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D E C I S I O N
of 12 September 2000

Case Number: T 0287/97 - 3.3.3

Application Number: 91106831.0

Publication Number: 9454158

IPC: C08L 79/08

Language of the proceedings: EN

Title of invention:
Polyamic acid composite, polyimide composite and processes for producing the same

Applicant:
Toho Rayon Co., Ltd.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 84

Keyword:
"Claims - clarity (yes)"

Decisions cited:
T 0454/89; T 0860/93

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0287/97 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 12 September 2000

Appellant: Toho Rayon Co., Ltd.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office issued on 28 October 1996 refusing European patent application No. 91 106 831.0 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. Gérardin
Members: R. Young
A. Lindqvist

Summary of Facts and Submissions

I. European patent application No. 91 106 831.0, filed on 26 April 1991 and claiming JP priorities of 27 April 1990 (JP 112540/90 and JP 112541/90) and 1 August 1990 (JP 204171/90 and 204172/90), respectively, and published under No. 0 454 158, was refused by a decision of the Examining Division, dated and issued in writing on 28 October 1996. The decision was based on a set of Claims 1 to 24, filed on 1 July 1996, Claim 1 of which reads as follows:

"A polyamic acid composite comprising
i) a polyamic acid having a three-dimensional network molecular structure obtainable by a ring-opening polyaddition reaction of a tetracarboxylic acid dianhydride with an aromatic diamine and tri- or tetramino compound wherein the tetracarboxylic acid dianhydride/aromatic diamine molar ratio is (100)/(50-100), the tetracarboxylic acid dianhydride/aromatic diamine/tri- or tetraamino compound molar ratio is (100)/(50-100)/(2-25) and an equivalent ratio of the reactive groups in the tetracarboxylic acid dianhydride to those in the aromatic diamine and the tri- or tetraamino compound (an acid value/ amine value ratio) is 0.95 to 1.05

ii) (a) at least one high molecular weight polymer component selected from polyamideimide, polyetherimide, polyethersulfone, polysulfone, polybenzimidazole, polybenzoxazole, polybenzothiazole, polyamide, polypeptide, polyester, polycarbonate and polyacrylonitrile which is (are) dispersed in the three-dimensional network molecular structure of the polyamic acid and the molecular

chains of which are interpenetrated with molecular chains of the polyamic acid or

(b) a curable resin composition not being a polyamic acid which is dispersed in the three-dimensional network molecular structure of the polyamic acid."

Claims 2 to 12 are dependent claims directed to elaborations of the composite according to Claim 1.

Claim 13, an independent claim, is directed to a process of preparing the polyamic acid composite of Claim 1.

Claims 14 to 17 are dependent claims directed to elaborations of the process according to Claim 13.

Claim 18, an independent Claim, is directed to a process for producing a polyimide resin composite, comprising the step of dehydrating and cyclizing the polyamic acid in the polyamic acid composite of Claim 1.

Claims 19 to 23 are dependent Claims directed to elaborations of the process according to Claim 18.

Claim 24 is an independent Claim directed to a polyimide composite obtainable by any of the processes according to Claims 18 to 23.

II. According to the decision, the mention, in Claim 1, that the component (ii)(a) was a "high molecular weight polymer" without indication of the molecular weight range of the polymer, was vague and did not

clearly define the matter for which protection was sought. The argument of the Applicant, that this wording meant that the compound had a molecular weight greater than 10 000 could not be accepted for the following reasons:

(a) According to the Römpp Chemie Lexikon, polyethylenes were considered as having a "high molecular weight" when they exhibited a molecular weight between 200 000 and 500 000.

(b) According to patent application WO-A-95/10560, alkenyl aromatic polymers were considered as having a low molecular weight when they exhibited a molecular weight between 100 000 and 165 000.

(c) According to patent application WO-A-88/07561 polyarylether polymers were considered as having a high molecular weight when they exhibited an inherent viscosity greater than 0.5 dl/g.

This showed that there was no unique and recognised meaning of the wording "high molecular weight" in the polymer field, which resulted in the skilled person not being able to ascertain the scope of a claim which included "high molecular weight polymer", but no further definition in terms of a molecular weight range. Nor was it relevant that there was enough information in the description that polymers having a molecular weight greater than 10 000 were meant, since the claims had to be clear in themselves when read by the skilled person, having knowledge of the prior art but none derived from the description. Reference was made to decision T 454/89 of 11 March

1991 (not reported in OJ EPO).

III. On 17 December 1996, 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 5 March 1997, was accompanied by three sets of Claims 1 to 24, forming a main request, a first auxiliary request and a second auxiliary request, respectively.

The claims of the main request corresponded to those underlying the decision under appeal. In relation to the latter, the Appellant argued substantially as follows:

(a) The decision T 454/89 relied upon in the decision under appeal did not reflect the most recent case law of the boards of appeal. According to the published decision T 860/93 (OJ EPO 1995, 047) which referred to T 454/89 in the Headnote, the principle of not using the description when interpreting the claims could only apply in the specific circumstances of T 454/89 where two features of the claims contradicted each other. On the contrary, the provision of Article 69(1) EPC, according to which the description and drawings shall be used to interpret the claims, applied also to the clarity requirement of Article 84 EPC, provided that the claims were not self contradictory.

(b) Since, in the application in suit, the use of the term "high molecular weight" did not lead to any self contradiction, there was no

recognisable reason why the description should not be used to interpret the claims.

(c) Applying these principles to the term "high molecular weight" in the claims, the skilled person would learn from the third section on page 3 of the description, that the term "high molecular weight" is not only used for component (ii)(a) but also for component (i). The relevant section read: "...a new polyamic acid composite having improved and new characteristics, in which molecular chains of a three dimensional network molecular structure (high molecular gel structure) of a polyamic acid [=component i)] are interpenetrated with molecular chains of another high molecular weight polymer" [=component ii)(a)]. Furthermore, for component i) (polyamic acid) a typical molecular weight range was disclosed as being 10 000 to 300 000 on page 8 of the description (last line). Consequently the skilled person was given a sufficiently clear idea as to the meaning of "high molecular weight" when used in conjunction with component ii)(a). Consequently, the claims complied with Article 84 EPC.

IV. The Appellant requested:

1. that the decision under appeal be set aside;

2. that the allowability, under Article 84 EPC, of Claims 1 to 24, submitted as main request be acknowledged and the case remitted to the Examining Division with the order to continue the substantive examination as to novelty and

inventive step, or,

3. if request 2 was not granted, that the allowability, under Article 123(2) EPC, of Claims 1 to 24 submitted as first auxiliary request be acknowledged and the case remitted to the Examining Division with the order to continue the substantive examination as to novelty and inventive step, or,

4. if request 3 was not granted, that the allowability, under Article 123(2) EPC, of Claims 1 to 24 submitted as second auxiliary request be acknowledged and the case remitted to the Examining Division with the order to continue the substantive examination as to novelty and inventive step, or, finally

5. the appointment of hold oral proceedings, should the above requests not be allowed on the basis of the written submissions.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request*

2.1 Admissibility of amendments

The claims of the main request correspond to those underlying the decision under appeal. No objection under Article 123(2) EPC was raised in the decision under appeal against these claims. Nor does the Board

see any reason to take a different view. Consequently Claims 1 to 24 are held to meet the requirements of Article 123(2) EPC.

2.2 Clarity

The sole issue to be decided is whether the term "high molecular weight" used to qualify the polymer component ii)(a) in Claim 1 is sufficiently clear to meet the requirements of Article 84 EPC.

In this connection, it is evident that the requirement of the "high molecular weight component" to be interpenetrated with molecular chains of the polyamic acid (Claim 1, sub-paragraph ii)(a)) implies a functional capability, on the part of the high molecular weight component, of effecting such interpenetration. Whilst this would predicate a certain minimum chain length, corresponding to a certain minimum molecular weight, to enable such interpenetration to take place, there is nothing in such a concept which would impose a corresponding upper limit on its molecular weight. Nor has any specific reason been put forward in the decision under appeal for regarding the term "high molecular weight" as implying a particular upper limit.

Hence, the question at issue boils down to what the skilled person would understand as the **minimum** molecular weight corresponding to such a "high molecular weight component".

2.2.1 According to the decision T 860/93 (supra), it is a general principle of law, that the proper interpretation of any document, and more specifically

any part of a document, is to be derived by having regard to the document as a whole. That principle is expressed in Latin as: *ex praecedentibus et consequentibus optima fit interpretatio* (the best interpretation is that made from what precedes and what follows.). The EPC and its Implementing Regulations do not suggest that any departure from the generally accepted principles of legal interpretation is contemplated (reasons for the decision, point 5.1).

Furthermore, the decision goes on to draw a distinction from the situation described in T 454/89 (supra), since the latter involved a factual situation in which a claim had two features which were mutually incompatible, and the subject-matter of the claim was therefore not feasible (reasons for the decision point 5.4).

2.2.2 The Board in the present case sees no reason to diverge from the general principles set out in T 860/93, and even less to resile from the narrowness of the exception which it permits on the basis of T 454/89 relied upon in the decision under appeal.

2.2.3 Applying these principles to the term "high molecular weight" polymer in the context in the application in suit, the Board is not aware of any element of self-contradiction, let alone mutual incompatibility in such a term. Nor does the decision under appeal mention any such contradiction in the words of the claim itself. Consequently, the claims of the application in suit are to be interpreted in the light of the description.

2.2.4 In this connection, the statement, in the application in suit, that it is an object to provide "a new polyamic acid composite..., in which molecular chains of a three dimensional network molecular structure (high molecular gel structure) of a polyamic acid are interpenetrated with molecular chains of another high molecular weight polymer (hereinafter referred to as a high polymer component)" is a relevant indication that the molecular weight of the "high polymer component" will at least be commensurate with that of the polyamic acid gel (page 3, penultimate paragraph). This understanding, read in the light of the statement on page 8 that "The polyamic acid in the gel form usually has a molecular weight of about 10,000 to 300,000.", is, in the Board's view, an unambiguous indication that a relevant species with a molecular weight of about 10 000 upwards would qualify as a "high molecular weight polymer".

2.2.5 The finding, in the decision under appeal, based on respective references to a definition of polyethylene in Römpp's Chemie Lexikon, and two references to a definition of the term "low molecular weight" in separate WO applications (section II. (a), (b) and (c) above) is not convincing, since none of the definitions is referred to in the application in suit. Consequently, they do not form part of "what precedes and what follows" in the sense of the decision T 860/93 referred to above. In other words, they have less bearing on the interpretation of the claims of the application in suit than does the description of the latter.

2.2.5.1 Quite apart from the contextual remoteness of the Römpp Chemie Lexikon reference, the polyethelenes it

refers to are not amongst the polymers listed as belonging to the relevant "high molecular weight component" in Claim 1. Consequently, the content of this reference has no relevance to the subject-matter of the application in suit.

2.2.5.2 Application WO 95/10560 referring to "low molecular weight alkenyl aromatic polymer foam" is also not concerned with a polymer of the type referred to in the definition of the relevant component in Claim 1 of the application in suit. Furthermore, it was not published until after the filing date of the application in suit. Clarity is, however, determined at the relevant filing date. Consequently the skilled person construing the relevant claim of the application in suit at the relevant date would not have had access to the information in this PCT application. Thus the latter has no relevance to the application in suit.

2.2.5.3 The reference to "high molecular weight polyarylether" in application WO 88/07561, although published before the priority date of the application in suit, is clearly given in the context of that specific application. Such a reference cannot be regarded as a general teaching in the sense of a dictionary. It is thus even more peripheral to the subject-matter claimed in the application in suit than a dictionary reference would have been (section 2.2.5.1, above). Finally, the polyethers it refers to are also not among the polymers listed in Claim 1. Consequently, its content has no relevance to the subject-matter of the application in suit.

2.2.5.4 In summary, the contextual and factual remoteness of

the statements made in the disclosures referred to means they have no relevance to the interpretation of Claim 1 of the application in suit.

2.2.6 Hence, on a proper interpretation, the lower limit of the term "high molecular weight" in Claim 1 can be unambiguously understood by the skilled person. Consequently, no valid objection under Article 84 EPC can be maintained. It follows that the main request must be allowed.

3. *Auxiliary requests*

In view of the above finding, there is neither any need for the Board further to consider the claims of the first or second auxiliary request, nor to appoint oral proceedings.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division for further prosecution, in particular as to novelty and inventive step, on the basis of the main request.

The Registrar: The Chairman:

E. Görgmaier C. Gérardin