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D E C I S I O N  
of 19 March 1997

Case Number: T 0309/94 - 3.3.3

Application Number: 90203318.2

Publication Number: 0434145

IPC: C08F 220/58

Language of the proceedings: EN

Title of invention:

Acrylamide copolymers containing (meth)acrylamide benzene dicarboxylic units

Patentee:

Eniricerche S.p.A., et al

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 113(1)  
EPC R. 67

Keyword:

"Substantial procedural violation"  
"Communication misleading the Appellant with the consequence of depriving him of the opportunity to comment"

Decisions cited:

-

Catchword:

-



Case Number: T 0309/94 - 3.3.3

D E C I S I O N  
of the Technical Board of Appeal 3.3.3  
of 19 March 1997

Appellant: ENIRECERCHE S.p.A.  
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Decision under appeal: Decision of the Examining Division of the  
European Patent Office posted 1 December 1993  
refusing European patent application  
No. 90 203 318.2 pursuant to Article 97(1) EPC.

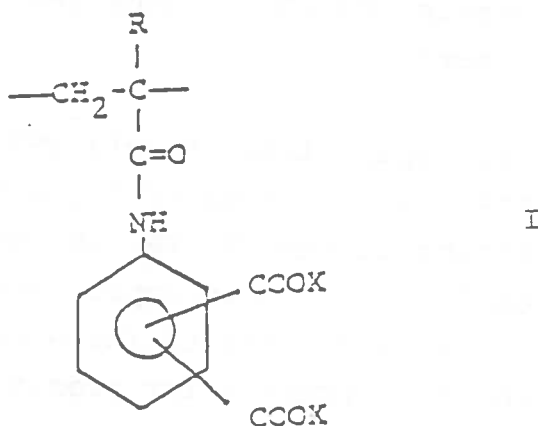
Composition of the Board:

Chairman: C. R. J. Gérardin  
Members: H. H. R. Fessel  
J. A. Stephens-Ofner

### Summary of Facts and Submissions

I. The European patent application No. 90 203 318.2 was filed on 13 December 1990 with a set of 8 claims of which the only independent Claim 1 read as follows:

"Acrylamide copolymers formed by monomer units in accordance complying with the following formula:



wherein R is H or CH<sub>3</sub>; X is H or an alkaline metal, or NH<sub>4</sub>; and wherein the COOX groups may be in ortho-, meta- or para- position in relation to each other;

and by acrylamide or (met)acrylamide monomer units (II), the molar ratio between units (I) and units (II) varying between 1:99 and 99:1."

Dependent Claims 2 to 8 related to preferred embodiments of the copolymers of that of Claim 1.

II. Following two communications wherein an objection of lack of inventive step with respect to the disclosures of

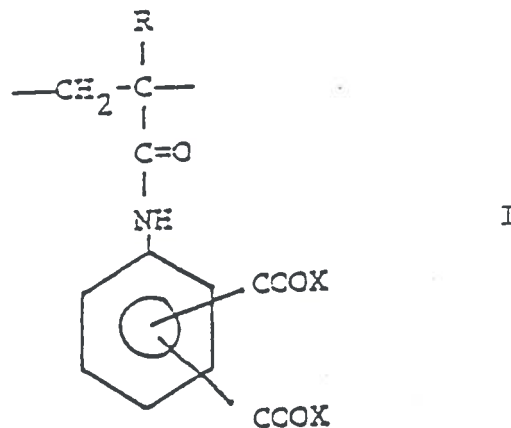
- D1 CA 82(16) : 98 923 u (JP 57-105409) and
- D2 US-A-3 598 792

had been raised, the Examining Division issued a third communication dated 26 May 1993 in which the Appellant was informed (cf. point 2) that "... it seems that an inventive step could only be acknowledged to the copolymers according to claim 1 which are able to represent such a chelating ring structure (Article 56 EPC). The Applicant is thus requested to restrict the subject-matter of claim 1 to monomer units of formula (I) wherein the COOX groups are in ortho- position to each other".

III. With its reply filed 26 July 1993 the Appellant submitted two new sets of 7 claims, one for the Contracting States DK, FR, GB, NL (hereinafter version A) relating to copolymers and another one for the Contracting State ES (hereinafter version B) relating to a process for producing these copolymers.

The then filed Claim 1 of version A reads as follows:

"Acrylamide copolymers formed by monomer units in accordance complying with the following formula:



wherein R is H or CH<sub>3</sub>; X is H or an alkaline metal, or NH<sub>4</sub>; and wherein the COOX groups are in ortho-position in relation to each other;

and by acrylamide or (meth)acrylamide monomer units (II), the molar ratio between units (I) and units (II) varying between 1:99 and 99:1." (emphasis added by the Board).

Claim 1 of version B differs in that before formula I the wording of Claim 1 of version A was amended to read:

"Process for preparing acrylamide copolymers, characterized by comprising the step of copolymerizing monomer units in accordance complying with the following formula:....."

Claims 2 to 7 of both versions concern preferred embodiments of the subject-matter defined in Claim 1.

IV. The application was refused by a decision of the Examining Division 2.1.02.011 of the European Patent Office dated 1 December 1993. It was based on the two sets of claims (Versions A and B) specified above.

The reason for the decision was that the subject-matter as claimed did not involve any inventive step vis-à-vis the teaching given in documents D1 and D2.

In accordance with the introduction of the application the problem to be solved vis-à-vis D2, regarded as the closest state of the art, was seen in providing further copolymers for use in water treatment, to eliminate and/or recover metals or to inhibit the formation of incrustations due to deposits of insoluble salts, particularly calcium salts, or with flocculants to precipitate solids suspended in water. The Examining Division held the solution of that problem not to involve an inventive step since it would have been

obvious to replace the N-acrylyliminodiacetate (hereinafter AMD) in the comonomer of Claim 11 of D2 by Compound (I) of Claim 1 of the present application in view of the well known complexing properties of such compounds reported in D1. As to the comonomer component (II) of Claim 1 of the present application the Examining Division held that, in the absence of any suggestion to exclude (meth)acrylamide copolymers from the acrylic acid family specified in Claim 11 of D2, it would have been obvious to use same as well as monomer (I) (cf. decision under appeal point 3.4).

V. On 28 January 1994 a Notice of Appeal was lodged against that decision together with payment of the prescribed fee. The Statement of Grounds of Appeal was received on 2 March 1994.

In the Grounds of Appeal the Appellant specified that the copolymers of the present application, like those described in D2, were linear and water-soluble whereas those disclosed in D1 were crosslinked due to trifunctionality of the hexahydro-1,3,5-triacryloyl-1,3,5-triazine moiety. The teachings of D1 and D2 should thus not be combined.

VI. The Appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the two sets of claims filed on 26 July 1993.

### Reasons for the Decision

1. The appeal is admissible.
2. The Board, as the Examining Division already did, considers the subject-matter of both versions of Claim 1 to be new since a copolymer of

N-acrylamido-o-benzenedicarboxylic acid with (meth)acrylamide is not disclosed in the cited prior art.

3. The application in suit concerns water soluble copolymers containing (meth)acrylamide benzene dicarboxylic acid units, more specifically units wherein the COOX groups are in ortho-position in relation to each other, useful in water treatment, to eliminate and/or recover metals or to inhibit incrustations (column 1, 11.46-50).
- 3.1 Polymers also useful as water treatment agents and antistats are described in D2, which the Board considers to represent the closest state of the art. These polymers are homopolymers or copolymers of diesters of N-acrylyliminodiacetic acid as well as the corresponding polymers, in which the ester groups have been converted into carboxylic groups by saponification and acidification (column 1, lines 30 to 52).
- 3.2 In the light of this disclosure the technical problem underlying the application in suit may thus be seen in the provision of further water soluble polymers suitable for the same applications.
- 3.3 According to the application in suit this problem is said to be solved by copolymers containing units (I) derived from N-methacryloyl-3-aminophthalic acid or metal salts thereof, and units (II) derived from (meth)acrylamide, the molar ratio between units (I) and units (II) varying between 1:99 and 99:1, as specified in claim 1 of the two sets of claims.
- 3.4 In view of the information provided in the application in suit as well as the two examples in the Statement of Grounds of Appeal (page 2, paragraph 3 to page 3, paragraph 3), which illustrate the suitability of the

copolymers as claimed in the water treatment, in particular as chelating agents for the recovery of metals, the Board is satisfied that the above problem is effectively solved.

4. It remains to be decided whether the claimed subject-matter was obvious to a person skilled in the art having regard to the teaching of D1 and D2.
- 4.1 Although D2 is a broad disclosure encompassing several embodiments, there is no mention of copolymers containing either units (I) or units (II), let alone a combination thereof.
- 4.1.1 Whatever the comonomer used in the preparation of the polymers of D2, it is evident that the units which are basically responsible for the general properties of these polymers derive from diesters of N-acrylyliminodiacetic acid, since homopolymers are explicitly envisaged. These units must thus be regarded as the essential feature of the polymers described in D2. In the absence in D2 of any alternative to these diesters this document cannot provide any guidance for the solution of the technical problem, which means that unit (I) in the application in suit must be regarded as non obvious with respect to this disclosure.
- 4.1.2 In all the embodiments directed to the preparation of copolymers, e.g. embodiments D, E, F and G, the only comonomers mentioned are acrylic acid, methyl acrylate, methyl methacrylate, vinylpyridine, N-vinylpyrrolidone, styrene, acrylonitrile and vinyl acetate (embodiment E: column 4, lines 43 to 46; embodiment F: column 4, line 74 to column 5, line 1; column 8, Table 1). This is also apparent from the formulae of the recurrent units in the case of copolymers (embodiment D: column 3, line 70 to column 4, line 15; embodiment G: column 5, lines 53 to 68), wherein the various meanings



of Z correspond exactly to the above comonomers. The above list of eight comonomers would thus be interpreted by a skilled person as exhaustive, who would have consequently no incentive to consider extending this specific teaching to further comonomers, in particular to acrylamide or methacrylamide. It follows that unit (II) in the application in suit must also be regarded as non obvious with respect to D2.

4.1.3 Consequently, D2 cannot provide any incentive to consider a solution along the line of a combination of units (I) and (II) as required in the application in suit.

4.2 D1 describes cation exchangers obtained by copolymerising N-methacryloyl-4-aminophthalic acid with hexahydro-1,3,5-triacryloyl-1,3,5-triazine. The latter being a trifunctional compound, the resulting copolymer must be a cross-linked, therefore solid product. Infrared spectroscopy and potentiometric titration reveal the presence in the copolymer of dicarboxylic acid units which correspond to unit (I) in the application in suit. No further comonomer is envisaged, which means that, even if the skilled person carried out routine experiments within the framework of D1 in order to explore the ion-exchanging activity provided by this specific dicarboxylic acid unit, copolymers comprising units derived additionally from acrylamide or methacrylamide would not be considered.

For this reason already D1 cannot lead to copolymers with the terms of the application in suit.

4.3 Even a combination of D1 and D2 would not lead to copolymers as claimed, since neither mentions the possibility to incorporate units derived from acrylamide or methacrylamide (units (II) in the application in suit) into the copolymers.

In fact, it is doubtful whether a skilled person would even contemplate such a combination. Firstly, there are differences in structure between the copolymers according to D1 and D2 which militate against it. Concerning D2, both the various recurring units of the copolymers according to Embodiments D to G and the method of preparation in the absence of any polyfunctional monomer, either by the use of high energy ionizing radiation or by the use of free radical initiating substances (column 6, lines 24 to 27), clearly indicate a linear structure of these copolymers. By contrast, as stated above, the copolymers obtained in D1 must be regarded as having a cross-linked structure. Secondly, it is far from evident that the mere reference to exchange capacity in D1 should be interpreted as meaning that these cationic exchangers would be suitable in the water treatment as chelating agents for the recovery of metals and that, consequently, a skilled person would regard the particular dicarboxylic acid unit as a promising feature for the solution of the technical problem. In view of these differences in terms of structure and properties, thus, a combination of D1 and D2 in the Board's view can only be made by hindsight.

- 4.4 All these considerations apply to the products (set of claims A) as well as to the process for preparing them (set of claims B), since both are characterized by the same combination of features, so that the claimed subject-matter in both cases involves an inventive step.
  
5. Claim 1 of the two sets of claims being allowable, the same applies to the respective dependent claims 2 to 7, which are directed to preferred embodiments of the copolymers respectively process as defined in claim 1 and whose patentability is supported by that of the respective main claim.

6. *Procedural matters*

In accordance with Rule 67 EPC, reimbursement of an appeal fee shall be ordered when the Board deems an appeal to be allowable and "if such reimbursement is equitable by reason of substantial procedural violation". Since the Board deems the appeal to be allowable (see above) it needs to be decided whether the above requirement is met.

The information given by the Examining Division in its last communication before the decision (see item III above) was that the chelating properties were due to a particular 7-membered ring structure and that, in the case of a restriction to such compounds, it seemed that an inventive step could be acknowledged. The Board regards this as a clear hint of the Examining Division to the Appellant that a positive decision, e.g. a grant of a patent could be expected if claims restricted in that sense were filed. Together with his reply to that communication the Appellant filed indeed two sets of claims amended in that sense as well as a description amended accordingly. Without any further information, however, the Examining Division deviated from the impression given to the Appellant and issued a decision of refusal of the application (Article 97(1) EPC), depriving the Appellant of any chance to present counter-arguments. The Board considers this to be a completely unacceptable conduct misleading the Appellant and depriving him of the opportunity to comment pursuant to the requirements of Article 113(1) EPC. The Board therefore holds that a substantial procedural violation of Article 113 EPC has occurred justifying the reimbursement of the appeal fee under Rule 67 EPC.

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 with the order to grant a patent on the basis of the sets of claims (A) and (B) filed 26 July 1993, and following description:
  - pages 1, 1a, 2 and 3 as filed on 26 July 1993;
  - pages 4 to 9 as originally filed.
3. The appeal fee is reimbursed.

The Registrar:

  
E. Görgmäier

The Chairman:

  
C. Gérardin