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D E C I S I O N
of 30 September 2003

Case Number: T 0130/02 - 3.3.5

Application Number: 95937472.9

Publication Number: 0789671

IPC: C01G 51/04

Language of the proceedings: EN

Title of invention:
The combinatorial synthesis of novel materials

Applicant:
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, et al

Opponent:
-

Headword:
Combinatorial synthesis/UNIVERSITY OF CALIFORNIA

Relevant legal provisions:
EPC Art. 54(1), 111(1)

Keyword:
"Amended claims - novelty (yes) - remittal for further prosecution"

Decisions cited:
-

Catchword:
-

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Case Number: T 0130/02 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 30 September 2003

Appellant: THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 25 July 2001 refusing European application No. 95937472.9 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: R. K. Spangenberg
Members: G. J. Wassenaar
M. B. Günzel

Summary of Facts and Submissions

I. European patent application No. 95937472.9 was refused by a decision of the Examining Division. The application was based on the International Application No. PCT/US95/13278, published under No. WO 96/11878. The decision was taken on the basis of the set of claims 1 to 31, filed with the letter dated 2 October 2000. Claim 1 thereof read as follows:

"A process for the production of an array of materials from at least two components of said materials, said process comprising:

a) delivering a first component of a first material and a first component of a second material at first and second regions on a substrate;

b) delivering a second component of a the first material and a second component of the second material at the first and second regions on the substrate; and

c) once the components of said materials have been delivered to said regions simultaneously reacting the components in the regions to form at least two different materials wherein the materials are covalent network solids, ionic solids, molecular solids, inorganic materials, said inorganic materials preferably being selected from intermetallic materials, metal alloys, ceramic materials organometallic materials, composite materials or non-biological organic polymers, polymers which are synthesised by a linear stepwise coupling of building blocks being excluded."

II. The Examining Division held that the subject-matter of claim 1 lacked novelty over WO 93/09668 (D1) since the teaching of D1 was not limited to the production of an array of biological polymers by stepwise coupling of building blocks but to an array of polymers in general by reacting different monomers. Specifically disclosed were organic polymers such as polyurethanes, polyesters and polycarbonates, which were also mentioned in the present application.

III. The appellant lodged an appeal against this decision. With the statement of grounds of appeal the appellant filed a number of further documents, among them D2, and a set of amended claims 1 to 50 as a main request and a set of amended claims 1 to 49 as first auxiliary request.

D2: Hawley's Condensed Chemical Dictionary, fourteenth edition, page 898.

Claim 1 of the main request read as follows:

"A process for the production of an array of materials from at least two components of said materials, said process comprising:

a) delivering a first component of a first material and a first component of a second material at first and second regions on a substrate;

b) delivering a second component of a the first material and a second component of the second material at the first and second regions on the substrate;

c) simultaneously reacting the delivered components in the regions to form at least two different materials wherein the materials are:
inorganic materials, said inorganic materials preferably being selected from intermetallic materials, metal alloys, and ceramic materials; organometallic materials; or non-biological organic polymers, the process for the production of an array of non-biological, organic polymers further comprising
(i) polymerizing the components in the regions of the substrate and
(ii) allowing the polymerization reaction to proceed to form the at least two different non-biological organic polymers."

With respect to novelty the appellant essentially argued that D1 was directed to the formation of an array of polymers by a stepwise coupling process and did not disclose other processes for the production of polymers. Where in D1 a reference was made to non-biological polymers it was stated that these polymers had different monomer sequences, which would imply a linear stepwise coupling of monomers. There was no disclosure of simultaneously polymerizing a mixture of monomers to form a polymer as now claimed.

IV. The appellant requested that the application be granted with the claims of the main request, alternatively, that the application be returned to the Examining Division for further examination if the Board was unwilling to grant the claims of the main request for any other reason than previously considered by the Examining Division. As a further alternative it was

requested that the application be granted with the claims of the first auxiliary request, alternatively, that the application be returned to the Examining Division for further examination if the Board was unwilling to grant the claims of the first auxiliary request for any other reason than previously considered by the Examining Division.

Reasons for the Decision

1. Apart from the special requirements for the production of non-biological polymers claim 1 of the main request is based on claims 13 to 23 and page 4, line 12 to page 5, line 5 of the application as originally filed. Features (i) and (ii) relating to the production of an array of non-biological organic polymers are based on page 50, lines 6 to 10 of the original description. Claim 1 of the main request therefore fulfils the requirements of Article 123(2) EPC.

2. D1 discloses a method of forming polymers having **diverse monomer sequences** on a single substrate which comprises a plurality of selected regions, whereby various monomers are delivered to the selected regions where they are reacted in parallel (page 2, lines 25 to 33 and claim 1). In order to obtain polymers having a predefined monomer sequence the monomers must be coupled with each other and the steps of delivering and coupling the monomers must be repeated. The coupling is generally provided by a coupling agent (page 3, lines 6 to 15). The "monomers" mentioned there need not to be single monomers but may be blocks of monomers (page 6, Glossary, point 2.) This process is known in the art as synthesis by linear stepwise coupling of building

blocks (present application page 14, lines 14 to 16). Although the process disclosed in D1 is primarily described with regard to the preparation of molecules containing sequences of monomers such as amino acids it was anticipated that it could also be applied to the preparation of other polymers including non-biological polymers such as polyurethanes, polyesters and polycarbonates (page 7, lines 3 to 14). It is stressed that also such polymers have different monomer sequences (page 7, lines 14 to 17). In the Board's opinion there can be no reasonable doubt that insofar as D1 discloses processes for the preparation of non-biological organic polymers such processes also involve synthesis by linear stepwise coupling of building blocks, whereby the product has a predefined sequence of monomers.

3. According to present claim 1 the process for producing non-biological organic polymers requires a **polymerization reaction** whereby all the delivered components (monomers) are simultaneously reacted to form a polymer. The expression "polymerisation reaction" clearly and unambiguously implies that a large number of chemical bonds is formed in each of the separate regions on the substrate (cf D2). In the Board's view this is an essential difference with regard to the process disclosed in D1 requiring that in one single step only one new chemical bond is formed so that a multiplicity of reaction steps are necessary to couple the building blocks and to form a polymer with a defined sequence of monomers. The process according to claim 1 of the main request is thus not anticipated by D1. Since other novelty objections have not been raised and are not apparent to the Board, the subject-

matter according to claim 1 of the main request must be considered to be new (Article 54(1) EPC).

4. Inventive step of the subject-matter of present claim 1 has not been discussed by the Examining Division. The Board deems it appropriate to have this issue investigated by the first instance in order to know whether there are any objections at all in this respect and, if any, what the basis for these objections is. Thus the Board exercises its power under Article 111(1) EPC to remit the case to the first instance for further prosecution.

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 for further prosecution.

The Registrar: The Chairman:

U. Bultmann R. Spangenberg