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**D E C I S I O N**  
**of 29 January 2001**

**Case Number:** T 0043/99 - 3.3.3

**Application Number:** 93906225.3

**Publication Number:** 0582707

**IPC:** C08G 64/14

**Language of the proceedings:** EN

**Title of invention:**  
Branched aromatic carbonate polymer

**Applicant:**  
GENERAL ELECTRIC COMPANY

**Opponent:**

-

**Headword:**

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

**Keyword:**  
"Disclaimer"  
"Inventive step"

**Decisions cited:**  
T 0863/96

**Catchword:**

-



Case Number: T 0043/99 - 3.3.3

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.3**  
**of 29 January 2001**

**Appellant:** GENERAL ELECTRIC COMPANY  
1 River Road  
Schenectady, NY 12345 (US)

**Representative:** Szary, Anne Catherine, Dr.  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 14 August 1998  
refusing European patent application  
No. 93 906 225.3 pursuant to Article 97(1) EPC.

**Composition of the Board:**

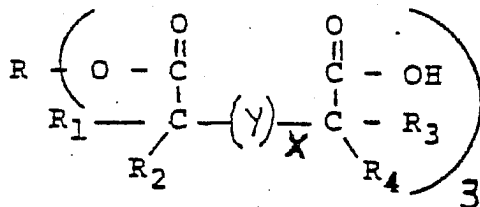
**Chairman:** C. Gérardin  
**Members:** C. Idez  
A. Lindqvist

**Summary of Facts and Submissions**

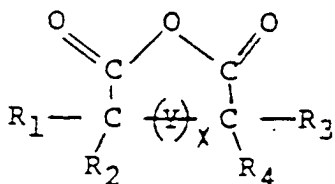
I. European patent application No. 93 906 225.3 filed as PCT/US93/01702 on 24 February 1993 and published on 16 September 1993 under No. WO 93/18082 (EP-A-0 582 707) was refused by the decision of the Examining Division issued on 14 August 1998. That decision was based on a set of claims made up of Claims 1 to 12 (page 24) filed with letter of 11 June 1996 and Claims 12 (page 25), 13 to 19 filed with letter of 18 June 1997.

Claim 1 reads as follows:

"A compound of the formula:



wherein R is a hydrocarbon of three to about 50 carbon atoms which compound is the reaction product of a triol of the formula R(OH)<sub>3</sub> with an anhydride of the formula:



Y is  $CR_5R_6$ , O, S,  $NCH_3$ , wherein  $R_5$  and  $R_6$  are the same or different and are hydrogen, alkyl of one to three carbon atoms, inclusive, or phenyl;

X is 0 or 1;

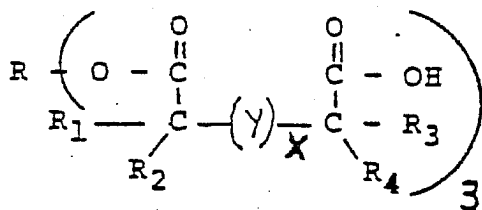
$R_1$  and  $R_3$  are the same or different and are selected from the group consisting of hydrogen, phenyl or aliphatic of one to about twenty carbon atoms, inclusive, and  $R_2$  and  $R_4$  joined together form an alkylene or alkenylene chain of two to six carbon atoms, inclusive, unsubstituted or substituted with one to six alkyl groups having from one to four carbon atoms, inclusive; excluding the polyacid half ester of trimethylolpropane and (methyl)hexahydrophthalic acid ".

Claims 2 to 7 refer to preferred embodiments of the compound according to Claim 1.

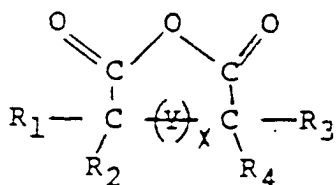
Claims 8 to 11 relate to a method for manufacturing the compound of Claim 1.

Independent Claim 12 reads as follows:

"A thermoplastic randomly branched aromatic carbonate polymer having incorporated therein a branching component in an amount sufficient to produce a thermoplastic randomly branched polycarbonate which is substantially free of crosslinking wherein the branching component comprises one or more compounds of the formula



wherein R is a hydrocarbon of three to about 50 carbon atoms and the residue of the reaction of a triol of the formula  $R(OH)_3$  with the anhydride of the formula



Y is  $CR_5R_6$ , O, S,  $NCH_3$ , wherein  $R_5$  and  $R_6$  are the same or different and are hydrogen, alkyl of one to three carbon atoms, inclusive, or phenyl;

X is 0 or 1 ;

$R_1$ ,  $R_2$ ,  $R_3$ , and  $R_4$  are the same or different and are selected from the group consisting of hydrogen, phenyl or aliphatic of one to about twenty carbon atoms, inclusive, or  $R_2$  and  $R_4$  are joined together to form an alkylene or alkenylene chain of two to about six carbon atoms, inclusive, unsubstituted or substituted with one to six alkyl groups having from one to about four carbon atoms, inclusive."

Claims 13 to 19 deal with preferred embodiments of the branched aromatic carbonate polymer according to Claim 12.

II. In its decision, the Examining Division held that the subject-matter of Claims 1 to 9 was novel over document D1 (US-A-4 917 955), since the polyacid half ester of trimethylol propane and (methyl)hexahydrophthalic acid had been disclaimed, and that the subject-matter of Claims 10 and 11 also differed from D1 by the absence of solvent (Claim 10) and the presence of a catalyst (Claim 11). The Examining Division further stated that the subject-matter of Claims 1 to 11 lacked inventive step in view of D1, since it would have been obvious for a person skilled in the art wanting to provide only an alternative to the half esters explicitly disclosed in D1, to select polyols and anhydrides from those disclosed in D1 to form other half esters.

III. On 21 September 1998 a Notice of Appeal against the above decision was filed, the prescribed fee being paid on the same day.

The Statement of Grounds of Appeal, filed on 17 December 1998, was accompanied by a set of Claims 1 to 8 as an auxiliary request.

In the Statement of Grounds of Appeal, the Appellant argued in substance as follows:

- (i) The Examining Division had considered that the subject-matter of the claims was derivable from D1 by combining two lists (i.e. a list of polyols with a list of anhydrides).
- (ii) The half esters disclosed in D1 were used as curing agents for epoxy resins. In contrast the half ester of the present application are used as branching agent for polycarbonates.

(iii) Thus, the person skilled in the art looking to provide branching agents for polycarbonates would not consider the half esters disclosed in D1 as curing agents for epoxy resins.

IV. The Appellant requested that the decision of the Examining Division be set aside and a patent be granted on the basis of Claims 1 to 19 on file, or alternatively on the basis of Claims 1 to 8 of the auxiliary request submitted with the Statement of the Grounds of Appeal. As a further auxiliary request, oral proceedings were requested.

### **Reasons for the Decision**

1. The appeal is admissible.

#### *Main request*

2. *Disclaimer*

2.1 Claim 1 comprises a disclaimer (i.e. "excluding the polyacid half ester of trimethylolpropane and (methyl)hexahydrophthalic acid") which is intended to exclude subject-matter from document D1.

2.2 In accordance with the principles set out in the decision T 863/96 of 4 February 1999 (not published in OJ EPO), it would be allowable under Article 123(2) EPC to formulate a disclaimer which is precisely defined and limited to the prior art disclosure provided this disclosure is an accidental novelty destroying disclosure. A disclaimer to be formulated on the basis

of a disclosure is only allowable if the cited document containing the said reference has no further relevance for any further examination of the claimed invention and it must then disappear from the prior art field to be taken into consideration.

2.3 Thus, the relevant question is whether or not the disclaimer used in present Claim 1 meets the requirements set out in the above mentioned decision.

2.3.1 There is no doubt that this disclaimer is precisely defined and limited to the prior art document disclosure.

2.3.2 On the one hand, D1 deals with coating compositions comprising a polyepoxide and a curing agent which is an half ester formed by reaction between a polyol and a 1,2-acid anhydride (cf. D1, column 3, lines 29 to 54). On the other hand, the claimed invention relates to branching agents for aromatic polycarbonates. These branching agents are half esters obtained by reacting triols having 3 to 50 carbon atoms with specific acid anhydrides.

2.3.3 Thus, D1 does not relate to the same field as the claimed invention. The disclosure of D1 can therefore be considered as an accidental novelty destroying disclosure and D1 as having no relevance for any further examination of the claimed invention.

2.3.4 Thus, it is considered that the requirements set out in the decision T 863/96 for the allowability of a disclaimer under Article 123(2) EPC are met in the present case.



*Novelty*

3. According to the Examining Division the subject-matter of Claims 1 to 11 was novel over the cited prior (Article 54 EPC) and the Board sees no reasons to deviate from this opinion.

*Documents*

4. Documents D2 (Chemical Abstracts Vol. 86, No. 24, abstract no. 173 232f), D3 (Chemical Abstracts, Vol. 71, No. 18, abstract no. 81796e) and D4 (DE-A-3 308 691 ) which have been considered during the examining procedure can be summarized as follows:

- 4.1 D2 refers to polyesters obtained by depolymerizing polyesters derived from aromatic dicarboxylic acids and aliphatic diols by heating them in the presence of polycarboxylic acid compounds (e.g. trimethylolpropane trisuccinate) at a temperature between 180°C and 300°C. These polyesters are used in admixture with epoxy resins in powder coating compositions.

- 4.2 D3 only deals with x-ray diffraction patterns and thermo-mechanical properties of polyesters obtained from trifunctional ester acid oligomers of the formula  $RC(CH_2CO_2(CH_2)_nCO_2H)_3$ .

- 4.3 D4 discloses branching agents for aromatic polycarbonates, which are chloroformiates of polyols such as the trichloroformiate of trimethylolpropane (cf. D4, page 9, line 1 to page 10, line 14; Claim 13). The branched polycarbonates obtained exhibit properties of non-Newtonian flow, melt elasticity, melt strength, which make them very suitable for the manufacture of

hollow bodies by extrusion blow molding (cf. D4, page 8, lines 9 to 27).

*Problem and solution*

5. As indicated in the application in suit (cf. page 1, lines 2 to 13; page 3, lines 6 to 14), the aim of the claimed invention is to provide branching agents for aromatic polycarbonates, which lead to polycarbonates having improved rheological properties (non-Newtonian flow, melt elasticity, melt strength) and being suitable for the manufacture of hollow articles by extrusion blow molding.
  - 5.1 Thus, D4 which is the only document concerned with branching agents for aromatic polycarbonates, qualifies as the closest state of the art.
  - 5.2 Starting from D4 the objective technical problem underlying the present application may be seen as to provide further branching agents for aromatic polycarbonates, leading to branched polycarbonates having specific rheological properties (i.e. non-Newtonian flow, melt strength, melt elasticity) and suitable for the manufacture of hollow articles by extrusion blow molding.
  - 5.3 According to the application in suit, this problem is solved by the half esters of triols as specified in Claim 1.
  - 5.4 Having regard to Examples 5, 8 to 12 and to the passage from page 10, line 28 to page 14, line 7, it is credible to the Board that the technical problem has effectively been solved.

*Obviousness*

6. It remains to be decided whether the claimed combination of features is obvious to a person skilled in the art having regard to these documents.
- 6.1 It appears from the above prior art discussion that the claimed subject-matter would not have been obvious to a person skilled in the art, since D2 and D3 clearly deal with different products and problems.

These prior art documents would not represent an incentive for a skilled person to envisage that the specific half esters according to the present application would solve the technical problem mentioned above.

Thus, inventive step can be acknowledged for the subject-matter of Claims 1 to 11 of the main request (Article 56 EPC).

7. The Examining Division had acknowledged the novelty of the subject-matter of Claims 12 to 19 and inventive step of the subject-matter of independent Claim 12. The Board agrees with these conclusions. By the same token the preferred embodiments to which dependent Claims 13 to 19 are directed, also involve an inventive step.
8. In view of these findings the main request must be allowed. It is therefore not necessary to consider the merit of the auxiliary request.

**Order**

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

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to grant a patent on the basis of Claims 1 to 19 of the main request with a description to be amended.

The Registrar:

The Chairman:

E. Görgmaier

C. Gérardin