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**Datasheet for the decision
of 4 June 2008**

Case Number: T 0200/05 - 3.3.10

Application Number: 98300593.5

Publication Number: 0857717

IPC: C07C 231/02

Language of the proceedings: EN

Title of invention:

Process for producing N-long-chain acyl acidic amino acids or salts thereof

Patentee:

Ajinomoto Co., Inc.

Opponent:

Clariant Verwaltungsgesellschaft mbH
Cognis GmbH

Headword:

Process for producing acyl acidic amino acids/AJINOMOTO

Relevant legal provisions:

EPC Art. 123(2)
EPC R. 80

Keyword:

"Main and auxiliary requests 1, 2 and 7: inventive step (no) - improvement (yes) - obvious solution - no deterrent teaching in the art"

"Auxiliary requests 3 to 6: amendments (not allowable) - not occasioned by grounds for opposition, but rather to improve clarity"

Decisions cited:

T 0249/88, T 1053/93

Catchword:

-



Case Number: T 0200/05 - 3.3.10

DECISION
of the Technical Board of Appeal 3.3.10
of 4 June 2008

Appellant I: Clariant Verwaltungsgesellschaft mbH
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Representative: -

Respondent: Ajinomoto Co., Inc.
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
14 December 2004 concerning maintenance of
European patent No. 0857717 in amended form.

Composition of the Board:

Chairman: R. Freimuth
Members: J. Mercey
J.-P. Seitz

Summary of Facts and Submissions

- I. The Appellant I (Opponent I) and Appellant II (Opponent II) lodged appeals on 16 February 2005 and 8 February 2005 respectively against the interlocutory decision of the Opposition Division posted on 14 December 2004 which found that European patent No. 857 717 in amended form met the requirements of the EPC.
- II. Notice of Opposition had been filed by Appellant I and Appellant II requesting revocation of the patent as granted in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC). *Inter alia* the following documents were submitted in opposition proceedings:
- (4) Römpps Chemie Lexikon 1987, page 3363,
 - (5) Römpps Chemie Lexikon 1981, pages 1512 to 1513 and
 - (9) JP-A-50 5305 (English translation).
- III. The Opposition Division held that the amendments made to the then pending main request fulfilled the requirements of Article 123(2) EPC, that the subject-matter thereof was novel and involved an inventive step, document (9) being considered to represent the closest prior art.
- IV. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal dated 15 February 2008, the Board indicated that amendments to the claims may need discussion in view of their compliance with Article 123(2) and Rule 80 EPC.

V. With letter dated 28 April 2008, the Respondent (Proprietor of the patent) filed a main request and auxiliary requests 1 to 7. Claim 1 of the main request corresponded to claim 1 as maintained by the Opposition Division and read as follows:

"A process for producing N-long-chain acyl acidic amino acids or salts thereof, wherein an acidic amino acid or a salt thereof is reacted with a long chain fatty acid halide containing from 8 to 22 carbon atoms in water in the presence of an alkali and a polyhydric alcohol, and at a temperature in the range of from 0°C to 50°C."

Claim 1 of each of the auxiliary requests 1 and 7 differed from claim 1 of the main request exclusively in that the temperature range was restricted to 5°C to 50°C, and 5°C to 30°C, respectively.

Claim 1 of the auxiliary request 2 differed from claim 1 of the main request exclusively in that the acidic amino acid was restricted to glutamic and aspartic acids.

Claim 1 of each of the auxiliary requests 3 to 6 differed from claim 1 of the main request *inter alia* in that the feature "water [...] and a polyhydric alcohol" was replaced by "a reaction solvent which is a mixed solvent of polyhydric alcohol and water".

VI. Appellant I submitted that the subject-matter of the patent in suit was not inventive over document (9) in combination with either of documents (4) or (5). Starting from document (9), which disclosed in Example 7 the preparation of N-cocoyl-L-glutamate by

condensation of L-glutamic acid with cocoyl chloride in water/ethanol in the presence of sodium hydroxide at 10°C, the problem to be solved by the patent in suit could be seen as the provision of N-long-chain acyl acidic amino acids in comparable yield, whilst reducing odour in the desired product. Since, however, the odour in the product was, at least in part, due to the presence of residual ethanolic solvent, and document (9) itself taught the use of any hydrous lower alcohol as solvent, it was obvious to replace ethanol with a less odorous alcohol, such as a polyhydric alcohol in order to reduce the overall odour, it being well known to the skilled person, for example from documents (4) and (5), that such polyhydric alcohols were odourless. The reduction of the odour of the desired product caused by esters formed by reaction of impurities (e.g. short chain acyl halides) in the starting acyl halide with the solvent could not be used to justify inventive step, since the presence of such impurities in the starting acyl halide was not specified in the claims of the patent in suit. With regard to the obtention of a comparable yield, Appellant I argued that this was not unexpected, since polyhydric alcohols and monohydric alcohols were chemically very related substance classes, both falling under the generic term "alcohol".

VII. Appellant II also submitted that the subject-matter of the patent in suit was not inventive over document (9). It added that any odour other than that of residual ethanol in the product that was also removed by replacing ethanol with a polyhydric alcohol was merely a bonus effect, which could not contribute towards inventive step. Document (9) did not deter the skilled person from using an aqueous polyhydric alcohol as the

reaction solvent, its general teaching being that depending on the type of amino acid (namely acidic, neutral or basic) used as starting material, particular concentrations of the alcohol in water should be used, no reference being made in this respect to either the valency or the lipophilicity of the alcohol.

VIII. The Respondent submitted that the claims of all requests fulfilled the requirements of Article 123(2) EPC and that the amendment to the solvent definition in the auxiliary requests 3 to 6 was in order to improve the clarity of the claims.

With regard to inventive step, the Respondent also started from document (9). In view of this prior art, the problem to be solved by the patent in suit was the provision of N-long-chain acyl acidic amino acids with reduced odour whilst obtaining a comparable yield. With regard to the reduction of odour, the Respondent argued that the product of the comparative example in the disputed patent was found to have a "strong odour", whereas those prepared according to the invention were found to have only a "slight odour" (see Example 8), said examples differing only in the nature of the solvent used, namely aqueous ethanol or an aqueous polyhydric alcohol. In this respect, it additionally referred to the declaration (12) filed with letter dated 15 October 2003 before the Opposition Division. It argued that even if the reduction of the odour of the residual alcoholic solvent by replacement of the ethanol with a polyhydric alcohol might be considered obvious, the use of a polyhydric alcohol to reduce the odour arising from by-products of the reaction itself, as shown by comparing samples T and U in declaration

(12), where the odour from the residual solvent was minimal, since the samples had been dried, was in no way suggested by the cited documents. With regard to the comparable yield, the Respondent referred to the data provided by Appellant I in its letter dated 17 October 2003 before the Opposition Division. It argued that in view of the well known sensitivity of the Schotten-Baumann reaction to the solvent used, and in view of substantial differences between the properties of monohydric and polyhydric alcohols, for example, boiling point and miscibility with other solvents, the skilled person would not have replaced the ethanol of Example 7 of document (9) with a polyhydric alcohol in the expectation that a comparable yield would be obtained. More particularly, Table 1 and Figure 3, respectively, of document (9) taught that the product yield was sensitive to the type of alcohol used and to the concentration thereof in water. The skilled person would have deduced therefrom that product yield was related to the lipophilicity of the solvent used, lipophilicity tending to result in increased yields. Since polyhydric alcohols in this respect resembled water, water according to Figure 3 resulting in lower yields, it was unexpected that similar yields were obtained by the method according to the invention when a polyhydric alcohol was used instead of ethanol, since the former was more lipophobic.

With regard to the auxiliary requests 1, 2 and 7, the Respondent submitted that the amendments made thereto *vis-à-vis* the main request were not designed to render the subject-matter inventive over document (9), but rather to distinguish the subject-matter further from that of a late-filed document published between the

priority and the filing date of the disputed patent.
The Respondent conceded that no particular effect was achieved by these additional features.

- IX. The Appellants requested that the decision under appeal be set aside and the patent be revoked.

The Respondent requested that the appeal be dismissed and the patent be maintained on the basis of the main request or, subsidiarily, the decision under appeal be set aside and the patent be maintained on the basis of any of auxiliary requests 1 to 7, all requests submitted on 28 April 2008.

- X. Oral proceedings were held on 4 June 2008. At the end of the oral proceedings, the decision of the Board was announced.

Reasons for the Decision

1. The appeals are admissible.

Main request

2. *Amendments (Article 123 EPC)*

- 2.1 The subject-matter of claim 1 is based on original claim 1, together with the temperature range of 0°C to 50°C, which is disclosed on page 8, line 13 of the application as filed as the temperature range in which the reaction is ordinarily performed.

2.2 Therefore, the amendment made to claim 1 of the main request does not generate subject-matter extending beyond the content of the application as filed or beyond the scope of the granted claims, such that the requirements of Article 123(2) and (3) EPC are satisfied.

3. *Inventive step*

3.1 According to the established jurisprudence of the Boards of Appeal it is necessary, in order to assess inventive step, to establish the closest state of the art, to determine in the light thereof the technical problem which the invention addresses and successfully solves, and to examine the obviousness of the claimed solution to this problem in view of the state of the art. This "problem-solution approach" ensures assessing inventive step on an objective basis and avoids an *ex post facto* analysis.

3.2 The patent in suit is directed to a process for producing N-long-chain acyl acidic amino acids or salts thereof. A similar process already belongs to the state of the art in that document (9) describes in Example 7 the preparation of N-cocoyl-L-glutamate by condensation of L-glutamic acid with cocoyl chloride in water/ethanol in the presence of sodium hydroxide at 10°C. The claim of document (9) discloses the use of any hydrous lower alcohol as solvent for the reaction.

Thus the Board considers, in agreement with the Respondent, both Appellants and the Opposition Division, that the process of Example 7 of document (9) represents the closest state of the art and, hence,

- takes it as the starting point when assessing inventive step.
- 3.3 In view of this state of the art, the problem underlying the patent in suit, as formulated by the Respondent at the oral proceedings and indicated on page 3, line 2 of the specification of the patent in suit, consists in the provision of N-long-chain acyl acidic amino acids with reduced odour whilst obtaining a comparable yield.
- 3.4 As the solution to this problem, the patent in suit proposes the process as defined in claim 1 wherein the reaction is carried out in an aqueous polyhydric alcohol.
- 3.5 The comparison of the results in Example 8 of the specification of the patent in suit and those for samples T and U of the declaration (12), demonstrates that the claimed process results in a product with less odour, all these comparative examples differing only by virtue of the use of ethanol or a polyhydric alcohol in the reaction solvent. The comparative tests filed before the Opposition Division by Appellant I in its letter dated 17 October 2003 demonstrate that the yield remains similar when the solvent is changed from aqueous ethanol to aqueous propylene glycol. For these reasons, the Board is satisfied that the problem underlying the patent in suit has been successfully solved. This finding was conceded by the Appellants.
- 3.6 Finally, it remains to be decided whether or not the proposed solution to the problem underlying the

disputed patent is obvious in view of the cited prior art.

- 3.6.1 All parties concurred upon the known fact that the pure end-product, namely an N-long-chain acyl acidic amino acid or a salt thereof, was odourless. Thus, the odour of the product resulting from the claimed process necessarily arises from impurities present therein. Said impurities inevitably comprise residual ethanolic solvent, the smell of which is well-known to the skilled person, said fact being uncontested by the parties. The parties also concurred on the fact that in view of further prior art, it was known that odorous by-products were also formed during the reaction.

In the Board's judgement, the skilled person, seeking to reduce the product odour, and being aware that it is at least in part caused by residual ethanolic solvent, would have had an incentive from the general textbooks (4) and (5), which teach that the polyhydric alcohols propylene glycol and glycerol, respectively, are odourless, to replace ethanol in the aqueous solvent by such an odourless polyhydric alcohol. In so doing, the skilled person does not even depart from the general teaching of document (9), this document disclosing that the reaction may be carried out in any hydrous lower alcohol, "alcohol" being a generic term which characterises the chemical compound as comprising a functional hydroxyl group without, however, indicating the number of hydroxyl groups contained in that compound, i.e. said term encompassing both mono- and polyhydric alcohols.

3.6.2 The Respondent conceded that the replacement of ethanol in the aqueous solvent by a polyhydric alcohol reduced the overall odour, regardless of whether or not odours of other origin were present, and submitted that insofar as the invention related to the reduction of the ethanolic odour, inventive step of the process lay in the maintenance of the yield.

3.6.3 The Board concludes from the above that the state of the art, in particular documents (4) and (5), gives the person skilled in the art a concrete hint as to how to solve the part of the problem underlying the patent in suit relating to odour reduction, namely by replacing the ethanol in the reaction solvent with a polyhydric alcohol.

3.6.4 With regard to the other part of the problem underlying the patent in suit, namely the obtention of a comparable yield, the general teaching of document (9) (see claim) is that any hydrous lower alcohol may be used as reaction solvent. The skilled person, thus, had a hint to replace the ethanol used in example 7 of document (9) with any other lower alcohol, including a polyhydric alcohol, taught therein to be equivalent alternatives. In view of the chemical similarity of said lower alcohols, a comparable yield was to be expected, unless there existed a deterrent teaching thereto.

3.6.5 The Respondent contended that there was such a deterrent teaching in document (9). More particularly, since it was apparent from Table 1 and Figure 3 therein that the reaction yield depended on the type of alcohol used and to the concentration thereof in water, the

skilled person would have deduced therefrom that the different yields were due to the different lipophilic properties of the solvent mixtures used, lipophilicity tending to result in increased yields. Since polyhydric alcohols were more lipophobic than monohydric alcohols, it was unexpected that similar yields were obtained by the method according to the invention when a polyhydric alcohol was used instead of ethanol.

- 3.6.6 However, document (9) does not address the lipophilic properties of the alcoholic solvents used therein at all, such that the Respondent's allegation is mere speculation. Document (9) thus contains no deterrent to employing a polyhydric alcohol in the reaction solvent. Indeed on the contrary, the general teaching thereof is rather to use any hydrous lower alcohol as solvent, hence also hydrous polyhydric alcohols.

Furthermore, when assessing inventive step it is not necessary to establish that the success of an envisaged solution of a technical problem was predictable with certainty. In order to render a solution obvious it is sufficient to establish that the skilled person would have followed the teaching of the prior art with a reasonable expectation of success (see decisions T 249/88, point 8 of the reasons; T 1053/93, point 5.14 of the reasons; neither published in OJ EPO).

In the present case, the Board cannot agree with the Respondent's argument that due to some purported uncertainty about the predictability of success, the skilled person would not have contemplated using a polyhydric alcohol as solvent. The skilled person has a clear incentive from documents (4) and (5) to do so

(see point 3.6.1 *supra*). It was only necessary for him to confirm experimentally by routine work that replacing ethanol by a polyhydric alcohol in the reaction known from document (9) indeed results in a process with a comparable yield, thus arriving at the claimed invention without inventive ingenuity.

Nothing was submitted by the Respondent from which the Board could reasonably conclude that the skilled person would have been deterred from following the straight teaching of the art. In the absence of substantiating facts and corroborating evidence, the Respondent's arguments do not convince the Board.

- 3.7 Therefore, in the Board's judgement, the subject-matter of claim 1 of the main request represents an obvious solution to the problem underlying the patent in suit and does not involve an inventive step.
4. As a result, the Respondent's main request is not allowable as the subject-matter of claim 1 thereof lacks inventive step pursuant to Article 56 EPC.

Auxiliary requests 1, 2 and 7

5. *Amendments (Article 123 EPC)*

- 5.1 The amendment made to claim 1 of auxiliary requests 1 and 7 *vis-à-vis* claim 1 of the main request comprises the restriction of the temperature range to 5°C to 50°C, and 5°C to 30°C, respectively. Claim 1 of the auxiliary request 2 differs from claim 1 of the main request exclusively in that the acidic amino acid is restricted to glutamic and aspartic acids.

5.2 Basis for the end value of 5°C is at page 8, line 15 and basis for the end value of 30°C is at page 8, line 16 of the application as filed. Glutamic and aspartic acids are disclosed on page 5, lines 3 to 4 of the application as filed.

5.3 Therefore, the amendments made to claim 1 of each of the auxiliary requests 1, 2 and 7 do not generate subject-matter extending beyond the content of the application as filed or beyond the scope of the granted claims, such that the requirements of Article 123(2) and (3) EPC are satisfied.

6. *Inventive step*

6.1 Claim 1 according to the auxiliary requests 1 and 7 differs from claim 1 of the main request exclusively in that the temperature range is restricted to 5°C to 50°C, and 5°C to 30°C, respectively, and claim 1 of the auxiliary request 2 differs from claim 1 of the main request exclusively in that the acidic amino acid is restricted to glutamic and aspartic acids. The Respondent conceded (cf. point VIII *supra*) that neither a particular technical effect was achieved by these additional features, nor did they render the claimed subject-matter inventive.

The Board considers that the specification of the particular temperature range or acidic amino acid cannot contribute to the inventiveness of the subject-matter claimed, since the closest prior art document (9) already discloses (cf. point 3.2 *supra*) that the reaction is carried out with glutamic acid at a

temperature of 10°C. Thus, the additional features indicated in claim 1 of the auxiliary request 1, 2 and 7 are already described in the closest state of the art, and, thus, cannot contribute to inventive ingenuity. Therefore, the considerations having regard to the assessment of inventive step given in points 3.2 to 3.6 *supra* and the conclusion drawn in point 3.7 *supra* with respect to the main request apply also to auxiliary requests 1, 2 and 7, i.e. the subject-matter claimed is obvious and does not involve an inventive step.

- 6.2 In these circumstances, the auxiliary requests 1, 2 and 7 share the fate of the main request in that they too are not allowable for lack of inventive step pursuant to Article 56 EPC.

Auxiliary requests 3 to 6

7. *Amendments (Rule 80 EPC)*

- 7.1 According to Rule 80 EPC, the claims of a granted patent may be amended, provided that the amendments are occasioned by a ground for opposition specified in Article 100 EPC, even if the respective ground has not been invoked by the opponent.

- 7.2 In the present case, claim 1 of each of auxiliary requests 3 to 6 has been amended *vis-à-vis* the granted claim 1 *inter alia* by the fresh wording of the solvent definition, i.e. a reaction solvent which is a mixed solvent of polyhydric alcohol and water. According to the Respondent, this amendment was made only in order to improve the clarity of the claims when incorporating the features of granted claims 2 and 3 into claim 1,

without however changing the subject-matter thereof,
and the Board sees no reason to take a different view.
However, clarity is not a ground for opposition.

- 7.3 The amendment to claim 1 of each of auxiliary requests 3 to 6 thus merely modifies the wording of the claim as granted but does not amend the subject-matter thereof, such that said amendment can under no circumstances overcome and, hence, cannot be occasioned by, any ground for opposition as required by Rule 80 EPC.

As a result, the auxiliary requests 3 to 6 are not allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

P. Cremona

R. Freimuth