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D E C I S I O N
of 11 November 2005

Case Number: T 0848/03 - 3.3.06

Application Number: 97118467.6

Publication Number: 0839897

IPC: C11C 3/14

Language of the proceedings: EN

Title of invention:

Method for producing conjugated linoleic acid

Patentee:

RINORU OIL MILLS CO., LTD.

Opponent:

BASF Aktiengesellschaft

Headword:

Conjugated linoleic acid/RINORU OIL MILLS

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step - main request, auxiliary requests 1 to 5
(no) "

Decisions cited:

-

Catchword:

-



Case Number: T 0848/03 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 11 November 2005

Appellant: BASF Aktiengesellschaft
(Opponent) Patente, Marken und Lizenzen
D-67056 Ludwigshafen (DE)

Representative: -

Appellant: RINORU OIL MILLS CO., LTD.
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Representative: Hansen, Bernd
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
10 June 2003 concerning maintenance of the
European patent No. 0839897 in amended form.

Composition of the Board:

Chairman: G. Dischinger-Höppler
Members: G. Raths
A. Pignatelli

Summary of Facts and Submissions

I. This appeal is from the interlocutory decision of the Opposition Division concerning maintenance in amended form of European patent No. 0 839 897 relating to a method for producing conjugated linoleic acid.

II. Claims 1 to 4 of the patent as granted read:

"1. A method for producing conjugated linoleic acid, comprising subjecting a fat or oil containing linoleic acid to alkali isomerization reaction in an alkali-propylene glycol solution.

2. The method according to claim 1, wherein the fat or oil containing linoleic acid is selected from the group consisting of safflower oil, sunflower oil, corn oil, soybean oil, cottonseed oil, linseed oil and wheat germ oil.

3. The method according to claim 1 or 2, wherein the alkali is potassium hydroxide or sodium methoxide.

4. The method according to any of claims 1 to 3, wherein the reaction is carried out at a temperature of 130 to 170°C."

III. A notice of opposition had been filed against the granted patent, wherein the Opponent had sought revocation of the patent on the grounds of Article 100(a) EPC for lack of novelty and inventive step (Articles 52(1), 54(2) and 56 EPC).

During the opposition proceedings the parties filed among others the following documents:

- (1) US-A-2 343 644;
- (3) WO-A-97-46 230 and
- (7) US-A-5 554 646.

IV. The Opposition Division maintained the patent in amended form on the basis of a set of four claims of auxiliary request 1, Claim 1 reading as follows:

"1. A method for producing conjugated linoleic acid, comprising subjecting a fat or oil containing linoleic acid to alkali isomerization reaction in an alkali-propylene glycol solution at a temperature of 110 to 170°C."

Claims 2 to 4 were identical to claims 2 to 4 of the main request.

V. In its decision the Opposition Division held

in respect of the main request

that the subject-matter of Claim 1 of the main request was novel over document (1) but not novel in respect of document (3) EPC (Article 54(3) EPC).

The Opposition Division held

in respect of the first auxiliary request

that the requirements of Articles 54, 56 and 123 EPC were met.

In particular, starting from document (7) as the closest prior art for evaluating inventive step, the problem underlying the patent in suit to be solved would be to provide a method for producing conjugated linoleic acid in a higher yield and in which the obtained conjugated product was less colored and could be used in the field of food (patent in suit, paragraphs 6 and 9).

This problem would have been solved in the patent in suit by replacing ethylene glycol with propylene glycol as shown in the examples (see tables 2 and 3).

Since there was no hint in the available prior art to replace ethylene glycol by propylene glycol in the method disclosed in document (7) in order to obtain higher rates of conversion and improved color appearance, the subject-matter of the first auxiliary request would involve an inventive step.

- VI. This decision was appealed by the proprietor (appellant 1) and the opponent (appellant 2).

- VII. Appellant 1 filed a new main request and five new auxiliary requests during oral proceedings before the Board which took place on 11 November 2005.

The new main request consisted of 4 claims, Claims 1, 3 and 4 of the new main request being identical to claims 1, 3 and 4 as granted, claim 2 reading:

"2. The method according to claim 1, wherein the fat or oil containing linoleic acid is selected from safflower oil, sunflower oil, corn oil, soybean oil, cottonseed oil, linseed oil and wheat germ oil."

Claim 1 of the new first auxiliary request differed from Claim 1 of the new main request in that "at a temperature of 110 to less than 180°C" was added at the end of claim 1.

Claim 1 of the new second auxiliary request read as follows:

"1. A method for producing conjugated linoleic acid, comprising subjecting a fat or oil containing linoleic acid selected from safflower oil, sunflower oil, corn oil, soybean oil, cottonseed oil, linseed oil and wheat germ oil, to alkali isomerization reaction in an alkali-propylene glycol solution."

Claim 1 of the new third auxiliary request differed from Claim 1 of the new second auxiliary request in that "at a temperature of 110 to less than 180°C" was added at the end of the claim.

Claim 1 of the new fourth auxiliary request differed from Claim 1 of the new main request in that "at a temperature of 110 to 170°C" was added at the end of the claim.

Claim 1 of the new fifth auxiliary request differed from Claim 1 of the new second auxiliary request in that "at a temperature of 110 to 170°C" was added at the end of the claim.

VIII. The arguments of appellant 1 can be summarized as follows:

The claimed subject-matter was not only novel over documents (1) and (3) but also inventive for the following reasons:

The method according to the patent in suit had the objective to result in a higher conversion rate and thus in a higher yield of conjugated linoleic acid, the obtained linoleic acid being less colored.

Example 1 of document (7) relating to the synthesis of conjugated linoleic acids from linoleic acid and safflower oil is taken as the starting point for evaluating inventive step. The method disclosed therein differed from that of Claim 1 of the main request in that ethylene glycol was used instead of propylene glycol as a solvent.

Document (1) relating to a procedure for the preparation of substances containing conjugated double bonds, guided a skilled person to use an ether of a polyhydric alcohol which contained a free hydroxyl group as a solvent. This was evident from the fact that an ether was used to carry out the invention according to document (1) and not propylene glycol which was mentioned in document (1) (page 2, left column, table). A skilled person would replace ethylene glycol with

glycol monomethyl ether since glycol monomethyl ether provided a higher degree of conjugation (1000) compared to ethylene glycol (160) as shown in document (1) (page 1, table in the right column). Glycol monomethyl ether gave a higher conversion rate in a shorter time and was superior to any solvent which had heretofore been utilized in this reaction.

Toxicity of ethylene glycol was not an issue since according to document (7) products comprising conjugated linoleic acid were incorporated into food, even into baby food.

None of the other documents cited by appellant 2 guided a skilled person to replace in the isomerization reaction according to document (7) ethylene glycol with propylene glycol.

IX. Appellant 2 refuted the arguments of appellant 1:

The skilled person looking for a replacement of the toxic ethylene glycol would take the next homologue to ethylene glycol and thus arrive at propylene glycol which was known to be food compatible.

Document (1) would teach that propylene glycol was a better solvent than ethylene glycol (page 1, column 1, line 51); the skilled person would learn from the table in the left column of page 2 of document (1) that propylene glycol was comparable to the ethers in respect of their isomerization performance and therefore, he would use propylene glycol as a solvent in the isomerization method of linoleic acid.

As to the temperatures it was known to run isomerization reactions below the boiling point of the solvent.

Therefore, the subject-matter of Claim 1 would not involve an inventive step (Article 56 EPC).

- X. Appellant 1 requested that the decision under appeal be set aside and the patent be maintained on the basis of claims 1 to 4 as granted (main request) or alternatively on the basis of claims 1 to 4 of the first auxiliary request, or claims 1 to 3 of the second auxiliary request, or claims 1 to 3 of the third auxiliary request, or claims 1 to 4 of the fourth auxiliary request, or claims 1 to 3 of the fifth auxiliary request, all filed at the oral proceedings.

Appellant 2 requested that the decision under appeal be set aside and the patent be revoked.

- XI. At the end of the oral proceedings the decision was announced.

Reasons for the Decision

1. *Main request*

1.1 Novelty

1.1.1 The Board is satisfied that the subject-matter of Claim 1 is novel. Since the request fails for other reasons, no further details have to be given.

1.2 Inventive step

1.2.1 According to the patent in suit the technical problem was to provide a method for producing conjugated linoleic acid, which could more efficiently transform linoleic acid into conjugated linoleic acid and which made it possible to use the conjugated product in the field of food (page 2, lines 34 to 36); conventional isomerization methods had the drawback that the resulting conjugated products could not be used for food, because of the toxicity of solvents such as ethylene glycol (page 2, lines 30 to 33).

Two advantages were addressed: the method according to the patent in suit could produce conjugated linoleic acid in a higher yield as compared with the conventional method which used ethylene glycol and the resulting fat or oil containing the conjugated linoleic acid would be less coloured (page 2, lines 44 to 47).

1.2.2 The Board concurs with appellants 1 and 2 that example 1 of document (7) was a reasonable starting point for evaluating inventive step.

According to this example linoleic acid, corn oil or safflower oil containing linoleic acid was subjected to alkali isomerization reaction in an alkali ethylene glycol solution at a temperature of 180°C.

- 1.2.3 The method for producing conjugated linoleic acid according to Claim 1 of the patent in suit differs from that of example 1 of document (7) in that ethylene glycol was replaced with propylene glycol as solvent for the isomerization reaction.
- 1.2.4 The Board is satisfied that the rates of conversion and Gardner colour standard numbers displayed in tables 2 and 3 of the patent in suit prove that the technical problem as stated in the patent in suit was plausibly solved also with respect to example 1 of document (7).
- 1.2.5 Therefore, in the present case the assessment of inventive step boils down to establishing whether or not the skilled person was given a hint to replace ethylene glycol with propylene glycol in order to improve the conversion rate and at the same time to obtain a less coloured product.
- 1.2.6 Higher yields were an issue in document (1) which concerned a method for converting unconjugated polyene substances into conjugated polyene substances (page 1, left column, lines 1 to 5 in combination with lines 17 to 26).

Appellant 1 argued that document (1) would point to conjugated double bonds of polyene substances in general rather than to a specific single substance like linoleic acid. Thus the skilled person would disregard document (1).

The Board does not accept this argument because a skilled person looking for information about methods for converting in a particular chemical substance

unconjugated double bonds into conjugated double bonds would consult all available literature dealing with this topic, regardless of the specific chemical compounds.

From the table in the left column of page 2 of document (1) it appears that the best result in terms of complete and rapid conversion into conjugated systems is obtained with glycolmonomethyl ether (GMME) as solvent, the second best result with propylene glycol, the poorest result with ethylene glycol.

Hence the above mentioned table on page 2 of document (1) and the comments referred thereto (column 2, lines 16 to 20) teaches the skilled person that propylene glycol performed better than ethylene glycol.

Consequently, the skilled person would also try propylene glycol as solvent for producing conjugated linoleic acid - contrary to the allegation of appellant 1. Since the objective of the patent in suit was not to obtain the highest yields achievable but only to obtain higher yields than those obtained with ethylene glycol as solvent, the Board holds that the skilled person would try all solvents performing better than ethylene glycol even if the rating for complete and rapid conversion is best for GMME.

Further, appellant 1 argued that document (1) would not teach to which extent linoleic acid contributed to a conversion into conjugated linoleic acid. The Board does not accept this argument for the following reasons:

The method according to document (1) is applicable to vegetable oils what is corroborated by the passage:

"Vegetable or animal oilsmay be directly treated." (page 2, left column, lines 63 to 64).

The fact that linoleic acid is not explicitly mentioned in document (1) is therefore not relevant since it is apparent for those skilled in the art that the method according to document (1) can be used to convert mixed fatty acids obtained by saponification of oil such as fish oil (e.g. sardine oil) or vegetable oil such as linseed or cottonseed oil (page 2, left column, lines 50 to 55). Linseed and cottonseed oil are both mentioned in Claim 2 of the main request as a suitable source for the oil to be used in Claim 1.

- 1.2.7 Therefore, document (1) contains a pointer for the skilled person to produce conjugated linoleic acid by subjecting an oil containing linoleic acid to alkali isomerization as disclosed by example 1 of document (7) by replacing ethylene glycol with propylene glycol in the expectation to obtain higher yields even if the improved conversion into conjugated systems was shown in document (1) on the basis of sardine oil.
- 1.2.8 The Board concludes therefore that the subject-matter of Claim 1 does not involve an inventive step and, therefore Claim 1 does not meet the requirements of Article 56 EPC.

2. *Auxiliary requests 1 to 5*

2.1 Auxiliary requests 1 and 3

The amendment "at a temperature of 110 to less than 180 °C" finds no support in the application as filed. So, Claim 1 of each of auxiliary requests 1 and 3 contravened Article 123(2) EPC.

Consequently, the subject-matter of Claim 1 of each of auxiliary requests 1 and 3 is not allowable under Articles 123(2) and 56 EPC.

2.2 Auxiliary requests 2, 4 and 5

2.2.1 Claim 1 of each of auxiliary requests 2 and 5 was directed to the selection of oils (see point VIII) and Claim 1 of each of auxiliary requests 4 and 5 was directed to the selection of the temperature ranges of 110 to 170°C

The Board is satisfied that each of said Claims 1 meets the requirements of Article 123(2) EPC. No further details have to be given since the arguments put forward under points 1.2.2 to 1.2.8 applies mutatis mutandis to Claim 1 of each of auxiliary requests 2, 4 and 5 since document (7) discloses already corn oil and safflower oil (see page column 2, lines 25 to 26) and linseed and cottonseed oils were mentioned in document (1) (page 2, left column, lines 54 to 55) (see point 1.2.6) as suitable materials to be subjected to alkali isomerization reaction for producing conjugated polyene.

Further, appellant 1 itself confirmed that the temperature would not contribute to inventive step.

2.2.2 Consequently, Claim 1 of each of auxiliary requests 2, 4 and 5 does not meet the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The patent is revoked.

The Registrar:

The Chairman:

G. Rauh

G. Dischinger-Höppler