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Title of invention:
PROCESS FOR REFINING VEGETABLE OIL WITH SUPPRESSION OF UNWANTED IMPURITIES

Patent Proprietor:
Bunge Loders Croklaan B.V.

Opponents:
Cargill, Incorporated
Stepan Company

Headword:
PROCESS FOR REFINING VEGETABLE OIL WITH SUPPRESSION OF UNWANTED IMPURITIES / Bunge Loders Croklaan B.V.

Relevant legal provisions:
EPC Art. 83, 54, 56

Keyword:
Sufficiency of disclosure - (yes)
Novelty - (yes)
Inventive step - non-obvious alternative

Decisions cited:
T 1977/22

Catchword:

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Beschwerdekammern

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Case Number: T 1880/22 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 10 April 2025

Appellant 1: (Opponent 1)	Cargill, Incorporated 15407 McGinty Road West Wayzata, MN 55391 (US)
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Appellant 2: (Opponent 2)	Stepan Company 22 West Frontage Road Northfield IL 60093 (US)
Representative:	Maiwald GmbH Elisenhof Elisenstraße 3 80335 München (DE)
Respondent: (Patent Proprietor)	Bunge Loders Croklaan B.V. Hogeweg 1 1521 AZ Wormerveer (NL)
Representative:	Potter Clarkson Chapel Quarter Mount Street Nottingham NG1 6HQ (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 7 June 2022 rejecting the opposition filed against European patent No. 3321348 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	R. Elsässer
Members:	P. Ammendola
	C. Heath

Summary of Facts and Submissions

I. The appeal of opponents 1 and 2 (hereinafter **appellants 1 and 2**) lies from the decision of the opposition division to reject the opposition against European patent No. EP 3 321 348.

II. Claim 1 of the patent as granted (hereinafter **claim 1**) reads:

"*1. Process for refining vegetable oil, to suppress the formation of monochloropropanediol esters (MCPDe) and reduce the content of glycidyl esters, comprising first and second refinement stages,*
wherein the first refinement stage comprises the steps of:
a) providing a crude vegetable oil having a combined MCPDe and glycidyl ester content below 0.2 ppm, preferably below 0.1 ppm;
b) degumming the crude vegetable oil to produce degummed vegetable oil;
c) bleaching of the degummed vegetable oil with activated bleaching earth under reduced pressure to yield bleached vegetable oil, preferably at a reduced pressure of 80-800 mbar;
d) adding a base to the bleached vegetable oil and subsequent stripping and deodorizing under reduced pressure at a temperature below 255°C to yield an intermediate refined vegetable oil;
and subsequently a second refinement stage comprising the steps of:
e) bleaching of the intermediate refined vegetable oil using activated bleaching earth under reduced pressure to yield a bleached vegetable oil, preferably at a reduced pressure of 80-800 mbar; and

f) deodorizing at a temperature below 220°C to yield fully refined vegetable oil, preferably at a reduced pressure below 5 mbar;
wherein the fully refined vegetable oil has a combined MCPDe and glycidyl ester content below 4 ppm."

The remaining claims 2 to 15 of the patent as granted define preferred embodiments of the process of claim 1.

III. In the appealed decision the opposition division had, *inter alia*, found that:

- the grounds of opposition of Article 100(b)/83 EPC did not prejudice the maintenance of the opposed patent as granted;
- the grounds of opposition of Article 100(a) EPC in relation with Article 54 did not prejudice the maintenance of the opposed patent as granted, when considering the prior art disclosed in **D3** (WO 2014/012548 A1) or **D7** (WO 2012/107230 A1);

and

- the grounds of opposition of Article 100(a) EPC in relation with Article 56 did not prejudice the maintenance of the opposed patent as granted, when starting from, *inter alia*, the prior art disclosed in D3 or that disclosed in D7 and also considering the disclosure in, *inter alia*, **D12** ("*MCPD Esters and Glycidyl Esters – Review of Mitigation Measures*", FEDIOL 24 June 2015), **D13** (Cheng *et al.* "*Glycidyl Fatty Acid Esters in refined edible oils: a review on Formation, Occurrence, Analysis, and Elimination Methods*" Vol. 16, Comprehensive Reviews in Food Science and Food Safety, Institute of Food Technologists, 2017) and **D14** (WO 2013/093093 A1).

IV. With their respective statements of grounds of appeal, appellants 1 and 2 disputed the above findings of the opposition division.

In addition:

- appellant 1 filed, *inter alia*, document **D17** (O.I. Mba *et al.* "*Palm oil: Processing, characterization and utilization in the food industry – A review*", Food Bioscience 10 (2015) 26–41) as evidence of common general knowledge,
- appellant 2 objected that a substantial procedural violation had occurred in opposition.

V. The patent proprietor (hereafter **respondent**) with the reply to the appeal filed auxiliary requests 1 to 12.

VI. At the oral proceedings, appellant 2 withdrew the request for remittal of the case due to a substantial procedural violation.

The final requests of the parties were therefore as follows:

Both appellants (opponents) requested that the decision under appeal be set aside and the patent be revoked.

The respondent (patent proprietor) requested that the appeals be dismissed or, as an auxiliary measure, that the patent be maintained in amended form based on any of auxiliary requests 1 to 12 filed with the reply to the appeals.

Reasons for the Decision

Main request (granted claims)

1. Interpretation of claim 1

1.1 It is undisputed that the opposition division read the initial wording of claim 1:

> "*to suppress the formation of monochloro-propanediol esters (MCPDe) and reduce the content of glycidyl esters*"

as substantially equivalent to the final requirement of the same claim

> "*wherein the fully refined vegetable oil has a combined MCPDe and glycidyl ester content below 4 ppm*".

Thus, the opposition division did not identify more precisely the meaning in said initial wording of the different expressions "*to suppress the formation*" of MCPDe and "*to reduce the content*" of glycidyl esters (hereinafter GE) or, at any rate, did not not consider that the initial wording implied any limitation going beyond the final requirement of the claim.

1.1.1 In contrast, the appellants argued that the clear literal meaning of said initial wording would instead impose that:

(a) no MCPDe may be formed during the refining process (in addition to any MCPDe possibly initially present in the starting crude oil),

and

(b) (at least part of) the GE initially present in the starting crude oil must be removed during the refining process.

It is self-evident that such construction necessarily implies that the combined MCPDe and GE content in the final fully purified oil must be lower than that in the starting crude oil.

Appellant 2 also submitted that the disclosure on page 2, lines 15-16, and claim 1 of D14 would confirm that processes aiming at removing GE from vegetable oils would be conventional.

1.1.2 In the opinion of the board, a skilled person already upon reading claim 1 *per se* would immediately discard such literal, isolated interpretation of the claim's initial wording, because the latter is manifestly at odds with the fact that the same claim, after having required combined amounts of MCPDe and GE ingredients in the starting crude vegetable oil of less than 0.2 ppm (see step "*a)*" of claim 1), allows for the much higher combined amounts of "*below 4 ppm*" for the same two ingredients in the final fully purified oil. In fact, the final requirement of claim 1 would, under such a literal construction of the initial wording of the same claim, be deprived of any plausible technical meaning, i.e. be completely redundant. Already this consideration suggests that the initial wording of claim 1 may not necessarily refer to GE already present in the starting crude oil, nor would it require that the "suppression" of the formation of MCPDe is absolute in the sense that no MCPDe is formed at all in the course of the claimed process.

1.1.3 Hence, the skilled person would also consider the common technical knowledge in order to arrive at a meaning of the whole claim that makes technical sense.

In particular, the skilled reader of claim 1 would take into consideration that MCPDe and GE are well-known contaminants that are inevitably formed in substantial amounts during the oil refining process itself, essentially in the deodorizing step, and that they must at least be partially removed due to their harmful nature (i.e. the common general knowledge whose existence is explicitly acknowledged e.g. in D13, see the abstract and the "Introduction" of this review article). It is hence also common general knowledge that these (unwanted) compounds are normally absent or nearly absent in crude vegetable oils.

The board stresses that the existence of this common general knowledge is not contradicted by the teachings of D14 firstly because this document is no evidence of common general knowledge, and secondly because it fails to disclose or to necessarily imply the existence of crude vegetable oils containing substantial amounts of GE.

Hence, it is also immediately apparent to the skilled person that at least the "reduction" of the GE "content" required by the initial wording of claim 1 (see 1.1.1 above) may possibly not refer to the GE content in the starting crude oil, as the latter is normally below the detectability threshold.
Thus, the common general knowledge confirms further that the initial wording of claim 1 may not refer to the amounts GE already present in the starting crude oil (as implied by the appellants' literal construction of said initial wording).

A further consequence of the above common general knowledge is therefore that the final requirement of claim 1 (allowing the combined amounts of MCPDe and GE in the fully refined oil to be much higher than in the starting crude oil) appears no longer a possibly redundant feature, but rather as the acknowledgement of the unavoidable generation of substantial amounts of these unwanted contaminants also during the claimed refining process itself.
Consequently, the skilled reader of claim 1 would also conclude that the "suppression of the formation" of MCPDe mentioned in the initial wording of claim 1 may be partial (rather than "necessarily complete", as alleged by the appellants' literal construction of said initial wording). Of course, the same applies to the "reduction of the GE content" also mentioned at the beginning of claim 1.

However, even when considering these conclusions based on the common general knowledge, at least the portion of the initial wording of claim 1 relating to the "reduction" of the GE content remains unclear since the reference point compared to which the reduction is to be achieved is not indicated.

1.1.4 To further clarify its meaning the skilled person must then turn to the patent specifications, and in particular to paragraph [0019] where it is explicitly stated that:

> "[i]*n the present invention, the suppression of the formation of MCPDe and reduction in the content of glycidyl esters means that the vegetable oil has a combined MCPDe and glycidyl ester content below 4 ppm*" (emphasis added by the board).

As the patent itself explicitly defines the meaning of the initial wording of claim 1 as equivalent to that of the final requirement in the same claim, the skilled person must conclude that the former does not contribute any clear limitation to the claimed subject-matter, i.e. that both these features of the claimed vegetable oil refining process only impose that the claimed process must ensure a content of less than 4 ppm of MCPDe and GE in the fully refined vegetable oil thereby obtained.

1.2 The respondent also underlined that the opposition division correctly (implicitly) construed the steps and the two stages of claim 1 as interlinked, because the claim explicitly requires that the starting oil for each step is the (oil) product of the preceding step (see in the middle of page 9 of the reply to the appeals). Hence, no further oil refining step could be additionally comprised between steps "*a)*" to "*f)*" other then those treatments (such as e.g. a filtration) that would not change the nature of the oil phase.

1.2.1 According to the appellants, the presence of further intermediate oil refining steps between the steps listed in claim 1 would be allowed by the claim wording already due to the claim language that "comprises" the recited steps/stages.

1.2.2 The board finds the respondent's interpretation of claim 1 to be correct.

Even though the "*step*"s and the "*stage*"s are described therein as "comprised" in the claimed process, still the skilled reader of, for example, step "*b)*" - which describes "*degumming the crude vegetable oil*" (emphasis

added) - would logically conclude that such step requires the oil undergoing the "*degumming*" treatment to necessarily be the same "*crude vegetable oil*" already mentioned above, i.e. the crude vegetable oil "provided" in step "*a)*" and, thus, also having the "*combined MCPDe and glycidyl ester content below 0.1 ppm*".

Similarly, the skilled reader of step "*c)*" - which describes the "*bleaching of the degummed vegetable oil*" (emphasis added) - would logically conclude that such step requires that the oil undergoing the "*bleaching*" treatment must necessarily be the same oil that resulted from the "*degumming*" described in the immediately preceding step "*b)*".

The same reasoning applies, *mutatis mutandis,* also to step "*d)*" which starts with "*adding base to the bleached oil*" (emphasis added) and ends with "*to yield an intermediate refined vegetable oil*", and to step "*e)*" which describes "*bleaching of the intermediate refined vegetable oil*" (emphasis added).

It is also apparent to the board, in particular since the literal and logical interlinking between the claimed process steps (hereinafter also referred to in short as the interlinking between the steps/stages) is also expressed by repeating the refining treatment to which the oil has just undergone, that the skilled reader of claim 1 would consider it to also necessarily imply the absence in-between steps "*a)*" to "*f)*" of claim 1, of any further intermediate oil refining step (i.e. a any treatment apt at further changing the chemical composition of the "oil" phase *per se*).

The board also stresses that there appear to be no teachings in the opposed patent suggesting the presence of further oil refining steps in-between those listed in claim 1.

1.2.3 Hence, the correct claim interpretation allows to exclude, *inter alia*:

- the possibility for "*the crude vegetable oil*" that is degummed in step "*b)*" to have a combined content in MCPDe and GE different from that provided in step "*a)*";
- the possibility for "*the degummed oil*" that is bleached in step "*c)*" to be an oil that has already undergone e.g. a "deodorization", or
- the possibility for "*the bleached oil*" that is added with base in step "*d)*" to be an oil that has already undergone (in addition to degumming and bleaching) e.g. a "deodorization".

For these reasons, the board also agrees in particular with the conclusion of (the opposition division in 18.3.1.4, 18.3.2.1, 18.3.3.1 and 18.3.4.1 of the appealed decision and) the respondent that claim 1 implicitly requires that the deodorization in step "*d)*" must be the first deodorization which the vegetable oil undergoes since the beginning of the refining process.

1.3 Finally, the board stresses that the literal and only technically plausible meaning of the description of step "*d)*" in claim 1 under consideration:

> "*d) adding a base to the bleached vegetable oil and subsequent stripping and deodorizing...*" (emphasis added),

is that the base is simply added to the "*bleached vegetable oil*", and that it is the output resulting from this addition that is then directly subjected to "*stripping and deodorizing*" as described.

2. Sufficiency of disclosure (Article 100(b) EPC): granted claim 1

2.1 Both appellants disputed sufficiency of disclosure firstly for the reason that none of the patent Examples 2 to 5 would be in accordance with claim 1, because during all exemplified processes there would still be additional formation of MCPDe and GE in comparison to the starting crude oil.

This objection is based on the interpretation of the initial wording of claim 1 summarised above in 1.1.1 and found unconvincing by the board for the reasons given above in 1.1.2 to 1.1.4. Thus, this objection is not pertinent.

The board stresses that all the processes in the invention Examples 2 to 5 in the opposed patent that achieve that "*the fully refined vegetable oil has a combined MCPDe and glycidyl ester content below 4 ppm*" are manifestly enabled embodiments of the process of claim 1 (when the latter is correctly interpreted as indicated above at 1.1.4). It is also noted that the process in Example 5 using 4 ppm of KOH, which is the only exemplified process that does not produce a fully refined oil with less than 4 ppm MCPDe and GE, does not represent "a non-working example" of the invention but rather a process outside the scope of claim 1.

2.2 In a further line of attack, the appellants submitted that the definition of the patented subject-matter in

terms of the aimed technical effect of "*a combined MCPDe and glycidyl ester content below 4 ppm*" (also referred to by the parties as the *desiderata* of claim 1) was not commensurate to the disclosure of the invention in the patent in suit.
In particular, the appellants stressed that the processes of Example 5 of the opposed patent would show that only certain amounts of KOH ensured the attainment of these *desiderata*. However, claim 1 failed to disclose these essential conditions of the "addition of base" in step "*d)*". The appellants also referred to the summary of the jurisprudence of the boards of appeal relating to the sufficiency of disclosure for claims containing a *desideratum,* reported in the previous decision of this board **T 1977/22** , in particular in reasons 2.4, 2.6 and 4.1 to 4.5 of this decision.

2.2.1 The board, too, finds that the skilled reader of the (whole) patent in suit would immediately derive from Example 5 that the addition of a base plays a critical role for achieving the "*combined MCPDe and glycidyl ester content below 4 ppm*" in the fully refined oil required in claim 1. However, the board finds that the combination of claim 1 with the description in paragraphs [0001], [0009], [0019] and [0030] logically implies that the (preferred) conditions for the "addition with base" that are recited in paragraph [0030] enable the attainment of the aimed combined MCPDe and GE content "*below 4 ppm*" in the fully refined oil (i.e. the *desiderata* of claim 1).

Hence, the skilled reader of the (whole) patent concludes that (also) the step of "*adding a base to the bleached vegetable oil*" mentioned in step "*d)*" claim 1 represents an essential feature of the claimed process whose specific conditions need (similarly to those of

the other process steps recited in claim 1) to be set so as to ensure the attainment of the *desiderata*. As the patent description also provides in paragraph [0030] not only a list of suitable bases but also specifies a range for the amount thereof to be added, the board finds that, in the absence of evidence of the contrary, the provided disclosure enables the skilled person to implement, in necessary with a limited amount of experimental work, many embodiments of the invention across the scope of claim 1, using different bases in different amounts.

2.2.2 The board considers appropriate to additionally stress the absence of any experimental evidence or sound theoretical reasoning justifying the expectation that a skilled person - hypothetically confronted with failure in achieving the aimed low combined amounts of MCPDe and GE when using a certain amount of a certain base in a process in accordance with the other features of the claim at issue - would not be able to rapidly arrive at an embodiment of the invention by e.g. replacing the used base by one of the other bases listed in paragraph [0030] and/or by using a different amount of base within the range thereof also disclosed in said paragraph.

2.2.3 Thus, the claimed process appears sufficiently disclosed.

2.2.4 The above finding of sufficiency of disclosure is also in line with the summary of the jurisprudence mentioned in reasons 4.3 and 4.5 of the cited decision **T 1977/22**, in particular where it is stated that:

> "... the key criterion is whether the teachings in the specification and/or from common knowledge would enable the skilled person to identify

multiple working variants over the scope of the claim with reasonable effort, or from a different perspective, whether the information at hand is commensurate with or justifies the breadth of the claim"

and

"The relevant teachings in the patent may take the form of instructions, technical explanations, examples and/or any other type of evidence. Moreover, where the achievement of the desideratum is technically challenging and cannot be solved with common knowledge, the teachings should include direct or indirect pointers to the ... process features required to achieve parametric values falling within the open-ended range. In other words, the teachings should not only demonstrate that the desideratum can be achieved..., but should also enable the skilled person to identify the technical features required to adjust the parametric values to achieve the required results. These features constitute the (alleged) technical contribution of the invention, or in other words, they are the essential features proposed for overcoming the burden of reproducing the technically challenging open-ended desideratum. Therefore, as explained above, these essential features should also be defined in the claim to ensure the invention is reproducible over the whole scope".

Indeed, as already indicated above, in the present case:

(a) since claim 1 explicitly mentions "*adding a base*" (in step "*d)*") as one of the essential features of the claimed process, and since the

latter is also defined in terms of the *desiderata* (i.e. a result to be achieved), it is apparent that the claim implies that (also) the conditions of the claimed "addition of a base" - i.e. the appropriate amount and the type of base - are implicitly defined in the claim as those that allow to ensure (in combination with the appropriate setting of the other process steps' conditions) that the the final fully refined oil contains less than 4 ppm MCPDe and GE,

and

(b) the identification of these conditions so as to enable carrying out many embodiments of the invention across the scope of the claim, appears to require only limited routine experimentation to a skilled person that e.g. starts from the invention examples disclosed in the patent in suit and considers the further instructions provided in paragraph [0030].

Hence, the requirements for sufficiency of disclosure identified in the cited passages of **T 1977/22**, are complied with in the present case as well.

2.3 Accordingly, the board finds that the appellants have failed to render it plausible that the grounds of opposition under Article 100(b)/83 EPC would prejudice the maintenance of the patent as granted.

3. Novelty (Articles 100(a) and 54 EPC)

3.1 Novelty over D3: claim 1

3.1.1 The appellants submitted that Example 9 of D3 (which starts from the same product as the preceding Example 1) anticipates the subject-matter of claim 1, *inter alia*, because in this prior art process an already purified palm oil olein "RBD POO IV56" (hereinafter the starting RBD oil) was added with a base and deodorised in the "*heat treatment*" step at the beginning of Example 9: this would correspond to step "*d)*" of the claimed process.

3.1.2 It is self-evident that this argument is based on the interpretation of claim 1 at issue (summarized in 1.2.1 above) not accepted by the board for the reasons given in 1.2.2 above.

Instead, as explained in 1.2.3 above, the claimed process has been found to imply (in step "*d)*") that a base is added to the bleached oil before that the oil undergoes deodorization for the first time.

Since it is indisputable that the starting RBD oil has instead already been deodorized (but not added with a base immediately before such first deodorization) it is apparent that in this oil refining process there is no step corresponding to step "*d)*" of claim 1.

3.1.3 Therefore, already for this reason, the board finds unconvincing the novelty objection based on Example 9 of D3.

3.2 Novelty over D7: claim 1

3.2.1 Appellant 2 raised this novelty objection starting from the disclosure in D7 (see in particular claim 8, which refers back to the preceding claim 1) of an oil refining process comprising, *inter alia*, an "*alkali*

treatment step selected from an alkali refining step and an alkali interesterification step" - whereby only the latter could admittedly correspond to "the addition of base" as required in step "*d)*" of claim 1, when correctly construed as indicated in 1.3 above - and combining this disclosure with, *inter alia*, the last sentence on page 8 of the same document stating that "*this type of alkali treatment step will preferably be performed prior to the first deodorization step*". Moreover, the passage reading "[o]*ther possible permutations will be apparent to a person skilled in the art*" on line 28 of page 9 would confirm the possibility to also carry out the "*alkali interesterification step*" before the first deodorization step as well.

3.2.2 The board finds however that the last sentence on page 8 of D7 can only logically be read in connection with the immediately preceding sentence and taking into account that both these sentences are part of the subsection of the patent description devoted to the "*Alkali refining*" alternative (page 8, from line 10 to the end). This renders apparent that said last sentence on page 8 does not refer to the "*alkali interesterification step*", but rather to the other "*type*" of alkali treatment step listed in claim 8 (namely, the "*alkali refining step*") which cannot possibly be considered the "addition of a base" required in step "*d)*" of claim 1.

Also the vague mention of "[o]*ther possible permutations*" on line 28 of page 9 of D7, cannot be equated to the direct and unambiguous disclosure of the possibility to carry out the (optional) "*alkali interesterification step*" at any point of this prior

art process, let alone specifically before the first deodorization.

Hence, as correctly noted by the respondent, it remains the fact that in D7 the (optional) "*alkali interesterification step*" is only directly and unambiguously disclosed as preferably occurring after the first deodorization (and before the second bleaching, see in D7, page 9, lines 10 to 12 and 26 to 28, and embodiments (II), (III), (V) and (VI) on page 10).

The board finds therefore that the prior art disclosed in D7 does not directly and unambiguously disclose even just the possibility to carry out the "*alkali interesterification step*" immediately before the first deodorization step, as instead mandatory for the addition of a base in step "*d)*" of claim 1 at issue.

3.2.3 Furthermore, it is noted that the sole apparent disclosure in D7 about the use of reduced pressure during a bleaching step is in the specific context of the mild final bleaching of Examples 5 and 6 of D7. It is stressed that all the other first or final bleaching steps of the examples of D7 have apparently not been carried out under vacuum. The board finds therefore that the patent examples in D7 do not even result in the disclosure of "vacuum" as generally applicable during the second bleaching step of this prior art, not to mention as an option also generally applicable during the first bleaching step. Hence, in the absence of any other pointer thereto, there is no direct and unambiguous disclosure in D7 of a process in which both bleaching steps are carried out under reduced pressure, let alone of a process in which two bleaching steps under vacuum are combined with a first deodorisation

step preceded by the addition of a base. Instead, in claim 1 both bleaching steps "*c)*" and "*e)*" explicitly require reduced pressure and step "*d)*" implies that the addition of a base must occur before the first deodorization.

3.2.4 Thus, the subject-matter of claim 1 is manifestly not anticipated by D7, either.

3.3 Accordingly, the board finds that the appellants have failed to render it plausible that the grounds of opposition under Articles 100(a) and 54 EPC would prejudice the maintenance of the patent as granted.

4. Inventive step (Articles 100(a) and 56 EPC): claim 1

4.1 The appellants during oral proceedings, after having been informed of the board's conclusion as to the construction of claim 1 at issue, only disputed the presence of an inventive step when starting either from the prior art disclosed in D3 (this objection was maintained in particular by appellant 1) or from that disclosed in D7 (this objection was maintained in particular by appellant 2). Therefore, there was no reason for the board to further consider the previous appellants' submissions on inventive step that were no longer relied upon by the appellants during the oral proceedings and that were based on a different construction of the claim.

4.2 Inventive step starting from D3

4.2.1 Appellant 1 essentially argued that the only feature of the process of claim 1 that would not be disclosed in D3 — when considering the combination of the oil treatment process of Example 9 with the common general

knowledge apparent from D12 and D17 — is the requirement that a base must be added to the oil immediately before the first deodorization step. In contrast, the starting RBD oil added with a base and deodorized in the initial "heat treatment" of Example 9 of D3 has undisputedly already undergone a preceding deodorization step.
Appellant 1 submitted that this difference had not been shown to result in any technical advantage and, therefore, that the technical problem solved was merely the provision of an alternative to the oil refining process of the prior art, which already achieved a low content of MCPDe and GE compounds in the resulting purified oil. According to appellant 1, omitting the first deodorization step from the vegetable oil refining process of the prior art — where two further deodorization steps were still performed — would have no relevant technical effect and thus would be an obvious option for solving such a problem.

4.2.2 It has become immediately apparent to the board that, even assuming in favour of appellant 1 that the assessment of inventive step would indeed be reduced to the sole question of whether a skilled person, starting from Example 9 of D3 and aiming to provide an alternative process for producing a fully refined vegetable oil with a very low content of MCPDe and GE, would find it obvious to suppress the first deodorization step suggested in the prior art, the answer would nevertheless be that such modification cannot possibly be considered obvious in view of the prior art.

The reasons for this conclusion are the following:

(a) First, the board notes the undisputable fact that also the addition of a base and deodorization (i.e. the step called "heat treatment") is exclusively disclosed in D3 as a treatment for reducing the content of MCPDe and GE in an oil that already contains substantial amounts of these unwanted contaminants, such as the already refined RBD oil used a starting material in all the examples of this citation (see in claim 1 of D3 the initial wording "Process for lowering the amount of esters of 2- and 3-MCPD in refined triglyceride oil wherein said oil prior to entering the process has been treated with one or more refining steps" emphasis added, and the results in the Table of Example 1).

(b) Accordingly, also in Example 9, the "heat treatment" has been carried out to lower the content of MCPDe (and GE) in an oil that already contains substantial amounts of the unwanted contaminants.

(c) As already discussed above, it is part of the common general knowledge that substantial amounts of MCPDe and GE are normally generated only when vegetable oils undergo a deodorization step. Hence, the modification of Example 9 required to allegedly arrive at the subject-matter of claim 1, namely by removing the first deodorization step (e.g., by using, as the starting material in Example 9, a vegetable oil that has only been degummed and bleached but not yet deodorized instead of an RBD oil) — would be manifestly at odds with the very function of the "heat treatment" with which Example 9 starts. In other words, a skilled person would consider it technically unreasonable to apply the

first step of the prior art process, whose only described purpose is to reduce the amount of MCPDe and GE, also to a "not yet deodorized" oil that is (therefore) expected to contain no substantial amounts of these contaminants in the first place.

(d) Hence, a skilled person aiming to render available a further process for producing a fully refined vegetable oil with a very low content of MCPDe and GE, would consider it technically unreasonable to suppress the first deodorization step in the prior art of departure.

(e) Moreover, the board finds that the skilled person would also have no reason to expect that such an (uncalled for) modification would still result in very low MCPDe and GE contents, comparable to those obtained in the prior art of departure. The difference in terms of chemical composition between a "not yet deodorized" oil and an already deodorized one (such as the RBD oil), appears to have rendered impossible for the skilled person any sound theoretical prediction as to the amounts of MCPDe and GE that would be generated when adding a base and deodorizing a "not yet deodorized" oil. Nor is there any relevant experimental evidence in the available prior art. Accordingly, the argument of appellant 1 that removing the first deodorization may be expected to have no technical effect (presumably also in terms of the aimed low levels if MCPDe and GE in the final fully refined oil) amounts to a mere allegation deprived of any supporting evidence and is disregarded.

(f) Consequently, the board finds that removing the first deodorization step in the process of Example 9 of D3 may only appear obvious with the benefit of hindsight from the invention disclosed in the patent in suit.

Accordingly, even the (sole) modification of the prior art of departure that, according to appellant 1, would be required to arrive at the claimed process — namely, applying the "*heat treatment*" of Example 9 to a "not yet deodorized" oil — would not represent an obvious solution, even for the less ambitious technical problem of merely providing an alternative to the prior art.

4.2.3 The board concludes that appellant 1 failed to render plausible that the subject-matter of claim 1 at issue does not involve an inventive step (Article 56 EPC) over the prior art disclosed in D3.

4.3 Inventive step starting from D7

4.3.1 Appellant 2 no longer disputed that the "*alkali interesterification step*" (i.e. the sole alkali treatment disclosed in this citation that could admittedly correspond to "the addition of a base" as required in step "*d)*" of claim 1, when the latter is correctly construed as indicated in 1.3 above) was only disclosed in D7 to preferably occur after the first deodorization and before the second bleaching step (see page 9, lines 10 to 12 and 26 to 28, and embodiments (II), (III), (V) and (VI) on page 10). However, in the opinion of appellant 2, this teaching rendered the requirement that a base must be added to the oil immediately before the first deodorization in step "*d)*" the only feature of the process of claim 1 that was not disclosed as a possible variant of the prior art

process described in D7 to allow the production of a refined vegetable oil with a very low content of 3-MCPDe (and thus also inevitably of 2-MCPDe, see D13) and GE contaminants. Since this difference had not been shown to result in any technical advantage, the technical problem solved by the oil refining process of claim 1 vis-à-vis this prior art was merely the provision of an alternative to the latter. According to appellant 2, shifting the "*alkali interesterification step*" to immediately before a deodorization step would be suggested in D3 and thus the combination of D7 with D3 would render obvious the solution of the posed problem that was offered in claim 1 under dispute.

4.3.2 The board stresses however that in order to arrive at a process in accordance with claim 1 at issue, the "*alkali interesterification step*" of the process disclosed in D7 need to be shifted not just immediately before a (any) deodorization, but specifically before the first deodorization. It has therefore become immediately apparent to the board that, even assuming in favour of appellant 2 that the assessment of inventive step would indeed be reduced to the sole question of whether a skilled person, starting from claims 1 and 8 of D7 (in combination with the other cited claims and passages of the description) and aiming to provide an alternative process for producing a fully refined vegetable oil with a very low content of MCPDe and GE, would find it obvious to shift the "*alkali interesterification step*" to immediately before the first deodorization step in the prior art of departure, the answer to this question would nevertheless be that D3 cannot possibly render such a modification obvious.

The reasons for this conclusion are the followings:

(a) D7 *per se* does not even indirectly point to the possibility of such modification. The board stresses that the teaching on page 9, line 28, of D7 that "[o]*ther possible permutations will be apparent to a person skilled in the art*" does not mean that any permutation of the alkali treatment steps described in this citation would be possible. Hence it cannot be inferred from D7 that the "*alkali interesterification step*" may be expected to at least not negatively interfere with (let aside to favour) the attainment of the desired low level of MCPDe and GE compounds, regardless of the moment when this step is carried out in this prior art oil refining process.

(b) As already discussed above in 4.3.2 (a) - (c) the addition of a base and deodorization (i.e. the "*heat treatment*") is exclusively disclosed in D3 as a treatment for reducing the content of MCPDe and GE in an oil that already contains substantial amounts of these unwanted contaminants and that has already been subjected to a first deodorisation step. In other words, the step of adding a base before the first deodorisation treatment is not even disclosed in D3. Hence, the combination of D7 with D3 would at most render obvious to shift the "*alkali interesterification step*" in the process disclosed in D7 to (after the second bleaching and) immediately before the second deodorization, and not to shift it to before the first deodorization, as this latter modification would mean to treat a "not yet deodorized" oil that is expected to contain no substantial amounts of the contaminants in the first place.

(c) Hence, a skilled person aiming to render available a further process for producing a fully refined vegetable oil with a very low content of MCPDe and GE would find in D3 no reason for shifting the "*alkali interesterification step*" to before the first deodorization in the process disclosed in D7.

(d) Moreover, the board finds that the skilled person would also have no reason to expect that such a modification of the prior art of departure (not suggested in D3 or in D7 itself) should still allow to obtain very low MCPDe and GE contents, comparable to those obtained (in some embodiments) of the prior art of departure. As already indicated in 4.3.2 (e) above, the difference in terms of chemical composition between a "not yet deodorized" oil and an already deodorized one (such as the RBD oil), appears to have rendered impossible for the skilled person any sound theoretical prediction as to the amounts of MCPDe and GE that would be generated when adding a base and deodorizing a "not yet deodorized" oil. Nor was any experimental evidence relevant in this respect to be found in the available prior art. Accordingly, the argument of appellant 2 that shifting the "*alkali interesterification step*" to before the first deodorization in the process disclosed in D7 may be expected to have no technical effect (presumably also in terms of the aimed low levels if MCPDe and GE in the final fully refined oil) amounts to a mere allegation deprived of any supporting evidence and is disregarded.

(e) Consequently, shifting the "*alkali interesterification step*" to before the first deodorization in the process disclosed in D7 may

only appear obvious with the benefit of hindsight from the invention disclosed in the patent in suit.

Accordingly, (even) the (sole) modification of the prior art of departure that, according to appellant 2, would be required to arrive at the claimed process, would not represent an obvious solution even to the less ambitious technical problem of merely providing an alternative to the prior art.

4.3.3 The board concludes that the appellant 2 failed to render plausible that the subject-matter of claim 1 at issue does not involve an inventive step (Article 56 EPC) over the prior art disclosed in D7.

4.4 Accordingly, the board finds that the appellants have failed to render it plausible that the grounds of opposition under Articles 100(a) and 56 EPC would prejudice the maintenance of the patent as granted.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar: The Chairman:

A. Wille R. Elsässer

Decision electronically authenticated