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DECISION
of 26 January 1999

Case Number:	T 0842/94 - 3.3.3
Application Number:	86202277.9
Publication Number:	0236593
IPC:	C08L 71/12
Language of the proceedings:	EN

Title of invention:
Polymer mixture which comprises a polyamide, a polyphenylene ether and an agent to improve the impact strength

Patentee:
General Electric Company

Opponent:
Sumitomo Chemical Company, Ltd.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - implicit disclosure (no)"
"Inventive step - ex post facto analysis"

Decisions cited:
-

Catchword:
-

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Chambres de recours

Case Number: T 0842/94 - 3.3.3

DECISION
of the Technical Board of Appeal 3.3.3
of 26 January 1999

Appellant: (Opponent)	Sumitomo Chemical Company, Ltd. No. 15, Kitahama 5-chome, Higashiku, Osaka-shi Osaka-fu, Osaka (JP)
Representative:	Vossius & Partner Postfach 86 07 67 81634 München (DE)
Respondent: (Proprietor of the patent)	General Electric Company 1 River Road Schenectady New York 12305 (US)
Representative:	Grever, Frederik General Electric Plastics B.V. P.O. Box 117 4600 AC Bergen op Zoom (NL)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted 4 August 1994 concerning maintenance of European patent No. 0 236 593 in amended form.**

Composition of the Board:

Chairman: C. Gérardin
Members: A. Däweritz
J. Stephens-Ofner

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 236 593 in respect of European patent application No. 86 202 277.9 filed on 16 December 1986 and claiming priority of 27 January 1986 of an earlier application in the Netherlands (8600166), was published on 26 June 1991 (Bulletin 91/26) on the basis of 16 claims.

Claim 1 as granted read as follows:

"A polymer mixture comprising 5-93% of polyamide(s), 93-5% polyphenylene ether(s), 1-50% of an agent to improve the impact strength of polyphenylene ether(s) and 1-50% of an agent not particularly suitable to improve the impact strength of polyphenylene ether(s), but suitable to improve the impact strength of polyamide(s), the percentages being calculated by weight with respect to the sum of the quantities by weight of polyamide(s), polyphenylene ether(s), and impact strength improving agents; and comprising as an agent to improve the compatibility between the polyamide(s) and the polyphenylene ether(s) one or more of the following:

A) liquid diene polymers or compounds having in their molecular structure a two-fold or three-fold carbon-to-carbon bond and a carboxylic acid, acid anhydride, acid amide, imido, carboxylic acid ester, amino or hydroxyl group, in a quantity of from 0.01 to 30 parts by weight per 100 parts by weight of polyamide plus polyphenylene ether,

B) a functionalised polyphenylene ether consisting of the reaction product of (a) a polyphenylene ether and (b) a compound of the general formula (i)-Z-(ii), wherein (i) is at least a group of the formula

[X-C(O)-]- with x = F, Cl, Br, I, OH, -OR, or -O-C(O)-R with R = H, alkyl or aryl, wherein (ii) is at least a carboxylic acid, acid anhydride, acid amide, imido, carboxylic acid ester, amino or hydroxyl group, and in which the groups (i) and (ii) are covalently bonded together via a bridge z, z being a bivalent hydrocarbon radical,

C) a copolymer with units of a vinylaromatic compound and of an alpha-beta unsaturated dicarboxylic acid or dicarboxylic acid anhydride or a copolymer with units of a vinylaromatic compound and of an imide compound of an alpha-beta unsaturated dicarboxylic acid, in a quantity of from 0.5 to 100 parts by weight per 100 parts by weight of polyamide plus polyphenylene ether,

D) the reaction product of a) a 1,2-substituted olefinic compound with carboxyl group or acid anhydride group, b) a polyphenylene ether and c) a radical initiator, in a quantity of from 0.5 to 150 parts by weight per 100 parts by weight of polyamide plus polyphenylene ether."

Independent Claims 13 and 14 related to methods of preparing the mixture as defined in any one of the preceding claims. Independent Claim 16 was directed to an article formed from the polymer mixture as claimed in any one of Claims 1 to 12 or as prepared in accordance with the methods according to Claims 13 to 15.

Claims 2 to 12 related to preferred embodiments of the polymer mixture within the scope of Claim 1, Claim 15 to a preferred embodiment of the methods according to Claims 13 to 14.

II. On 26 March 1992, a Notice of Opposition was filed in which revocation of the patent in its entirety was requested on the grounds of lack of novelty within the meaning of Article 54(1) and (2) EPC and lack of inventive step within the meaning of Article 56 EPC. This statement also contained an experimental report.

These objections were supported essentially by the following documents:

D1: WO-A-85/05372, and

D5: Beyer/Walter, "Lehrbuch der organischen Chemie", S. Hirzel Verlag, Stuttgart 1984, page 314, cited after the opposition period.

III. By decision announced orally on 12 July 1994 and issued in writing on 4 August 1994, the Opposition Division held that the grounds for opposition did not prejudice the maintenance of the patent in amended form, the amendments consisting in the deletion of "liquid diene polymers or" from the definition of component (A) and in the deletion of component (D) from Claim 1. The other claims remained unamended.

(i) In its decision, the Opposition Division took the view that the claimed subject-matter was novel over D1, because the experimental data provided by the Opponent did not demonstrate clearly and unambiguously that the compositions in D1 contained specific compatibilizers within the terms of component (A) and in the amounts required in the patent in suit.

(ii) Starting from D1, which was also regarded as representing the closest state of the art, it was not considered obvious to modify the definition of the compatibilizer (A) in accordance with the requirements of the patent in suit in order to improve the impact strength of the known composition. Consequently, an inventive step was acknowledged.

(iii) From a procedural viewpoint, although the patent could be maintained on the basis of the above amended claims, in view of the likelihood of an appeal it was considered to be in the interest of an economic procedure to dispense with the requirement of adaption of the description.

IV. On 12 October 1994, a Notice of Appeal was lodged by the Appellant (Opponent) against that decision together with payment of the prescribed fee.

In the Statement of Grounds of Appeal filed on 14 December 1994 as well as in later submissions, the Appellant maintained its previous objections. To that end it relied on four experimental reports (Annexes-1 to -4) and on a new document which was discussed in the patent specification, EP-A-0 024 120. In substance, it argued essentially as follows:

(i) Polymer mixtures as claimed were implicitly disclosed in D1, in particular in examples 59, 66 and 67 in conjunction with Table 13.

A skilled person upon reading D1 would realize that the saturated hydroxy group-containing carboxylic acids as used in D1 were converted under the relevant conditions into an unsaturated acid falling within the definition of component (A) of present Claim 1.

(ii) As to inventive step, the claimed subject-matter was obvious in view of D1 or EP-A-0 024 120, both of which suggesting - in the knowledge of a textbook such as D5 - the use of an unsaturated compatibilizer in compositions as disclosed in the examples of D1 referred to above. As demonstrated in the experimental data submitted during the opposition proceedings, no surprising effect could be shown with respect to D1.

V. In its various counterstatements, the Respondent (Proprietor) supported the findings of the decision under appeal substantially as follows:

(i) The Appellant's experimental results were not conclusive regarding the simultaneous presence of the three polymer components in the extruder. Such a device was a dynamic system wherein complex reactions occurred giving rise to various species, whose composition was most likely to change before the final product was even formed.

(ii) The use of an unsaturated compatibilizer within the terms of component (A) was also inventive, since the teaching of D1 was not only strictly limited to saturated compounds, but would have even deterred a skilled person from considering unsaturated compounds in order to improve impact strength.

(iii) The statement of 23 December 1998 contained a test report carried out under the same experimental conditions as the Appellant's experiments. The results thereof were deemed to clarify the situation regarding the correlation between the unsaturation of the compatibilizer and the impact properties of the blends.

VI. Oral proceedings were held on 26 January 1999. In view of the close similarity of the appeal cases T 841/94 and T 842/94 the Board decided to have a common discussion of the various issues to be decided, the possibility to consider more in detail a specific aspect of one of the cases being self-evidently left open to the parties.

(i) The Appellant emphasised its previous submissions essentially as follows:

1. As the skilled person knew from D5 that the saturated hydroxy group-containing acids decomposed under the experimental conditions to unsaturated compounds as defined in Claim 1, the objection of lack of novelty did not require any interpretation of D1. The saturated compounds used in D1 were "pre-drugs" which were converted in the process according to method Claim 13 (similar to Claim 4 in T 841/94) into the "drug", i.e. the unsaturated component (A) which was the real compatibilizer in the composition of Claim 1. In view of the known conversion, it was evident or (with respect to inventive step) obvious to replace the compounds used in D1 by component (A) of Claim 1, which was *per se* known for this purpose.

2. Moreover, the article according to Claim 16 was identical to the products of the examples in D1 referred to above. Any differences in the properties were within normal experimental margins of error.

3. In view of the word "comprising" used in the definition of the polymer mixture in Claim 1, the article formed from this polymer mixture did not consist exclusively of a product derived from an unsaturated compatibilizer within the terms of component (A).

4. The experiments demonstrated that the "drug" reacted with the polymers so that it could no longer be found in the final product.

(ii) The Respondent pointed out that in its view the mechanisms of compatibilization with different compounds could be different. Thus, the hydroxy groups of the known saturated acids might also react with amine groups. The reactions actually occurring in an extruder were not exactly known, so that any argument about the intermediate presence of a given species could only be based on hindsight. As to inventive step, Table 13 of D1 would suggest to replace the graft polymer by high impact polystyrene (HIPS) rather than to modify the compatibilizer.

VII. The Appellant requested that the decision be set aside and the patent be revoked.

The Respondent requested that the appeal be dismissed or, as an auxiliary request, that the patent be maintained on the basis on the set of claims attached to the decision under appeal as "2nd Auxiliary Request".

Reasons for the Decision

1. The appeal is admissible.

2. *Procedural matter*

2.1 As noted above, the Appellant relied on late filed document EP-A-0 024 120 to support its objection of lack of inventive step. The document has been duly examined by the Board, but not found sufficiently relevant to be admitted in the proceedings (Article 114(2) EPC).

2.2 The last written submissions of the parties (Appellant: 22 January 1999; Respondent: 23 December 1998) contain each experimental evidence deemed to support their respective arguments. In view of the fact that (i) no convincing explanation was given why these test reports were submitted at such a late stage, (ii) the other party was not in a position to evaluate the data, and (iii) in the Board's view these results would have no influence on the ultimate outcome of the case, the Board has decided to disregard them pursuant to Article 114(2) EPC.

3. *Amendments*

No objection has been raised under Article 123(2) and (3) EPC in the appeal proceedings to the amended text of the claims under consideration forming the basis of the interlocutory decision of the Opposition Division and corresponding to the present requests of the Respondent. The Board does not see any reason to raise such an objection itself either.

4. *Claim 1 (Main request)*

4.1 Novelty

4.1.1 D1 concerns compositions derived from (a) one or more polyphenylene ether resins, (b) one or more polyamide resins, and (c) one or more aliphatic polycarboxylic acids or derivatives thereof represented by the general formula $(R^{I}O)_{m}R(COOR^{II})_{n}(COR^{III}R^{IV})_{s}$ (Claim 1). From that formula and the classes of compounds more specifically envisaged (page 11, line 23 to page 12, line 10), it appears that the compatibilizers (c) encompass hydroxy, alkoxy, aryloxy, acyl and carbonyl dioxy polycarboxylic acids as well as acid esters and acid amides thereof, all of them being characterised by the presence of a linear or branched saturated aliphatic hydrocarbon chain having 2 to 20 carbon atoms. Suitable polycarboxylic acids are said to be citric acid, malic acid and agaricic acid. Thus, there is nothing in the citation, either in the general definition or in the specific examples, which can be interpreted as the disclosure of an unsaturated component (c).

4.1.2 The novelty objection is based (i) on Examples 59, 66 and 67 in Table 13, wherein citric acid is used as compatibilizer, (ii) on Claim 4, which refers to malic acid as an alternative to citric acid, and (iii) on the allegation that these acids form under the processing conditions within an extruder unsaturated compounds corresponding to component (A) of Claim 1 of the patent in suit following a decomposition reaction, well known in the art.

4.1.3 In order to demonstrate that a mixture within the terms of the patent in suit is actually formed within the extruder, the Appellant has submitted an experimental test report containing comparative data about the composition of the intermediate products present in the extruder as well as of the end products, the initial components being polyphenylene ether/polyamide/malic acid or maleic anhydride, and the processing conditions corresponding allegedly to the kneading procedure described in D1, namely (i) twin-screw extruder, (ii) screw revolution speed of 300 rpm, and (iii) temperature of 285°C (Annex-3).

According to the Appellant, the results of analysis of samples taken from nozzle A show that, in the melt-kneading operation of malic acid and polyphenylene ether, malic acid is converted into maleic anhydride and/or fumaric acid before reacting with polyphenylene ether, irrespective of whether or not malic acid reacts with the polyether. From a quantitative viewpoint the amounts of unsaturated acid detected are higher than the lower limit required in Claim 1 of the patent in suit (Statement of Grounds of Appeal, page 9, paragraphs 3 and 4). Such acids exist only in the reaction system at the melt-kneading step and are consumed by reactions therein, which explains why they do not remain in the final composition in a detectable quantity (Statement of Grounds of Appeal, point 2.1.2.6, first paragraph).

4.1.4 It is undisputed between the parties that maleic anhydride may be formed by heating from certain saturated carboxylic acids. According to D5 the reaction of decomposition of malic acid giving rise to maleic anhydride by dehydration and cyclisation simply occurs by heating malic acid rapidly to up to 250°C. Similarly, Appendix-1 accompanying the Statement of Grounds of Appeal shows that maleic anhydride may also be obtained from malic acid at 160°C by a more complex mechanism involving racemisation, isomerisation, dehydration and cyclisation reactions.

However, as pointed out by the Respondent in both its written and oral submissions, it is not legitimate to assume that a reaction occurring in such ideal conditions would be identical in an extruder, e.g. in a dynamic system and in the presence of polyphenylene ether and polyamide which are by far the major components of the compositions. On the contrary, side reactions and equilibrium reactions are most likely to take place, which will affect the amount of maleic anhydride possibly available for compatibilization purposes.

In view of this essential difference D5 and Appendix-1 show at most that maleic anhydride may be formed, not that it must inevitably be formed in the required amount under the processing conditions.

4.1.5 Furthermore, the experimental evidence relied upon by the Appellant is not conclusive for the following reasons.

The critical Examples 59, 66 and 67 belong to a group of examples (Examples 46 to 67) carried out under unspecified conditions; there are no particular requirements in this respect in the whole citation and only the following observations can be made:

- any of the melt-blending methods, whether applied in batchwise or in continuous form, may be used; extruders, Banbury mixers, rollers, kneaders are said to be suitable devices (page 19, lines 7 to 11). In the examples both single and twin screw extruders are mentioned;

- in practice the screw revolution speed varies between 200 and 300 rpm and the temperature between 285 and 302°C (575°F).

The combination of features selected by the Appellant, namely twin screw extruder/300 rpm/285°C, corresponds at most to the processing conditions reported in Examples 11 to 17, but there is no reason to assume that Examples 59, 66 and 67 were also carried out on that basis. On the contrary, the different process conditions reported for the other groups of examples would appear to represent each an equally suitable basis of comparison, which casts strong doubts on the validity of the conclusions drawn by the Appellant regarding these examples.

4.1.6 In the same respect, the experimental evidence provided by the Appellant to demonstrate lack of novelty with respect to the Examples 59, 66 and 67 is based on the assumption that in Examples 59, 66 and 67 the polycarboxylic acid is precompounded with the polyphenylene ether alone.

The way of addition of the ingredients in the examples is mentioned on page 20 (Example 1: "direct addition of ingredients and extruded") and on page 40, lines 4 to 11 (Examples 71 to 79: "Specifically, examples within and outside the scope of the present invention were prepared by directly compounding all of the ingredients. Examples within the scope of the improved process of the present invention were prepared by precompounding the polycarboxylic acid, alone or in combination with an amine and/or modifier resin, and subsequently compounded with the polyamide."). Examples 2 to 70 are totally silent in this respect. More particularly, the individual examples wherein the polycarboxylic acid is precompounded are clearly identified on page 39 *et seq.*: Examples 69, 70, 72, 73, 75 to 78. None of these examples refers e.g. to the grafted rubbery impact modifier component as used in Examples 59, 66 and 67.

4.1.7 A further point to consider is the validity of the experimental results provided the Appellant.

From Figure 1 of Annex-3 it appears that the nozzles through which the intermediate products are discharged for analysis purposes are in the middle between the first and second hopper. According to the procedure followed the polyphenylene ether and malic acid are introduced into the extruder through the first hopper, and the polyamide is introduced therein through the second hopper located between the end of the extruder and the first hopper. The experimental results in Table 1 show that the acid content before the addition of the polyamide is zero, which means that no compatibilizer is available any more even before the polyamide is added and that, consequently, any consideration about the degree of conversion within the extruder of malic acid into an unsaturated acid is irrelevant.

A second objection concerns the results themselves. These results concern the products present in the extruder as they exist before the addition of the polyamide, e.g. vent gases and solid reaction product. The withdrawal of some components will affect the state as well as the composition of the sample and, thereby, the equilibrium of the system, making an exact determination of the composition practically impossible.

4.1.8 For these various reasons the Board concludes that the experiment of Annex-3 cannot be regarded to be meaningful with respect to the content of Examples 59, 66 and 67 of D1, and that processing the various components according to these examples does not give rise to a polymer mixture within the terms of Claim 1, so that there is no basis for an objection of implicit disclosure. Thus, novelty is acknowledged.

4.2 Problem and solution

The patent in suit concerns a polymer mixture which comprises a polyamide, a polyphenylene ether and an agent to improve the impact strength, methods of preparing such polymer mixtures and articles formed therefrom.

4.2.1 Such compatibilized blends are disclosed in D1 which the Board, like the Opposition Division and the parties, regards as the closest state of the art. These blends are described as modified polyphenylene ether-polyamide compositions having in particular improved impact strength properties as compared to unmodified compositions, e.g. to the corresponding compositions without an aliphatic polycarboxylic acid modifier in accordance with the teaching of this citation. Although these impact strength properties may even be further enhanced by incorporating conventional impact modifiers (page 1, lines 20 to 24; page 13, line 14 to page 18, line 2), the level achieved cannot be regarded as entirely satisfactory.

4.2.2 In line with the introductory statement in the patent specification (page 2, lines 27 to 29) the technical problem underlying the patent in suit may thus be defined as the provision of compositions based on polyphenylene ether and polyamide having improved impact strength properties.

4.2.3 According to the patent in suit this problem is to be solved by using an unsaturated compatibilizer, as specified under (A) in claim 1.

4.2.4 The experimental data submitted by the Appellant in opposition proceedings demonstrate that the use of an unsaturated carboxylic acid provides an effective solution of the above defined problem.

Table 1 of the Experiment Report accompanying the Notice of Opposition shows an improvement of notched Izod impact strength of 14.0 % and 13.8% for the two temperatures (comparison between Experiment 1: citric acid and Experiment 2 aconitic acid) and an improvement of the low temperature value of 36.9% (comparison between Experiment 1 and Experiment 3: itaconic acid). Similarly, it appears from Table 1 of the Appellant's submission of 9 June 1994 that the use of maleic anhydride results in an increase of the Izod impact strength at -30°C of 16.7% as compared to malic acid (comparison between composition X: malic acid, and composition Y: maleic anhydride). As pointed out by the Respondent during oral proceedings, such improvements cannot be regarded as marginal.

4.3 Obviousness

It remains to be decided whether for a person skilled in the art this solution was obvious having regard to the documents relied upon by the Appellant.

4.3.1 This issue boils down to the question whether a skilled person upon reading D1 would have any reason to establish a link between polycarboxylic acids liable to convert into unsaturated compounds and improved impact strength properties. If anything, in the Board's view, the experimental results tend to show the major influence of other factors, for instance the number of carbon atoms in the case of acid-amine derivatives (Examples 26 to 32) or, more generally, the type of modifier resin.

Even the allegedly novelty destroying Examples 59, 66 and 67 correspond to average impact strength values and do not suggest compatibilization of the polymers by more complex mechanisms. The general formula of the polycarboxylic acids would thus be assumed to define a group of compatibilizers homogeneous not only in their ability to improve impact strength properties, but also in the possible mechanisms involved. Consequently, any consideration about structural modifications which would selectively affect a certain sub-group of compounds under the processing conditions within an extruder would amount to suspect a hidden disclosure contrary to the very teaching of D1.

For these reasons, D1 alone cannot provide an incentive to consider unsaturated polycarboxylic acids and derivatives thereof for the solution of the technical problem.

4.3.2 The ability of certain saturated polycarboxylic acids to convert into unsaturated acids by more or less complex sequences of restructuration is known in the art. However, as noted above, both D5 and Appendix-1 consider such reactions in isolation, e.g. in the absence of the major polymer ingredients required in the patent in suit and without reference to the compatibilization effect of the resulting species.

4.3.3 It follows that a skilled person would have no reason to interpret D1 in the light of D5 and that a combination of these citations can only be made with hindsight.

4.4 Claim 1 being allowable the same applies also to dependent Claims 2 to 12, which are directed to preferred polymer mixtures according to Claim 1, as well as to Claims 13 to 15 concerning a method of preparing such polymer mixtures, the patentability of which is supported by that of the main composition claim.

5. *Claim 16 (Main request)*

5.1 Novelty

The Appellant's objection is based on the assumption that unsaturated polycarboxylic acid formed at an intermediate stage should be present in the moulded articles and that there should be no difference between an article obtained from a polymer mixture containing an unsaturated polycarboxylic acid and an article obtained from a polymer mixture containing a saturated polycarboxylic acid converted into an unsaturated polycarboxylic acid.

5.1.1 There is agreement between the parties that compatibilizers, such as malic acid and maleic anhydride, assuming they exist in the reaction system at the melt-kneading step, do not remain in the final composition in a detectable quantity (Statement of Grounds of Appeal, point 2.1.2.6; Counterstatement of Appeal, page 4, paragraph 4).

5.1.2 However, as pointed out by the Respondent, the Appellant's assumption about the equivalence of saturated and unsaturated carboxylic acids in an extruder is not acceptable for the following reasons.

First, the different results in terms of impact strength properties when saturated and unsaturated carboxylic acids are used can be attributed to the fact that the conversion of the saturated into an unsaturated acid is not quantitative and results in fact in an equilibrium reaction. This is admitted by the Appellant (Statement of Grounds of Appeal, page 2, first full paragraph). In the Board's view an even greater difference can be expected in the light of the mechanism explained in Appendix-1 which suggests a complex restructuration of saturated carboxylic acids with several intermediate products. Thus, from a quantitative viewpoint, it is not correct to assume that the saturated carboxylic acid will be present without loss in the form of its unsaturated counterpart in the final product.

Secondly, the structure of the compatibilized blend according to D1 is said to be unknown and in any case complex (page 4, lines 15 to 31). There may be some dispersion of one polymer in the other, some graft polyphenylene ether-polyamide products as well as some grafting and/or graft-linking induced by the polycarboxylic acid itself. Although Annex-3 mentions the extraction of a block copolymer component from the final compositions, whatever the basis is for this assertion, the situation is undoubtedly more complex, particularly if one takes the Appellant's view that at a given time there is not just one acid, but a mixture of the intermediate acids including racemic and isomeric species, let alone a further reactive group, e.g. the hydroxy group, in the saturated polycarboxylic acid.

Thirdly, the Respondent's argument that nobody knows in which way the polycarboxylic acid added as compatibilizer reacts with the polyphenylene ether and the polyamide in an extruder under melt-blending conditions is valid for both the unsaturated acid in the patent in suit and the saturated hydroxy acid in Examples 59, 66 and 67 of D1.

5.1.3 The evidence available shows that the compatibilization of polyphenylene ether and polyamide occurs by mechanisms which involve much more than simple esterification and amidification reactions. It is thus not proper to refer to the active ingredient in D1 which a skilled person would immediately identify as being the unsaturated carboxylic acid formed within the extruder as an intermediate product.

That it is not equivalent to use an unsaturated carboxylic acid as in the patent in suit and a saturated carboxylic acid as in D1 is in fact demonstrated by the Appellant's own experiments which show unambiguously improved impact strength properties which differ from each other and which can only be attributed to compositional and/or structural differences of the compatibilized blend themselves.

5.1.4 It follows that the articles moulded therefrom are also different, which demonstrates novelty of the claimed subject-matter.

5.2 Inventive step

Whatever the interpretation of D1, e.g. with or without conversion of the saturated carboxylic acid, the correlation between the unsaturation of the compatibilizer and the improved impact strength properties of the moulded articles cannot be regarded as obvious, so that an inventive step must also be acknowledged.

6. *Auxiliary request*

As the Respondent's main request is successful, the auxiliary request need not be further taken into account.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

2. The case is remitted to the Opposition Division with the order to maintain the patent with Claims 1 to 16 submitted as main request in the course of the oral proceedings before the Opposition Division on 12 July 1994 and after the description has been adapted to those claims.

The Registrar:

E. Görgmaier

The Chairman:

C. Gérardin

C. Gérardin