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D E C I S I O N
of 27 November 2001

Case Number: T 0429/98 - 3.3.1

Application Number: 91302494.9

Publication Number: 0448402

IPC: C10M 69/04

Language of the proceedings: EN

Title of invention:
Refrigerator oil composition

Patentee:
ASAHI DENKA KOGYO KABUSHIKI KAISHA

Opponent:
Cognis Deutschland GmbH

Headword:
Refrigerator oil/ASAHI DENKA

Relevant legal provisions:
EPC Art. 54(3)(4); 56; 89; 111(1); 113(1); 123(2)(3)
EPC R. 57a; 71(2)

Keyword:
"Main and first auxiliary request : inventive step (no) - obvious solution"
"Second auxiliary request: inventive step (yes) - non obvious solution."

Decisions cited:
G 0004/88, T 0536/88; T 0385/97

Catchword:

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Case Number: T 0429/98 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 27 November 2001

Appellant: Cognis Deutschland GmbH
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Representative: -

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 5 March 1998
rejecting the opposition filed against European
patent No. 0 448 402 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: A. J. Nuss
Members: P. F. Ranguis
R. T. Menapace

Summary of Facts and Submissions

I. The Appellant (Opponent) lodged an appeal against the decision of the Opposition Division rejecting the opposition against the European patent No. 0 448 402 (European patent application No. 91 302 494.9) pursuant to the provisions of Article 102(2) EPC.

II. The decision under appeal was based on claims 1 to 7 as granted. Independent claims 1, 5 and 7 read as follows:

"1. A refrigerator lubricant composition comprising an ester compound and an epoxy compound characterised in that said epoxy compound is an aliphatic glycidyl ether compound, an aromatic glycidyl ether compound or a polyalkyleneglycol diglycidyl ether compound and in that the ester compound is obtained from an acid selected from fatty acids, dicarboxylic acids and branched chain dicarboxylic acids each having 2 to 6 carbon atoms, and a neopentyl polyol and in that the epoxy compound is present in an amount of from 0.01 to 25 percent by weight based on the weight of the ester compound."

"5. A refrigerator oil composition characterised in that it is free of chlorine-containing fluorocarbon and in that it comprises (A) a chlorine-free fluorocarbon and (B) a refrigerator lubricant composition claimed in any of claims 1 to 4 in a volume ratio of (A) to (B) of 1:99 to 99:1."

"7. A refrigerator oil composition characterised by being free of chlorine-containing fluorocarbons and by comprising (A) 1,1,1,2-tetrafluoroethane and (B) a composition as claimed in any of claims 1 to 4 in a

volume ratio of (A) to (B) of 1:99 to 99:1."

III. The opposition sought revocation of the patent in suit on the ground that its subject matter was not patentable under Article 100(a) EPC, namely lack of novelty (Article 54(3), (4) EPC) in view of the documents:

(1) EP-A-0 435 253

(1a) English translation of JP 341 244/89 (one of the four priority patent applications of document (1))

for Contracting States DE, DK, GB and IT only, and

(2) EP-A-0 415 778

(2a) English translation of JP 314657/89 (one of the two priority patent applications of document (2))

for Contracting states DE, ES, FR and GB only

and non-compliance with the requirements of Article 56 EPC (lack of inventive step) in view of the following documents:

(3) JP-A-62/292 895

(3a) German translation of document (3)

(4) DD-B-0 133 966

(5) DE-B-1 768 765

(6) DE-A-1 444 851

(7) Process Engineering, July 1988, pages 33 to 34.

IV. Regarding the objection of lack of novelty under Article 54(3) and (4) EPC, the Opposition Division held that the subject matter of the claims concerned a specific combination of features which resulted from a multiple selection over either the disclosure of document (1) or document (2). Such a specific combination was, therefore, not unambiguously disclosed in those documents.

Furthermore, the Opposition Division was of the opinion that the technical problem addressed by the patent in suit was to improve the stability of chlorine-free hydrocarbon refrigerants and to avoid the corrosion problem and that, hence, the claimed solution was not obvious over document (4) taken alone or in combination with any of the other documents (3), (5), (6) and (7).

V. Oral proceedings before the Board were held on 27 November 2001. The Appellant and the Respondent (Proprietor of the patent), having been duly summoned, had informed the Board that they would not be represented at these oral proceedings and had requested that the decision be taken on the basis of their respective written submissions. The oral proceedings thus took place in the absence of both the Appellant and the Respondent (Rule 71(2) EPC).

VI. The Appellant disputed that the subject matter of Claim 1 of the patent in suit resulted from a selection which would have conferred novelty on said Claim and argued in that respect as follows:

- Document (1) not only disclosed a refrigerator oil

comprising four types of ester compounds respectively of formula (I) to (IV), but also pointed directly in its Example 7 to an octaester of tripentaerythritol (1 mol), 3-methylbutanoic acid (4 mol) and 3-methylpentanoic acid (4 mol).

- Document (1) also disclosed various additives. In that context, he pointed out that those additives were clearly differentiated depending on the result to be achieved. To improve the stability of the refrigerator oil, epoxy compounds were exclusively mentioned. In particular, phenylglycidyl ethers were preferred (cf. page 8, lines 3 to 5). Furthermore, given that the refrigerator oil comprised not less than 70% of ester by weight of the total amount of the mixed oil and given that the epoxy compounds were present in a ratio of 0.1 to 5.0% by weight of the total amount of the refrigerator oil, it was clear that the amount of epoxy additive was within the range of from 0.01 to 25% by weight based on the weight of the ester compound as defined in Claim 1.

- Thus, he argued, the claimed invention emerged clearly in the form of a technical teaching from the disclosure of document (1).

- Regarding document (2), the Opposition Division had wrongly assessed that the subject matter of Claim 1 related to an ester compound resulting from the reaction of **an** acid with **a** neopentyl glycol, differentiating, therefore, from the disclosure of document (2) which required esters obtained by reacting **two carboxylic acids** and a

polyhydric alcohol. Reference was made, in that respect, to examples Nos. 1 to 4 of the patent in suit. Furthermore, document (2) also disclosed the addition of glycidyl ether to stabilize the refrigeration oil composition. Although no amount of glycidyl ether was mentioned in that document, the range of from 0.01 to 25% by weight defined in Claim 1 of the patent in suit was so large that the reproduction of the teaching of document (2) led inevitably to use an effective amount falling within that range. The disclosure of document (2) was also novelty destroying vis-à-vis the subject matter of Claim 1 of the patent in suit.

In support of his further contention that the claimed subject matter did not involve an inventive step over document (4) taken in combination with documents (6) and (7), the Appellant argued as follows:

- The Opposition Division had unduly restricted the teaching of document (4) to the provision of refrigerator oil composition to stabilize chlorine-containing hydrocarbon refrigerants. Document (4) addressed the problem to prepare refrigerator oil compositions which brought about no chemical reaction between the refrigerant (a halogenated hydrocarbon) and the lubricant in order to avoid, in particular, corrosion problems. It could not be derived from this disclosure that the teaching was limited to chlorine-containing fluorocarbon refrigerants and that the disclosed lubricating composition comprising a lubricating oil and an epoxy compound in an amount of 0.1 to 5% by weight based on the weight of the lubricating oil could only be used with that kind

of refrigerant. The fact that the type of lubricating oil was not specified simply meant that any oil known to be used in refrigerant mixtures might be suitable. In that context, reference was made to document (6) which disclosed esters as lubricating oils.

- The patent in suit addressed the same problem as document (4), ie avoiding corrosion problems. In view of document (4), it would have been obvious for the person skilled in the art to use, on the one hand, a chlorine-free hydrofluorocarbon, such as HCF 134a, since it was known to replace the chlorine fluorine fluorocarbon by chlorine-free hydrofluorocarbon (cf. document (7)) and, on the other hand, to use a lubricant oil as taught by document (6).

VII. The Respondent argued that the subject-matter of Claim 1 of each request resulted from a multiple selection in view of the disclosure of document (1):

- (a) Selection of an ester (I) and/or (IV) among the esters (I) to (IV); (b) selection of the number of carbon atoms in the acid on which the claimed ester is based; (c) selection of the epoxy compound specified in Claim 1 from the nine possible types of additives set out in the disclosure of document (1); (d) from epoxy compounds in general, selection of phenylglycidyl ethers; (e) selection of the ratio epoxy/ester compounds since the epoxy compound level of 0.1 to 5.0 wgt% based on the total amount of oil disclosed in document (1), referred to the total of esters (I) to (IV) and not to only those esters

which contained a neopentyl group. Furthermore, even the disclosure of the example No. 7 required a further selection to extract from the three-component mixture, the particular ester allegedly falling within the scope of Claim 1.

- Moreover, the selection of one class of additive from nine possibilities (cf. (c) above) required, as admitted by the Appellant, the consideration of the objective to be hit what was contrary to the standards for deciding novelty.

Regarding document (2), the Respondent admitted that esters of mixed acids were clearly within the scope of Claim 1. However, document (2) did not contain any reference to the amount of phenyl or alkyl glycidyl ether "additive" which was to be present in the oil compositions disclosed. Moreover, the selection first of epoxy compounds from the three classes of additives listed in document (2) and then of phenyl glycidyl ethers and alkylglycidyl ethers from the stated epoxy compounds constituted selections from two lists rendering Claim 1 novel.

Regarding inventive step, the Respondent argued that document (4) failed to refer to the presence of any ester compound. Nor was this document concerned with chlorine-free fluorocarbon refrigerants. Said document, therefore, did not address the technical problems solved by the claimed invention which included the problem of incompatibility of previously-known refrigerator lubricant compositions with fluorocarbon refrigerants, particularly chlorine-free fluorocarbon refrigerants, and instability to hydrolysis of such refrigerator lubricant compositions. Furthermore,

combining the teachings of documents (4), (6) and (7) in the form of a mosaic amounted to an *ex post facto* analysis contrary to a correct approach of the obviousness issue.

VIII. In its response to the statements of grounds of appeal dated 30 December 1998, the Respondent filed two auxiliary requests:

The first auxiliary request comprised an amended set of claims for the Contracting States DE, DK, GB and IT and the set of claims as granted for the other Contracting States.

The second auxiliary request comprised an amended set of claims for the Contracting States DE, DK, GB and IT, independent Claim 1 reading as follows:

"1. A refrigerator lubricant composition characterised in that it is free of chlorine-containing fluorocarbons and in that it comprises (A) a chlorine-free fluorocarbon and (B) a refrigerator lubricant composition in a volume ratio of (A) to (B) of 1:99 to 99:1, the refrigerator lubricant composition comprising an ester compound and an epoxy compound characterised in that said epoxy compound is an aliphatic glycidyl ether compound, an aromatic glycidyl ether compound or a polyalkyleneglycol diglycidyl ether compound and in that the ester compound is obtained from an acid selected from fatty acids having 2 to 6 carbon atoms, and a neopentyl polyol selected from trimethylolpropane, pentaerythritol, dipentaerythritol, ditrimethylolpropane and ditrimethylolethane and in that the epoxy compound is present in an amount of from 0.01 to 25 percent by weight based on the weight

of the ester compound."

and an amended set of claims for the other Contracting States, independent Claim 1 reading as follows:

"1. A refrigerator lubricant composition characterised in that it is free of chlorine-containing fluorocarbon and in that it comprises (A) a chlorine-free fluorocarbon and (B) a refrigerator lubricant composition in a volume ratio of (A) to (B) of 1:99 to 99:1, the refrigerator lubricant composition comprising an ester compound and an epoxy compound characterised in that said epoxy compound is an aliphatic glycidyl ether compound, an aromatic glycidyl ether compound or a polyalkyleneglycol diglycidyl ether compound and in that the ester compound is obtained from an acid selected from fatty acids, dicarboxylic acids and branched chain dicarboxylic acids each having 2 to 6 carbon atoms, and a neopentyl polyol and in that the epoxy compound is present in an amount of from 0.01 to 25 percent by weight based on the weight of the ester compound."

IX. In a communication dated 6 June 2001 accompanying the summons to oral proceedings, the Board informed the parties that Claims 5 to 7 of the patent as granted as well as of the first auxiliary request, and Claims 1 to 5 of the second auxiliary request related to a refrigerator oil composition free of chlorine-containing fluorocarbons, such as Flon-134a. In that context, possibly the question would arise whether document (4) was still the closest state of the art. The Board observed that document

(8) US-A-4 755 316

was cited in the patent in suit as the closest prior art and, therefore, formed part of the (opposition and appeal) proceedings. The parties had, therefore, to be prepared to discuss inventive step according to the "problem-solution" approach over the cited published prior, including document (8).

The parties did not file any submissions in response to this communication.

- X. The Appellant (Opponent) requested in writing that the decision of the Opposition Division be set aside and that the patent be revoked.

The Respondent (Proprietor of the patent) requested in writing:

- as main request, that the appeal be dismissed,
- as first auxiliary request, that the decision of the Opposition Division be set aside and that the patent be maintained with the set of seven claims filed as annex 1 for Contracting States DE, DK, GB and IT and with the set of claims as granted for the other Contracting States.
- as second auxiliary request filed as annex 2, that the decision of the Opposition Division be set aside and that the patent be maintained with the set of five claims for Contracting States DE, DK, GB and IT and with the set of five claims for the other Contracting States.

- XI. At the end of the Oral proceedings the decision of the Board was announced orally.

Reasons for the Decision

1. The appeal is admissible.
2. *Identity of the Appellant/Opponent*

The opposition was originally filed by Henkel KGaA, Germany. The Appellant (Opponent) informed the Board by letter received on 17 August 1999 that Henkel KGaA had transferred its entire chemical business to Cognis Deutschland GmbH. A copy of the relevant parts of the agreement between Henkel KGaA and Cognis Deutschland GmbH was filed. The Board is satisfied that the present opposition was validly transferred to Cognis Deutschland GmbH (cf. G 4/88, OJ EPO 1989, 480) and that Cognis Deutschland GmbH must be considered as the Appellant.

Main request

3. *Novelty - Article 54(3) and (4) EPC*

Since the Board came to the conclusion that the present request had to fail for lack of inventive step, there is no need to detail the reasons why novelty is recognized.

4. *Inventive step - Article 56 EPC*

- 4.1 The patent in suit relates to a refrigerator oil composition and more particularly to a refrigerator oil composition for a refrigerator using a chlorine-free fluorocarbon refrigerant such as Flon-134a (1,1,1,2-

tetrafluoroethane) (cf. page 2, lines 3 to 5). The general object to be achieved is reflected by Claim 1 which in no way is restricted to a refrigerator lubricant composition for use in combination with a chlorine-free fluorocarbon refrigerant. In other words, the claimed composition may be used with any refrigerant, chlorine-fluorocarbon refrigerants included.

4.2 Document (4) discloses a refrigerator oil composition containing an oil and a refrigerant (cf. page 1, lines 3 to 5), the improvement consisting in the presence of an epoxy compound such as phenylglycidyl ether (cf. Example No.2) in an amount of from 0.1 to 5% based on the lubricating oil (cf. page 2, lines 30 to 33) in order to get a sufficient stability of the refrigerator oil vis-à-vis the chlorine-fluorine hydrocarbon (cf. page 2, lines 24 to 27).

4.3 The Respondent argued that document (4) was only concerned with problems arising from chlorine-containing refrigerants, submitting thereby that this document could not represent relevant prior art and, in any case, not the closest state of the art. In accordance with the "problem-solution approach" consistently applied by the Board of Appeal to assess inventive step, the closest prior art is normally a prior art document disclosing subject-matter aiming at the same objective as the claimed invention and having the most relevant technical features in common. Contrary to the Respondent's view, the Board holds that there is at least a common objective between the claimed invention and the document (4) since the claimed composition is not limited to the use with chlorine-free fluorocarbon refrigerants (cf. point 4.1

above) and since document (4) discloses a refrigerator oil composition containing an oil and a refrigerant, in particular a chlorine-fluorocarbon as refrigerant. Furthermore, this document has the most relevant technical features in common with the claimed subject-matter and, therefore, qualifies to be the closest state of the art.

- 4.4 The Respondent has provided nothing relevant in respect of any advantage of the claimed composition in comparison with the compositions disclosed in document (4). In view of document (4), the technical problem to be solved cannot be seen, therefore, in providing an improved composition but rather in the provision of a further lubricating composition to be used in combination with a refrigerant and presenting the same valuable properties as those of document (4).

It is not contested that the latter is solved by the claimed refrigerator lubricant composition.

- 4.5 The remaining question is thus whether the prior art relied upon by the Appellant would have suggested to the person skilled in the art solving the technical problem indicated above in the proposed way (cf. point II above). In particular, the question arises whether or not the person skilled in the art would have been directed to use an ester compound as lubricating oil within the teaching of document (4).

- 4.6 It is true that document (4) does not mention the type of oil to be used. The Board observes, however, that the Respondent has not indicated any particular oil to which the teaching of document (4) would be restricted. In the absence of any reason for a narrow

interpretation of the term "lubricating oil", it can be assumed that any oil suitable as lubricating oil for refrigeration machines can be used.

- 4.7 Document (6) discloses a lubricating ester oil suitable, in particular, in refrigeration machines (cf. page 4, lines 22 to 25). It is not contested that the ester oil to be used is of the same kind as that defined in Claim 1 of the patent in suit, namely an ester of neopentyl polyol and carboxylic acids having 2 to 12 carbon atoms (cf. page 2, lines 13 to 21), among which acetic, propionic and butyric acids are explicitly mentioned (cf. page 4, lines 5 to 9).
- 4.8 Having regard to the fact that the ester oil of document (6) is designed for the same purpose as in the claimed invention, the Board holds that, in the absence of evidence to the contrary, the person skilled in the art would have considered, with a reasonable expectation of success, using the said ester oil within the teaching of document (4). In other words, the person skilled in the art, seeking an alternative to the lubricating compositions as disclosed in document (4) would have had a clear incentive to use the refrigerator oil disclosed in document (6) and, as a result arrive at the claimed solution of the above defined technical problem. Nor has the Board a reason to deviate from this conclusion when considering the indicated weight ratio epoxy compound / ester compound since document (4) discloses a weight ratio from 0.1 to 5%, which is within the range defined for the claimed invention.

The Respondent did not provide any convincing arguments to rebut this finding. In particular, the Board cannot

share the opinion of the Respondent that the combination of the teachings of documents (4), (6) and (7) could only have been considered by the person skilled in the art with hindsight.

First, document (7) is not at issue since the question to be decided here is not the obviousness or non obviousness of a composition **containing chlorine-free fluorocarbons** but rather of a composition containing a refrigerant with or without chlorine. In that context, the fact that, as taught by document (7), chlorine-fluorocarbons must be replaced by chlorine-free fluorocarbon is irrelevant.

Secondly, in the Board's view, an *ex post facto* case, in the present situation, would have required showing that the person skilled in the art had no reason without the prior knowledge of the claimed invention to combine the teachings of documents (4) and (6). This is precisely what the Respondent failed to demonstrate.

4.9 Therefore, in the Board's judgement, the subject-matter of Claim 1 of the main request represents an obvious solution to the problem underlying the patent in suit and does not involve an inventive step.

4.10 Since a decision can only be taken on a request as a whole, none of the further claims need be examined and the main request has to be refused.

First auxiliary request

5. *Inventive step - Article 56 EPC*

The Respondent requested that the patent be maintained with the set of seven claims as granted for the Contracting States other than DE, DK, GB and IT. For the same reasons as already set out in point 4 above, Claim 1 of the set of claims as granted does not involve an inventive step and, therefore, this request must also fail.

Second auxiliary request

6. *Rule 57a EPC*

Claim 1 of the set of claims for the designated Contracting States DE, DK, GB and IT differs from Claim 1 as granted in that:

- it is limited to a composition comprising a chlorine-free fluorocarbon and to a volume ratio chlorine-free fluorocarbon/refrigerator lubricant composition of 1:99 to 99:1.
- the acid moiety of the ester compound is limited to fatty acids and the polyol moiety is limited to trimethylolpropane, pentaerythritol, dipentaerythritol, ditrimethylolpropane and ditrimethylolethane.

In Claim 3, the term "1,4 butanedicarboxylic acid" was deleted. Claims 5 and 7 as granted were cancelled.

Claim 1 of the set of claims for the designated Contracting States other than DE, DK, GB and IT differs from Claim 1 as granted in that it is limited to a composition comprising a chlorine-free fluorocarbon and to a volume ratio chlorine-free

fluorocarbon/refrigerator lubricant composition of 1:99 to 99:1. Claims 5 and 7 as granted were cancelled.

Those amendments are designed to overcome the grounds of opposition, namely absence of novelty and/or inventive step. Therefore, those amendments can be admitted under Rule 57a EPC.

7. *Article 123(2) and (3) EPC*

The Board is satisfied that both sets of claims of the second auxiliary request have not been amended in such a way that they contain subject matter which extends beyond the application as filed. The amendments (cf. point 6 above) indeed find support in the disclosure of the application as filed (cf. page 6, lines 15 to 22; page 7, lines 13 to 16 and page 10, lines 13 to 17).

Those sets of claims have not been amended such as to extend the protection conferred either.

8. *Novelty - Article 54(3) and (4) EPC*

- 8.1 The Respondent did not file any arguments against the novelty of both sets of claims. However, since he had requested in its statement of grounds of appeal that the patent be revoked, the Board considers that, in the present case, his arguments apply *mutatis mutandis* to the present request.

Document (1) is relevant for the assessment of novelty under Article 54(3) and (4) EPC as far as the designated Contracting States DE, DK, GB and IT are concerned. Therefore, only novelty of the set of claims

filed for those States must be considered in view of this document.

Document (2) is relevant for the assessment of novelty under Article 54(3) and (4) as far as the designated Contracting States DE, ES, FR and GB are concerned. Therefore, novelty of both set of claims must be considered in view of this document.

The Board is satisfied, in that respect, that pursuant to Article 89 EPC the date of 28 December 1989 counts as the date of filing of document (1) for the purposes of Article 54(3) EPC since the content of document (1) relevant for the present issue can be found in document (1a). The same is true regarding the date of 4 December 1989 as the filing date of document (2).

- 8.2 Document (1) discloses a refrigerator oil for use with hydrogen-containing halogenocarbon refrigerants comprising as a base oil at least one kind of an ester selected *inter alia* from the group consisting of pentaerythritol esters (I), trimethylol esters (II) and polyol ester (IV) obtained by the synthesis of, as raw materials, (a) a neopentyl type polyhydric alcohol having 5-6 carbon atoms and 3-4 hydroxyl groups, (b) a monocarboxylic acid and (c) a dicarboxylic acid (cf. page 3, lines 9 to 48).

According to the general disclosure, the refrigerator oil composition may be incorporated with at least one kind of a phosphorous compound (cf. page 7, lines 23 to 43) and to further improve the refrigerator oil in stability, it may be incorporated with at least one kind of an epoxy compound selected from phenylglycidyl ether type epoxy compounds, glycidyl ester type epoxy

compounds, epoxidized fatty acid monoester and epoxidized vegetable oils (cf. page 7, line 44 to page 8, line 2). Among these epoxy compounds, the most preferred are phenylglycidyl ether, butylphenylglycidyl ether and mixtures thereof (cf. page 8, lines 3 to 5). In a case where these epoxy compounds are to be incorporated in the refrigerator oil composition, it is desirable that they be incorporated therein in a ratio of 0.1 to 5.0% by weight of the total amount of the refrigerator oil (cf. page 8, lines 6 to 8). Furthermore, Example No. 7 discloses a refrigerator oil made of a mixture of three esters, one of which being an octaester of tripentaerythritol, 3-methylbutanoic acid and 3-methylpentanoic acid (cf. page 9, lines 36 to 49), said oil being tested **alone** for its compatibility with HFC-134a, insulating property, wear resistance and hygroscopicity (cf. page 12, lines 35 to 39 and page 13, Table 1).

- 8.3 The Board concurs with the Appellant that the disclosure of document (1) is not limited to refrigerator oils comprising esters of formula (I) to (IV) but also, in Example No. 7, points directly to one of the esters of Claim 1. However, the Board does not share the Appellant's view that this example is such that it is representative of all that is encompassed by the general disclosure of document (1) and, therefore, may be combined with all that is disclosed therein. Indeed, the Board observes that none of the 23 examples discloses a refrigerator oil comprising an epoxy compound. The sole example of refrigerator oil comprising an additive is Example No. 21 and this additive is not an epoxy compound but a phosphoric ester type wear inhibitor. This finding is quite in line with the general disclosure of document (1) that

the refrigerator oil merely **may** comprise at least one epoxy compound (cf. page 7, line 44). Thus, Example No. 7 as well as all the other examples are representative of a refrigerator oil which **does not** comprise an epoxy compound. That example cannot, therefore, be considered as an embodiment representative of any conceivable variant encompassed by the general disclosure. In other words there is no disclosure of an ester composition as defined in Example No. 7 which includes an epoxy compound. The general disclosure of document (1) does not point unambiguously to the claimed subject-matter either. This was eventually not disputed by the Appellant.

- 8.4 Document (2) discloses a refrigeration oil composition comprising a hydrogenated fluoroethane and an ester of mixed acids (cf. Claim 1). The Respondent admitted that this type of esters fell within the definition of the claimed subject-matter. To this composition, it is possible to add epoxy compounds (cf. page 5, lines 47 to 49) to stabilize it. Although no indication regarding the amount of epoxy compounds is given, the Appellant argued that the claimed range (0.01 to 25% by weight) was so large that the person skilled in the art could only have met this range by using such additive in an effective amount.

However, the Appellant did not adduce any evidence substantiating this assertion, in particular no relevant common general knowledge. It follows that a composition comprising an ester as defined in Claim 1 of the patent in suit and an epoxy compound and in that the epoxy compound is present in an amount of from 0.01 to 25 percent by weight based on the weight of the ester compound does not emerge unambiguously from the

disclosure of document (2).

8.5 In view of the above the Board comes to the conclusion that Claim 1 of the set of claims for designated Contracting States DE, DK, GB and IT is novel in view of the document (1) and Claim 1 for each set of claims is novel in view of document (2). The same applies to dependent Claims 2 to 5 of each set of claims which only specify the features of Claim 1.

9. *Inventive step - Article 56 EPC*

9.1 The Appellant argued that in view of the disclosure of document (4) in combination with the disclosures of documents (6) and (7), the person skilled in the art would have been directed to the claimed invention in an obvious manner since document (4) disclosed a refrigerator oil composition comprising any oil composition in combination with a glycidyl ether and a refrigerant, document (6) taught that ester compounds were valuable oils for refrigeration machines and document (7) recommended to use chlorine-free hydrofluorocarbons in place of chlorine fluoro hydrocarbons for environmental reasons. However, in the Board's judgment, this line of argumentation ignores the objective technical problem the claimed invention addresses and thereby the closest state of the art serving to define that technical problem.

9.2 According to the constant jurisprudence of the Boards of Appeal, an objective definition of the problem to be solved by the invention should normally **start from** the problem described in the contested patent (cf. Case Law of the Boards of Appeal of the European Patent Office, 3rd edition 1998, I.D.4.1, page 115). Given that the

claimed invention relates to refrigerator oil compositions comprising a chlorine-free fluorocarbon refrigerant and that the patent in suit indicates that the technical problem to be solved is to provide such compositions (cf. page 2, lines 46 to 47) and, in that context, identifies document (8) as the state of the art in relation to which the invention is defined (cf. page 2, lines 34 to 38 and page 4, lines 13 to 17), this document is to be considered in the present proceedings (cf. e.g. T 536/88, OJ EPO 1992, 638, point 2.2 of the reasons and T 385/97, point 3.2 of the reasons). The requirements of Article 113(1) EPC are satisfied in this respect although the parties did not attend the oral proceedings, and this all the more so since they had been specifically informed as set out in point IX above.

- 9.3 Document (8) proposes a refrigerator oil composition for a refrigerator using Flon-134a as the refrigerant, a polyoxyalkylene glycol having a molecular weight of 2000 or less and at least two functional hydroxyl groups. This document aims at the same objective as the claimed invention.

Contrary to the Appellant's view, document (4) does not aim at the same objective as the patent in suit since it relates to refrigerator oils exhibiting a suitable stability vis-à-vis chloro-fluoro hydrocarbons (cf. page 2, lines 24 to 27).

In conclusion, document (8) represents the closest prior art in relation to which the technical problem is to be defined.

- 9.4 In view of document (8), the technical problem

underlying the patent in suit consists in the provision of a further refrigerator oil composition of excellent compatibility with chlorine-free fluorocarbon refrigerants, having a low hygroscopicity, a good stability against hydrolysis and suitable insulation properties (cf. page 2, lines 46 to 47; page 4, lines 9 to 17 of the patent in suit).

The examples Nos. 1 to 16 and Table 2 of the patent in suit demonstrate that the problem is indeed solved within the entire scope of the claims. This finding was not contested by the Appellant.

- 9.5 It remains to be decided whether or not the claimed solution to the problem so defined is obvious in view of the prior art cited.
- 9.6 Starting from document (8), the person skilled in the art would have noted that a specific problem existed regarding the miscibility of R134a with a lubricating oil: "small amounts of lubricants may be soluble in R134a over a wide range of temperatures, but as the concentration increases the temperature range over which complete miscibility occurs narrows substantially" (cf. column 2, lines 6 to 11). The document further indicates that "the present inventors have found that certain members of a related class having at least two hydroxyl groups (ie difunctional) provide an unexpected wider range of miscible mixtures with R134a" (cf. column 2, lines 46 to 49). It is also observed that polyoxypropylene glycols which have a hydroxy group at one end of each molecule and a n-butyl group at the other end (mono-functional glycols) are not fully miscible (cf. column 2, lines 26 to 45) and compared with the mono-hydroxy functional glycols the

dual-hydroxy functional glycols have a wide range of miscibility (cf. column 7, lines 39 to 43). In view of that, document (8) not only does not provide any indication to use an oil which does not contain any hydroxyl group but, furthermore, teaches away from replacing polyglycol oils by ester compounds such as defined in Claim 1, let alone to use them associated to an epoxy compound.

9.7 The consideration of the other documents cannot rebut this finding. In the Board's judgment, the person skilled in the art would not have considered the disclosures of documents which deal with lubricating compositions to be used in combination with chloro-fluoro hydrocarbon, since there is no problem of compatibility between the lubricant oil and the chloro-fluoro hydrocarbon as taught by the patent in suit (cf. page 2, lines 23 to 25) and confirmed by document (8) (cf. column 4, lines 26 to 33). Therefore, the person skilled in the art could not have found relevant information in those documents because they are not related to the technical problem to be solved. In that context, document (4) is clearly of no relevance (cf. point 9.2 above). Nor would the disclosure of document (3a) have been considered since it also relates to lubricating compositions for use with Freon (cf. page 1, second and third paragraphs).

9.8 The disclosure of document (5) relates to a method for refining a mixture of esters such those obtained by reaction of polyol with mono or dicarboxylic acids in order to lower the acid number which consists in treating said mixture with a glycidylester. Firstly, using a glycidylether, is not envisaged by this document. Secondly, no use of those esters in a

refrigerator oil composition is disclosed, let alone the fact that the problem of compatibility of the esters with chlorine-free hydrofluorocarbons is not mentioned. In conclusion, this document is of no relevance for solving the technical problem at issue.

9.9 It is true that document (6) teaches that ester compounds such as esters of neopentylglycol and monocarboxylic acids are valuable oils for refrigeration machines and that document (7) encourages the use of chlorine-free hydrofluorocarbons as refrigerants. However, document (6) does not address the technical problem of miscibility of the oil with a chlorine-free hydrofluorocarbon refrigerant; furthermore, in view of the teaching of document (8) (cf. point 9.6 above), the person skilled in the art would not have followed this way given that esters of neopentylglycol and monocarboxylic acids contain no hydroxyl groups. Furthermore, document (7) does not contain any hint regarding the lubricating oil to be used with a chlorine-free hydrofluorocarbon refrigerant.

9.10 It follows from the above that the subject-matter of each Claim 1 of the second auxiliary request (for designated Contracting States DE, DK, GB and IT and for designated Contracting States other than DE, DK, GB and IT) is not rendered obvious by the prior art cited taken as a whole. For the same reasons, the Board concludes that the subject-matter of each of the dependent Claims 2 to 5, relating to specific embodiments of each Claim 1, involves an inventive step.

The requirements of Article 56 EPC are met by the

claimed invention.

10. *Discretion under Article 111(1) EPC*

Although the Board has come to the conclusion that the claimed subject-matter complies with the requirements of Article 52(1) EPC, the description has still to be brought into line with the claims held allowable. To that end, the Board exercises its discretion under Article 111(1) EPC to remit the case to the first instance.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the set of five claims for the Contracting States DE, DK, GB and IT and the set of five claims for the other Contracting States, both filed as annex 2 (second auxiliary request) with the letter dated 30 December 1998 and a description yet to be adapted.

The Registrar:

The Chairman:

N. Maslin

A. Nuss

