayer film comprising (i) *at least one* layer comprising a nylon layer containing components (a) and (b) and (ii) *at least one* other thermoplastic layer comprising EVA, VLDPE or mixtures thereof (cf. section VII in conjunction with section IV, above). According to the Respondents, none of them complied with Article 123(2) EPC.

In view of an identical situation in this respect in these requests, the parties agreed that the issue of Article 123(2) EPC could be dealt with for all of these requests together.

The films of these requests will be referred to as "two-layer films" (layers (i) and (ii), above) herein below in order to provide a simplified distinction from the "three-layer films" (two outer layers and at least one intermediate layer) as defined in Claim 1 in each of Auxiliary Requests V to VIII (section VII, above).

3.1 In order to support its argument that the skilled person reading the patent in suit would have understood that the films as disclosed and claimed therein related also to a film containing in fact two layers, the Appellant referred to passages in the description on pages 2, 4, 7 and 13 of the patent in suit (section VII, above). Thus, on page 2 (lines 35 to 37), reference was made to multilayer films which "may include one or more additional layers of films made of various resins, for example, low density polyethylene (LDPE), ethylene-vinyl acetate copolymer (EVA), ionomer, PVDC, or ...". On page 7, lines 6/7, mention was made of "... biaxially oriented films of one or more layers", followed by a list of polymers which could be used therein. And according to page 13, line 54 of the specification, "... two layers as well as four or more layer films are contemplated.".

By contrast, the Respondents argued on the basis of the application as filed and expressed their common opinion that a basis for the other thermoplastic layer comprising EVA, VLDPE or mixtures thereof could only be found in original Claims 63 and 65, both appendant to original Claim 36 (section I, above) relating to "three-layer films" only. Moreover, according to the Respondents, the passage in the description explaining the chemical nature of the polymers in the non-nylon layer also related only to such "three-layer films" (page 14, line 30 to page 15, line 29; *page 6, lines 30 to 48 of the published version; any reference to this publication will be given in italics*).

3.2 From the wording of Article 123(2) EPC, it is evident that the patent specification is not the proper basis for the assessment of whether the requirements of this Article have been met. In fact, the patent in suit as granted contained in each of its two sets of claims an independent Claim 48 directed to "two-layer films" (additionally requiring a specific minimum shrinkage value in at least one direction) (section I, above). No such claim could, however, be found in the application as filed, which, instead, contained two completely separate groups of claims to films. A first, more general group (Claims 13 to 35 and 66) related to thermoplastic flexible films comprising a nylon blend, and a second, more specific group (Claims 36 to 65 and 67) concerned oriented multilayer films comprising two outer layers and at least one intermediate layer, which comprised a nylon blend (ie a "three-layer film", cf. section 3, above). Although, within the first of these two groups, mention was made (i) of the optional presence of a plurality of optionally oriented layers (Claims 31 and 34) and (ii) of the option that the film comprised a tubular casing which might be a multilayer film (Claims 32 and 33), respectively, this group of claims did not contain any reference to the specific chemical nature of the polymers in the "other thermoplastic layer" as defined in Claim 1.

Hence, the original set of claims did not contain any disclosure concerning a "two-layer film" having at least one layer comprising EVA, VLDPE or mixtures thereof. Rather, this specific composition of the "other thermoplastic layer" was only disclosed with respect to and in the context of the "three-layer film" (Claims 63 and 65).

Hence, the original set of claims does not provide the clear and unambiguous disclosure of a "two-layer film" wherein the "other thermoplastic layer" comprises EVA, VLDPE or mixtures thereof.

3.3 Therefore, it must be examined whether the description as originally filed provides such a basis.

The first passage of the patent specification referred to by the Appellant (page 2, lines 35 to 38) corresponds to the passage on page 2, lines 18 to 34 of the application as filed (*page 2, lines 28 to 36*). However, within the "Background of the Invention", this passage refers only to the state of the art: "In general, nylon films are made ... Specific types of nylons ... have been made into films. ... It is known to use certain nylon films as core layers in oriented multilayer films. ... These multilayer films may include one or more additional layers of films ..."). Nor does it refer to EVA and/or VLDPE.

The second passage cited by the Appellant in this context (patent: page 4, lines 40/41; application: page 6, printed lines 17 to 19, *page 3, lines 54/55*) refers to the fact that the "newly disclosed blend may be utilized to form novel thermoplastic flexible films of one or more layers." However, this statement neither refers to a film having *two* layers, nor does it indicate the chemical nature of these further layers, let alone does it hint to the use of the specific thermoplastic polymers EVA and/or VLDPE in any layer of such films.

This finding is also valid for the passage on page 7, lines 6/7 of the specification, referring to blown films as well as uniaxially or biaxially oriented films of one or more layers (application: page 14, lines 26 to 28; *page 6, lines 28/29*).

Then, in the paragraph directly following this latter passage, both the specification and application texts clearly relate to multilayer film applications, wherein the *first outer layer* and *second outer laye*r and additional optional *intermediate layers* may be made of any suitable resins or resin blends. This statement is followed by a list of polymers including polyolefin resins, copolymers and/or blends thereof, polyesters, other nylons, ionomers, poly(vinylidene chloride) copolymers (PVDC), ethylene vinyl alcohol copolymers and various blends thereof. Then preferred components of the *outer layers* are named, ie LLDPE (linear low density polyethylene, densities of between 0.91 to 0.93g/$cm^3$), VLDPE (densities between 0.86 and 0.91g/$cm^3$), EVA and blends thereof, namely blends of EVA with LLDPE or VLDPE (patent in suit: page 7, lines 7 to 26; application: page 14, line 30 to page 15, line 29; *page 6, lines 30 to 48*).

This passage clearly and unambiguously teaches that LLDPE, VLDPE and EVA can be used in *outer layers* of multilayer films. This disclosure does not, however, provide a basis for "two-layer films", containing one layer of VLDPE and/or EVA, but not LLDPE.

Finally, the statement after Table 5 (patent in suit: page 13, lines 53/54; application: page 31, lines 1 to 4; *page 15, lines 1/2*), although referring explicitly

to two layer films, neither refers to any specific part of the description, nor does it indicate that the "other thermoplastic layer" should have a particular chemical composition, let alone does it hint to the use of EVA and/or VLDPE in the second layer of such a film.

3.4 The application of the specific features of original Claims 63 and 65 on a film not having two outer layers and at least one intermediate layer in accordance with original Claim 36 would, however, mean a generalisation of the particular disclosure of these dependent claims which included all the features of Claim 36 to which they were appendant (Rule 29(4) EPC).

In other words, when reading the claims according to the Main Request or Auxiliary Requests I to IV, in particular, their Claims 1, the reader is confronted with information which is not directly and unambiguously derivable from that previously presented by the application, even when account is taken of matter which is implicit to a person skilled in the art.

Consequently, the subject-matter of Claim 1 of each of the above requests extends beyond the content of the application as filed and, thus, contravenes Article 123(2) EPC.

Since a decision can only be made for a request as a whole, the Main Request and each of Auxiliary Requests I to IV must, therefore, be refused.

*Auxiliary Request V*

4. *Assertion of abandonment of subject-matter by estoppel*

4.1 Whilst in the Notice of Appeal, the Appellant had requested that the patent should be maintained in "vollem Umfang", ie as granted, it was said in the Statement of Grounds of Appeal that "Das Patent wird nur noch im Umfang der beigefügten Ansprüche 1 bis 11 verteidigt." (section IV, above). From this latter statement, the Respondents concluded that all embodiments not including each and every formulation of Claim 1 as filed with the Statement of Grounds of Appeal (section IV, above) had been abandoned, and they raised an objection against the claims of Auxiliary Request V, because of the absence of the expression "adjacent to said nylon containing layer" from Claim 1. In the Respondents' view, the Appellant's above latter statement in German, was an estoppel or waiver which would bar the Appellant from reinstating subject-matter which had been abandoned by this statement. Therefore, the Appellant should be allowed only to defend the patent in suit on the basis of the "Main Request on appeal or appropriate narrower claims" (cf. letter of Respondent 3, dated 16 September 2004, item 1.7).

4.2 The Appellant disputed this objection and these arguments (section IX, above), pointing out that neither Article 123(2) nor 123(3) EPC, the only relevant provisions in the EPC, had been violated by the contested claims. Moreover, the claims submitted with the Statement of Grounds of Appeal had only been the mere attempt of formulating new claims, on the basis of which the opposed patent was to be defended.

4.3 The patent in suit as granted contained, in both of its sets of claims, claims to a nylon resin blend *per se* (Claims 1 to 9) and claims to films comprising the above nylon resin blend (Claims 10 to 58).

4.4 Having regard to the alleged abandonment of subject-matter, it is evident that two different statements as to the scope defended were made by the Appellant in these appeal proceedings (section 4.1, above). The latter statement, accompanied by new limited claims covering only thermoplastic flexible coextruded biaxially oriented heat shrinkable multilayer films, ie the subject-matter within the scope of Claims 10 to 58 as granted, can, in the Board's view, only be construed as the intention of the Appellant, at that moment, of not pursuing further the nylon resin blends as such (ie the subject-matter of Claims 1 to 9 as granted). In any case, the above statement cannot, in the Board's view, be interpreted as a formal waiver or estoppel.

4.5 Having regard to the filing of requests containing claims of different scope during appeal proceedings, the Board concurs with the findings in decision T 123/85 (OJ EPO 1989, 336) as far as that Board held that "in requesting that his patent be maintained in a limited form the patentee is merely trying to delimit his patent to meet objections expressed by the European Patent Office or the opponents. However the patentee does not, by virtue of such limitation, irrevocably surrender subject-matter covered by the patent as granted ..." (reasons for the decision: number 3.1.1, third paragraph). This view has also been confirmed in T 296/87 (OJ EPO 1990, 195, number 2.2. of the reasons)

and T 564/98 of 6 June 2000 (not published in OJ EPO; number 2 of the reasons). Moreover, the Patent Proprietor is the only Appellant, so that according to the finding of the Enlarged Board of Appeal in G 9/92 and G 4/93 (OJ EPO 1994, 875), the Respondents cannot suffer from an inadmissible *reformatio in peius*.

These findings apply to both submissions of new claims, ie of the set of claims submitted together with the Statement of Grounds of Appeal and of those sets of claims now under consideration.

Moreover, the latter sets of claims were filed in reply to objections raised in the communication dated 29 November 2001 and within the time limit set by the Office, so that the amendment of the previous request cannot be considered as an abuse of procedural law (T 123/85, above, number 3.1.2 of the reasons).

In the Board's view, the feature "adjacent to said nylon containing layer", which has been replaced in Auxiliary Request V *et seq.* by a more precise wording, ie the requirement that the film contained two outer layers (comprising EVA and/or VLDPE) and at least one intermediate layer comprising the nylon resin blend between the two outer layers, is clearly based on the disclosure of the application as filed (original Claim 36), whilst the previous try of the Appellant "to delimit his patent to meet objections expressed by the European Patent Office or the opponents" had given rise to objections in this respect (cf. the above communication, in particular, items 3 and 4.c).

4.6 Consequently, the Board has come to the conclusion that the set of claims of Auxiliary Request V does not extend the scope of the patent in suit to something which had previously been abandoned.

5. *Article 123(2) EPC*

5.1 In the context of Claim 1, the question arose of whether the disclaimer in the definition of nylon component (a) was still allowable in view of decisions G 1/03 and G 2/03 (above). Since according to OJ EPO 2004, 448, all parts of G 2/03 are the same as those of G 1/03, each reference to G 1/03 herein below should be understood as to refer to both decisions.

5.2 It was not in dispute between the parties, and it is beyond doubt for the Board, that the disclaimer ("provided said amorphous copolymer is not present in an amount of from 60 to 90 weight percent of said blend") was inserted during the examination proceedings, resulting in the grant of the patent in suit, in order to exclude the disclosure of D16, which belongs to the state of the art according to Article 54(3) and (4) EPC. Hence, it is, insofar, in line with G 1/03 (above, numbers 2.1 to 2.13 of the reasons).

5.3 However, the Respondents were of the opinion that pre-published D14/D15b also anticipated the claimed subject-matter of the patent in suit and, under such circumstances, a disclaimer would, according to G 1/03, be admissible only if this anticipation was accidental (G 1/03: number 2.2.2 of the reasons). However, since D15b had been identified in the decision under appeal as the closest state of the art, this anticipation was,

according to the Respondents, not accidental and the disclaimer, therefore, contravened Article 123(2) EPC (cf. G 1/03: number 2.6.5 of the reasons).

5.4 Document D14/D15b concerns polyamide films which are dimensionally stable in steam sterilisation at temperatures in the range of 130 to 150°C (D15b: first paragraph of the description "does not give effect to ... configurative changes by steam sterilization at high temperatures (130 - 150°C) (hereinafter simply referred to at retort treatment)"; in D15a: "no changes ... in shapes ... at elevated temperatures (130 - 150°C) (hereinafter called 'high-retort processing')").

5.4.1 A multilayer film is only referred to in Example 19. More precisely, the example discloses a three-layer film having a shrinkage rate of 0% in high retort treatment. The intermediate layer of the film was formed from a nylon blend of 85% by weight of PA 6I/6T (60:40) and 15% by weight of PA 6, and the outer layers were based on "Admer®", a modified polyolefin (D15b: page 9, lines 10 and 12; and D15a: page 8, lines 12/13).

5.4.2 According to the Appellant (letter of 29 May 2002: page 12, third paragraph) and not disputed by the Respondents, "Admer®" is a maleic anhydride-modified LLDPE, but not VLDPE. In order to meet the composition of a multilayer film as claimed, distinct modifications of the film of Example 19 would be necessary, ie with respect to both the qualitative and quantitative composition of the nylon blend in the intermediate layer, the thermoplastic polymer of the outer layers and, furthermore, as argued by the Respondents, also

the treatment of the multilayer film, ie by omitting the heat-treatment at 200°C.

5.4.3 On page 9 of D15b (page 8 of D15a), a list of different types of thermoplastic polymers (polyamide, polyolefin, polyester, "denatured" = modified polyolefin) for any layers in addition to the nylon blend layer is given. However, no details, nor requirements concerning the properties of these polymers as such are given in the document. From the above list of polymers, the skilled reader can derive nothing more than that each of them was suitable for the preparation of the dimensionally stable, ie not heat-shrinkable, films of D15b. The mention of some examples of such polymers, including eg "Admer", "Surlyn" and "Tafmer", does not change this situation. Nor, in this context, is the question relevant whether the Tafmer, identified in D15b as an ethylene-hexene-2 copolymer, had had a density of less than 0.91 $g/cm^3$ (as required for VLDPE in the patent in suit). Anyway, the assertion of Respondent 2 to this end, on the basis of the late-filed Tafmer brochure (section IX; above), was disputed by the Appellant, since only some types of Tafmer of different compositions had been characterised therein.

5.4.4 According to D15b, the two nylon components may be present in the "reverse" weight ratio of 80% of aliphatic polyamide and 20% of PA 6I/6T in applications requiring rigidity rather than oxygen-barrier properties (cf. D15b: page 7, lines 18 to 21). However, unlike D15b, the patent in suit is not directed to a rigid film, nor to a dimensional stable film. Any change of the latter stability of the known films into its contrary would have gone, however, straight against

the above teaching of the document. Consequently, the reader, positively, could not derive from D15b that one of the above thermoplastic polymers of D15b (section 5.4.2, above) would provide a film having different properties when combined with a nylon layer having a different qualitative and quantitative composition. Nor could the reader derive from D15b that the heat-treatment could be dispensed with.

5.5 The experimental report (submitted with the letter dated 18 October 2004 by Respondent 2), which did not contain any true repetitions of embodiments disclosed in D15b, could not change the above assessment either.

5.6 It follows that D15b does not anticipate the heat-shrinkable multilayer film of Claim 1. This means, in fact, that the disclaimer in Claim 1 is not related to this document and, therefore, the above argument of the Respondents to show that the disclaimer would not be allowable fails, and that the disclaimer complies with the requirements for the allowability of disclaimers as defined in G 1/03, above.

5.7 Furthermore, Claim 1 of this request finds its basis in the following claims and passages of the application as filed:

Claims 36, 37, 39, 44, 45, 47, 48, 52, 63 and 63; Description: page 6, lines 17 to 19 (*page 3, lines 54/55*); page 7, lines 3, 9/10, 14 to 24 and 21 to 27 (*page 4, lines 6, 10, 13 to 18 and 38 to 41*); page 11, lines 23/24, (*page 5, line 29*); page 14, lines 26 to 29 (*page 6, lines 28/29*); and page 17, lines 10 to 12 (*page 7, lines 19/20*).

In particular, the findings in sections 3 to 3.4, above, demonstrate that, in contrast to the Main Request and Auxiliary Requests I to IV, the composition of the film according to Claim 1 of Auxiliary Request V, comprising two outer layers comprising EVA and/or VLDPE and at least one intermediate layer comprising a blend comprising an amorphous PA 6I/6T and at least one of the specific nylon copolyamides (PA 6/12 and/or PA 6/66) having a melting point of from 145 to 215°C, is based on the disclosure in Claims 36, 63 and 65 as filed.

5.8 The dependent claims are based in the following claims and passages of the application as filed:

Claims 32, 41 to 43 and 49 to 51; Description: page 11, last line to page 12, line 2 (*page 5, lines 34 to 37*); page 17, lines 27 to 33 (*page 7, lines 33 to 35*); and page 31, lines 1 to 18 (*page 15, lines 1 to 11*); page 31, line 34 to page 32, line 5 (*page 15, lines 19 to 23*); page 32, lines 19 to 33 (*page 15, lines 31 to 36*); and page 33, lines 15 to 17 (*page 15, lines 48/49*).

No objections have been raised by the Respondents in this respect.

5.9 Consequently, the requirements of Article 123(2) EPC are met.

6. *Article 123(3) EPC*

6.1 The patent in suit as granted contained, in both of its sets of claims, claims to a nylon resin blend *per se* (Claims 1 to 9) and claims to films comprising the above nylon resin blend (Claims 10 to 58).

It is evident that the protection conferred by the broadest claim within Auxiliary Request V, ie Claim 1, does not extend beyond the scopes of Claim 1, Claim 10 and Claim 23 as granted, respectively (sections I and VII, above), but has rather been further limited. Hence, the requirements of Article 123(3) EPC are met by the claims according to Auxiliary Request V.

7. *Article 84 EPC*

The Respondents raised an objection against Claim 1 because of the allegedly unclear formulation "copolymer of nylon 6 and nylon 12 or a copolymer of nylon 6 and nylon 66", because it would not be clear whether this meant something different from PA 6/12 and PA 6/66 copolyamides referred to in the description (patent in suit: page 6, line 7; application: page 11, lines 23/24; *page 5, line 29*). Hence, this would give rise to a question of support of Claim 1 by the description.

Apart from the fact that Article 84 EPC is not a valid ground for opposition, Claim 1 has not been amended during the opposition and appeal proceedings in this respect. According to established jurisprudence, however, only amendments in a claim carried out during the opposition and/or appeal proceedings are subject to an examination in accordance with Article 102(3) EPC.

Reference can thus be made to T 301/87 (OJ EPO 1990, 335, numbers 3.7 and 3.8 of the reasons), T 367/96 of 3 December 1997 (not published in OJ EPO, number 6.2 of the reasons) and T 381/02 of 26 August 2004 (not published in OJ EPO; numbers 2 to 2.5 of the reasons).

8. *Request for referral to the Enlarged Board of Appeal*

Since the Board has accepted Auxiliary Request V in respect of the requirements of Article 123(2) EPC, there is no need to consider the auxiliary request of the Appellant that the legal question (section IX, above) be referred to the Enlarged Board of Appeal.

9. *Problem and Solution*

The patent in suit relates to multilayer films comprising two outer layers and at least one intermediate layer between the two outer layers, wherein the intermediate layer comprises a blend of at least two different nylon polymers and the outer layers comprise polyolefin resins.

In the introduction of its description, the patent in suit refers to a number of properties which are to be considered when selecting films for packaging food products such as barrier properties, cost, durability, puncture resistance, flex-crack resistance, approval by authorities, machinability, optical properties such as gloss and haze, printability, sealability, shrinkability, shrink force, stiffness and strength (page 2, lines 25 to 28), and problems encountered in this field (cf. page 3, lines 28 to 39).

9.1 Films having a composition as mentioned in the first paragraph of section 9, above, are known from Example 19 of D14/D15b, and from D17, in particular its Example 6, as referred to by the Respondents.

9.1.1 The decision under appeal held D14/its translation(s), eg D15b, to represent the closest state of the art. This point of view was also adopted by Respondents 2, 4 and 5, whereas Respondent 3 considered D17 as closest prior art (section V(b) and IX, above).

Whilst Respondent 3 based its opinion on the properties of the films disclosed in D17 and the desired properties of the films of the patent in suit (cf. section 9, second paragraph, above), Respondents 2, 4 and 5 compared the translations of D14 with the patent in suit on the basis of features found in an analysis of features to be common to both the prior art document and the patent in suit. The properties were considered as the automatic result of the choice of components used in the preparation of the films (cf. eg the letter of Respondent 5, dated 28 March 2000, page 3, the paragraph relating to "Merkmal (iii)").

9.1.2 As pointed out in the observations of the Board in sections 5.4 to 5.6, above, concerning the disclosure of D15b, that document relates to films which are dimensionally stable even at "high-retort processing". This is confirmed by Example 19, the only disclosure relating to a multilayer film, according to which its biaxially-stretched coextruded three-layer film product showed no changes in transparency, oxygen barrier and mechanical properties, nor shrinkage (contraction rate/ shrinkage rate 0%) after high-retort processing

at 137°C for 5 minutes (cf. the translations 15a and 15b).

9.1.3 Document D17, however, aims at a transparent, shrinkable film suitable for packaging goods, especially foods. Such a film, which, on the one hand, should also be glossy, should not, on the other, be brittle, in order to avoid damage to the film or the goods due to the action of mechanical stress, eg during transport (column 1, lines 7 to 15, column 2, lines 3 to 13 and 45 to 55).

9.1.4 Situations concerning the determination of an appropriate starting point for the assessment of inventive step in pre-grant and opposition proceedings have already been considered and adjudicated in decisions T 686/91 of 30 June 1994 and T 325/93 of 11 September 1997 (neither published in OJ EPO). In both decisions the Boards observed that, in the determination of the closest state of the art, *ex post facto* considerations should be avoided. Therefore, a document not mentioning the technical problem that is at least related to that derivable from the patent specification or patent application, does not normally qualify as a description of the closest state of the art on the basis of which the inventive step is to be assessed, regardless of the number of technical features it might have in common with the subject-matter of the patent or patent application concerned (cf. T 686/91, number 4 of the reasons; T 325/93, number 4.4. of the reasons).

9.1.5 In the decision under appeal, the technical problem was formulated as the provision of further polyamide films having similar good overall properties as the films of D15b (as enumerated on pages 2 and 3 of the document). In this respect, Respondents 2, 4 and 5 argued along the same lines (cf. sections III, V(b) and IX, above).

Since, on the one hand, the patent in suit is, however, directed to the provision of coextruded multilayer films of improved nylon blends which ameliorate many problems associated with known films by improving one or more properties such as haze, gloss, oxygen permeability, tensile strength, dynamic puncture or shrink percentage after extrusion (patent in suit: page 4, lines 6 to 14 and page 5, lines 1 to 3), in particular heat-shrinkability ("at temperatures well below 127°C"; patent in suit: page 4, line 56 to page 5, line 1) and, on the other hand, D15b unambiguously aims at films being, in particular, dimensional stable in "high retort-processing" conditions rather than heat-shrinkable at the above low temperatures (sections 5.4 to 5.6, above), it cannot represent the closest state of the art.

9.1.6 Consequently, the Board has come to the conclusion that D17 (this would apply also to D27, its counterpart in German) represents the closest state of the art.

9.2 As already indicated above, Document D17 relates to a transparent shrinkable film comprising at least one layer of a polyolefin and at least one layer which is composed of a mixture of (i) 85 to 10 wt.% of a linear polyamide, linear copolyamide, or an elastomeric component, selected from the group consisting of

polybutadiene, mixtures of polyamides and polybutadiene, mixtures of polyamide nitrile rubber, block copolymers of polyether segments and polyamide segments and (ii) 15 to 90 wt.% of a partially aromatic polyamide or partially aromatic copolyamide, said film having been stretched at a temperature below 120°C (Claim 1). Preferably the polyolefin layer consists of an ethylene copolymer (Claim 11) or of polyethylene types of low density with a linear molecular structure (Claim 13). According to Claims 15 and 16, the layers may be glued together or coextruded.

9.2.1 Particular emphasis is put on the fact that the films of D17 can advantageously be thermoformed, ie by deformation with heating to the desired temperature, and applying a vacuum or optionally compressed air, thus allowing to dispense with stretching the film, thereby, in particular, avoiding the expensive process of biaxial stretching, but rather stretching the film only, when a thermoformed container is made, in the shaped regions of the composite film (column 6, line 63 to column 7, line 13 and column 8, lines 49 to 54).

9.2.2 The polyolefin layer(s), especially polyethylene and its copolymers, adhering to the polyamide film, show a high barrier effect against water vapour and, in the case of polyethylene, a good sealability (column 7, lines 32 to 37).

9.2.3 The linear polyamides include a variety of polymers such as polyamides 6, 66, 610, 11 and 12; linear copolyamides mentioned are polyamides 6/66, 6/12 and "69". They may also include copolyamides containing cycloaliphatic and aromatic compounds such as

isophthalic acid in subordinate amounts of up to 15 wt.% (column 3, lines 21 to 37).

9.2.4 Partially aromatic polyamides and copolyamides are understood to be those polyamides, in which either the diamine or the dicarboxylic acid component is present as an aromatic material, either in equimolar amounts or at least as the predominant portion in the case of copolymers. "Preferredly suitable are the poly-condensation products of aliphatic diamines, such as hexamethylenediamine, and aromatic dicarboxylic acids, such as terephthalic acid, especially isophthalic acid. In particular, the following ... partially aromatic polyamides may be used ...: Polycondensates from diamines, such as ethylenediamine, hexamethylenediamine, decamethylenediamine, dodecamethylenediamine, 2,2,4- and/or 2,4,4-trimethylhexamethylenediamine, m- and/or p-xylylenediamine with dicarboxylic acids such as iso-phthalic acid and terephthalic acid. When the aromatic component is in the diamine component, aliphatic dicarboxylic acids, such as oxalic acid, adipic acid, sebacic, etc. may be used as the carboxylic acid components." (column 3, line 57 to column 4, line 10).

9.2.5 Further details of the polyamides are given in columns 5 and 6. Thus, PA 6I (admittedly amorphous, section IX, last paragraph, above) could be added to PA 6 in order to improve the shrinkage (column 5, lines 20 to 27) or to a combination of PA 66 and PA 6/66, the latter being named as one example of *amorphous* linear copolyamides which can serve to reduce brittleness (column 6, lines 13 to 25).

9.2.6 In numerous experiments, shrinkage and stretching properties of different polyamide monolayer films were tested (columns 9 and 10; Fig. 1 to 9; cf. D27: columns 10 to 13). Individual examples of polyamides used in these experiments were nylons 6, 6I and 66, polytrimethylhexamethylene terephthalamide and polyhexamethylene phthalamide, exemplified copolyamides used were PA 69, PA 6/66 and PA 6/AI. These polymers were used individually or in polymer mixtures.

In Fig. 10, the shrinkage behaviour of a composite film consisting of a polyamide layer (75 wt.% PA 6 + 25 wt.% PA 6I) and an EVA layer is shown in relation to the degree of stretching. Likewise in Fig. 11, the shrinkage of different types of composite films was determined wherein a layer of an ethylene homopolymer (density 0.922 $g/cm^3$) was combined with polyamide layers either composed of blends of PA 66 and PA 6I, blends of PA 66, PA 6I and PA 6/AI, or blends of PA 66, PA 6/66 and PA 6I, respectively, or made of PA 6/AI.

9.2.7 In Example 1, a "relatively rigid" film having a crystal clear appearance was made from a mixture of PA 6/AI and PA 6I and subsequently stretched. The stretchability and shrinkability were determined by uniaxially stretching film samples to different degrees and measuring their reduced lengths after rapid immersion in a hot water bath (95±1°C, 5 s). This film corresponded to the film used in Fig. 8 and 9. Examples 2 and 3 concern similar measurements with other monolayer films made of blends of PA 6 and PA 6I.

In Examples 4 and 5, films of mixtures of PA 6/AI and PA 6I and of PA 6/PA 6I blends, respectively, were coated uniformly on conventional laminating equipment with a polyurethane adhesive and then laminated with the corona-treated side of an EVA film.

In Example 6, specifically referred to by the Respondents, a polyamide/polyolefin composite film was prepared by coextrusion using a blow-moulding process. The polyamide layer was prepared from 60 parts by weight of PA 6/66 (85:15) and 40 parts by weight of PA 6I. The polyolefin was high-pressure polymerised LDPE having a density of 0.922 $g/cm^3$. The polyamide layer was coated on both sides with an intermediate layer of ionomeric resin and a layer of the polyolefin and then blow-moulded at a blow ratio of B = 1.8:1.

Apart from the layer thicknesses of the film, only shrinkage values, measured as in Example 1 (see above), in relation to different degrees of stretching are given, whilst the transparency of the film was referred to only as being "very good". However, no details are given with regard to the further properties (toughness elasticity or flexibility, gas tightness, vacuum mould-ability, surface gloss, heat-sealing properties, shrinkage force) referred to in column 2, lines 45 to 61 of D17. Nor are any data available relating to further properties mentioned in the patent in suit (tensile strength, elongation, secant modulus, dynamic puncture resistance, oxygen barrier properties, cf. patent in suit: Table 5).

9.3 On the basis of the passages in the patent in suit, as mentioned in section 9.1.5, above and with respect to Table 5 (previous paragraph), and in view of the lack of any quantified details of the properties of the films known from D17, apart from the shrinkage referred to in the previous paragraph, the technical problem may be seen, as suggested by the Appellant, in the provision of coextruded biaxially stretched films which combine good heat shrinkability and improved qualities required for food packaging such as tensile strength, elongation, secant modulus, dynamic puncture, haze, gloss and oxygen permeability properties.

9.4 According to the patent in suit, this problem is solved by the multilayer film as defined in Claim 1.

9.5 As demonstrated by the experimental data in Table 5 provided for films of those examples in accordance with Claim 1, this technical problem has been solved.

Thus, the Board cannot reject the arguments of the Appellant that (i) Example 14 showed that amorphous PA 6I/6T was hardly shrinkable, but (ii), nevertheless, the combination of this component with PA 6/12 (a shrinkable polyamide; cf. Example 15), provided films with, in part, even further improved shrinkability. By contrast, (iii) two apparently amorphous polymers (PA 6/66 and PA 6I), both shrinkable, were combined in D17. Moreover, (iv) Table 5 in the patent in suit also provided measurements of a number of further properties of the claimed films, whilst D17 was silent in this respect.

In view of the experimental data before it, the Board is, therefore, not in a position to accept the arguments of the Respondents who, like the decision under appeal, argued that the Appellant would have failed to provide convincing arguments for unexpected or surprising properties of the claimed films in comparison to films of the closest state of the art. As pointed out by the Appellant and in accordance with established jurisdiction, the onus of proof for an asserted failure to solve the relevant technical problem, worded on the basis of the disclosures of the patent in suit and the closest state of the art, is on the opponents or, as in this case, on the Respondents. However, they have not discharged this burden.

10. *Novelty*

A novelty objection was raised on the basis of D15b. This objection has been dealt with in the context of the decision on the allowability of the disclaimer in Claim 1. As concluded in that context (sections 5.3 to 5.6, above), D15b does not anticipate the subject-matter of Claim 1.

Moreover, document D17 does not, in either its general description or its examples, refer to a multilayer film comprising a core layer comprising PA 6I/6T (cf. sections 9.2 to 9.2.7, above).

Therefore, the Board is satisfied that the requirements of Article 54 EPC are met.

11. *Inventive step*

It remains to be decided whether the solution found was obvious to a person skilled in the art having regard to the state of the art relied upon by the Respondents.

11.1 Although mentioning in general terms the combination of linear aliphatic polyamides and partially aromatic polyamides, D17 never refers to a blend of (a) 10 to 70 weight percent of an *amorphous* nylon copolymer having no measurable melting point or no heat of fusion as measured by DSC and (b) 10 to 90 weight percent of a copolyamide having a *melting point within a range of from 145 to 215°C*, let alone to such a combination comprising (a) *amorphous* PA 6I/6T and (b) PA 6/66 and/or PA 6/12 having melting points of 145 to 215°C, as required in Claim 1.

11.1.1 Nowhere in D17 is any mention made of a PA 6I/6T copolyamide at all, let alone of such copolyamides being in *amorphous* form. Whilst it is true that, in the general description of D17 (bottom of column 3 and at the top of column 5), reference is made to terephthalic acid and to isophthalic acid, these acids were, however, used only separately, eg in PA 6I or in polytrimethyl-hexamethylene terephthalamide (column 5, lines 23/24, 45/46 and 63 to 65). The latter homopolymer was also used as the polymer of Curve K of Fig. 4 and of Curve K1 of Fig. 5 (column 9, lines 53 and 67, respectively), the only further references to a terephthalamide in D17.

11.1.2 Even in the part referred to by the Respondents as being particularly relevant, Example 6, it was PA 6I that was used as the only aromatic polyamide in a

binary blend with a linear and obviously *amorphous* copolyamide PA 6/66 (column, 14, lines 12 to 16 in conjunction with column 6, lines 13 to 25), ie neither component meets the requirements for the nylon blend in Claim 1 under consideration. The issue of amorphous or non-amorphous character and of melting point of the polyamides will be addressed again in the context of the further documents also relied upon by the Respondents.

11.1.3 The present claims relate to a multilayer film, which in its outer layers comprises EVA and/or VLDPE. In fact, EVA has been used in D17, so that this feature is not an appropriate delimitation from D17. However, the only polyethylene further characterised in D17 is a specific LDPE having a density of 0.922 g/cm$^3$ obtained in a high pressure polymerisation process (Example 6: column 14, lines 31 to 34), which is clearly different from VLDPE (cf. page 7, lines 22/23 in the patent in suit).

11.1.4 As already mentioned in sections 9.2.7, 9.3 and 9.5, above, no data have been made available by D17 or the Respondents to show that the films previously known from D17 already had a combination of properties comparable to those of the claimed multilayer films as demonstrated in the patent in suit (Table 5).

Hence, the skilled person could not derive from the document in an obvious manner that the combination of particularly chosen components having specific properties would provide the desired multilayer films.

Consequently, D17 itself does not provide an incentive to prepare films of the particular composition as defined in Claim 1 in order to solve the above relevant technical problem.

11.1.5 In view of these findings, the question arises of whether the further documents relied upon by the Respondents provide an incentive to modify the subject-matter of D17 in order to solve the above technical problem and, when doing so, to arrive at something within the range of independent Claim 1.

11.2 As already pointed out with respect to the issues concerning the disclaimer, novelty and the closest prior art (sections 5.3 to 5.6, 9.1.1, 9.1.2 and 10, above), D14/D15b relates to a film which is dimensionally stable even at temperatures of 130 to 150°C as used in "high-retort processing". For this reason alone, the document itself can hardly provide an incentive to produce a film heat-shrinkable at even lower temperatures, nor to modify the teaching of another document relating to shrinkable films. This finding is further confirmed by the shrinkage-free three-layer film of Example 19, the only part of the document relating to a multilayer film.

11.2.1 The arguments of the Respondents that, in Example 1 of the document, the film made of a blend of 85 weight percent of a PA 6I/6T (in a molar ratio of 70/30) and 15 weight percent of PA 6 had shown heat shrinkability and that it would have been obvious to replace PA 6 by one of the other polyamides listed on page 4, line 17 of D15b are not convincing. Thus, no plausible explanation has been given why such a replacement

should have been carried out, in particular in view the statement of Respondent 2 (letter dated 18 October 2004, page 7, paragraph (b)), who had pointed out that, on the basis of D14 and its translations and "as stated and shown by several of the opponents ..., the change from using nylon 6 homopolymers to other nylon (co-)polymers does not at all change the thermal behaviour of the multilayer film."

Furthermore, when considering the thermal properties of the film of Example 1 with regard to the shrinkage rate (L/W) of 20/40 shown in the table at the bottom of page 10 of D15b in comparison with the other examples shown there, it becomes evident that this film and those in those other examples had equally been "heat-treated in the vicinity of the melting point of aromatic polyamide (B)" (page 8, lines 18/19), ie at 200°C for 10 s (page 10, line 8). Therefore, the argument of the Respondents, that the skilled person would have known, that the very low film shrinkability or its absence in the further examples of D15b (in particular in Example 19) had been the result of the heat treatment at 200°C, and that the skilled person would have dispensed with this treatment if he had desired to prepare heat-shrinkable films, is not convincing.

On the contrary, this document cannot provide any incentive to modify the teaching of D17, because the two documents aim at film products having completely different properties, ie dimensional stability (D14/D15b) as opposed to heat-shrinkability (D17) as discussed above. Hence, it is not obvious to combine

the teachings of the two documents. Any suggestion to this end can only be based on hindsight.

11.2.2 These findings are not devalued by the hint to another document, D6, that it would have been obvious to omit the above heat-treatment (section 11.2.1, above) in order to obtain a heat-shrinkable film. The packaging film of D6, after its orientation, can be heat-set by bringing it to a temperature near its orientation temperature to reduce shrinkability (paragraph bridging pages 2/3). This document concerns multilayer films comprising a core layer comprising ethylene-vinyl alcohol (EVOH) copolymer, two outer layers comprising polymeric material or a blend thereof, two intermediate layers comprising an adhesive polymeric material (acid- or acid anhydride-modified polyolefin) to bond the outer layers to the EVOH core layer or, when present, to further intermediate layers comprising a polyamide.

In the Board's view, D6 is irrelevant, because it provides no incentive either to go directly against the clear teaching of D14/D15b (requiring dimensional stability of its film products) by modifying the preparation of the only multilayer film of D14/D15b (in Example 19), which film, furthermore, has a composition different from the films of D6 (above), let alone, to apply the teaching of D14/D15b after such a modification further to modify the disclosure of D17 in order to solve the relevant technical problem. In other words, D6 cannot serve to remedy the above deficiencies of D14/D15b with regard to the above purposive suggestions of the Respondents of rendering, in combination with D17, the solution of the relevant technical problem, as disclosed in the patent in suit, obvious.

11.2.3 On the contrary, all these suggestions of the Respondents, for the purpose of arriving at a heat-shrinkable multilayer film as claimed in the patent in suit by modification of the disclosure and teaching of D14/D15b, in particular by the specific selection of particular components and processing steps whilst omitting others, could only be made in the knowledge of the relevant solution of the above technical problem, ie the subject-matter of the patent in suit. Hence, they can only be construed to be based on an *ex post facto* analysis.

11.2.4 In this context, the question arose of whether the experimental report of Respondent 2 (cf. sections IX, X(b) and 5.5, above) provided any incentive to apply the teaching of D14/D15b for finding a solution to the relevant technical problem. As already stated above, the report contained no true repetition of any embodiments of D14/D15b. Modifications of the teaching of the document with the aim of arriving at a product having the specific properties contrary to those of the products aimed at in D14/D15b could, however, only be made in a retrospective manner. Consequently, the Board took the view in the oral proceedings that this report was *prima facie* not relevant (cf. also the Appellant's opinion in its letter dated 8 November 2004, item 2). Therefore, the report has been disregarded with regard to D15b under Article 114(2) EPC.

11.2.5 Consequently, D14/D15b cannot provide any information which could provide the features missing from D17 with regard to the desired solution of the above technical problem.

11.3 The reference to D1 by Respondent 5 (section V(b), above), in its letter dated 28 March 2000 (page 1), is obviously erroneous, since it is further identified at the bottom of page 8 of that letter as "D1 (Feldmühle AG)" (cf., however, the Notice of Opposition of this party which cited "1 EP 0 065 278 B1 Feldmühle I", later numbered D27, eg in Annex B to the decision under appeal). From the references to specific parts of its description on page 9 of the above letter it becomes apparent that, in fact, D27, a patent family member of D17, already considered above in detail, had been meant. D1, as numbered in section II, above, and as referred to in the course of the opposition proceedings, concerned an application filed by E.I. DuPont de Nemours and Company.

11.4 Document D29, mentioned once by Respondent 3 in connection with D15b (letter dated 24 March 2000, item 3.2) does not contain any hint to PA 6I/6T copolyamides. Moreover, this document relates to multilayer films suitable for thermoforming. They are not stretched (Claim 1, last line) and, preferably, they comprise a polyolefin layer which is not shrinkable (Claim 16; page 15, lines 12 to 23). Consequently, this document is of no assistance either for the assessment of inventive step.

11.5 As indicated in section 11.1.2, above, the amorphous or non-amorphous character of polyamides used in the state of the art or to be used according to Claim 1 of the present request was in dispute between the parties. Thus, the amorphous character of PA 6I and PA 6I/6T containing components 6I and 6T in molar ratios of at

least 60/40 or 70/30 (as used in D14/D15b) was considered by the Respondents as being inherent to all of these polymers.

This has been disputed by the Appellant with regard to PA 6I/6T, in general. In addition, the Appellant referred to the "melting points" mentioned in D15b in connection with the aromatic polyamide (B).

11.5.1 To support their argument, reference was made by the Respondents eg to a list of examples of amorphous polyamides including those explained in paragraph a) and d) on pages 5 and 6 of D7. Thus, in paragraph a), mention was made of "polyamides obtained from hexamethylene diamine and a mixture of 55-100 weight percent isophthalic acid and 45-0 terephthalic acid (based on total weight of the acids)" and, in paragraph d), of copolyamides comprising 2 to 50 mol % of at least one aliphatic amine constituent containing between 8 and 20 carbon atoms and at least one cyclohexane nucleus. At least, the latter polymers cannot contribute to the answer of this question.

However, the Appellant interpreted the cited passage of D7 in such a way that it did not establish that *all* "polyamides obtained from hexamethylene diamine and a mixture of 55-100 weight percent isophthalic acid and 45%-0 terephthalic acid (based on the total weight of the acids)" (as referred to in the above passage of D7) would be amorphous.

11.5.2 Therefore, the Respondents additionally referred to a graph submitted by Opponent 5 during the opposition proceedings (Fig. 1 annexed to its letter dated

16 April 1997) to show that PA 6I/6T as referred to above with regard to D14/D15b would be amorphous. Moreover, this would also be valid for Selar PA 3426, as recommended in the patent in suit (page 5, lines 27 to 29).

11.5.3 However, it is noteworthy that the identity of the polyamide mentioned on page 6, lines 13 to 15 of D15b and Selar PA 3426 cannot be derived from this document. Moreover, contrary to the arguments of the Respondents and as pointed out by the Appellant, reference is made of on page 8, lines 20/21 of D15b to a melting point of the partially aromatic polymer, which, according to the list on pages 4, 5 and 6 of the document, encompassed also PA 6I/6T with predominant amounts of 6I units (D15b: page 6, lines 13 to 15). In order to refute this fact, the Respondents contended that, in the field of chemical engineering ("Verarbeitungstechnik"), the term of "melting point" would often be used erroneously instead of "softening point" (cf. the letter of Opponent 1, dated 21 March 1997, page 2).

11.5.4 However, this argument is not convincing, because the author of D14/D15b was apparently well aware of the meaning of "melting point" as can be seen from the explanation following the table of Examples 10 to 13 (D15b: page 13, last three lines and page 15, lines 1 to 5; "temperature at the peak heat absorption accompanying the melting of crystals ... in a scanning type differential calorimeter (DSC) ...", ie contrary to the wording in present Claim 1). Moreover, in the first two lines on page 9 of the document, reference was made to the glass transition temperature ("a

temperature to cause thermal deformation to film") and, separately, to the melting point.

11.5.5 Furthermore, D17, allegedly suggesting the use of PA 6I/6T (section V(b), above), refers to an *amorphous* polyamide only twice (column 6, lines 13 and 24), both times in relation to the linear copolyamide such as PA 6/66 (as used eg in Example 6 of D17). Such a copolyamide and another PA 6/12 having a melting point of less than 145°C may in fact be used, according to the patent in suit (patent in suit: page 6, lines 14 to 17), however, only in addition to component (b) of Claim 1, defining copolyamides having a melting point in the range of 145 to 215°C, including PA 6/66 and/or PA 6/12.

11.5.6 For these reasons, the Board is not convinced of the argument of the Respondents that the description of the polyamides in D17 provided a clear indication that, on the one hand, the partially aromatic polyamide would have been amorphous and that, on the other hand, the linear copolyamide blended therewith would have had a melting point of from 145 to 215°C.

In view of the above facts and arguments and having regard to the above findings, the Board cannot refute the above arguments of the Appellant that neither D17 nor D14/D15b demonstrated that the nylon components used in those documents would have fulfilled the requirements of the nylon components (a) and (b), respectively, as defined in Claim 1.

12. Therefore, based on the above considerations, the Board has come to the conclusion that neither D17 itself nor in combination with the further documents relied upon by the Respondents renders the subject-matter of Claim 1 obvious.

It follows that the claimed subject-matter of Claim 1 involves also an inventive step (Article 56 EPC).

13. By the same token, the subject-matter according to Claims 2 to 9 appendant to Claim 1 are also novel and involve an inventive step.

14. The Respondents further resumed the initial objection under Article 100(b) EPC on the basis of the argument that polyethylene and polyamide were incompatible so that composite films containing layers of these components would delaminate in the absence of an adhesive promoter. In other words, without an adhesive, the claimed invention could not be carried out. Hence, the presence of an adhesion promoter would be an essential feature of Claim 1. In the absence of the requirement for such a further component, the skilled person would not know how to carry out the invention.

However, these arguments of the Respondents are obviously not valid in this generality, as demonstrated by the composite films used in the measurements in Fig. 11 of D17, which were based on polyamide and LDPE layers, but obviously did not contain an adhesion promoter (column 10 ,lines 39 to 44; cf. section 9.2.6, above). Moreover, in column 7, lines 32 to 35, of D17, explicit reference is made to polyethylene and its copolymers "adhering to the polyamide film", and in

column 10, lines 33 to 38, of the document, mention is made of a film, which "film consists of a polyamide layer, ..., and a polyethylene layer of a copolymer of ethylene and vinyl acetate". Again, there is no reference to an adhesive.

Moreover, Article 100(b) EPC refers to the disclosure of the patent as a whole rather than to individual claims, and the specification provides ample information about the production of the claimed multilayer films, as argued by the Appellant.

Consequently, the Board cannot but accept the argument of the Appellant that the use of such a component is not essential for the success of the claimed invention.

Hence, the Board does not see any reason for raising doubts that a person skilled in this art could not carry out the claimed invention. It follows that the objection under Article 100(b) EPC must be rejected, because the requirements of Article 83 EPC are met.

15. Since the Auxiliary Request V of the Appellant is successful, there is no need to consider the subsequent Auxiliary requests VI to VIII.

## Order

**For these reasons it is decided that:**

1. The decision under appeal is set aside.

2. The Main Request and Auxiliary Requests I, II, III, IV of the Appellant are refused.

3. The case is remitted to the first instance with the order to maintain the patent on the basis of Claims 1 to 9 of Auxiliary Request V filed with the letter dated 29 May 2002 and after any necessary consequential amendment of the description.

The Registrar: The Chairman:

E. Görgmaier R. Young