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**Datasheet for the decision
of 4 August 2011**

Case Number: T 0433/08 - 3.3.05

Application Number: 00948791.9

Publication Number: 1261398

IPC: A62D 1/00

Language of the proceedings: EN

Title of invention:

Use of fluorinated ketones in fire extinguishing compositions

Patentee:

3M Innovative Properties Company

Opponent:

Solvay Fluor GmbH

Headword:

Fluorinated ketones/3M

Relevant legal provisions:

EPC Art. 52(1), 54(1)(2), 56, 111(1), 113(1), 123(2)(3)

EPC R. 103(1)a)

RPBA Art. 13(1)(3)

Keyword:

"Reimbursement of appeal fee: no - not equitable"

"Remittal (direct remittal for further prosecution: no -
remittal with order to maintain patent in amended form: yes)"

"Inventive step (main request, 1st to 3rd auxiliary request): no
- improvement not proven - reformulation of the problem -
obvious further method"

"Inventive step (4th auxiliary request): yes - evidence for
improvement - non-obvious solution to the technical problem"

Decisions cited:

-

Catchword:

-



Case Number: T 0433/08 - 3.3.05

DECISION
of the Technical Board of Appeal 3.3.05
of 4 August 2011

Appellant 1:
(Patent Proprietor)
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(Opponent)
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Decision under appeal:
Interlocutory decision of the Opposition
Division of the European Patent Office posted
28 December 2007 concerning maintenance of
European patent No. 1261398 in amended form.

Composition of the Board:

Chairman: G. Rath
Members: B. Czech
D. Prietzel-Funk

Summary of Facts and Submissions

I. The appeals are from the interlocutory decision of the opposition division concerning maintenance of European Patent No. 1 261 398 in amended form.

II. Independent claims 1 and 8 held allowable by the opposition division read as follows (amendments compared to claims 1 and 9 as granted highlighted by the board):

*"1. A method of extinguishing a fire comprising applying to said fire at least one nonflammable composition comprising a fluorinated ketone compound containing up to two hydrogen atoms and having a boiling point in a range of about 0°C to about 150°C, in an amount sufficient to extinguish the fire, **wherein said fluorinated ketone compound is selected from the group consisting of fully fluorinated ketones in which all the hydrogen atoms in the carbon backbone have been replaced with fluorine, ketones that are fully fluorinated except for one or two hydrogen atoms remaining on the carbon backbone and (CF₃)₂CFC(O)CF₂Cl.**"*

*"8 9. A method of preventing fires or deflagration in an air-containing enclosed area containing combustible materials comprising introducing into said area a non-flammable extinguishing composition comprising a fluorinated ketone compound containing up to two hydrogen atoms, optionally having up to two halogen atoms selected from chlorine, bromine, iodine and a mixture thereof, and *[sic]* optionally containing one or more catenated heteroatoms interrupting the carbon backbone of the fluorinated ketone, and maintaining*

said composition in an amount sufficient to suppress combustion of combustible materials in the enclosed area."

III. The prior art documents cited in the opposition proceedings include the following:

D1bis: NIST Technical Note 1279, "Construction of an exploratory list of chemicals to initiate the search for halon alternatives", August 1990;
and

D2: Excerpt from the study "Investigation of unique organometallic compounds as potential fire extinguishants" by R.L.Hough; 1969.

IV. In the contested decision the opposition division concluded that the patent as amended according to the auxiliary request then on file met the requirements of the EPC.

The opposition division found inter alia

- that the method according to claim 1 as granted lacked novelty over document D2;
- that the invention as defined in claims 9 and 10 as granted was sufficiently disclosed;
- that the claims according to the auxiliary request then on file were not objectionable under Article 100(c) EPC;
- and that the subject-matter of the claims according to the auxiliary request then on file was novel even in view of document D1bis.

Moreover, it referred to the following document, which had already been cited in the examination proceedings:

E2: Database WPI, Section Ch, Week 199925, Derwent publications, Class E16, AN 1999-290791.

The opposition division held that in the light of document E2, taken as the closest prior art rather than document D2, the claimed subject-matter was also inventive.

- V. In its statement of grounds of appeal dated 25 April 2008, appellant 1 (the patent proprietor) requested the maintenance of the patent as granted. It also filed an amended set of claims as an auxiliary request and submitted *inter alia* that the amended claim 1 according to the latter request was clearly novel over document D2.

Claim 1 according to said auxiliary request reads as follows (amendments compared to claim 1 as granted highlighted by the board):

*"1. A method of extinguishing a fire comprising applying to said fire at least one nonflammable composition comprising a fluorinated ketone compound containing up to two hydrogen atoms and having a boiling point in a range of about 0°C to about 150°C, in an amount sufficient to extinguish the fire, **wherein the fluorinated ketone has a total of from 4 to 8 carbon atoms.**"*

- VI. In its statement of grounds of appeal, appellant 2 (the opponent) submitted that document E2, considered as the closest prior art in the contested decision, had not been previously referred to in the opposition proceedings. Its right to be heard had thus been

violated. Appellant 2 therefore requested the remittal of the case, in order to be able to present its case before two instances, as well as the reimbursement of the appeal fee.

As an auxiliary request, appellant 2 requested the full revocation of the patent in suit. In this respect, it maintained its objection under Article 100(b) EPC regarding claim 9 as granted (main request of appellant 1 then on file; same wording as claim 8 under point II above). It also maintained that the subject-matter of claims 1 and 9 as granted lacked novelty over document D2. Moreover, it held that the claimed subject-matter according to both requests of appellant 1 then on file was obvious, starting from either document D2 or document E2 as the closest prior art. In this connection, it also referred to document D1bis and the following newly filed documents:

E2': JP 11-276634 A (Japanese published application corresponding to document E2), a machine translation thereof and the PAJP abstract thereof;

D13: FR 2 003 870 A;

D14: G. Kauschka et al.; "Berechnung von thermodynamischen Stoffdaten und Reaktionsgleichgewichten bei Poly- und Perhalogenwasserstoffen"; Zeitschrift für Chemie, 16. Jg. (1976), Heft 10, pages 377 to 385; and

D15: A DuPontTM information leaflet (2 pages) entitled "Some facts you should know about Novec 1230 and ECARO-25"; published in 2004 or later.

VII. Under cover of a further letter, appellant 2 filed document

D2bis: A complete copy of document D2.

VIII. Under cover of its reply of 12 November 2008, appellant 1 filed three amended sets of claims as its 3rd to 5th auxiliary requests, the 2nd auxiliary request being (implicitly) that the appeal of appellant 2 be dismissed.

In its reply, appellant 1 submitted that a remittal of the case and/or a reimbursement of the appeal fee was not equitable since the introduction of document E2 by the opposition division was to the advantage of appellant 2. Appellant 1 also rebutted the objections raised by the adverse party by providing detailed comments on novelty, inventive step and sufficiency of disclosure. In this connection, it referred to two graphs ("Annex 1") and to the following post-published documents:

"Annex 2": "NovecTM 1230 fire protection fluid" -
Summary of toxicity studies; 2002

"Annex 3": Confidential results of a study ("ST-53") on
the inhalation toxicity of "L-16141"
(C7 diisopropyl ketone); 2001

"Annex 4": Final report of a study ("ST-58") on the
inhalation toxicity of L-15947 (Perfluoro C7
ketone) performed in 2001

IX. In response to the summons for oral proceedings, appellant 1 filed five sets of claims as its new main and 2nd to 5th auxiliary requests under cover of a letter dated 6 June 2011. Under cover of the same letter it also filed the following document:

D16: Declaration by Mr Owens dated 2 June 2011.

X. In its letter dated 19 July 2011, appellant 2 informed the board that it would not be present at the oral proceedings. It did not specifically comment on the pending requests and further arguments of appellant 1 but maintained its request for revocation of the patent in its entirety.

XI. In a communication issued in preparation for the oral proceedings, the board drew the parties' attention to several points of potential importance, inter alia to the conditions under which a request for reimbursement of the appeal fee was possible.

XII. In response thereto, appellant 2 clarified its requests in a fax received on 26 July 2011.

XIII. In reaction to the board's communication, under cover of a letter dated 2 August 2011, appellant 1 filed five sets of claims constituting its main and 1st to 4th auxiliary requests, replacing the requests previously on file.

Claim 1 according to the new main request has the same wording (see point V above) as claim 1 according to the auxiliary request filed by appellant 1 under cover of its statement of grounds of appeal.

Claim 1 according to the 1st auxiliary request has the same wording (see point II above) as claim 1 held allowable by the opposition division.

Claim 1 according to the 2nd auxiliary request differs from claim 1 according to auxiliary request 1 only in that the expression "in which all the hydrogen atoms" was replaced by "in which all ~~the~~ hydrogen atoms".

Claim 1 according to the 3rd auxiliary request differs from claim 1 according to the 2nd auxiliary request in that the definition of the fluorinated compounds to be used was amended to read as follows:

"wherein said fluorinated ketone compound is selected from the group consisting of fully fluorinated ketones in which all hydrogen atoms in the carbon backbone have been replaced with fluorine, ~~ketones that are fully fluorinated except for one or two hydrogen atoms remaining on the carbon backbone and (CF₃)₂CFC(O)CF₂Cl.~~"

Claim 1 of the 4th auxiliary request reads as follows (amendments compared to the combined wordings of claims 1 and 7 as granted are made visible by the board):

"1. A method of extinguishing a fire comprising applying to said fire at least one nonflammable composition comprising a fluorinated ketone compound containing up to two hydrogen atoms and having a boiling point in a range of about 0°C to about 150°C, in an amount sufficient to extinguish the fire, wherein the fluorinated ketone is at least one compound selected from CF₃CF₂C(O)CF(CF₃)₂, (CF₃)₂CFC(O)CF(CF₃)₂, ~~(CF₃)CFC(O)CF(CF₃)₂~~, CF₃(CF₂)₂C(O)CF(CF₃)₂,

~~CF₃(CF₂)₃C(O)CF(CF₃)₂, CF₃(CF₂)₅C(O)CF₃,
CF₃CF₂C(O)CF₂CF₂CF₃, CF₃C(O)CF(CF₃)₂, **HCF₂CF₂C(O)CF(CF₃)₂,**
(CF₃)₂CFC(O)CF₂Cl ~~perfluorocyclohexanone, and mixtures
thereof".~~~~

Independent claim 2 of the 4th auxiliary request reads as follows (amendments compared to claim 9 as granted made apparent by the board):

~~"2 9. A method of preventing fires or deflagration in an air-containing enclosed area containing combustible materials comprising introducing into said area a non-flammable extinguishing composition comprising a fluorinated ketone compound **as defined in claim 1, and containing up to two hydrogen atoms, optionally having up to two halogen atoms selected from chlorine, bromine, iodine and a mixture thereof, and optionally containing one or more catenated heteroatoms interrupting the carbon backbone of the fluorinated ketone,** and maintaining said composition in an amount sufficient to suppress combustion of combustible materials in the enclosed area."~~

Claim 3 of the 4th auxiliary request depends on the independent claim 2 quoted above.

XIV. In a further fax received by the board on the morning of the day of the oral proceedings, appellant 2 informed the board that it did not intend to comment on the submission of appellant 1 dated 2 August 2012.

XV. Oral proceedings were held on 4 August 2011 in the absence of appellant 2.

XVI. Insofar as they concern the final requests of the appellants and the specific issues to be decided by the board, the further arguments of the parties can be summarised as follows:

Appellant 1 held that the fire prevention method according to claim 9 as granted was sufficiently disclosed, since the skilled person knew how to achieve a composition in gaseous form or in the form of a mist (paragraphs [0009] and [0024] of the patent in suit).

Appellant 1 considered that the claimed methods were novel and also inventive, irrespective of whether document D2/D2bis or document E2/E2' was considered to constitute the closest prior art.

At the oral proceedings, appellant 1 argued that starting from the method disclosed in document E2/E2', which disclosed the use of specific, not fully fluorinated ketones, the technical problem consisted in providing a method using compounds having an improved extinguishing performance in terms of their "mass ratios to HALONTM 1211" ("mass ratio" hereinafter) while having a low atmospheric lifetime and a low toxicity and being obtainable at similar manufacturing costs. The improved extinguishing performance was apparent when comparing examples 1, 6, 9 (same number of C atoms) or example 4 (comparable structure) with example C13 (compound according to E2). With respect to the alleged low toxicity of the compounds used according to the patent in suit, appellant 1 referred to the studies reported in Annexes 2 to 4 (dealing with the compounds according to examples 1, 2 and 7 of the patent in suit), which were representative of the compounds according to

the claims at issue, and to paragraph [0013] of the description of the patent in suit. There was no evidence on file proving the desired low toxicity of the compounds disclosed in E2/E2' or disproving the low toxicity of the compounds used according to the claims at issue, which had not been called into question by appellant 2. Concerning the low atmospheric lifetime, appellant 1 also referred to paragraph [0013] of the description of the patent suit. At the oral proceedings, referring to the indications in comparative example C12, appellant 1 also submitted that the compounds used according of the invention could be prepared at comparable costs.

E2/E2' taught very specific fluorinated ketones with non-fluorinated methyl or ethyl groups. Replacing these groups by more fluorinated groups was not obvious for the skilled person. Referring to the declaration D16 and the graphs in document "Annex 1", appellant 1 contested that the fire extinguishing effectiveness could generally be expected to increase with increasing heat capacity, as alleged by appellant 2. There was no correlation between the molecular complexity of the extinguishing agent, i.e. its molecular weight, heat capacity and its extinguishing effectiveness expressed as mass ratio.

Both documents D2/D2bis and D1/D1bis taught away from the claimed invention. With respect to document D2/D2bis, appellant 1 argued that it actually pointed away from using fluorinated ketones. The specific ketones mentioned in D2 were merely referred to as comparative compounds and displayed a very poor extinguishing performance. Document D1bis did not

suggest actually using the fluorinated ketones as extinguishers as defined in the claims at issue since it did not contain indications as to what the expected extinguishing capabilities of these compounds would be. D1bis merely suggested studying the performance of the listed ketone compounds in order to gain a better understanding of the underlying principles of fire suppression. Moreover, D1bis suggested that fully fluorinated ketones could not be expected to have a low toxicity and thus dissuaded the skilled person from going in this direction.

Appellant 2 held that a fire prevention method according to claim 9 as granted was insufficiently disclosed since the skilled person could not gather from the patent in suit (paragraphs [0004], [0007] and [0029]) how ketones which were solid or liquid at room temperature could be used as "*clean extinguishing agents*" leaving no residue, let alone when supplied continuously.

Document D13 proved that the two fluorinated ketones disclosed in D2bis were known and available to the skilled person at the publication date of document D2bis.

The subject-matter of the claims as granted and of the claims restricted to the use of C4 to C8 compounds (main request at issue) was not inventive.

Starting from document D2/D2bis as the closest prior art, the problem consisted in providing further flame-extinguishing fluorinated ketones. From D1bis it could be gathered that a fire-extinguishing compound having a

higher heat capacity was more effective in reaching the combustion-suppressing limit heat capacity of the mixture (fuel/oxidizer/inert) of 201 J/(mole-O₂ K), that heat capacity generally increased with increasing molecular complexity, and that (iC₃F₇)₂CO had a higher heat capacity than the compound (CF₃)₂CO. Hence, it was obvious to replace the fluorinated ketones mentioned in D2bis by a fluorinated ketone having a higher heat capacity due to a higher complexity of the molecule, such as the compound (iC₃F₇)₂CO expressly mentioned in D2bis, to achieve a flame-extinguishing effect even at lower concentrations.

Similarly, starting from document E2 as the closest prior art, the problem also consisted in providing further flame-extinguishing fluorinated ketones. An improvement in terms of the required extinguishing concentration and/or the mass ratio to HALONTM 1211 was not achieved for all the compounds that could be used according to the claims at issue. It was obvious to use ketones which were more fully fluorinated than the ones disclosed in E2 since the former had a higher heat capacity, as apparent from document D14.

In this context, appellant 2 also referred to the post-published document D15 in order to show that an improvement in terms of the "mass ratio" value was not necessarily achieved for every fluorinated ketone compound covered by claim 1.

XVII. Appellant 1 requested that the decision under appeal be set aside and that the patent be maintained on the basis of the claims according to the main request or, alternatively, on the basis of the claims according to

one of the 1st to 4th auxiliary requests, all requests filed under cover of the letter dated 2 August 2011.

Appellant 2 requested in writing as its main request that the decision under appeal be set aside (implicitly), that the case be remitted to the opposition division and that the appeal fee be reimbursed or, as an auxiliary request, that the decision under appeal be set aside and the European patent be revoked in its entirety.

Reasons for the Decision

Procedural issues

1. Admissibility of the final requests of appellant 1
 - 1.1 The claims according to the final requests at issue were filed on 2 August 2011, i.e. two days before the oral proceedings. They differ from the claims according to the requests that were previously on file (filed on 6 June 2011) only in that the obviously incorrect formula $(CF_3)CFC(O)CF(CF_3)_2$ was deleted from the claims comprising it, and in that the formula $(CF_3)_2CFC(O)CF(CF_3)_2$ was inserted in the latter claims (namely the respective claims 6 of the main and 1st auxiliary requests, and the respective claims 3 of the 2nd and 3rd auxiliary requests) provided it was not already present therein (as in claim 2 of the 4th auxiliary request).
 - 1.2 The filing of these amended requests was occasioned by an objection raised in the board's communication with

regard to the incorrect formula and can be considered as an attempt to overcome this objection. Neither these last amendments made to the claims, nor the other amendments to the claims made at earlier stages of the appeal proceedings pose a prima facie allowability problem. Moreover, they are of no particular complexity and could be anticipated by the board and the opposing party.

1.3 Appellant 2 did not object to the filing of any of the earlier requests of appellant 1, and even expressly abstained from commenting on the final requests of appellant 1 filed on 2 August 2011.

1.4 Considering these particular circumstances, the board decided to admit the last requests of appellant 1 despite their very late filing on 2 August 2011, pursuant to Article 13(1)(3) RPBA.

2. Admissibility of late-filed evidence

2.1 Both parties filed additional evidence (documents E2', D13 to D16, "Annex 2", "Annex 3", and "Annex 4") in the course of the appeal proceedings.

2.2 Neither of the parties requested the non-admittance of one or more of these newly filed documents. In the board's judgement, their filing did not raise any particularly complex issues and sufficient time was available for considering them during the preparation for the oral proceedings.

2.3 Considering these particular circumstances, the board thus decided to admit said late-filed evidence in accordance with Article 13(1) and (3) RPBA.

Allowability of the amendments to the claims - All requests of appellant 1 - Article 123(2)(3) EPC

3. The board is satisfied that the post-grant amendments made to the claims according to all the requests of appellant 1 meet the requirements of Article 123(2) and (3) EPC. Appellant 2 did not raise objections under Article 123(2)(3) EPC either.

3.1 More specifically, the amendments to the claims according to the requests of appellant 1 find a basis in the following parts of the application as filed (published as WO 01/05468 A2):

3.1.1 Amended claim 1 according to the main request is based on a combination of claims 1 and 4 of the application as filed.

3.1.2 The respective claims 1 according to the 1st, 2nd and 3rd auxiliary requests find their basis in claim 1 and in the description, page 3, line 28, page 4, lines 26 to 29, page 28, examples 6 and 8, of the application as filed.

3.1.3 In the dependent claims corresponding to granted claim 7, i.e. the respective dependent claims 6 according to the main request and the 1st auxiliary request 1, and the respective claims 3 according to the 2nd and 3rd auxiliary requests, the erroneous second formula was deleted and the formula of the compound of

example 2 was inserted. Said deletion is not objectionable and said insertion finds a basis in example 2 and claim 7 of the application as filed, which recite said inserted formula.

3.1.4 Claim 1 according to the 4th auxiliary request is based on a combination of claims 1 and 7 of the application as filed. Moreover, some of the fluorinated ketones listed in said claim 7 were deleted. The introduction of additional compound formulas is based on examples 2, 6 and 8 of the application as filed.

3.2 Compared to claim 1 as granted, the ambit of the respective claims 1 according to all requests is narrower in terms of the fluorinated ketone compounds to be used.

In the amended independent claims corresponding to granted independent claim 9, i.e. the respective claims 5 according to the 2nd and 3rd auxiliary requests, and claim 2 according to the 4th auxiliary request, the previous definition of the fluorinated ketone compounds to be used was limited by virtue of a reference to the ketones defined in the respective claims 1, whereby the ambit of said claims is narrower compared to claim 9 as granted.

3.3 The board is thus satisfied that the amendments to the claims are not objectionable under Article 123(2)(3) EPC.

Main request of appellant 1

4. Novelty - Claim 1

4.1 The sole novelty objection raised by appellant 2 in the course of the appeal proceedings (inter alia against claim 1 as granted) was based on document D2/D2bis.

4.2 Document D2bis (see title page) is a report dealing with organometallic compounds as potential fire-extinguishing agents. For comparative purposes, the specific compounds investigated by the authors include two halogenated ketones, namely $\text{CF}_3\text{COCF}_2\text{Cl}$ and $(\text{CF}_3)_2\text{CO}$ (see Table 2 on page 21).

However, D2 does not implicitly or explicitly refer to a C_4 to C_8 fluorinated ketone, let alone to its use as a fire-extinguishing agent. Hence, D2 does not disclose a method according to claim 1 at issue.

4.3 The board is also satisfied that none of the other prior art documents relied upon by appellant 2 discloses a method with all the features of present claim 1.

4.4 The subject-matter of claim 1 is thus novel (Articles 52(1) and 54(1)(2) EPC).

5. Inventive step - Claim 1

5.1 The invention relates to a method of extinguishing a fire using extinguishing compositions comprising a fluorinated ketone compound (see claim 1).

According to the patent in suit (see paragraph [0007]), the fluorinated ketones compounds are suitable as a substitute for the known bromine-containing agents in view of their good extinguishing capabilities and environmental acceptability.

5.2 Document E2/E2' can be considered to represent the closest prior art. Both parties presented an argumentation taking this document as the starting point in the assessment of inventive step.

5.2.1 As acknowledged by appellant 1 at the oral proceedings, the authors of document E2, like the present inventors, aimed at providing substitute fire extinguishing compounds having a low atmospheric lifetime and being acceptable in toxicity (see E2': PAJP abstract and in paragraph [0002] of the translation, the reference to "safety to a living body"). Even absent any data, appellant 1 accepted that it was reasonable to assume a low atmospheric lifetime for the compounds to be used according to E2.

5.2.2 Document E2/E2' (see PAJP abstract) teaches the use of specific fluorinated ketones as fire-extinguishing agents. More particularly, E2 discloses the use of ketones represented by the formula $C_nH_mF_{2n+1-m}COR^1$, wherein $n = 4$ to 8 , $m = 0$ or 1 , and R^1 is a methyl or ethyl group. According to document E2/E2', these compounds are suitable as a substitute for the conventionally used "halon" agents since they have an equivalent fire-extinguishing capacity but, being bromine-free, less influence on the global warming which is due to the destruction of the ozonosphere (see E2': PAJP Abstract and paragraph [0010] of the

translation). The fluorinated ketones used are stated to have a shorter atmospheric lifetime than perfluorinated hydrocarbons due to the presence of a hydrogen atom and of the carbonyl bond.

5.3 Appellant 1 maintained at the oral proceedings that starting from the disclosure of document E2/E2' as the closest prior art, the technical problem consisted in the provision of a method of extinguishing a fire using different fluorinated ketones having an improved fire-extinguishing performance whilst having a low toxicity, a short atmospheric lifetime and comparable costs of manufacture.

5.4 As a solution to this technical problem, the patent proposes a method of extinguishing a fire according to claim 1 at issue, which is characterised in that the fluorinated ketone to be used is a compound *"containing up to two hydrogen atoms and having a boiling point in a range of about 0°C to about 150°C"* and having *"a total of from 4 to 8 carbons atoms"*.

5.5 As to the success of the proposed solution, the board observes the following:

i) Concerning the environmental acceptability, it was not disputed and it is plausible that the compounds as defined in claim 1 can be expected to have a short atmospheric lifetime as indicated in [0013] of the patent in suit (at least compared to bromine containing "halons"), considering that they contain no bromine but comprise a carbonyl group expected to have impact on their photolysis (see E2': PAJP abstract and D1bis,

page 49, bullet point "1. Justification", the first two paragraphs).

ii) As pointed out by appellant 1 with reference to comparative example C13, the compounds referred to in claim 1 at issue can be manufactured by similar methods and hence at comparable manufacturing costs to the ketones according to document E2/E2'.

iii) Concerning the alleged improvement in extinguishing efficiency, it can be gathered from the experimental data reported in the patent in suit (see table 1) that not all of the C₄ to C₈ fluoroketones investigated and covered by claim 1 exhibit an extinguishing performance which can be considered as improved in comparison to the performance of the fluorinated ketones according to E2 in terms of their extinction concentration (vol.-%) and their "mass ratio". The latter value expresses the ratio of the mass (per volume), as compared to the mass (per volume) of HALON™ 1211, required for extinguishing a flame under test conditions (see paragraph [0067] of the patent in suit). A low extinguishing concentration and a low mass ratio can be considered to stand for a good extinguishing efficiency. The compounds according to E2/E2' are represented by comparative example C13 of the patent in suit, which reports an extinguishing concentration of 6.3 vol-% and a mass ratio of 2.77. Compared thereto, the respective values measured when using e.g. the C₄ to C₆ compounds according to example 10 (7.3 vol-%, mass ratio 2.55), example 13 (7.4 vol-%, mass ratio 2.68) or example 15 (6.0 vol-%, mass ratio 2.80) of the patent in suit do not, for the board, show an improvement.

Appellant 1 argued that it was not appropriate to compare examples 10, 13 and 15 to example C13 in view of the differences in structure of the compounds concerned, and that the improvement was demonstrated by a more appropriate comparison of example C13 with example 4 (closest in structure) or with examples 1, 6 and 9 (same number of C atoms).

The board does not accept this argument, since the available data clearly show that not all of the fluorinated ketones covered by claim 1, i.e. meeting the criteria recited in claim 1 in terms of boiling point, number of carbon, hydrogen and/or halogen atoms will display the alleged improved extinguishing performance as compared to a compound representing the teaching of E2/E2'.

iv) Moreover, as regards the alleged low toxicity, the board notes that the claims are silent on the toxicity of the compounds to be used. Moreover, in the patent in suit it is merely stated that substitutes for the commonly-used bromine-containing fire-extinguishing agents will "**preferably** ... be low in toxicity" (page 2, line 25), that "*the compounds can be low in toxicity*" (page 2, lines 42 to 43), and that "*the fluorinated ketones can offer additional important benefits in toxicity*". Some specific toxicity data are only mentioned for one out of the many compounds covered by claim 1 at issue, i.e. for $\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$ (page 3, lines 21 to 23).

The board does not accept that, in the absence of evidence to the contrary, the indications in the patent may be "extrapolated" in the sense that all compounds

covered by claim 1 at issue will have to be assumed to be, on the balance of probability, of "low" toxicity, as submitted by appellant 1 at the oral proceedings. Considering also that the skilled person would apparently have expected these compounds to be of some toxicity, as argued by appellant 1 in connection with document D1bis (page 52, last paragraph), the burden of proof lay with appellant 1 to convincingly demonstrate that all the compounds covered by claim 1 actually could be considered to be of "low" toxicity.

The board moreover notes that the expression "low" toxicity is somewhat vague and that the toxicological acceptability of a given extinguishing compound will depend on its field of application. In this connection, the board observes that, on the one hand, the specific studies reported in the document labelled "Annex 2" appear to confirm said positive rating on the toxicity of the compound according to example 1 of the patent in suit, i.e. $\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$, commercialised as "Novec 1230". On the other hand, however, document D15 contains information which calls into question whether the toxicity of said particular compound can indeed be rated as being "low". More particularly, "Novec-1230TM" is stated to target the liver and to have much lower exposure limits than the comparative product.

v) In view of the above points iii) and iv), the board does not accept it as proven that a low toxicity or an improvement in terms of the extinguishing performance can be attributed generally to all the compounds covered by claim 1 at issue. Hence, it has not been convincingly shown that the technical problem formulated by appellant 1 is successfully solved over

- the full ambit of claim 1, i.e. for the broad range of compounds falling under the definition given in claim 1.
- 5.6 The alleged low toxicity and the alleged improvement in extinguishing performance can thus not be retained in the formulation of the technical problem. The technical problem as stated under point 5.3 must thus be reformulated in a less ambitious manner. It can be seen in the provision of a further fire-extinguishing method using different, environmentally acceptable extinguishing compounds obtainable at comparable costs.
- 5.7 For the board, it is plausible that this technical problem is indeed successfully solved by the method according to claim 1 (see points 5.5 i) and ii)).
- 5.8 Hence, it remains to be assessed whether or not the claimed solution to the stated technical problem is obvious in the light of the prior art.
- 5.9 The fluorinated ketone compounds to be used according to document E2/E2' comprise a methyl or ethyl group and may even comprise a further hydrogen not replaced by fluorine (when coefficient $m = 1$). This means that they may comprise **from three** to six hydrogen atoms. Hence, E2/E2' taken alone does not suggest using compounds as defined in claim 1 which comprise **at most two** hydrogen atoms.
- 5.10 However, document D1bis identifies a potentially environmentally-friendly fluorinated ketone compound meeting the definition given in claim 1 as a possible fire-extinguishing agent.

- 5.10.1 Dlbis (see page 1, first paragraph) is a report presenting the results of a project initiating "a systematic search for optimal halon replacements by identifying approximately 100 gases and/or liquids, covering a range of chemical and physical principles thought to affect flame suppression capability". The report was "designed to provide a basis for the search for alternatives to the current commercial halons". A skilled person facing the technical problem identified under point 5.6 above would thus certainly take into consideration the contents of this document.
- 5.10.2 "Halogenated ketones, anhydrides" and esters (Dlbis, Section III.C, pages 49, 52 to 54, 125 to 131) form one of the many groups of compounds of interest identified and discussed in document Dlbis. With regard to this specific group, the authors of Dlbis identify several compounds which are expressly "recommended for further testing" (see Dlbis; page 52, Section "3. Recommendations", first two sentences).
- 5.10.3 Appellant 1 considered that the indications given in Dlbis with regard to fluorinated compounds containing carbonyl groups would rather discourage the skilled person from actually considering their use as extinguishing agents. It was expressly stated in Dlbis that some of the compounds listed were "clearly not candidates as alternatives" but were only included "to test principles of fire suppression or ozone depletion" (Dlbis, page 1, fourth paragraph). In this connection, appellant 1 argued that the authors of Dlbis merely suggested the testing of the carbonyl group containing compounds as flame suppressants in order to "elucidate the role of the organic fluorine species generated

during fire situations" because of their repeatedly addressed toxicity (page 52, third paragraph, last sentence, and last paragraph, first two sentences; pages 125 to 131, toxicity data).

The board does not accept this argument. Irrespective of the rather theoretical considerations contained in sections III.C.1 to III.C.3 of Dlbis, this document expressly recommends testing the fire-suppressing properties of the compounds listed in Table 6 thereof, *inter alia* the compound $(iC_3F_7)_2CO$, which is a fully fluorinated ketone having seven carbon atoms and a boiling point ($73^\circ C$) within the range according to claim 1 at issue. It is also to be noted that the teaching of Dlbis is in line with that of E2/E2' having regard to the positive effect of the presence of a carbonyl group on environmental acceptability (Dlbis, section III.C.1, first two paragraphs). Moreover, concerning the compound $(iC_3F_7)_2CO$, Dlbis (see page 127) mentions the estimated heat capacity value of 280 J/K-mol at 298 K, specifically points out that no toxicity data were available, and indicates that a "comparison of the fire suppressant capacity of this compound with hexafluoroacetone will highlight heat capacity effects". These comments thus incite the skilled person to have a closer look at the impact of the relatively high heat capacity of this compound on the extinguishing performance. Considering that toxicity can vary substantially from one compound to another (depending also on the toxicity tests used), the fact that no toxicity data at all were available for this specific compound makes it a rather interesting candidate despite its structural resemblance to the apparently very toxic hexafluoroacetone.

5.10.4 Starting from the disclosure of document E2/E2' and trying to solve the technical problem stated under point 5.6 above, the skilled person thus would be incited by document D1Bis to investigate the suitability of, *inter alia*, the compound $(i-C_3F_7)_2CO$ as a fire-extinguishing compound suitable as a substitute for commercial halons such as HALON™ 1211 (CF_2ClBr). In other words, the skilled person would have good reasons to try to replace ketone compounds used according to document E2/E2' by said more fully fluorinated ketone compound. By doing so, the skilled person would arrive at a method falling within the terms of claim 1 in an obvious manner.

5.11 Claim 1 is thus directed to subject-matter which is obvious to the skilled person in the light of the prior art and which, therefore, does not involve an inventive step (Articles 52(1) and 56 EPC).

5.12 The main request of appellant 1 is thus not allowable.

1st and 2nd auxiliary requests of appellant 1

6. Novelty - Method claims 1

6.1 The definition of the fluorinated ketones to be used according to the respective claims 1 of the 1st and 2nd auxiliary requests differs from that according to claim 1 of the main request in that the restriction to a C₄ to C₈ ketone compound was lifted and replaced by a limitation to a ketone compound selected from "*fully fluorinated ketones*", "*ketones that are fully fluorinated except for one or two hydrogen atoms*

*remaining on the carbon backbone" and
"(CF₃)₂CFC(O)CF₂Cl".*

- 6.2 Document D2/D2bis discloses only one fully fluorinated ketone, namely (CF₃)₂CO (page 21, table 2). The boiling point of this compound (-26°C according to D1bis, page 53) is undisputedly out of the range of from 0 to 150°C prescribed by the respective claims 1 according to the 1st and 2nd auxiliary requests. The other fluorinated ketone disclosed in document D2bis, i.e. (CF₃)(CF₂Cl)CO, is a C₃ compound which is neither fully fluorinated, nor fully fluorinated except for one or two remaining hydrogen atoms, and also differs from the sole chlorinated compound that may be used according to said claims 1, which is a C₅ compound.
- 6.3 The board is also satisfied that none of the other prior art documents relied upon by appellant 2 discloses a method as claimed according to the 1st or 2nd auxiliary request.
- 6.4 The subject-matter of the respective claims 1 according to the 1st and 2nd auxiliary requests is thus novel (Articles 52(1) and 54(1)(2) EPC).
7. Inventive step - Method claims 1
- 7.1 There is no reason for departing from considering document E2/E2' to represent the closest prior art.
- 7.2 There is no reason for departing from the technical problem stated under point 5.6 in connection with the main request because, despite the amendments made, the respective claims 1 according to the 1st and 2nd

auxiliary requests still define the extinguishing compounds to be used in terms which are so broad that fluorinated ketone compounds are encompassed which have not been convincingly shown to have an improved extinguishing performance, e.g. the compounds of examples 10, 13 and 15 of the patent in suit, and/or a low toxicity (see the above points 5.5 iii) to v)).

- 7.3 As a solution, the patent in suit proposes a method according to the respective claims 1 of the 1st and 2nd auxiliary requests, which is characterised in particular in that the fluorinated ketone to be used is selected from "*fully fluorinated ketones*", "*ketones that are fully fluorinated except for one or two hydrogen atoms remaining on the carbon backbone*" and "*(CF₃)₂CFC(O)CF₂Cl*".
- 7.4 For the reasons given under points 5.5 i) and ii) above, which still apply, it is plausible that the technical problem stated under point 5.6 above is successfully solved using the compounds recited in the respective claims 1.
- 7.5 As regards obviousness, the board's considerations (under points 5.9 to 5.10.4 concerning the obviousness of a method according to claim 1 of the main request apply analogously to the more limited subject-matter of the respective claims 1 according to the 1st and 2nd auxiliary requests. At the oral proceedings, appellant 1 did not submit any additional, more specific arguments applicable to the assessment of said narrower claims as compared to claim 1 according to the main request.

Hence, in the board's judgement, starting from the disclosure of document E2/E2' as the closest prior art, the skilled person trying to solve the stated technical problem would be induced by the teaching of document D2bis to try replacing the extinguishing compounds used according to E2/E2' by the compound $i-(C_3F_7)_2CO$ and would thereby arrive at a method falling within the terms of the respective claims 1 in an obvious manner.

7.6 The respective claims 1 of the 1st and 2nd auxiliary requests are thus directed to subject-matter which is obvious to the skilled person in the light of the prior art and which, therefore, does not involve an inventive step (Articles 52(1) and 56 EPC).

7.7 Consequently, the 1st and 2nd auxiliary requests are not allowable either.

3rd auxiliary request of appellant 1

8. Novelty - method claim 1

8.1 The definition of the fluorinated ketones to be used according to claim 1 of the 3rd auxiliary request is even more limited than the definition given in claim 1 according to the 2nd auxiliary request by virtue of the deletion of the alternative directed to "*ketones that are fully fluorinated except for one or two hydrogen atoms remaining on the carbon backbone*".

8.2 The considerations concerning the respective claims 1 according to the 1st and 2nd auxiliary requests thus apply *mutatis mutandis* to present claim 1.

8.3 The subject-matter of claim 1 according to the 3rd auxiliary request is thus novel (Articles 52(1) and 54(1)(2) EPC).

9. Inventive step - Method claim 1

9.1 The deletion, from claim 1, of the alternative directed to "*fully fluorinated ketones except for one or two hydrogen atoms remaining on the backbone*" has no bearing on the considerations under the above points 7.1 to 7.5, which thus also apply analogously to the present claim 1.

9.2 Claim 1 is thus directed to subject-matter which is obvious to the skilled person in the light of the prior art and which, therefore, does not involve an inventive step (Articles 52(1) and 56 EPC).

9.3 The 3rd auxiliary request is thus not allowable either.

4th auxiliary request of appellant 1

10. Sufficiency of disclosure

10.1 The objection raised under Article 100(b) EPC by appellant 2 concerned the "*method of preventing fires ...*" according to claim 9 as granted. Such a method is now the subject-matter of amended claim 2 according to the 4th auxiliary request.

10.2 According to appellant 2, the patent in suit did not disclose to the skilled person how ketones which are not gaseous at room temperature could be used, let

alone in a continuous manner, for preventing fires without leaving residues.

10.3 These arguments did not, however, convince the board of a lack of sufficiency of disclosure.

10.3.1 Firstly, claim 2 at issue neither prescribes a continuous introduction of the composition containing the fluorinated ketone into the enclosed area, nor does it require that the method works without leaving a residue.

10.3.2 Secondly, it is specifically indicated in the patent in suit (see paragraphs [0019], [0024] to [0026]) that the extinguishing composition may be introduced into the enclosed area *inter alia* in the form of a mist. Ketone compounds having a boiling point in the range of from 20 to 110°C are generally preferred in case the composition is introduced by misting (page 4, lines 33 to 35, of the patent in suit). The board notes that the compounds now specifically recited in claim 1 (i.e. the compounds of examples 1, 2 and 4 to 9) have boiling points in that range (see patent in suit, Table 1, second and fourth column).

10.4 Since there are no gaps of information and no lack of guidance, the board is convinced that the claimed method can be performed based on the total information contained in the patent in suit. Hence, the invention as defined in the claims at issue is disclosed in the patent in suit in a manner sufficiently clear and complete to be carried out by a person skilled in the art (Article 100(b) EPC).

11. Novelty

11.1 The board is satisfied, and it was not disputed, that none of the prior art documents invoked by appellant 2 discloses a method for extinguishing a fire using one of the fluorinated ketones specified in present independent claim 1.

11.2 Nor does the prior art disclose methods of preventing fires or deflagration in an air-containing area according to present claim 2, which methods require the use of a compound as defined in claim 1.

11.3 The subject-matter of claims 1 and 2 and, consequently, of claim 3 dependent on claim 2, is thus novel (Articles 52(1) and 54(1)(2) EPC).

12. Inventive step

12.1 The patent in suit relates to methods of extinguishing and preventing fires and deflagration using fluorinated ketone compounds (see paragraph [0001]).

12.2 For the board, there is no reason for departing from document E2/E2' as the closest prior art.

12.3 The board accepts that starting out from the disclosure of E2/E2', when considering the claims according to the 4th auxiliary request, the technical problem can be seen in providing methods for extinguishing fires using further fluorinated ketones having an improved fire extinguishing performance whilst having a low toxicity, a short atmospheric lifetime and comparable costs of manufacture.

12.4 As a solution to this technical problem, the patent proposes the method according to claim 1 at issue, which is characterised in particular in that the fluorinated ketone to be used is a compound "containing up to two hydrogen atoms and having a boiling point in a range of about 0°C to about 150°C" and is selected from " $CF_3CF_2C(O)CF(CF_3)_2$, $(CF_3)_2CFC(O)CF(CF_3)_2$, $CF_3(CF_2)_2C(O)CF(CF_3)_2$, $CF_3(CF_2)_5C(O)CF_3$, $CF_3CF_2C(O)CF_2CF_2CF_3$, $CF_3C(O)CF(CF_3)_2$, $HCF_2CF_2C(O)CF(CF_3)_2$, $(CF_3)_2CFC(O)CF_2Cl$ ".

12.5 The board is satisfied that the stated technical problem is effectively solved over the full scope of the claim, i.e. for all the specific compounds recited in claim 1.

12.5.1 The experimental data presented in the patent in suit (see Table 1) show that the use of the specific compounds to which claim 1 at issue was restricted (examples 1, 2, 4 to 9) exhibit a significantly better extinguishing performance (extinguishing concentrations in the range from 3.1 to 4.9 vol-%; mass ratios to HALONTM 1211 in the range from 1.86 to 2.39) than some of the other fluorinated ketones (see e.g. examples 10, 13 and 15 (extinguishing concentrations of 7.3, 7.4 and 6.0 vol-%; mass ratios to HALONTM 1211 of 2.55, 2.68 and 2.80, respectively) which were investigated, but are no longer referred to in the present claims.

12.5.2 Moreover, the results convincingly demonstrate a significant improvement in terms of extinguishing performance when compared to the fluorinated ketone compound C13, which is a compound according to the closest prior art E2/E2': whereas the compound C13 requires an extinguishing concentration of 6.3 %

(volume) and a "mass ratio to HALON™ 1211" of 2.77, none of the specific compounds to be used according to the present claims requires an extinguishing concentration of more than 4.9 % (example 6) or features a "mass ratio to HALON™ 1211" of more than 2.39 (example 9).

- 12.6 Hence, it remains to be decided whether starting from the closest prior art as disclosed in document E2, the claimed solution to the technical problem was obvious in view of the prior art.
- 12.7 Document E2/E2' teaches the use of fluorinated ketones mandatorily comprising an unfluorinated methyl or ethyl group, and optionally a further H atom (see the formula under point 5.2.2 above; m may be 0 or 1). Taken alone, it does not suggest using more fully fluorinated compounds, let alone for the purpose of achieving a higher extinguishing performance.
- 12.8 The argument of appellant 2, according to which the skilled person would expect such an improved performance when using more fully fluorinated compounds, fails to convince the board for the following reasons:
- 12.8.1 Although the heat capacity of fluorinated ketones may indeed be assumed to increase with an increase in the complexity and/or molecular weight of the molecule, see e.g. D1bis, page 17, third full paragraph, last sentence, and D14, page 380, table 5, 1st and 4th to 6th columns), a high extinguishing performance is not necessarily due to a high heat capacity. As emphasised in D1bis (see e.g. page 24, penultimate paragraph; page 36, last paragraph), the extinguishing performance

of a compound is not only based on physical heat extraction mechanisms, but chemical mechanisms can play a significant role.

12.8.2 Moreover, it can be gathered from the data presented in declaration D16 (Table 1 and Graphs 1 and 2), which were not disputed by appellant 2, that there is no clear correlation between the heat capacity and the extinguishing efficiency (mass ratio) of the compounds tested in the patent in suit.

12.9 As already mentioned above, document D1bis generally suggests investigating further the suitability for flame-suppressing purposes of fluorinated carbonyl compounds, including *inter alia* (i-C₃F₇)₂CO. Concerning the other compounds referred to in claim 1 at issue, no information whatsoever is contained in document D1bis.

12.9.1 However, even considering the total information content of document D1bis, the skilled person starting from the disclosure of document E2/E2' had no reason to expect that the use of the specific C₇ compound (i-C₃F₇)₂CO mentioned in D1bis would lead to a significantly improved extinguishing performance compared to one of the preferred compounds disclosed in E2, i.e. the C₆ compound CF₃(CF₂)₃C(O)CH₃ (see comparative example C13 of the patent in suit).

12.9.2 Appellant 2 emphasised that concerning the compound (i-C₃F₇)₂CO it is stated in D1bis (page 127) that a "comparison of the fire suppressant capacity of this compound with hexafluoroacetone [(CF₃)₂CO] will highlight heat capacity effects".

For the board, said statement merely implies that the authors of D1bis appear to consider that an increase of unknown magnitude in terms of extinguishing power may possibly be achieved in comparison to the homologous hexafluoroacetone. No conclusion can be drawn therefrom as to the extinguishing performance of $(i-C_3F_7)_2CO$ in comparison to the compounds according to E2/E2'.

12.9.3 Hence, the skilled person starting from the teaching of E2/E2' and aiming for an improvement in terms of extinguishing performance was not induced by the disclosure of document D1bis to replace the compounds used according to E2/E2' by one of the compounds recited in claim 1 at issue. For analogous reasons the skilled person was not induced by documents E2 and D1bis to provide a method of preventing fire or deflagration according to claim 2 at issue, i.e. a method relying on the use of a fluorinated ketone compound as defined in claim 1.

12.10 In support of its objections, appellant 2 also referred to the post-published commercial leaflet D15, wherein the properties of the commercial product "NovecTM 1230" (comprising the compound according to example 1 ($CF_3CF_2C(O)CF(CF_3)_2$) of the patent in suit), are compared to the properties of a product called "ECARO-25TM", which allegedly is pentafluoroethane. It is stated *inter alia* that using "NovecTM 1230" requires a higher mass of agent to protect a given volume of space and has a higher price per mass unit (second sheet, the two upper graphs).

12.10.1 However, the board notes that according to the comparison made in D15, the fluorinated ketone is

compared to a fluorinated alkane, and not to the compounds according to E2/E2'. Hence, D15 is not suitable as a means of disproving the (relative) advantageousness of the compounds to be used according to the claims at issue in comparison to other fluorinated ketones, such as the ones disclosed in the closest prior art document E2/E2'.

12.10.2 Moreover, the board notes that the findings reported in document D15 appear to contradict the allegation of appellant 2, according to which an increase in the complexity of the molecule (compare CF_3CHF_2 to $\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$) of the extinguishing agent could be expected to lead to an improved extinguishing performance. The upper right graph on the second sheet of document D15 shows that it takes more "NovecTM", in terms of mass needed to protect a given space, although said agent comprises the more complex molecule.

12.11 The board is also satisfied that none of the other prior art documents or evidence admitted into the proceedings contains further relevant information that could corroborate the alleged obviousness of the claimed subject-matter.

12.12 According to a further line of argument of appellant 2, the claimed invention was obvious in view of a combination of document D2/D2bis, taken as the closest prior art, with the disclosure of document D1bis. However, this argumentation did not convince the board either for the following reasons.

Firstly, according to the established case law of the boards of appeal, D2 does not qualify as the closest

prior art, since it is focused on the use of a different class of compounds as potentially useful fire-extinguishing agents, namely of organometallic halogenated alkoxides such as $\text{Si}(\text{OCHF}_6)_4$ and $\text{Al}(\text{OCHF}_6)_3$. The two fluorinated ketone compounds mentioned in D2bis are merely referred to for comparative purposes. Secondly, this document rather discourages the skilled person from further exploring halo ketones as fire-extinguishing agents since it questions the effectiveness of these compounds (see page 22, "Conclusions", second sentence).

- 12.13 In the board's judgement, the subject-matter of independent claims 1 and 2, and, consequently, of dependent claim 3, thus involves an inventive step (Articles 52(1) and 56 EPC).

Procedural requests of appellant 2

13. Request for the remittal of the case for further prosecution
- 13.1 Under Article 111(1) EPC, the board may either decide on the appeal or remit the case to the opposition division. In this respect, appellant 2 argued that it should be given the chance to pursue its case with respect to said document E2 before two instances, which it would be deprived of if the board of appeal decided on the merits of the case at once. However, it is well established in the jurisprudence of the Boards of Appeal that a party does not have an absolute right to have every aspect of a case examined in two instances (see e.g. decision T 0133/87 of 23 June 1988, point 2 of the reasons).

13.2 The board observes in this regard that in its statement of grounds and its first reply to the statement of grounds of appellant 1, appellant 2 has *inter alia* extensively taken position on the relevance of document E2 having regard to the issue of inventive step in connection with the requests of appellant 1 pending at that time.

13.3 Under these circumstances the board, in the exercise of the discretion conferred on it by Article 111(1) EPC, and particularly taking into account the principle of procedural economy, decided not to remit the case directly to the department of first instance, but to take a decision on the merits of the case.

14. Request for reimbursement of the appeal fee

14.1 According to Rule 103(1)a) EPC, "the appeal fee shall be reimbursed ... where the Board of Appeal deems an appeal to be allowable, if such reimbursement is **equitable** by reason of a substantial procedural violation" (emphasis added).

14.2 In the reasons given in the decision under appeal, the opposition division relied on document E2, which document had not been referred to at all in the course of the opposition proceedings before the issuance of the decision to maintain the patent in amended form.

14.3 This course of action is in breach of the requirements of Article 113(1) EPC, which stipulates that "decisions of the European Patent Office may only be based on grounds or evidence on which the parties concerned have had an opportunity to present their comments".

- 14.4 It was common ground between the parties that a procedural error had occurred. They had, however, diverging views as to the equitability of a remittal and/or reimbursement considering the particular circumstances of the case.
- 14.5 Concerning the given circumstances, the board notes on the one hand that although document E2 had been cited as relevant prior art in the substantive examination of the case, the opponent chose not to invoke it in the opposition proceedings. However, even though it could thus be assumed that the opponent considered this document to be less relevant than the other documents which it relied upon, this does not in itself empower the opposition division to use as a basis for the decision a document not having been referred to at all in the opposition proceedings.
- 14.6 On the other hand, the opposition division considered document E2 to be the closer prior art, and hence to be more relevant for the assessment of inventive step and for a potential denial of inventiveness, than those cited by the opponent. The opposition division would not have reached a decision more favourable to the opponent (and less favourable to the patent proprietor) if it had not taken into account document E2. Thus, the opposition division did not act to the detriment of the opponent (now appellant 2). Such detriment was not even asserted by appellant 2. Indeed, with its letter setting out the grounds of appeal, appellant 2 submitted document E2/E2' of its own volition as advantageously supporting its request to revoke the patent in suit as a whole.

14.7 Moreover, it is to be noted that the board, in the present decision, (also) considered that an inventive step attack based on a combination of document D2/D2bis as closest prior art with document D1bis could not succeed (see point 12.12 above), contrary to the arguments of appellant 2 brought forward in the opposition proceedings. .

14.8 Under these circumstances, the board concludes that by this course of action the rights of appellant 2 were not curtailed to an extent that would make the reimbursement of its appeal fee equitable by reason of a substantial procedural violation.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of claims 1 to 3 according to the 4th auxiliary request filed under cover of the letter dated 2 August 2011, and the description to be adapted.

The Registrar

The Chairman

G. Rauh

G. Raths