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**Datasheet for the decision
of 22 September 2009**

Case Number: T 0086/05 - 3.3.05

Application Number: 94301199.9

Publication Number: 0616821

IPC: B01D 11/02

Language of the proceedings: EN

Title of invention:
Fragrance extraction

Patentee:
Ineos Fluor Holdings Limited

Opponent:
Ineos Fluor Holdings Ltd.

Headword:

-

Relevant legal provisions:
EPC Art. 56, 84, 123(2)

Keyword:
"Disclaimer (not allowable) - main, auxiliary request 1"
"Amendments (no proper basis): auxiliary requests 2, 3, 4, 7,
8 and 11"
"Lack of clarity: auxiliary requests 2, 3 and 4"
"Inventive step (no): auxiliary requests 5, 6, 9, 10, 12, 13
and 14"

Decisions cited:
G 0001/03, T 0629/90

Catchword:

-



Case Number: T 0086/05 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 22 September 2009

Appellant:

(Patent Proprietor)

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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 19 November 2004
revoking European patent No. 0616821 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman:

G. Rath

Members:

E. Waeckerlin

H. Preglau

Summary of Facts and Submissions

- I. This appeal lies from the decision of the opposition division to revoke European patent No. 0 616 821.
- II. Having regard to the main request, the opposition division concluded that the disclaimer contained in claim 1 of the patent as granted was not allowable under the terms of Article 123(2) EPC.

Regarding the first auxiliary request the opposition division held that the disclaimer contained in Claim 1 is not allowable either.

Claims 1 to 5 of the second and third auxiliary requests, respectively, were found to contravene the requirements of clarity and conciseness laid down in Article 84 EPC.

The subject-matter of claim 1 of the fourth auxiliary request did not involve an inventive step having regard to the disclosure of documents D3 (or D4 belonging to the same patent family), E 108 and D1.

The fifth auxiliary request was found to contravene Article 123(2) EPC.

The subject-matter of claim 1 of the sixth auxiliary request was found to lack an inventive step.

In the decision of the opposition the following references were cited *inter alia*:

D1 GB 2 225 205 A

D3 GB 928 594 A;

D4 US 3 150 050 A;

E 108 Stevenson, Richard: "CFCs - alternatives on the starting blocks". Chemistry in Britain, vol. 24, number 7, July 1988, p. 629 - 630;

III. Together with the grounds of appeal dated 29 March 2005 the appellant, at that time proprietor of the patent in suit, filed 14 amended sets of claims as the 1st to 14th auxiliary requests, respectively.

IV. With letters dated 9 August 2005 and 16 August 2005, respectively, the respondent, at that time opponent, filed extensive comments as well as various witness statements.

V. With letter dated 8 March 2006 the respondent requested to record the transfer of the patent in suit from the appellant to the respondent. The request was granted by the European Patent Office taking effect on 9 March 2006.

With letter dated 27 June 2006 the former respondent and now proprietor stated its withdrawal from involvement as opponent and respondent, and announced its intention to continue the appeal procedure as the now proprietor.

VI. Oral proceedings were held on 22 September 2009. As announced in a letter dated 20 September 2009, the

appellant (proprietor) did not attend the oral proceedings.

VII. The independent claims 1 and 2, respectively, of the main request correspond to claims 1 and 2 of the patent as granted and read as follows:

"1. A process for extracting one or more components from material of natural origin, but not including a process for removing oil from ready-to-eat potato-based and cereal-based products which have accumulated oil in a cooking process thereof, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;*
- b) collecting the charged solvent; and*
- c) removing the solvent to isolate the component."*

"2. A process for extracting one or more fragrant or flavour or pharmacologically active components from material of natural origin, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;*
- b) collecting the charged solvent; and*
- c) removing the solvent to isolate the component."*

The respective claims 1 of the first to fourteenth auxiliary request read as follows (emphasis added by the board):

First auxiliary request:

"1. A process for extracting one or more components from material of natural origin, but not including a process for **the removal of oil from oil-rich snack foods such as potato crisps and corn products**, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;
- b) collecting the charged solvent; and
- c) removing the solvent to isolate the component."

Second auxiliary request:

"1. A process for extracting one or more components from material of natural origin, **wherein said one or more components is/are natural constituents of the material of natural origin**, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;
- b) collecting the charged solvent; and
- c) removing the solvent to isolate the component."

Third auxiliary request:

"1. A process for extracting one or more components from material of natural origin, **wherein said one or more components are essential ingredients of said material of natural origin**, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;
- b) collecting the charged solvent; and
- c) removing the solvent to isolate the component."

Fourth auxiliary request:

"1. A process for **obtaining and preserving the essential ingredients of natural products which are responsible for their characteristic aroma, fragrance, flavour and pharmacological properties**, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;
- b) collecting the charged solvent; and
- c) removing the solvent to isolate the component."

Fifth auxiliary request:

Claim 1 is identical with claim 2 of the main request.

Sixth auxiliary request:

"1. A process for extracting one or more fragrant or flavour or pharmacologically active components from

*material of natural origin, **the material being selected from flowers, bulbs, corms, moulds, yeasts, fungi, algae, lichens, herbs, seeds, bark and buds**, the process comprising the steps of:*

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;*
- b) collecting the charged solvent; and*
- c) removing the solvent to isolate the component."*

Seventh and eighth auxiliary requests:

"1. A process for extracting one or more components from material of natural origin, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;*
- b) collecting the charged solvent;*
- c) removing the solvent to isolate the component;*
- d) **preserving the component.**"*

Ninth auxiliary request:

"1. A process for extracting one or more flavour or pharmacologically active components from material of natural origin, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;*
- b) collecting the charged solvent; and*
- c) removing the solvent to isolate the component."*

Tenth auxiliary request:

"1. A process for extracting one or more flavour components from material of natural origin, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;
- b) collecting the charged solvent; and
- c) removing the solvent to isolate the component."

Eleventh auxiliary request:

"1. A process for extracting one or more flavour from material of natural origin, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;
- b) collecting the charged solvent;
- c) removing the solvent to isolate the component;
- d) **preserving the flavour.**"

Twelfth auxiliary request:

"1. A process for extracting one or more fragrant or flavour or pharmacologically active components from material of natural origin, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component; **said solvent being cooled prior to contact;**
- b) collecting the charged solvent; and

c) removing the solvent to isolate the component."

Thirteenth auxiliary request:

"1. A process for extracting one or more fragrant or flavour or pharmacologically active components from material of natural origin, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;*
- b) collecting the charged solvent; and*
- c) removing the solvent to isolate the component.*
- d) **sequentially obtaining a variety of products from a single material of natural origin by varying the operating parameters of the process."***

Fourteenth auxiliary request:

"1. A process for extracting one or more fragrant or flavour or pharmacologically active components from material of natural origin, the process comprising the steps of:

- a) contacting the material with a non-chlorinated tetrafluoroethane solvent so as to charge the solvent with the component;*
- b) collecting the charged solvent;*
- c) removing the solvent to isolate the component;*
- d) **sequentially obtaining a variety of products from a single material of natural origin by varying the temperature of solvent used in the process."***

VIII. The arguments submitted by the appellant can be summarised as follows:

Claim 1 of the main request includes a disclaimer to the exclusion of "*a process for removing oil from ready-to-eat potato-based and cereal-based products which have accumulated oil in a cooking process thereof*". Such a disclaimer complies with the requirements set forth in the decision G 1/03 by the enlarged Board of Appeal for the following reasons:

- (a) It restores novelty by delimitating claim 1 against the document D1, which has to be regarded as an accidental anticipation under Article 52(2) EPC.
- (b) It is based on the field of the invention in combination with the definitions included in D1.
- (c) It is not relevant for the assessment of inventive step.

The appellant held that the disclaimer in claim 1 was allowable. For the same reasons the disclaimer contained in claim 1 of the first auxiliary request was also allowable.

Before the priority date of the patent in suit it was known to use the compound difluorodichloromethane ("*R12*") in the extraction of one or more fragrant, flavour and/or pharmacologically active components from materials of natural origin. In contrast to that, the process according to the patent in suit uses a non-chlorinated tetrafluoroethane solvent, in particular 1,1,1,2-tetrafluoroethane ("*R134a*").

The claimed invention is based on an appreciation by the inventor that "*R134a*" can advantageously be used as a selective solvent in a process for extracting one or

more components from material of natural origin. Despite the fact that the compound "R134a" had been known for nearly 40 years before the priority date of the patent in suit, none of the prior art discloses any application wherein its solvating power is exploited. In the prior art it was widely recognised that "R134a" was a very poor solvent. If the compound was nevertheless considered for use in refrigerant formulations and propellant formulations, this was not primarily because of its solvency power, but for other of its properties, in particular thermodynamic properties. The solvent properties of "R134a" were only investigated after the inventor of the patent in suit had disclosed that the compound could be used as a solvent.

Given that the skilled person was aware of the poor solvating power of "R134a", he could not have predicted that "R134a" could be used as a solvent in a process as described in the patent in suit. On the contrary he would have been deterred from using "R134a" in any technical area wherein the solvency properties of the material are important. Despite the fact that "R134a" had been known for some 40 years, the skilled person failed to appreciate that its solvency properties could be exploited, until the present invention opened up a whole host of potential opportunities.

The selection of "R134a" as a replacement for "R12" in extraction processes cannot be regarded as an obvious step, let alone as a *"one way street scenario"*.

The advantageous effects of the claimed invention are not just a *"bonus effect"*, since the skilled person had

no reason to expect an advantageous effect in the first place.

Document D3, which was regarded as the closest prior art in opposition proceedings, does not provide an incentive to use "R134a" in a process for extracting one or more components. There is no hint in D3 that "R134a" is better than any of the solvents described in the document, for example "R12", or that it even works at all.

All evidence before the priority date of the patent in suit suggested that "R134a" was useless as a solvent. The skilled person perceived "R134a" as very significantly different from "R12". Faced with the problem of finding a replacement for "R12" in the light of the *"Montreal Protocol"* or otherwise, the skilled person would not have considered to use "R134a" in a technical area where the solvating power is an essential and fundamental property to be exploited.

In the appellant's view the fact that the solvent properties of "R134a" can be used advantageously in extracting components from material of natural origin amounts to an inventive step.

The appellant submitted that the opposition division's conclusion to the contrary was based on hindsight.

- IX. The present appellant and proprietor of the patent did not submit any explicit requests regarding the maintenance of the patent. The board concludes, therefore, that the requests filed with the grounds of

appeal dated 29 March 2005 by the then proprietor of the patent are still valid.

These requests are worded as follows:

"The Patentee requests that the Patent be upheld on the basis of the Main Request in this Appeal which comprises the Patent as granted" (see page 1, paragraph 1.1 of the grounds of appeal) and *"we also submit Auxiliary Requests 1 to 14 in Annexes 1 to 14 hereto for consideration in the event the Board is not minded to accept the Main Request"* (see page 16, paragraph 13 of the grounds of appeal).

Reasons for the Decision

1. Procedural matters

- 1.1 In the present case the patent in suit has been transferred from the original proprietor and appellant to the respondent and opponent. Subsequently, the respondent withdrew its involvement as respondent and opponent with an aim to defending the case as proprietor and appellant.
- 1.2 Withdrawal of the opposition in appeal proceedings has no immediate procedural significance if the opposition division has revoked the European patent. In such cases the board has to re-examine the substance of the opposition division's decision of its own motion. When the board examines the decision, evidence may be cited which had been submitted by the opponent before the opposition was withdrawn (see e.g. T 629/90, OJ EPO 1992, 654, point 2.2 of the reasons).

2. *Allowability of the disclaimers - Claim 1 of the **main request** and the **first auxiliary request***

2.1 Claim 1 of the main request contains a disclaimer excluding "*a process for removing oil from ready-to-eat potato-based and cereal-based products which have accumulated oil in a cooking process thereof*" from the scope of the claim. This disclaimer was incorporated in claim 1 with letter dated 16 June 1998, i.e. during the course of the examination of the application, in order to establish novelty vis-à-vis the disclosure of D1 representing state of the art under Article 54(2) EPC. Since the disclaimer has not been disclosed in the application as originally filed, it is an "*undisclosed disclaimer*" within the meaning of the decisions (see G 0001/03, OJ EPO 2004, 413, point 2, first paragraph of the reasons).

2.1.1 The allowability of undisclosed disclaimers is governed by the principles set out in decisions G 1/93 and G 2/93. According to these decisions, a disclaimer may be allowable in order to restore novelty by delimiting a claim against an accidental anticipation, provided that the disclaimer does not remove more than is necessary to restore novelty. An anticipation has to be regarded as accidental if, from a technical point of view, the disclosure in question is so unrelated and remote that the person skilled in the art would never have taken it into consideration when working on the invention. Thus, it appears from the outset that the anticipation has nothing to do with the invention (see G 1/03, reasons 2.2.2, 2.3.4).

- 2.1.2 D1 relates to a process for reducing the oil content of oil-rich snack food, comprising *inter alia* the steps of:
- a) contacting the oil-rich snack food with a solvent so as to charge the solvent with the oil;
 - b) collecting the charged solvent; and
 - c) removing the solvent to isolate the oil.

Fluoroalkanes, for example "1,2,2,2-tertrafluoroethane", are mentioned as a suitable solvent (see D1, claim 1; page 4, lines 20 - 22; page 5, Table 1, solvent (i)). Furthermore it is stated in D1 that the use of liquefied gases as solvents has previously been known in the fields of flavour extraction and decaffeination (see page 3, lines 10 - 12).

- 2.1.3 The board does not accept the argument submitted by the appellant, according to which the skilled person would never have taken the disclosure in D1 into consideration, because in D1 the selection of the solvents is based on what the appellant considers to be a "*completely irrelevant physical property*", namely the normal boiling points (see grounds of appeal, pages 3 to 4, point 3.4).

The board considers that, even if the appellant's allegations were true, the skilled person would have had to read and evaluate the contents of D1 in the first place, in order to judge whether D1 was relevant, or not. Therefore it is not plausible to assume that the skilled person would never have taken D1 into consideration. Rather the skilled person would have regarded document D1 at least *prima facie* as relevant and far from being remote from and unrelated to the claimed process.

- 2.1.4 From an objective point of view, there are no doubts that the process disclosed in D1 relates to the same technical area as the subject-matter of the patent in suit, namely methods for the extraction of components, and that the process is substantially similar to the claimed process. Therefore it appears *prima facie* that D1 is highly relevant to the present invention. Consequently D1 cannot be regarded as an accidental anticipation within the meaning of the decision G 1/03 (see reasons 2.2).
- 2.2 Claim 1 of the **first auxiliary request** contains a disclaimer excluding "*a process for the removal of oil from oil-rich snack foods such as potato crisps and corn products*". Since the wording of the disclaimer has been taken literally from page 1, lines 3 - 5 of D1, there is no doubt that the excluded subject-matter forms part of the disclosure of D1. The board observes, however, that the disclaimer is not allowable because, as in the case of the main request, D1 is not an accidental anticipation.
- 2.3 For these reasons claim 1 of the main request and the first auxiliary request contravene Article 123(2) EPC.
3. *Allowability of the amendments of the **second to fourteenth auxiliary requests** - Article 123(2) and Article 84 EPC*
- 3.1 Claim 1 of the **second auxiliary request** has been amended to include the limitation that the products that are extracted are "*natural constituents of the material of natural origin*". The limitation to

"*natural*" constituents is not explicitly foreseen in the application as originally filed, wherein it is stated that the products of the claimed process are "*one or more components from material of natural origin*" (see claim 1 of the application as originally filed). The appellant argued, however, that the skilled person reading the specification would understand that the claimed process is concerned with extracting components which are "*natural*" constituents. In this respect the appellant referred to the description, in particular to page 2, lines 6, 11, 19, 21, 24 and 30 of the patent in suit (corresponding to page 1, lines 9 to 15 and 21 to 22; page 2, lines 1 to 2, 6 to 7, 11 to 12 and 26 of the application as originally filed), as well as to the examples. As far as the meaning of the term "*natural constituents*" is concerned, the appellant explained that the skilled person would understand that the specification is concerned with "*the constituents produced by nature*" (see letter dated 1 September 2004. Annex 5, page 2, second last and last lines).

- 3.1.1 The board notes that the passages of the description referred to by the appellant relate to the history of various methods for obtaining and preserving ingredients of natural products which are responsible for their characteristic aroma, fragrance, flavour and pharmacological properties. For the board, since these references refer to the background art and not specifically to the claimed invention, they do not provide a proper basis for the limitation of claim 1.

As far as the examples are concerned, they relate to three specific extracts, namely "*rose oil*" (example 1), "*natural vanillin*" (example 2) and "*oil or solutes*" of

ginger root (example 3), but not to "*natural constituents of the material of natural origin*" in general. Nor does the description contain any teaching that the claimed process is restricted to "*natural constituents*", thus excluding any components produced as a result of some chemical transformation and not by nature.

The board concludes, therefore, that the amendment of claim 1 extends beyond the content of the application as originally filed and, thus, contravenes Article 123(2) EPC.

- 3.1.2 Moreover, for the sake of argument, an objection on grounds of lack of clarity arises against the term "*natural constituents*". According to the appellant the term stands for constituents produced by nature (see above), occurring in natural products, for example flavours and fragrances from flowers, herbs and the like. However, the description refers to various materials which, although designated as "*natural materials*", are not produced by nature but are rather the result of chemical transformation by roasting or fermentation processes, in particular roasted coffee beans, black tea and vanillin (see patent, page 5, Table 1, lines 11 and 52 to 56; page 7, line 50).

Having regard to this ambiguity, the board concludes that the term "*natural constituents*" is not clear, thus giving rise to doubts as to its precise meaning in the context of the patent in suit. Therefore the term "*natural constituents*" contravenes Article 84 EPC.

- 3.2 Claim 1 of the **third auxiliary request** has been amended to refer to "*a process for extracting one or more*

components from material of natural origin, wherein said one or more components are essential ingredients of said material of natural origin". The amendment is based on page 1, lines 9 to 10 of the application as originally filed, where it is stated that "*for many generations man has sought to obtain and preserve the essential ingredients of natural products*".

3.2.1 The board notes that said statement forms part of the section of the description dealing with the background art. It does not specifically relate to the features of the claimed process. For this reason its incorporation into the wording of claim 1 is not in conformity with Article 123(2) EPC.

3.2.2 In addition, again an objection under Article 84 EPC arises against the term "*essential ingredients of material of natural origin*" in claim 1, because the meaning of the term "*essential ingredients*" is left open in the claim.

3.3 Claim 1 of the **fourth auxiliary request** has been amended to restrict the process to "*obtaining and preserving the essential ingredients of natural products which are responsible for their characteristic aroma, fragrance, flavour and pharmacological properties*". The wording incorporated in claim 1 is contained literally on page 1, lines 9 to 15 of the application as originally filed. But as in the case of the third auxiliary request it relates to the background art and not to the process as originally claimed. Therefore the amendment contravenes Article 123(2) EPC.

3.3.1 Furthermore neither claim 1 nor the description provides any specific information on how the expression "*preserving the essential ingredients*" has to be construed. Therefore, even taking the common general knowledge of the skilled person into account, it is not possible to derive in an unambiguous manner from the wording, whether preservation means just step c) of the process, i.e. the isolation of the extracted component, or whether some additional specific process step has to be performed. For this reason an objection of lack of clarity under Article 84 EPC arises against claim 1.

3.4 In the **fifth auxiliary request**, claim 1 as granted has been deleted, so that claim 2 as granted becomes claim 1 of the fifth auxiliary request. No objection under Article 123(2), (3) EPC or Article 84 arises against the amendment.

3.5 In the **sixth auxiliary request** the same amendment as in the fifth auxiliary request has been made. Furthermore, claim 11 as granted has been incorporated in claim 1. No objection under Article 123(2), (3) EPC or Article 84 arises against these amendments.

3.6 In the **seventh and eight auxiliary requests** claim 1 corresponds to claim 1 as granted, except that the disclaimer contained in claim 1 as granted has been deleted, and that a further process step d) directed to the preservation of the extracted component has been added.

3.6.1 Regarding the further process step d) of the claimed process, i.e. preserving the component, the board observes that there is no basis for the amendment in

the application as originally filed. Therefore the incorporation of said step into claim 1 contravenes Article 123(2) EPC.

- 3.7 In the **ninth auxiliary request** claim 1 as granted has been deleted and claim 2 as granted has been made claim 1 of the auxiliary request. Moreover "*fragrant components*" have been deleted from scope of the claim, thus leaving flavour or pharmacologically active components as extracts obtained by the process.

In the **tenth auxiliary request** claim 1 has been further restricted to flavour as extract.

No objections under Article 123(2) EPC arise against these amendments. Since they restrict the scope of the claims, no objection under Article 123(3) EPC arises either.

- 3.8 In the **eleventh auxiliary request** the same amendments as in the tenth auxiliary request have been effected to claim 1. Furthermore a process step d) directed to the preservation of the flavour components has been added.

- 3.8.1 Since the application as originally filed contains no basis for the incorporation of step d) into the claims (see above, seventh and eighth auxiliary requests), the amendment contravenes Article 123(2) EPC.

- 3.9 In the **twelfth auxiliary request**, claim 1 as granted has been deleted, so that claim 2 as granted becomes claim 1 of the twelfth auxiliary request. In addition, step a) of the process has been specified by stating that the solvent is cooled prior to contact. This

amendment is based on page 15, lines 15 - 18 of the application as originally filed.

The amendments are in conformity with Article 123(2), (3) EPC.

- 3.10 In the **thirteenth auxiliary request**, claim 1 as granted has been deleted, so that claim 2 as granted becomes claim 1 of the thirteenth auxiliary request. In addition, a further step d) directed to sequentially obtaining a variety of products from a single material of natural origin by varying the operating parameters of the process has been incorporated in the claim. This amendment is based on page 15, lines 23 - 25 of the application as originally filed.

The amendments are in conformity with Article 123(2), (3) EPC.

- 3.11 In the **fourteenth auxiliary request** the same amendments as in the thirteenth auxiliary request have been effected to claim 1, and further it has been specified that the operating parameter which is varied is the temperature of solvent.

This amendment can be derived from the statements on page 15, lines 19 to 22 in combination with page 18, lines 24 - 36 of the application as originally filed.

The amendments are in conformity with Article 123(2), (3) EPC.

4. *Novelty - Article 54 EPC*

- 4.1 During the opposition and appeal proceedings objections on grounds of lack of novelty were raised on the basis

of various published documents, as well as an alleged public prior use or oral disclosure of the claimed process.

4.2 The board is satisfied that the subject-matter according to the **fifth, sixth, ninth, tenth, twelfth, thirteenth and fourteenth auxiliary requests** is neither anticipated by the cited prior art, in particular documents D1, D3, D4 and E 108, nor by the alleged prior use or oral disclosure. There is no need to give details here since, as far as the above auxiliary requests are concerned, the appeal fails for lack of inventive step. Nevertheless the board observes that, although D3 reveals that in the process described therein non-chlorinated hydrofluorocarbons in general are suitable solvents, there is no specific disclosure in D3 of the non-chlorinated tetrafluoroethanes.

5. *Inventive step*

5.1 **Fifth auxiliary request**

D3 was considered to represent the closest prior art. The board can agree with the selection of this document as the starting point for the assessment of inventive step.

D3 relates to the same technical area as the patent in suit, namely to processes for extracting one or more fragrant components from material of natural origin, using liquefied fluorinated hydrocarbon aerosol propellants as solvents. According to D3 the material of natural origin is contacted with the solvent in order to charge the solvent with the extracted

components. Subsequently the charged solvent is collected and the product of the extraction is isolated by removing the solvent (see D3, claim 1; page 4, lines 57 - 76).

5.1.1 Therefore, starting from D3 as the closest prior art, the technical problem underlying the claimed process can be seen in providing an improved process for extracting one or more fragrant components from material of natural origin, the process comprising the steps of:

- (a) contacting the material with a solvent to charge the solvent with the components;
 - (b) collecting the charged solvent; and
 - (c) removing the solvent to isolate the components;
- the improvement being a reduced ozone depletion potential of the process and, thus, a better environmental compatibility.

5.1.2 As a solution to this technical problem the patent in suit proposes a process according to claim 1 of the fifth auxiliary request, which is characterised in that the solvent is selected from a specific group of fluorinated hydrocarbon aerosol propellants, namely non-chlorinated tetrafluoroethane, whereby 1,1,1,2-tetrafluoroethane ("R 134A", see patent in suit, page 4, lines 21 and 44) is of particular interest.

5.1.3 It is well known in the prior art that non-chlorinated tetrafluoroethane compounds such as 1,1,2,2-tetrafluoroethane ("R 134") and 1,1,1,2-tetrafluoroethane ("R 134a") have an insignificant ozone depletion potential. Therefore the board is

satisfied that the technical problem is effectively solved by the proposed solution.

- 5.1.4 It remains to be investigated whether the proposed solution was obvious to the skilled person having regard to the prior art.
- 5.1.5 D3 discloses that suitable aerosol propellants may belong to one of two distinct groups of compounds, namely "*chlorofluorinated hydrocarbons*" on the one hand, or "*fluorinated hydrocarbons*", i.e. non-chlorinated hydrofluorocarbons, on the other hand (see page 3, lines 25 - 29 in connection with claim 1). In view of the common general knowledge as reflected by the "*Montreal Protocol on Substances that Deplete the Ozone Layer*" the person skilled in the art was aware that compounds belonging to the group of "*chlorofluorinated hydrocarbons*" possess the disadvantage of a high ozone depletion potential. The "*Montreal Protocol*" is an international treaty which entered into force on 1 January 1989 and which was designed to protect the ozone layer. The parties to the treaty agreed to phase out the production and consumption of a number of substances, notably CFC and HCFC.
- 5.1.6 Certain solvents used in the process according to D3, in particular chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HCFC) such as dichloro-difluoromethane ("*R 12*"), 1,2-dichloro-1,1,2,2-tetrafluoroethane ("*R 114*") and 1,1-dichloro-1,2,2,2-tetrafluoroethane ("*R 114a*") (see D3, page 3, lines 40 - 41; 46 - 47; 57 - 59; 72 - 74), possess a particularly high ozone depletion potential leading to negative effects on the stratospheric ozone layer.

The skilled person was aware that the group of non-chlorinated hydrofluorocarbons encompassed by D3 was relatively "ozone friendly". Therefore, when confronted with the technical problem posed, the skilled person would have contemplated the use of non-chlorinated hydrofluorocarbons in the expectation of success.

- 5.1.7 As explained above, D3 reveals that non-chlorinated hydrofluorocarbon solvents are suitable in general, but there is no specific disclosure of non-chlorinated tetrafluoroethanes as solvents. However, D1 provides a pointer to the use of 1,1,1,2-tetrafluoroethane ("R 134a") for the purpose of extracting components of natural origin. Among the examples of suitable solvents given in D1, the compound "1,2,2,2-tetrafluoroethane" (corresponding to 1,1,1,2-tetrafluoroethane according to the systematic nomenclature) is specifically mentioned for use in the extraction process. Moreover it is stated in D1 that the "Normal Boiling Point" of the compound is -26 °C and lies within the preferred vapour pressure range (see page4, lines 23 - 25; page 5, Table 1, compound i).
- 5.1.8 Under these circumstances it was obvious to the skilled person to select 1,1,1,2-tetrafluoroethane ("R 134a") as solvent in the extraction process of D3 and, thus, to arrive at the process of claim 1 of the fifth auxiliary request.
- 5.1.9 It should also be mentioned that the suitability of 1,1,1,2-tetrafluoroethane ("R 134a") as a replacement for chlorofluorocarbons such as "R 12" in various technical areas including aerosol propellants and

solvents is also emphasised in document E 108 (see page 629, column in the middle, last paragraph; page 630, left hand column, table and first full paragraph, lines 1 - 5).

5.1.10 The appellant argued that there existed a prejudice in the prior art against the use of "R 134a" as a solvent. In support of this, the following arguments were submitted:

(i) Despite the fact that the compound "R 134a" was known for nearly 40 years before the priority date of the patent-in-suit, it had not been proposed in any application wherein its solvating power was an essential property.

(ii) Before the priority date it was widely recognised that "R 134a" was a poor solvent and had a very poor solvating power. The compound was therefore only considered for use in applications, where the thermodynamic properties were essential, e.g. in the area of refrigerants or aerosol propellants, but not as a solvent.

(iii) In view of the prior art and the knowledge as regards the poor solvency characteristics of "R 134a" a skilled person was deterred from using "R 134a" in processes in extraction processes.

5.1.11 The board does not accept this line of argumentation. As to point (iii) above: The fact that "R 134a" was recognised, in general terms, as a "poor solvent", does not mean at all that the compound was *a priori* unsuitable as a solvent. On the contrary in extraction processes the solvent needs to be selective in order to meet the requirement of sufficient selectivity. In fact, very good solvents would dissolve undesirable

components in addition to the desired fragrant, flavour or pharmacologically active components. Accordingly it is emphasised in D3 that the essence of the idea of the process described therein was "*to utilize the **limited solvency** of fluorinated hydrocarbon propellents for perfume oils to fractionate the perfume oils*" (page 2, lines 62 - 70; emphasis added by the board). Far from establishing a prejudice, D3 teaches on the contrary that fluorinated hydrocarbons as a class are poor solvents and that it is this property that enables them to be selective. That "R 134a" is, in fact, a suitable solvent in spite of its limited solvency power is confirmed by the disclosure of D1, wherein "R 134a" is described as a selective solvent in the extraction of oil from potato-based or cereal-based food products. Moreover it can be derived from D1 that the solvents described therein possess a considerable solubility for "*flavours or seasonings*". As is stated in D1 "*seasoning or flavour compositions are "washed out", i.e. extracted, together with the oil* (see page 3, lines 4 - 9).

- 5.1.12 As to point (ii) above: The appellant's allegation that in certain applications, such as aerosol propellants, solvents are selected primarily on the basis of "*thermodynamic properties*", whereas in applications like extraction the selection is based on "*solvating power*", appears to be arbitrary. In this respect the board observes that no clear distinction can be made between "*thermodynamic properties*" and "*solvating power*". Indeed, the "*solvating power*" of a compound forms part of its thermodynamic properties and is governed by the laws of thermodynamics. Furthermore the "*Normal Boiling Point*", which is essential for the

selection of a solvent, is clearly a thermodynamic property.

- 5.1.13 As to point (i) above: Regarding the long period of time between the first disclosure of the compound "R 134a" as such and its application in extraction processes, the board is of the opinion that this cannot be regarded as an indication of a prejudice. As was pointed out, conventional solvents such as "R 12" were successfully used in extraction processes for a long period of time. No incentive was provided to the persons skilled in the art to switch from "R 12" to non-chlorinated solvents like "R 134a" until they were compelled to do so by the ban on compounds having a high ozone depletion potential, which culminated in the entry into force of the "Montreal Protocol" in 1987. It is significant that "R 134a" was not produced on a large scale basis until about 1990. Before that date, there may have been limitations regarding the commercial availability of "R 134a", but there is no evidence on file that there existed technical reasons which deterred the skilled person from considering the use of "R 134a" as a selective solvent in the extraction process of D3.
- 5.1.14 In support of the inventive step of the claimed process, the appellant argued further that the process offers a number of advantages, particularly the ability to directly and selectively extract mobile liquid fragrant oils but not solid waxy concretes and other non-fragrant materials normally extracted with conventional solvents (see patent-in-suit, page 6, paragraphs [0034] to [0038]). In the appellant's view these advantages cannot be dismissed as a mere "*bonus effect*", because

the conditions for the existence of a "*bonus effect*" set out in decision T 21/81 were not met.

5.1.15 For the board, whether the alleged advantages of the claimed process are a "*bonus effect*", or not, is a question which does not arise in the present case. Before being able to decide whether a technical advantage is crucial to the invention or merely a "*bonus effect*", it has to be established in the first place that the advantage exists over the whole scope of the claims.

5.1.16 The board is of the opinion that the evidence on file is not sufficient in this respect. According to claim 1 of the fifth auxiliary request both the starting materials, i.e. "*material of natural origin*", and the products of the process, i.e. "*one or more fragrant or flavour or pharmacologically active components*" are defined in a completely unspecific manner and in extremely broad terms. Apart from the requirement that some fragrant, flavour or pharmacological activity has to be present, there are no limitations regarding the composition, properties and structure of the extracted components. Thus, claim 1 aims at a whole wealth of diverse materials which may be either used as a starting material or obtained as a product. It is apparent that the advantages relied upon by the appellant are achieved only in cases where the starting materials, the products and the operating parameters of the process are selected properly.

5.1.17 In view of the fact that the non-chlorinated tetrafluoroethane compounds used in the claimed process are acting as selective solvents, it follows that only

products having a reasonable solubility in said solvents can be obtained.

The board does not deny that the examples given in the patent-in-suit support the argument according to which the claimed process offers technical advantages (see pages 7 to 8, paragraphs [0051] to [0058]). However, it is not credible that such advantages are achieved over the whole scope of claim 1 on the basis of the available evidence. Furthermore it is on the contrary likely that claim 1 encompasses a large number of embodiments where the technical advantages are not achieved. The available experimental evidence, as already explained above, supports the presence of advantageous effects only for specific combinations of starting materials and products, and even then not for all possible operating conditions.

Thus, the appellant has not discharged its burden of proving that the effect on which it relied for the assessment of an inventive step is displayed by all claimed embodiments of the process.

5.1.18 For all these reasons, and in the absence of evidence to the contrary, the board concludes that the process according to claim 1 of the fifth auxiliary request does not involve an inventive step as required by Articles 52(1) and 56 EPC.

5.2 **Sixth, ninth, tenth and twelfth to fourteenth auxiliary requests** - inventive step

5.2.1 For the same reasons as in the case of the fifth auxiliary request, the respective claims 1 of the **sixth,**

ninth, tenth and twelfth auxiliary requests do not involve an inventive step. None of the additional features contained in these claims has a bearing on the issue of inventive step.

5.2.2 The respective claims 1 of the **thirteenth and fourteenth auxiliary requests** contain the additional feature that a variety of products is obtained sequentially from a single material by varying the operating parameters, in particular the temperature of solvent. This feature does not support the presence of an inventive step, however, because it is well known in the prior art that the variation of the operating parameters leads to changes of the composition of the product obtained in extraction processes. For example it is stated in D3 that the extraction may be conducted at various temperatures at, below or above room temperature, or at high temperatures. D3 discloses also that the operating temperature has an impact on the purity and, thus, the composition of the obtained product (see page 4, lines 41 to 52). Having regard to the teaching of D3 and in the light of the common general knowledge of the skilled person, a sequential change of the operating parameters resulting in a sequence of products having different compositions is an obvious embodiment of the process. The board observes in this respect again, that the claims are not restricted to specific products, let alone to a sequence of various specific products.

6. *Conclusions*

- 6.1 In summary, the subject-matter of the **main request and the first auxiliary request** has to be refused because the disclaimer contained in claim 1 is not allowable.
- 6.2 The **second, third and fourth auxiliary requests** are not in conformity with Article 123(2) EPC and Article 84 EPC.
- 6.3 The **seventh and eighth auxiliary requests** are not in conformity with Article 123(2) EPC in combination with Article 123(3) EPC.
- 6.4 The **eleventh auxiliary request** is not in conformity with Article 123(2) EPC.
- 6.5 The **fifth, sixth, ninth, tenth, twelfth, thirteenth and fourteenth auxiliary requests** are not allowable, because the claimed subject-matter does not involve an inventive step as required by Article 52(1) EPC and 56 EPC.

Consequently all requests have to be refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

C. Vodz

G. Raths