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19

Aktenzeichen / Case Number / N° du recours :

T 227/84

Anmeldenummer / Filing No / N° de la demande :

81 200 352.3

Veröffentlichungs-Nr. / Publication No / N° de la publication :

36 699

Bezeichnung der Erfindung:

Title of invention:

Titre de l'invention :

Extraction of poly-beta-hydroxybutyric acid

Klassifikation / Classification / Classement :

C 12 P7/62

ENTSCHEIDUNG / DECISION

vom / of / du

7 November 1986

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /

Titulaire du brevet :

Imperial Chemical Industries PLC
(respondent)

Einsprechender / Opponent / Opposant :

Solvay & Cie (appellant)

Stichwort / Headword / Référence :

EPÜ / EPC / CBE

Art. 52(1) and 54(3) EPC

Kennwort / Keyword / Mot clé :

"Novelty -Senior right -Not only formal distinction
but also essential non-identity - Bogus Limitation"

Leitsatz / Headnote / Sommaire

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Case Number : T 227 /84



D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 7 November 1986

Appellant :
(Opponent)

Solvay & Cie, S.A., Bruxelles
Département de la Propriété industrielle
Rue de Ransbeek, 310
B-1120 Bruxelles

Representative :

Respondent :
(Proprietor of the patent)

Imperial Chemical Industries PLC
Imperial Chemical House
Millbank
London SW1P 3JF

Representative :

Denerley, Paul Millington, Dr.
Imperial Chemical Industries PLC
Legal Department: Patents
PO Box 6
Welwyn Garden City
Herts. AL7 1HD

Decision under appeal : Decision of Opposition Division of the
European Patent Office dated 18 July 1984
rejecting the opposition filed against
European patent No. 36 699 pursuant to
Article 102(2) EPC.

Composition of the Board :

Chairman : P. A. M. Lançon

Member : G. S. A. Szabo

Member : C. Payraudeau

Summary of Facts and Submissions

- I. European patent No. 36 699 was granted on 2 February 1983 with six claims in response to the European patent application No. 81 200 352.3 filed on 14 February 1980 claiming priority of the earlier applications (GB-7 906 076, 7 906 077, and 7 915 858) of 21 February 1979 and 8 May 1979. Claim 1 was worded as follows:
- "A process for the extraction of poly- β -hydroxybutyric acid (PHB) from bacterial cells containing PHB comprising contacting the bacterial cells with 1,2-dichloroethane at a temperature below 40°C and separating the PHB-containing solvent phase from the bacterial cell residue".
- II. The opponent filed opposition against the European patent on 27 October 1983 requesting that it be revoked on ground that the subject-matter of the patent was not patentable for lack of novelty under Article 54(3) EPC. The opposition was supported by EP-14 490 (1), having a priority date of 22 January 1979, and by *Ind. & Eng. Chem.* 1947, 39, 519. (2).
- III. The Opposition Division rejected the opposition in a decision dated 18.07.1984. The reason given for the decision was that (1) only disclosed specifically the extraction of PHB (poly- β -hydroxybutyric acid) from a dried biomass at 60°C using 1,2-dichloroethane (DCE) as a solvent, there being no reference to the pressure at which the extraction had taken place (Example 4). The temperature was 20°C above that required by the main claim in the patent. Although the cited earlier application generally refers to a pressure range from 0.1 to 10 kg/cm², and it was known from tabulations in (2) that the boiling point of DCE was below 40°C at a pressure around 0.1 to 0.2 kg/cm² (i.e. 76 to 152 mm Hg/cm² in the Table), the preferred temperature range for

DCE was expressly 60 to 80°C. There was no evidence suggesting that the 0.1 kg/cm² pressure should be applied contrary to the stated preference for temperatures. The subject-matter of the opposed patent was not directly and unambiguously derivable from the cited earlier application, and there was therefore no loss of novelty under Article 54(3) EPC.

- IV. The opponent filed an appeal against the above decision on 14.09.1984 by a telex message confirmed on 22.09.84 by letter. The Statement of Grounds was submitted on 14.11.84. After a communication by the Board, the respondent filed further arguments and submitted amended new Claims 1 to 5 and corresponding amended new pages on 06.03.1986 to replace the existing set. Claim 1 of these was worded as follows:

"A process for the extraction of poly-β-hydroxybutyric acid (PHB) from an aqueous suspension of bacterial cells containing PHB comprising contacting said suspension with 1,2-dichloroethane at a temperature below 40°C and then separating the PHB containing solvent phase from the bacterial cell residue."

- V. The appellant (opponent) submitted in the proceedings substantially the following arguments:

DCE was one of the most preferred solvents in (1), recommended for the extraction of bacteria containing PHB. The particular use of DCE according to the patent-in-suit at a temperature below 40°C was no novel selection of conditions from the state of the art, since the results represented no advantage in purity when compared with the applicant's own examples in the parent application, i.e. EP-15 123 (3), using rather high temperatures (e.g. 83°C) for extraction. The same applied to the citation (1) which

operated at 60°C. Non-distinctive characteristics should be disregarded (Guidelines for Examination in the EPO, Part C.IV-7.6).

VI. The respondent (patentee) argued substantially as follows:

There was no disclosure as to the use of DCE at 40°C or below that temperature for extraction of PHB from bacteria in (1). As to the allegation that the invention represented no improvement over extractions at 83°C or 60°C according to the disclosures in (3) or (1), the suggested comparisons were unfair. The initial PHB content and the amount of lipids in the biomass could greatly influence the result and the pretreatment with acetone or ethanol significantly improved the purity after subsequent extraction with DCE. In addition, the use of different bacteria and the milling of the material also rendered the comparisons irrelevant. Much better conclusions could be drawn from the tests shown in Example 13 of (3) or the corresponding Example 10 of the patent since these clearly indicated that DCE loses specificity as an extractant at higher temperatures when compared with chloroform.

VII. The appellant requests that the decision of the Opposition Division be set aside and the patent be revoked. The respondent requests that the appeal be rejected.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.
2. There can be no formal objection to the new set of Claims 1 to 5 since this is supported by the application as filed. Claim 1 is in fact now the combination of the earlier Claims 1 and 3, and represents a restriction in scope. The

amendments therefore comply with the requirements of Article 123(2) and (3) EPC.

3. The issue is that of novelty under Article 54(3) EPC. The cited earlier European patent application (1) was filed on 14.01.80, claiming priority from an earlier application on 22.01.79 (FR-7 901 862), and was published on 20.8.1980 as EP-A-14 490. The priority and filing dates of the present EP-36 699 are later than that of the cited document but earlier than the publication date of the same. Since the cited earlier patent application is supported by the relevant disclosures in its own priority document, it constitutes prior art as defined by Article 54(3) EPC but may not be taken into account for obviousness under Article 56 EPC.
4. Document (1) also relates to the extraction of PHB with DCE from a biomass. In Example 4 dried biomass is used and the temperature is 60°C. Although the cited document refers to the general possibility of direct extraction from a culture medium, which is an aqueous suspension, there is a preference expressed for the separation of the biomass for instance by centrifugation followed by freeze-drying ((1), page 2, lines 46-52). The preferred temperature for DCE is at least 60°C (page 3, lines 1 and 2). Although the process with this or the other solvents may also be carried out under substantially reduced or increased pressure, i.e. from 0.1 to 10 kg/cm² (page 3, lines 3-4), this possibility is not specifically related to any one of the solvents or conditions within the disclosure of (1).
5. It is readily conceivable that a skilled person would know from common general knowledge that a 0.1 kg/cm² pressure implies a refluxing temperature of less than 40°C for DCE having a boiling point at 83°C under atmospheric conditions. In view of this, the Board need not go into the question

whether or not this document (2) could be construed as part of general knowledge at all in consequence of its publication in a journal.

6. Notwithstanding the possible recognition of a low boiling point for DCE at a low pressure, the skilled person would be rather discouraged to consider this for processing according to the method described in (1), because of the recommended higher temperature range of 60 to 80°C for DCE. There is nothing in the document which expressly or by implication specifically points to 40°C or an even lower temperature in this particular context.
7. Although the distinction based on temperature already appears to establish the novelty of the claimed subject-matter, the appellant raised the question whether such restriction is technically meaningful or merely a "bogus" limitation, i.e. an arbitrarily selected range without any practical consequence. It was earlier decided that novelty must "entail more than just a formal delimitation of the process concerned vis-à-vis the state of the art" so that the selected range is not an "arbitrary specimen from the prior art" which "has the same properties and capabilities" as the original range ("purposive selection") ("Thiochloroformates/HOECHST", T 198/84, OJ 7/1985, 209 and 214).
8. However, the submission of the appellant that notwithstanding the different operating temperatures the results are substantially the same, cannot be accepted. Although (3) uses DCE with dried biomass at 83°C in the relevant examples, the patent-in-suit claims the extraction of the bacteria in aqueous suspension. In addition the cited examples either use *M. organophilum* (Examples 1, 2 and 3) instead of *A. chroococcum*, or also extract the mass with acetone (Examples 3 and 4) before the treatment with DCE.

The preliminary extraction removes part of the lipids and improves the purity of the final product. Such differences and those in the initial PHB and lipid contents of the bacteria, as well as their different species-related extractabilities influence the results to an extent that the suggested comparisons are meaningless.

Similar considerations apply to (1), according to which a freeze-dried biomass of *A. eutrophus* was pretreated with ethanol and then extracted with DCE at 60°C. (Example 4). The original cells contained very high amounts of PHB and consequently less lipids (cf. Examples 4 and 5 and Table 1). Thus again, the results are not wholly attributable to the temperature of the process and no valid conclusions can be drawn from the data.

9. Contrary to the above, the outcome of comparisons with various solvents under otherwise identical conditions in Example 13 of (3) and Example 10 of the present patent allow the conclusion that DCE is more selective than chloroform in respect of extracting PHB at lower temperatures, and that the distinction disappears at 83°C. The invention relies on such relative improvements, and the onus was on the opponent to refute such distinctions with experimental results or to prove that the results are substantially the same under otherwise identical conditions irrespective of the selection of the temperature range. In the absence of such evidence the presumption stands that the subject-matter of Claim 1 is a "purposive selection" and therefore novel as such over the cited earlier application (1). The same applies to the dependent claims.

Order

For these reasons

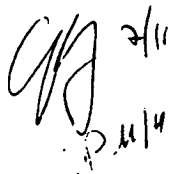
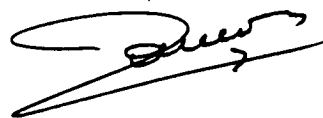
it is decided that:

1. The decision of the Opposition Division is set aside.
2. The case is remitted to the first instance with the order to maintain the patent, amended on the basis of the following documents:
 - (a) Claims 1 to 5 received on 6 March 1986, and
 - (b) Description as replaced by amended pages 1 to 14, received on 6 March 1986.

The Registrar:



The Chairman:



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12/11/84