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**Datasheet for the decision
of 14 February 2013**

Case Number: T 1717/11 - 3.3.09

Application Number: 99972501.3

Publication Number: 1142493

IPC: A23L 1/28, A23L 1/221,
A23L 1/227, A23L 1/231,
A23L 1/22, A23L 1/229

Language of the proceedings: EN

Title of invention:
Process for producing flavor-enhancing agent for foods

Patent Proprietor:
Ajinomoto Co., Inc.

Opponent:
Lesaffre International

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes"

Decisions cited:
-

Catchword:
-



Case Number: T 1717/11 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 14 February 2013

Appellant: Ajinomoto Co., Inc.
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted
18 May 2011 concerning maintenance of European
patent No. 1142493 in amended form.**

Composition of the Board:

Chairman: W. Sieber
Members: J. Jardón Álvarez
R. Menapace

Summary of Facts and Submissions

I. This decision concerns the appeal filed by the patent proprietor against the interlocutory decision of the opposition division that European patent No. 1 142 493 in the name of Ajinomoto Co., Inc. met the requirements of the EPC.

II. The patent was granted with 9 claims, independent claims 1, 2, 5, 6, 8 and 9 reading as follows:

"1. A process for producing a cysteine-rich food material, which comprises maintaining a food material containing γ -glutamylcysteine at a ratio of 1 or more weight % to the solid content thereof, at a temperature of 50 to 120°C and a pH value of 1 to 7 in the absence of a sugar and in the presence of water."

"2. A process for producing a cysteine-rich food material, which comprises allowing a γ -glutamyl peptide hydrolase to act at a pH value of 3 to 9 and a temperature of 15 to 70°C in the presence of water on a food material containing γ -glutamylcysteine at a ratio of 1 or more weight % to the solid content thereof."

"5. A process for producing a flavor-enhancing material for foods, which comprises maintaining γ -glutamylcysteine or a food material containing γ -glutamylcysteine at a ratio of 1 or more weight % to the solid content thereof, at a pH value of 1 to 7 and a temperature of 50 to 120°C for a period of 3 to 300 minutes in the absence of a reducing sugar and in the presence of water, and then adding a reducing sugar to the resulting mass in an amount of 1 to 10 moles per

1 mole of the γ -glutamylcysteine present in said resulting mass."

"6. A process for producing a flavor-enhancing material for foods, which comprises allowing a γ -glutamyl peptide hydrolase to act at a pH value of 3 to 9 and a temperature of 15 to 70°C for a period of 1 to 300 minutes in the presence of water on γ -glutamylcysteine or a food material containing γ -glutamylcysteine at a ratio of 1 or more weight % to the solid content thereof, and then adding a reducing sugar to the resulting mass in an amount of 1 to 10 moles per 1 mole of the γ -glutamylcysteine present in said resulting mass."

"8. A process for producing a flavor-enhancing agent for foods, which comprises maintaining the flavor-enhancing material for foods as described in any one of Claims 5 to 7 at a temperature of 50 to 180°C for a period of 10 to 300 minutes."

"9. Use in food of yeast cells or a yeast extract which contains γ -glutamylcysteine at a ratio of 1 or more weight % to the solid content thereof."

Claims 3, 4 and 7 were dependent claims.

III. Notice of opposition had been filed by Lesaffre International (opponent) on 8 December 2006 requesting revocation of the patent in its entirety based on the grounds of Article 100(a) EPC (lack of novelty and inventive step) and Article 100(b) EPC.

The documents cited during the opposition proceedings included:

A1: French translation of JP-4-66069 A;

A2: French translation of JP-4-91762 A;

A9: *Glutathione, Chemical Biochemical, and Medical Aspects, Part A*, Editors D. Dolphin *et al.*, Wiley-Interscience Publication, 1989, pages 400-403; and

A10: Binkley *et al.*, *Metabolism of glutathione.*

II. Determination of glutathione and products of its hydrolysis in blood". *J. Biol. Chem.*, 186, (1950) pages 159-161.

IV. With its decision announced orally on 15 December 2010 and issued in writing on 18 May 2011, the opposition division maintained the patent in amended form on the basis of claims 1 to 4 of the then pending auxiliary request 4.

The opposition division held that the patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art and that the subject-matter of the claims as granted was novel over the prior art cited by the opponent.

The opposition division did not allow the then pending main request (patent as granted), because the subject-matter of claims 1, 2 and 9 lacked inventive step. With regard to the subject-matter of claim 1 the closest prior art was A10, which disclosed in the context of

the determination of glutathione in blood the hydrolysis of glutathione and γ -glutamylcysteine (GGC). The only difference between the subject-matter of claim 1 and the teaching of A10 was the application of the hydrolysis reaction disclosed in A10 to a food material, in which GGC was present at 1% or more. A10 was considered to reflect the general teaching that hydrolysis of GGC led to cysteine and saw no reason why the skilled person would not apply this known hydrolysis in food materials. Consequently the subject-matter of claim 1 lacked inventive step. The same reasoning applied to the subject-matter of claim 2 with A9 as the closest prior art, which disclosed that γ -glutamyl peptide hydrolase was used to hydrolyse GGC.

- V. On 28 July 2011 the patent proprietor (in the following: the appellant) lodged an appeal against the decision of the opposition division and paid the prescribed fee on the same day. With the statement setting out the grounds of appeal, filed on 16 September 2011, the appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of a new main request containing granted claims 1 to 8, or alternatively on the basis of auxiliary requests 1 to 3, all filed with the statement of grounds of appeal.
- VI. On 26 October 2012 the board dispatched the summons to oral proceedings. In the attached communication the board indicated that in its preliminary opinion the subject-matter of claims 1 and 2 of the main request lacked inventive step for the reasons given by the opposition division.

- VII. By letter received 8 January 2013 (erroneously dated 8 January 2012), the appellant maintained its main request and filed new auxiliary requests 1 to 4 to replace the previous auxiliary requests. It further filed an experimental report in support of its arguments.
- VIII. The opponent/respondent did not take an active part in the appeal proceedings. It merely informed the board by letter dated 23 November 2012 that it would not be attending the oral proceedings.
- IX. Oral proceedings before the board were held on 14 February 2013. After discussion of the various requests and after the board had indicated that the subject-matter of the claims of auxiliary request 1 fulfilled the requirements of Article 56 EPC, the appellant withdrew the main request and the second to fourth auxiliary requests and maintained as its only request the first auxiliary request. Claims 1 and 2 read as follows:
- "1. A process for producing a cysteine-rich food material, which comprises maintaining a food material containing γ -glutamylcysteine at a ratio of 1 or more weight % to the solid content thereof, at a temperature of 50 to 120°C and a pH value of 1 to 7 in the absence of a sugar and in the presence of water, wherein the food material containing GGC at a ratio of 1 or more weight % to the solid content thereof is a yeast extract or yeast cells."
- "2. A process for producing a cysteine-rich food material, which comprises allowing a γ -glutamyl peptide

hydrolase to act at a pH value of 3 to 9 and a temperature of 15 to 70°C in the presence of water on a food material containing γ -glutamylcysteine at a ratio of 1 or more weight % to the solid content thereof, wherein the food material containing GGC at a ratio of 1 or more weight% to the solid content thereof is a yeast extract or yeast cells."

Dependent claim 3 is identical to claim 3 as granted and claims 4 to 7 correspond to claims 5 to 8 as granted (see point II above).

X. The arguments presented by the appellant, insofar as they are relevant for this decision, may be summarised as follows:

- The invention as claimed in claims 1 and 2 yielded unexpected benefits as it produced a yeast extract powder having good roast meat flavour, as indicated in examples 1 and 2 of the specification and in the further experimental evidence provided in the appeal proceedings.
- Documents A1 and A2 represented the closest prior-art documents. In these documents high-quality roast meat flavour-like seasonings were prepared by adding sugars to a yeast extract. The problem underlying the patent in suit was to provide an alternative process for producing a seasoning having good roast meat flavours from a food material containing GGC. There was no hint in the available prior art towards the solution according to claims 1 or 2. None of the prior-art documents provided any motivation for the skilled person to

carry out the process of A1 or A2 without an added reducing sugar. In particular, documents A9 and A10 could not give any hint towards the claimed solution as they did not relate to the production of food material.

XI. The appellant requested that the decision under appeal be set aside and that the patent be maintained with claims 1 to 7 filed as auxiliary request 1 with letter received on 8 January 2013, an amended description as filed during the oral proceedings and the figures as granted.

Reasons for the Decision

1. The appeal is admissible.

AUXILIARY REQUEST 1

2. *Framework of the appeal*

2.1 The only request of the appellant includes seven claims.

2.2 Claims 4 to 7 are identical to claims 1 to 4 of the request on the basis of which the opposition division maintained the patent in amended form (claims 5 to 8 of the granted patent). As the opponent did not appeal the opposition division's decision, the board has no power to examine these claims.

2.3 The issue to be decided in the present appeal is whether the subject-matter of claims 1 to 3 meets the requirements of the EPC.

3. *Amendments*

3.1 Independent claims 1 and 2 have been amended to include the subject-matter of granted claim 4 which specifies that "the food material containing GGC at a ratio of 1 or more weight % to the solid content thereof is a yeast extract or yeast cells".

3.2 Granted claim 4 is identical to claim 4 as filed, so that this amendment is fully supported by the application as filed. Since, furthermore, the amendment clearly restricts the scope of the claims as granted, the amendments meet the requirements of Articles 123(2) and (3) EPC.

4. *Novelty*

The novelty of granted claims 1 and 2, which were broader than present claims 1 and 2, was not contested during the opposition proceedings. The board also sees no reason to raise an objection of its own.

5. *Inventive step*

5.1 Claims 1 and 2 are directed to processes for producing a cysteine-rich food material by treating a yeast extract or yeast cells containing γ -glutamylcysteine (GGC) at a ratio of 1 or more weight % to the solid content. The process of claim 1 is carried out at a temperature of 50 to 120 °C and a pH value of 1 to 7 in the absence of sugar and in the presence of water, and the process of claim 2 is carried out using a γ -

glutamyl peptide hydrolase at a pH value of 3 to 9 and a temperature of 15 to 70 °C in the presence of water.

The cysteine-rich yeast extract obtained according to both processes is an effective seasoning in itself and was found to have good roast meat flavours (see examples 1 and 2).

- 5.2 The board agrees with the appellant that documents A1 and A2 represent the closest prior art. These documents disclose the preparation of high-quality roast meat flavour-like seasonings by heating a saccharide (reducing sugar) and GGC (see A2, claim) or by adding a saccharide to a yeast extract containing sulphur-containing compounds such as glutathione, cysteine or glutamylcysteine (see A1, claim). In both processes all the reactants are added at the initial stage and then heated in order to produce cysteine from GGC, which then immediately reacts with the saccharide to form the flavour-enhancing material (see A1 and A2 under "exemples de réalisation").

As explained by the appellant the presence of a reducing sugar in the processes of A1 and A2 gives rise to the problem of burnt smells, which intensify with increased meat flavours (see paragraph [0010] of the patent specification).

- 5.3 The problem underlying the patent in suit in the light of A1 and A2 can therefore be seen in the provision of an alternative process for producing a seasoning having good roast meat flavours.

- 5.4 As a solution to this problem the patent in suit proposes the processes of claims 1 and 2 discussed above (see point 5.1).
- 5.5 Examples 1 and 2 of the patent show that this problem has been credibly solved by the claimed means. The yeast extract powder obtained in these examples is an effective seasoning in itself (although not claimed) and was found to have good roast meat flavour. This is explicitly stated in examples 1 and 2 and has been further demonstrated in the experimental report filed in the appeal proceedings. This report shows that the addition of the yeast extract obtained by the claimed process to a vegetable and meat stir-fry (660g cabbage, 300g bean sprout, 250g onion, 150g red bell pepper and 450g pork meat) gives a product having stronger roast meat flavour than a control sample without the yeast extract.

In view of the above results, the board is satisfied that the above-mentioned technical problem has been credibly solved by the claimed means.

- 5.6 Obviousness
- 5.6.1 It remains to be decided whether or not the claimed solution is obvious over the cited prior art. The relevant question is whether the skilled person would have been directed to suppress the use of a reducing sugar in the processes of A1 or A2.
- 5.6.2 There can be no hint in documents A1 and A2 towards the claimed process because the presence of a reducing sugar is in fact the key feature of the processes

disclosed therein. The teaching of both documents is that the presence of a reducing sugar is effective in order to improve the flavour of foods.

On the contrary, the processes now claimed are carried out without adding a reducing sugar. This is done to prevent the resulting cysteine from reacting with the reducing sugar to generate burnt smells, as well as to prevent browning.

The yeast extract powder thus obtained is therefore a non-obvious alternative to the extracts prepared in A1 and A2, and consequently involves an inventive step.

- 5.6.3 The other documents cited by the opposition division in its decision also contain no suggestion of not using a reducing sugar. Although documents A9 and A10 disclose the enzymatic hydrolysis of GGC and the hydrolysis of glutathione, these documents are directed to the chemical, biochemical and medical aspects of glutathione (A9) and to the determination of glutathione and products of its hydrolysis in blood (A10).

Neither A9 nor A10 deals with the production of food materials. A person skilled in the art faced with the problem of providing an alternative process for producing a seasoning having good roast meat flavours would certainly not get any hint from these documents as to how to solve the problem posed.

- 5.7 Even if the processes *per se* were seen as mere analogy processes to A9 and A10, the processes of claims 1

and 2 still involve an inventive step because they yield inventive yeast extracts, as explained above.

5.8 For these reasons the board concludes that the subject-matter of claims 1 and 2 and, by the same token, the subject-matter of dependent claim 3, involves an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent with the following documents:
 - Claims 1 to 7 according to auxiliary request 1 as filed with letter received on 8 January 2013;
 - Amended description pages 3 to 17 as filed during the oral proceedings on 14 February 2013; and
 - Figures 1 to 8 of the patent as granted.

The Registrar:

The Chairman:

M. Cañueto Carbajo

W. Sieber