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Datasheet for the decision of 7 October 2021

Case Number: T 0229/18 - 3.3.01

Application Number: 08718910.6

Publication Number: 2144618

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Language of the proceedings: EN

Title of invention:
BIOEFFECTIVE KRILL OIL COMPOSITIONS

Patent Proprietor:
AKER BIOMARINE ANTARCTIC AS

Opponent:
RIMFROST AS

Headword:
Krill oil / RIMFROST

Relevant legal provisions:
EPC Art. 54, 56
RPBA Art. 12(4)
RPBA 2020 Art. 13(1), 13(2), 25

Keyword:
Novelty - public prior use (yes)
Inventive step - (yes)

Decisions cited:
G 0007/93

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Beschwerdekammern

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Case Number: T 0229/18 - 3.3.01

D E C I S I O N
of Technical Board of Appeal 3.3.01
of 7 October 2021

Appellant: (Opponent)	RIMFROST AS Vägsplassen 6090 Fosnavåg 1515 Herøy (NO)
Representative:	Gevers Patents Intellectual Property House Holidaystraat 5 1831 Diegem (BE)
Respondent: (Patent Proprietor)	AKER BIOMARINE ANTARCTIC AS J.M.Johansens vei 99 8340 Stamsund (NO)
Representative:	Carpmaels & Ransford LLP One Southampton Row London WC1B 5HA (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 27 November 2017 rejecting the opposition filed against European patent No. 2144618 pursuant to Article 101(2) EPC**

Composition of the Board:

Chairman	A. Lindner
Members:	S. Albrecht
	L. Bühler

Summary of Facts and Submissions

I. European patent 2 144 618 ("the patent") was opposed on the grounds that its subject-matter lacked novelty and inventive step and was not sufficiently disclosed.

II. The documents filed during the opposition proceedings included the following.

A4a: Certificate of Analysis "^{31}P NMR analysis of Phospholipids in Sample: KRILL OIL CAPSULES 20509121 Sample A", 18 March 2015

A4b: Certificate of Analysis "^{31}P NMR analysis of Phospholipids in Sample: KRILL OIL CAPSULES 20509121 Sample B", 18 March 2015

A4c: Certificate of Analysis "^{31}P NMR analysis of Phospholipids in Sample: KRILL OIL CAPSULES 20509121 Sample A", 7 December 2016

A5a, A5b, A5c and D13: photographs of a bottle labelled "100% Wild Krill Oil"

A7: A. MacKenzie, "^{31}P NMR Method for analysis of Phospholipids in Krill Samples", 14 May 2012, 3 pages in total

D4: EP 1 127 497 A1

D5: K. Yamagushi *et al.*, "Supercritical Carbon Dioxide Extraction of Oils from Antarctic Krill", J. Agric. Food Chem., 34, 1986, 904-7

D6: G.J. Grantham, "The Utilization of Krill", Rome: Food and Agriculture Organization of the United Nations, 1977, pages (ii) to (vi) and 1 to 51

D11: WO 2007/123424 A1

D21: US 6,800,299 B1

D23: WO 2008/060163

III. The appeal by the opponent ("appellant") lies against the opposition division's decision to reject the opposition.

IV. The opposition division decided, *inter alia*, not to admit document A4c and the "corresponding new arguments put forward in O's letter of 2.08.17" into the proceedings (see item 8 of the minutes posted on 27 November 2017 of the oral proceedings held on 4 October 2017; item 2 on page 5 of the impugned decision).

V. In its statement of grounds of appeal, the appellant requested that the decision under appeal be set aside and that the patent be revoked. With the same statement, the appellant refiled document A4c.

VI. In its reply to the appeal, the patent proprietor ("respondent") requested that the appeal be dismissed (main request) or, alternatively, that the patent be remitted to the opposition division to be upheld on the basis of one of auxiliary requests 1 to 5 filed on 4 August 2016, or auxiliary request 6 filed with the reply.

Independent claims 1 and 21 of auxiliary request 2 read as follows.

"1. A composition comprising:
from about 3% to 10% ether phospholipids on a w/w basis; and
from about 400 to about 2500 mg/kg astaxanthin."

"21. A process for producing krill oil comprising 40% to 60% w/w phospholipids, said process comprising:

a) providing a denatured krill product, produced by (i) providing fresh krill; and (ii) treating said fresh krill to denature lipases and phospholipases in said fresh krill to provide a denatured krill product, wherein the denatured krill product is krill meal that has been stored for a period of from 1 to 36 months; and b) extracting said oil from said denatured krill product."

VII. The board issued a summons to oral proceedings in accordance with corresponding requests of the parties.

VIII. In a communication pursuant to Article 15(1) RPBA, the board drew the parties' attention to the points to be discussed during the oral proceedings.

IX. Oral proceedings took place before the board on 7 October 2021 as a mixed-mode hearing. The respondent attended the proceedings via videoconference; the appellant and the board were physically present. During these proceedings, the respondent withdrew its main request, auxiliary request 1 and auxiliary requests 3 to 6, and maintained auxiliary request 2 as its main and sole request. The appellant intended to present an inventive-step objection concerning the subject-matter of claim 21 starting from document D21 in combination with document D4. The admissibility was contested by the respondent. When asked about the arguments for admittance, the appellant stated that they did not want to further discuss the combination. In view of the lack of substantiation of admittance and substance, this statement amounted in effect to a withdrawal of this objection. The appellant also withdrew its objection under Article 100(b) EPC.

At the end of the oral proceedings, the Chair announced the board's decision.

X. The appellants' written and oral submissions relevant to the present decision may be summarised as follows.

Main request - claim 1 - novelty

The subject-matter of claim 1 lacked novelty over the public prior use based on documents A4a, A4b, A5a, A5b, A5c, A7 and D13.

The analytical data in documents A4a and A4b evidenced that the krill oil constituting the public prior use contained ether phospholipids in an amount falling within the range recited in claim 1.

Contrary to the respondent's contention, these data were not inconsistent. The variations in ether phospholipid content of the two tested samples (i.e. samples A and B) resulted from significant measurement errors deriving from the P^{31} NMR method applied to determine these contents. The very same method was described in paragraphs [0082] and [0083] of the patent.

Being aware of these measurement errors, the skilled person would average the two ether phospholipid contents of samples A and B (i.e. 2.2% w/w and 3.3% w/w) and arrive at a result of 2.75% w/w. This value fell within the range of ether phospholipids recited in claim 1 since, as set out in the Guidelines Part G-VI, 8.1, the skilled person would understand the lower end of this range (i.e. 3%) to include any value between 2.5 and 3.4%.

Main request - claim 1 - inventive step

The subject-matter of claim 1 differed from the closest prior art, extract 2 of example 18 of document D11, in that the amount of astaxanthin in the composition must be from about 400 to about 2500 mg/kg. The objective technical problem was the provision of a composition with increased health effects. To solve this problem, the skilled person would have naturally turned to krill oils available on the market at the effective date of the patent. In doing so, they would have come across the product "Antarctica Select 100% Wild Krill Oil Dietary Supplement", i.e. a krill-oil based dietary supplement presented in bottles of 60 softgel capsules. As shown in documents A5c and D13, the bottle label heavily advertised the krill oil contained in these capsules for its powerful antioxidant properties by virtue of its astaxanthin content of 1800 mg/kg. In light of this teaching, the skilled person would have adapted the astaxanthin content of extract 2 of example 18 of document D11 accordingly and thereby have arrived at the claimed invention.

Main request - claim 21 - inventive step

The subject-matter of claim 21 differed from the closest prior art, document D21, in that the fresh krill used as starting material in the extraction process had been denatured before being used in the extraction. The technical effect linked to this difference was the production of a krill oil which contained virtually no decomposed phospholipids. The objective technical problem to be solved by the claimed invention was "how to modify the process of document D21 in such a manner that oil can be extracted from a krill product which contains no virtually decomposed

phospholipids even when the krill product has not been stored at extremely low temperatures". The proposed solution, i.e. the process of claim 21, would have been obvious in light of the closest prior art taken in combination with document D6.

XI. The respondent's written and oral submissions relevant to the present decision may be summarised as follows.

Main request - claim 1 - novelty

The analytical data in documents A4a and A4b were too inconsistent to prove that the krill oil according to the alleged public prior use contained ether phospholipids in an amount falling within the range recited in claim 1.

Main request - claim 1 - inventive step

The skilled person would not have taken into account the Antarctica Select 100% Wild Krill Oil Dietary Supplement cited by the appellant for solving the technical problem of providing a composition with increased health effects. As a matter of fact, example 18 of document D11 did not even mention astaxanthin. If this compound had nonetheless been on the mind of the skilled person, they would have expected it to be deliberately removed with extract 1 of example 18 of document D11 which contained all the neutral material. This expectation was further corroborated by document D5. As a consequence, the skilled person would have found it counter-intuitive to arbitrarily add astaxanthin back into extract 2 when trying to increase the amount of healthy components in extract 2.

Main request - claim 21 - inventive step

The skilled person would not have been motivated by document D6's disclosure to modify the process of document D21 to include a heating step where the active enzymes of the fresh krill were denatured. Adding such a step would be incompatible with the central purpose of the process of document D21, i.e. the provision of a product with high levels of active enzymes. Only with hindsight would the skilled person have focused on the oil fractions of document D21 and decided to heat the krill to denature the enzymes before the extraction.

XII. The parties' final requests relevant for the present decision were as follows.

The appellant requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

The respondent requested that the patent be remitted to the opposition division to be maintained on the basis of the main request filed as auxiliary request 2 on 4 August 2016 and a description to be adapted thereto.

Reasons for the Decision

1. The appeal is admissible.

2. In its reply, the respondent argued that large sections of the statement of grounds merely repeated arguments which were already submitted during the first-instance written procedure, without providing any reasons why the decision by the opposition division was wrong to reject these arguments. The respondent also noted that arguments were based on documents which were not

admitted into the first-instance proceedings. However, the respondent did not argue that the appeal was not substantiated contrary to the requirements of Article 108, third sentence, EPC in conjunction with Rule 99(2) EPC. Rather, the respondent contested the admittance of such submissions and requested that they be disregarded. Accordingly, admittance of contested submissions as well as new submissions filed after the statement of grounds of appeal will be addressed below where relevant for the decision and to the extent that the losing party is negatively affected by the procedural decision taken.

Procedural issues

3. Admittance of document A4c into the proceedings (Article 12(4) RPBA 2007)

3.1 The appellant requested to overturn the opposition division's decision not to admit document A4c into the appeal proceedings. Document A4c contained the same data as documents A4a and A4b with the addition of the analytical method. Document A4c thus provided a better understanding of how the samples were prepared. In particular, document A4c explained the yield of 68,1% w/w oil from 3 capsules. This issue had been raised at the oral proceedings on 4 October 2016. Document A4c was thus *prima facie* relevant.

3.2 The admittance of document A4c by the opposition division was a discretionary decision. According to G 7/93 (OJ 1994, 775, point 2.6 of the Reasons), a board should only overrule the way in which a first-instance department exercised its discretion if the board concludes either that the first-instance department did not exercise its discretion in

accordance with the right principles, or that it exercised its discretion in an unreasonable way, and thus exceeded the proper limits of its discretion.

3.3 The appellant has failed to explain in its statement of grounds why it considered that the opposition division had exercised is discretion incorrectly. At the oral proceedings, the appellant mainly relied on the relevance of document A4c for understanding documents A4a and A4b. The board cannot however find fault with the way the opposition division exercised its discretion. The public prior use had been thoroughly discussed at the oral proceedings on 4 October 2016 and the opposition division had reached a conclusion on this issue (see minutes of 21 October 2016, points 6 to 17). The information relied on by the appellant in its statement of grounds of appeal (pages 8 and 9) was considered in full by the opposition division in reaching its conclusion. Document A4c was filed together with further evidence relating to the public prior use two months before the second oral proceedings on 4 October 2017. When deciding on the admittance of this late-filed evidence, the opposition division considered the relevance of this newly-filed evidence against the backdrop of the full discussion at the previous oral proceedings. These were the right criteria.

3.4 In view of the above, the board did not overturn the opposition division's discretionary decision and did not admit document A4c into the appeal proceedings (Article 12(4) RPBA 2007).

4. Admittance of the appellant's objection of lack of clarity with respect to claim 21 of the main request (Article 13(1) RPBA 2020)

4.1 In its letter dated 17 October 2019, the appellant put forward that the introduction of a product-by-process feature in step a) of the method of claim 21 resulted in a lack of clarity (see page 16 et seq.). The respondent objected to this objection as being late-filed. It could and should have been raised in opposition proceedings since the respective amendment had been filed on 4 August 2016. The respondent reiterated its request filed by letter dated 6 December 2019 to not admit this objection. The appellant pointed out that the objection was raised before the issuance of the summons and the preliminary opinion by the board and was highly relevant.

4.2 The appellant has given no reasons for submitting this objection for the first time in its letter dated 17 October 2019. The board does not see any reason for the appellant not having submitted this line of attack in the opposition proceedings. The contested amendment has been on file since 4 August 2016. With the late submission on appeal, the appellant confronted the respondent with new material issues at a very late stage of the proceedings. The admittance of such a late and unjustified amendment to the appellant's case into the proceedings would have been contrary to procedural fairness and would not have been conducive to procedural economy. The board thus decides to exercise its discretion not to admit the new line of attack into the proceedings (Article 13(1) RPBA 2020 in conjunction with Article 25(1) RPBA 2020).

4.3 The board notes that the further added-matter objection raised in the appellant's letter dated 17 October 2019 was no longer pursued at the oral proceedings.

5. Admittance of the appellant's objections of lack of novelty with respect to the subject-matter of claim 1 of the main request in view of table 22 of the patent and with respect to the subject-matter of claim 25 of the main request in view of document D23 (Article 13(2) RPBA 2020)

5.1 The appellant raised these objections during the oral proceedings before the board. The respondent requested to not admit the objections.

5.2 The board considers the filing of these objections to be an amendment of the appellant's appeal case within the meaning of Article 13(2) RPBA 2020 (which is applicable according to Article 25(3) RPBA 2020). Although the text passages relied on by the appellant had been discussed during opposition and appeal proceedings, the appellant's objections raised new technical issues, as rightly pointed out by the respondent. Moreover, the ground of lack of novelty had never been invoked against claim 27 of the patent corresponding to claim 25 of the main request.

5.3 The appellant did not contest that these objections were presented for the first time during the oral proceedings before the board, nor did the appellant justify their late filing. Absent any such explanation from the appellant, exceptional circumstances within the meaning of Article 13(2) RPBA 2020 cannot be acknowledged.

5.4 The board therefore decided not to admit the aforementioned lack of novelty objections into the appeal proceedings in accordance with Article 13(2) RPBA 2020.

Substantive issues

6. Novelty of the subject-matter of claim 1 of the main request

6.1 The appellant submitted that the subject-matter of claim 1 lacked novelty over the public prior use based on documents A4a, A4b, A5a, A5b, A5c, A7 and D13.

6.2 Documents A5a, A5b, A5c and D13 are photographs of a labelled bottle taken at different angles. The label carries, *inter alia*, the following information.

(a) The bottle has the lot number 20509121 (see document A5b).

(b) The product contained in the bottle is a dietary supplement named "Antarctica Select 100% Wild Krill Oil" and composed of 60 softgel capsules (see document A5a).

(c) This dietary supplement ("Antarctica Select capsules 20509121") contains, *inter alia*, astaxanthin (see document D13).

6.3 Uncontestedly, the label shown in documents A5a, A5b, A5c and D13 does not mention any ether phospholipid content.

6.4 Relying on documents A4a, A4b and A7, the appellant submitted that the oil contained in the Antarctica

Select capsules 20509121 comprises ether phospholipids in an amount falling within the range recited in claim 1.

6.5 Documents A4a and A4b are laboratory test reports showing the results of a ^{31}P NMR analysis of phospholipids in "sample A" and "sample B" respectively. Samples A and B are each composed of krill oil extracted from three softgel capsules of the dietary supplement shown in documents A5a, A5b, A5c and D13. The phospholipid content of these samples is determined by a ^{31}P NMR method which is described in more detail in document A7.

6.6 Document A4a gives an ether phospholipid content of sample A of 2.2 g per 100 g oil, i.e. 2.2 % on a w/w basis. By contrast, document A4b reports an ether phospholipid content of sample B of 3.3 g per 100 g oil, i.e. 3.3 % on a w/w basis. The ether phospholipid content of sample B is thus 1.5 times higher than the ether phospholipid content of sample A.

6.7 The board, in agreement with the opposition division and the respondent, finds this divergence to be of such magnitude that it casts doubt on the reliability of the data presented in documents A4a and A4b.

6.8 The appellant's arguments to the contrary are not convincing.

6.8.1 There is no doubt that the ether phospholipid content of samples A and B disclosed in documents A4a and A4b is affected by measurement errors deriving from the P^{31} NMR method applied to determine this content.

6.8.2 However, none of documents A4a, A4b and A7 indicate the magnitude of these errors. The same holds true for paragraphs [0082] and [0083] of the patent which, according to the appellant, disclose the same NMR method as the one used for determining the ether phospholipid content of samples A and B.

6.8.3 At the oral proceedings, the appellant explained that these errors were in line with the wording of claim 1 which specified the lower end of the claimed ether phospholipid content (3%) as whole number, i.e. without decimals. As set out in the Guidelines Part G-VI, 8.1, the skilled person would interpret this value to include any value between 2.5 and 3.5%.

6.8.4 The part of the Guidelines relied on by the appellant reads as follows.

"The skilled person knows that numerical values relating to measurements are subject to measurement errors which place limits on their accuracy. For this reason, the general convention in the scientific and technical literature is applied: the last decimal place of a numerical value indicates its degree of accuracy. Where no other error margins are given, the maximum margin is ascertained by applying the rounding-off convention to the last decimal place (see T 175/97), e.g. for a measurement of 3.5 cm, the error margin is 3.45-3.54. When interpreting ranges of values in patent specifications, the skilled person proceeds on the same basis."

6.8.5 This passage does not support the appellant's contention that the degree of accuracy is determined by the low end of the range of ether phospholipid content claimed. Rather, the degree of accuracy is determined

by the numerical value of the measurements in documents A4a and A4b. Applying the above rounding convention to the ether phospholipid contents of samples A (i.e. 2.2% w/w) and B (3.3% w/w) leads to error margins of 2.15-2.24% w/w and 3.25-3.34% w/w respectively. Taking these error margins into account, it remains that the ether phospholipid contents of samples A and B diverge considerably. The considerable divergence between the two samples does not support an arithmetic average.

6.9 In light of these divergences, the board concludes that documents A4a and A4b do not directly and unambiguously show that the krill oil contained in the Antarctica Select capsules 20509121 comprises ether phospholipids in an amount falling within the range recited in claim 1.

6.10 It follows that the appellant's objection under Article 54 EPC against claim 1 does not prejudice the maintenance of the patent on the basis of the set of claims of the main request.

7. Inventive step of the subject-matter of claim 1 of the main request

The closest prior art

7.1 The appellant identified a phospholipid-rich extract referred to as "extract 2" in example 18 of document D11 as the closest prior art for assessing the inventive step of the claimed subject-matter.

7.2 This example discloses a process for the fractionation of krill lipids from krill powder.

7.2.1 In a first extraction, freeze-dried krill powder is extracted continuously with supercritical carbon dioxide at 300 bar and 313 K until no further extract is obtained. This extract (i.e. "extract 1") contains no phospholipids and is substantially all neutral lipids. Its amount is 650 g, i.e. about 11.56% w/w of the starting powder (document D11, page 24, lines 1 to 8).

7.2.2 The residual powder is subsequently extracted with carbon dioxide and absolute ethanol. This second extraction results in a phospholipid-rich extract, i.e. "extract 2", and a further extract (document D11, page 24 lines 8 to 13).

7.2.3 As evidenced by table 16 of this example, extract 2 contains 4.8% w/w ether phospholipids.

Distinguishing feature(s) vis-à-vis extract 2 of example 18 of document D11

7.3 The following points were not in dispute between the parties.

(a) Example 18 of document D11 does not mention astaxanthin.

(b) Astaxanthin forms part of the initial freeze-dried krill powder of this example.

(c) Astaxanthin is a neutral compound.

7.4 In view of the foregoing, the board does not have any reason to doubt the respondent's submission that in example 18 of document D11 most - if not all - of the astaxanthin is removed with the neutral lipids by the

first extraction such that extract 1 contains most, if not all, of the astaxanthin.

7.5 The appellant disputed this finding, arguing that extract 2 comprised a high, albeit unspecified, amount of astaxanthin. In support of its argument, the appellant referred to example 3 of the patent (paragraph [0077], tables 9 to 16). This example disclosed a two-step extraction process which was very similar to that of example 18 of document D11. As evidenced by table 16 on page 24 of the patent, the polar krill oil obtained by the second extraction contained 580 mg/kg of astaxanthin esters, whilst the neutral krill oil obtained after the first extraction only comprised 98 mg/kg of astaxanthin esters.

7.6 The board does not concur. In example 18 of document D11 the initial freeze-dried krill powder was subjected to continuous extraction with supercritical carbon dioxide at 300 bar and 313 K until no further extract was obtained. By contrast, the first extraction process of example 3 of the patent was performed with supercritical carbon dioxide at a higher temperature (60°C) and for a duration of 30 minutes. In view of these material differences, example 3 of the patent cannot serve to support the appellant's argument.

7.7 It follows that the composition of claim 1 differs from extract 2 of example 18 of document D11 in that it contains astaxanthin in an amount of about 400 mg/kg to about 2500 mg/kg.

Objective technical problem and solution

7.8 The appellant defined the objective technical problem as the provision of a composition with increased health effects. The board agrees.

7.9 As a solution to this problem, the claimed invention proposes adding astaxanthin in an amount of about 400 mg/kg to about 2500 mg/kg.

Assessment of obviousness of the proposed solution

7.10 The claimed solution would not have been obvious having regard to the state of the art.

7.10.1 There is no doubt that the skilled person would have been aware of the product "Antarctica Select 100% Wild Krill Oil Dietary Supplement" (see documents A5a, A5b, A5c and D13) including its antioxidant properties by virtue of its astaxanthin content of 1800 mg/kg.

7.10.2 However, the skilled person would not have had any motivation to add astaxanthin to extract 2 of example 18 of document D11 in the first place. As submitted by the respondent and not disputed by the appellant, the skilled person would have known that astaxanthin is a neutral compound. Reading example 18 of document D11 with this knowledge in mind, the skilled person would have understood that the first extraction of example 18 served to remove astaxanthin along with the neutral lipids from the initial freeze-dried krill powder to form extract 1 (see point 7.2.1. above). As a consequence, the skilled person would have found it counter-intuitive to add astaxanthin back into the product of the second extraction of example 18 (i.e. extract 2) when the point of making extract 1 first was

to do the exact opposite, i.e. to get rid of the neutral components of the freeze-dried krill powder.

7.10.3 What is more, in document D5 the skilled person would have found confirmation of their understanding of example 18 of document D11.

7.10.4 Document D5 (see title, abstract) concerns a process for extracting oils from Antarctic krill using supercritical carbon dioxide. The extract is composed solely of nonpolar lipids, without phospholipids, contains high proportions of EPA and is red in colour due to astaxanthin. The final sentence of the abstract states that the process is "*effective in obtaining nonpolar lipids from the oil by only one-step extraction and in excluding phospholipids that interfere with the utilization of krill oils*".

7.10.5 Having this technical information of document D5 in mind when studying example 18 of document D11, the skilled person would have been aware of the similarities between the extraction process of document D5 and the first extraction of example 18 of document D11 (see point 7.2.1 above). From this, the skilled person would have inferred the following.

(a) Like the extract of document D5, extract 1 of example 18 of document D11 is composed of nonpolar lipids, without phospholipids, and astaxanthin.

(b) Like the extraction described in document D5, the first extraction of example 18 of document D11 deliberately excludes phospholipids to avoid interferences between these compounds and extract 1.

7.10.6 In view of the foregoing, the skilled person would have been dissuaded from adding astaxanthin to the phospholipid-rich extract 2 of example 18 of document D1 to solve the technical problem posed.

7.10.7 The appellant did not question the disclosure of document D5 as such but argued on the basis of example 3 of the patent, specifically tables 9 and 16, that contrary to the respondent's contention, extract 2 of example 18 of document D11 contained much higher amounts of astaxanthin than extract 1 as well as high amounts of EPA and DHA.

7.10.8 However, as correctly noted by the respondent, the information disclosed in the patent was not available to the skilled person at the effective date of the patent. As a consequence, the appellant's argument cannot succeed.

7.11 It follows that the appellant's objection under Article 56 EPC against claim 1 does not prejudice the maintenance of the patent on the basis of the set of claims of the main request.

8. Inventive step of the subject-matter of claim 21 of the main request

The closest prior art

8.1 The appellant identified document D21 - a US patent specification - as the closest prior art.

8.2 The invention forming the subject of this document is a method for extracting lipid fractions from marine and aquatic animals (e.g. krill) by dehydration with

solvents and recovering a solid residue rich in active enzymes (see column 1, lines 5 to 12).

8.3 In a preferred embodiment (see column 3, line 54 to column 4, line 19), the extraction is carried out by two successive extraction treatments.

8.3.1 In a first step, freshly harvested marine and aquatic animal material is subjected to acetone extraction. This produces a lipid fraction ("fraction I") and a solid residue.

8.3.2 After separation by filtration, this residue is extracted with an alcohol or an ester of acetic acid. This procedure gives rise to a second lipid fraction ("fraction II") and a dry residue enriched in protein, including active enzymes.

8.4 Table 13 of document D21 shows the lipid class composition of lipid fractions I and II extracted from fresh krill with acetone and ethyl acetate, respectively. According to this table, fraction I contains 54.1% of phospholipids or other polar material.

Distinguishing feature(s) vis-à-vis document D21

8.5 It was common ground between the parties, and the board agrees, that the process of claim 21 differs from the method of document D21 at least in that the oil extraction is performed on denatured krill meal produced by providing fresh krill and treating said fresh krill to denature lipases and phospholipases in said fresh krill.

Objective technical problem and solution

8.6 To formulate the objective technical problem, it is necessary to establish the technical effect(s) achieved by the aforementioned distinguishing feature.

8.7 In this regard, the following was not in dispute.

(a) Krill oil extracted from fresh krill in accordance with the method of document D21 - even if extracted immediately and at low temperatures - inevitably contains decomposed triglycerides and phospholipids, including free fatty acids (see fatty acid content of fractions I and II of Table 13 of document D21).

(b) By contrast, krill oil extracted from denatured krill meal in accordance with claim 21 contains virtually no decomposed phospholipids (see paragraph [0047] of the patent).

8.8 Accordingly, the objective technical problem to be solved starting from document D21 is the provision of a process which produces a krill oil having virtually no decomposed phospholipids.

8.9 The solution proposed to this problem is a process in accordance with claim 21.

Assessment of obviousness of the proposed solution

8.10 The claimed solution would not have been obvious having regard to the state of the art.

8.11 The board does not dispute that the skilled person would have known that active enzymes (e.g. lipases,

phospholipases) in fresh krill are responsible for the formation of decomposed triglycerides and phospholipids in the krill oil produced by the method of document D21.

8.12 Moreover, the skilled person would have learned from document D6 that these enzymes of these products can be inactivated by boiling krill and krill products (see document D6, page 28, last paragraph).

8.13 However, as convincingly argued by the respondent, the skilled person would not have introduced this inactivation step in the method of document D21, because such a modification would have made it impossible to achieve one of the main goals of the method described in document D21, i.e. to obtain a solid residue rich in active enzymes (see column 1, lines 8 to 12; column 2, lines 40 to 44; column 3, lines 48 to 53; column 7, lines 43 to 45; column 8, lines 34 to 36; column 18, table 19).

8.14 As a consequence, the subject-matter of claim 21 involves an inventive step when starting from document D21 in combination with document D6.

8.15 The appellant submitted that document D6 would have prompted the skilled person faced with the technical problem of avoiding decomposition products of triglycerides and phospholipids in oil extracted from krill material to modify the extraction process of document D21 accordingly. The inability of this modified process to produce a solid residue rich in active enzymes represented a foreseeable disadvantageous modification of the closest prior art which was not accompanied by any surprising technical advantage. According to the case law of the Boards of

Appeal, no inventive step could be acknowledged on this basis. What is more, this disadvantage was of minor importance, because the invention underlying the subject-matter of claim 21 was not concerned with the recovery of such a residue.

8.16 The board does not agree. As explained in point 8.13 above, the recovery of a solid residue rich in active enzymes is an essential feature of the extraction method described in document D21. As a consequence, the skilled person would not have abandoned this essential feature in the context of document D21 without using hindsight.

8.17 It follows that the appellant's objection under Article 56 EPC against claim 21 does not prejudice the maintenance of the patent on the basis of the set of claims of the main request.

9. Overall conclusion on the main request

The board finds that none of the grounds for opposition invoked by the appellant prejudice the maintenance of the patent on the basis of the set of claims of the main request.

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 claims and a description to be adapted thereto:

   Claims 1 to 25 of the main request filed as auxiliary request 2 on 4 August 2016.

The Registrar: On behalf of the Chair (according to Art.8(3) RPBA):

M. Schalow L. Bühler

Decision electronically authenticated