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D E C I S I O N
of 12 May 1999

Case Number: T 0447/96 - 3.3.2

Application Number: 89311894.3

Publication Number: 0371659

IPC: A23L 1/305

Language of the proceedings: EN

Title of invention:
Liquid food for supplying protein

Patentee:
Nippon Oil and Fats Company, Limited

Opponent:
Stichting Behartiging Octrooibelangen
Coöperatieve Zuivelindustrie

Headword:
Liquid food/NIPPON OIL

Relevant legal provisions:
EPC Art. 83, 56

Keyword:
"Sufficiency of disclosure - yes - suitable starting product can be found without undue burden"
"Inventive step - yes - no hint that stability effect is linked to denaturating step"

Decisions cited:
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Catchword:

-

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Case Number: T 0447/96 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 12 May 1999

Appellant: (Opponent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 14 March 1996 rejecting the opposition filed against European patent No. 0 371 659 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: U. Oswald
Members: J. Riolo

Summary of Facts and Submissions

I. European Patent No. 0 371 659 based on application No. 89 311 894.3 was granted on the basis of 8 claims.

Claim 1 as granted reads as follows:

"1. A liquid proteinaceous food comprising lactalbumin, seasonings and/or flavouring material and water, characterised in that lactalbumin having a purity of at least 90% by weight is used in an amount to constitute 5 to 15% by weight of the food and in that the lactalbumin has been dissolved in water at 50°C or below and then heated to 60 to 100°C to denature it in cloudy conditions.".

II. Opposition was filed against the granted patent by the appellant. The patent was opposed under Article 100(b) EPC for insufficiency of disclosure and under Article 100(a) EPC for lack of inventive step.

The following documents, cited during the proceedings before the opposition division, remain relevant for the present decision:

(7) US-A-2 919 195

(5) K. J. Hannigan, Food Engineering, 1982, pages 54, 55: Super protein from acid-whey.

(6) Declaration of Dr. JN de Wit.

(1) JG Zadow, ed., Elsevier Applied Science, London, 1992, pages 26 to 27: Whey and lactose processing.

III. The decision of the opposition division posted on 14 March 1996 rejected the opposition under Article 102(2) EPC.

The Opposition Division took the view that the patent as granted met the requirements of Article 100(b) EPC and Article 56 EPC.

As regards the opponent's objections under Article 100(b) EPC with respect to the terms "lactalbumin having a purity of at least 90%" in claim 1, the Opposition Division considered that the term "lactalbumin" as well as the meaning of "a purity of at least 90%" were sufficiently disclosed in the patent in suit.

In fact, having regard to the disclosure of the patent (page 4, lines 7 to 10), the Opposition Division was of the opinion that the skilled person would consider the "purity of at least 90%" as meaning "at least 90% proteins".

Moreover, although it was acknowledged that the term "lactalbumin", a protein product comprising proteins derived from whey, covered manifold products having different properties depending on their preparation methods, the Opposition Division concluded that the "lactalbumin" of the patent in suit was sufficiently defined by its functional features as given in claim 1 and that the person skilled in the art could, without undue burden and without inventive skills, experiment whether "lactalbumins" available on the market would fulfil the functional requirements of claim 1.

The Opposition Division also contended that the subject-matter of claim 1 of the patent in suit was inventive over the available prior art documents since none of them contained any hints that a "lactalbumin" exhibiting the currently defined essential characteristics according to claim 1 should be used in a liquid proteinaceous food; the more so since the only document dealing also with a liquid proteinaceous food (ie (7)) taught that the egg yolk protein present in the liquid food should not be denatured (column 3, lines 6 to 10).

IV. The appellant (opponent) lodged an appeal against the said decision.

V. Oral proceedings were held before the Board on 12 May 1999. The respondent did not attend the oral proceedings as announced in his letter dated 4 January 1999.

VI. The appellant's submissions both in the written procedure and at the oral proceedings can essentially be summarised as follows:

On the question of insufficiency of disclosure under Article 100(b) EPC, the appellant took the view that the skilled person could not learn, either from the patent specification or from the prior art publications including encyclopaedia references, what was meant by the term "lactalbumin" used in claim 1.

He also stressed that an invention could in any case not be sufficiently disclosed by documents not mentioned in the application as filed.

Referring to (7), he pointed out that the presently claimed "lactalbumin" could not correspond to the "whey protein precipitate" known as "lactalbumin" since it was a powder insoluble in water, whereas, according to the application, the lactalbumin" to be used must be dissolved in water.

Moreover, the appellant maintained that the skilled person could not even assume that it was a (fraction of) milk or whey protein since, according to the patent in suit (claim 3 and page 4, lines 11 to 13), that would not be the "lactalbumin" but "the other protein".

In addition, the appellant contended that the expression "having a purity of at least 90%" with respect to the lactalbumin of claim 1 was not suitable to define the product because it was not clear whether the "purity" was related to the purity of the proteins present, the protein content, the salt content or a combination of all these features.

In that respect, the comparative experiments of Dr. de Wit, an expert in the field of (whey) proteins, demonstrating the importance of the salt content in the whey protein for the achievement of a turbid dispersion instead of a gel, were referred to (6). The appellant concluded from these experiments that the patent in suit did not contain a disclosure of the invention allowing the invention to be performed in the whole range claimed.

Furthermore, during oral proceedings, the appellant pointed out that the description of the patent in suit did not contain an enabling disclosure of the

denaturation into cloudy conditions of the lactalbumin as the conditions involved in the denaturation process were merely described as preferred (page 4, lines 27 to 29).

He also contended that, claim 1 of the patent in suit also encompassed the solidified products obtained by the process according to comparative examples 1 to 3 of the patent in suit since said process involved a homogenising step at a temperature of 70°C and thus involved also the denaturation of the lactalbumin.

He concluded that either the disclosure of the key feature for avoiding gel formation was missing in the description of the patent in suit or claim 1 encompassed embodiments which did not solve the problem of gel formation and which were therefore obvious.

For the assessment of inventive steps the appellant stated moreover, in the last paragraph of the grounds of appeal, that the subject-matter of the patent in suit was obvious in the light of the disclosure in (7), since it would be obvious to use a solution of low salt content whey protein as described in (5) to obtain a "cloudy" precipitate after denaturation, in order to solve the problem of gel formation in a preparation according to said document.

VII. The respondent (patentee) contested these arguments. His written submissions in support of his requests can be summarised as follows:

Regarding the meaning of the term "lactalbumin" the respondent submitted that it was precisely because said

term had no exact definition that an essentially functional definition was used in the patent claims. Accordingly, the definition of "lactalbumin" did not depend on documents not disclosed in the patent in suit as filed but only on the requirement set out in the specification together with the knowledge of the skilled reader.

Therefore, the only conclusion to be drawn from the disclosure in (7) concerning an insoluble "lactalbumin" was merely that it was not a suitable product for the present invention.

Concerning the passage in the patent in suit (claim 3 and page 4, lines 11 to 13), the Respondent explained that the terms "further protein" and "other" introducing, among other things, "milk protein" merely meant protein additional to that (ie lactalbumin) referred to in claim 1. Therefore the appellant's conclusion that the term "lactalbumin" used in the patent in suit could not be understood as meaning "whey protein" was baseless.

As regards the expression in claim 1 "a purity of at least 90% by weight is used", it was the respondent's view that it was clear that it meant at least 90% by weight lactalbumin as it appeared from the specification (page 4, lines 8 to 10).

Referring to the comparative examples of the declaration of Dr. J. N. de Wit (6), the respondent contended that showing that the benefits of the invention could be avoided by selection of particular materials and conditions outside the scope of the

claims did not detract from the sufficiency of the disclosure of the invention as claimed in the claims. He moreover stressed that the requirement that the lactalbumin employed in claim 1 must denature in cloudy conditions when heated to 60 to 100°C after having been dissolved in water below 50°C applied over the whole range of the invention and that it was this functional feature which determined whether or not a particular lactalbumin fell within claim 1.

With respect to the inventive step objection, the respondent maintained that neither document (7) nor any other available document contained any hint that a protein exhibiting the presently defined essential characteristics was to be used in a liquid proteinaceous food.

VIII. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested in writing that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Sufficiency of disclosure*

2.1 An objection of insufficiency of disclosure of the invention was raised in relation to the lactalbumin of the liquid proteinaceous food.

The Board notes that claim 1 does not require for the lactalbumin any special features other than those of having a purity of least 90%C by weight, of being water soluble and of denaturing in cloudy conditions when heated to 60 to 100°C.

The term "cloudy conditions" without any further definition has to be understood in its broadest sens. Therefore any type of lactalbumin meeting the above conditions would appear to be equally suitable for the present invention.

Lactalbumin, as all the other components of the claimed liquid proteinaceous food, is referred to in the patent description (page 4, lines 7 to 16, lines 23 to 26). Products available on the market are quoted as suitable lactalbumin provided they fulfill the above requirements (page 4, paragraph 2).

The description also contains three detailed examples of the claimed liquid proteinaceous food. Moreover, each of these examples sufficiently illustrates the process how to bring the lactalbumin in the "cloudy conditions".

The description of this aspect of the invention is therefore regarded as complete.

2.2 It is true that the disclosure in the contested patent gives no detailed information about the chemical structure of "lactalbumin" in the context of the present invention. Accordingly, the term has also to be given its broadest meaning, ie any milk protein product from whey. Said lactalbumin must however fulfill the

following requirements according to the patent in suit:

- it must be soluble in water at 50°C or below,

- it must denature between 60 to 100°C in cloudy conditions,

- it must have a purity of at least 90% by weight.

As regards the first requirement, the appellant contested that lactalbumin was a soluble product in the light of the disclosure in (1)(page 26, item 3.1).

It is however common general knowledge in the field of lactalbumin that the physical and chemical properties of the lactalbumin products depend strongly on their method of preparation. Accordingly, the only conclusion the skilled person can draw from (1) is that the lactalbumin disclosed therein is not suitable for the present food, but not that lactalbumin is a water insoluble product.

In illustration of the above, it is noted that the appellant provided two comparative experiments (see (6)), wherein two **water soluble** lactalbumins were used, one of them being a lactalbumin which was commercially available before the priority date of the patent in suit (see (5)).

The appellant's argument concerning the alleged contradiction in the patent in suit in claim 3 and on page 4, lines 11 to 13 leading to the conclusion that the term "lactalbumin" was used so as to exclude whey protein cannot be followed either.

In fact, it is clear from the wording used in claim 3, ie "further protein", that what is meant is protein, including milk protein, additional to the particular lactalbumin of claim 1. The Board could not find, in the disclosure of the patent in suit, any elements for departing from this usual and logical understanding of the term "other protein" used on page 4 lines 11 to 13 in connection with the particular lactalbumin of the liquid food.

The same applies to the objection raised by the appellant with respect to the purity requirement for the lactalbumin according to claim 1 of the patent is suit.

The purity of the lactalbumin to be used in the food according to claim 1 is defined in the patent in suit on page 4, lines 7 to 10. The Board could not find, either from this disclosure or from any other part of the description, any reason to believe that the purity of 90% by weight could relate to anything other than the usual protein content.

In illustration of the above, it is noted that the technical expert Dr. JN De Wit did indeed choose lactalbumins having a protein content of more than 90% by weight to carry out the comparative experiments of (6).

2.3 The Board cannot agree with the appellant's finding that the term "preferably" used in connection with the dissolution temperature of the lactalbumin and the purity degree of the lactalbumin can put the feasibility of the present subject-matter into

question.

As long as the preferred values do indeed lead to the desired result, it is indeed immaterial for the assessment of sufficiency of disclosure to ask whether or not values outside the preferred disclosure would also be suitable.

In that respect, the Board notes that the examples of the patent in suit as well as the comparative example filed by the appellant (6)(experiment carried out with Bipro^{R}), which have all been carried out within the preferred values, do indeed produce a lactalbumin according to claim 1.

Nor does the Board share the opinion that the subject-matter of claim 1 of the patent in suit also covers embodiments wherein the lactalbumin is dissolved in water together with the remaining ingredients of the food prior to the denaturation step.

It is indeed very clear from the claims itself as well from all passages relating to the preparation of the denatured lactalbumin and working examples 1 to 3 of the application as originally filed that the lactalbumin to be used must first be dissolved in water and then denatured in cloudy conditions before being used for any purpose in any other steps.

In that respect the Board notes that dependent claim 8 of the patent in suit, which has been quoted by the Appellant, was not present in the application as originally filed but that there is nothing in the application as originally filed which could cast any

doubt on the fact that the water in which the lactalbumin has to be dissolved and denatured is just pure water.

Accordingly, in the Board's view the subject-matter of claim 1 of the patent in suit does not encompass the working method of comparative examples 1 to 3 and claim 1 does recite all the mandatory technical features of the invention as demonstrated by examples 1 to 3 of the patent in suit and by the comparative example filed by the Appellant (6)(comparative example with Bipro^{R}).

The appellant failed to plausibly substantiate that the skilled person could not, without undue burden, find a suitable lactalbumin for preparing the liquid proteinaceous food according to the patent in suit since his comparative examples (6) have clearly demonstrated that of two tested lactalbumins one of them, Bipro^{R} (6), ie a well known commercially available lactalbumin, fulfilled all the requirements of the patent in suit.

In conclusion, the Board's judgement is that the invention is sufficiently disclosed in all respects and that the patent meets the requirements of Article 83 EPC.

3. *Novelty*

Novelty of the subject-matter of the claims of the patent in suit has been acknowledged by the Opposition Division. As it has never been contested by the Appellant, the Board sees no reason to object to these

findings.

4. *Inventive step*

4.1 Document (7), the closest prior art, describes a liquid proteinaceous food comprising lactalbumin, ie an acidic fruit juice enriched with protein, which can be kept a day without objectionable separation (column 1, lines 29 to 33; column 2 lines 54 to 70; example 1).

According to the preparation method disclosed in (7)(column 2 line 66 to column 3 line 33), lactalbumin is mixed in water with other ingredients and additives (such as whey, glycine, egg yolk, skim milk powder, vitamins or minerals). The obtained mixture is homogenized and then pasteurised and dried.

The final step is mixing the additive composition obtained above, in either dried or liquid form, with the fruit juice.

In the light of the said prior art, the problem underlying the patent in suit can be seen in providing a liquid proteinaceous food having prolonged stability.

The problem is solved by the liquid proteinaceous food of claim 1.

Since the text of the patent in suit and the working examples 1 to 3 highlight the high stability of the claimed liquid proteinaceous food (no precipitate observed after six months at room temperature), the Board has no reason to doubt that the technical problem has actually been solved. The Appellant did not contest

the results of the said examples.

The question to be answered is thus whether the proposed solution is obvious for the skilled person, ie a skilled formulator in the field of food industry having moreover good knowledge of the chemical and physical properties of alimentary proteins in general, faced with the problem defined above.

4.2 The Board agrees that the skilled person would try to use a solution of Bipro^{R} in a preparation according to (7), as it is, indeed, well within the normal practice of the skilled person to replace the ingredients of prior art formulations with any new and promising products available on the market.

By doing so the skilled person would however not end up with the desired stable liquid food. It is only if the lactalbumin is dissolved in water and denatured in cloudy conditions before being used for preparing the liquid food that the desired effect on stability can be achieved.

Comparative examples 1 to 3 of the patent in suit clearly demonstrate that the stability of the liquid proteinaceous food depends on the physical form in which the lactalbumin is mixed with the other ingredients.

Document (5) discloses a water soluble lactalbumin (page 96, title; figure; column left, line 9) which has a protein content of 97% (page 96, column left, lines 12 to 13) and which is suitable for preparing protein enriched fruit-based drinks (page 96, column right, lines 26 to 28; page 97, column right, lines 35 to 36).

There is not the slightest hint in document (7) or document (5) of such a denaturation step of the lactalbumin prior to its mixing with the other ingredients, let alone of the stability effect linked to the use of any form of denatured lactalbumin in the liquid food.

In view of the above it is concluded that the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar The Chairman

P. Martorana U. Oswald