DECISION of 15 May 2002

Case Number: T 0025/99 - 3.3.1

Application Number: 91119342.3

Publication Number: 0485979

IPC: C10M 105/38

Language of the proceedings: EN

Title of invention: Refrigerating apparatus and refrigerant compressor

Patentee: Hitachi, Ltd.

Opponent:
Cognis Deutschland GmbH & Co. KG
RWE- DEA Aktiengellschaft für Mineralöl und Chemie
Matsushita Electric Industrial Co., Ltd.
Sanyo Electric Co., Ltd.
The Lubrizol Corporation

Headword:
Refrigerating apparatus/HITACHI

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

Keyword:
"Main request and auxiliary requests 1 to 3 - disclaimers not admissible as based on a non-novelty destroying disclosure - no inescapable trap - unwarranted advantage given to the patentee"
"Auxiliary request 4 - inventive step (no) - arbitrary selection"

Decisions cited:
G 0001/93, T 0626/90, T 0651/91, T 0526/92, T 0955/93,
T 0934/97, T 1071/97

Catchword:
-
Case Number: T 0025/99 - 3.3.1

DE C I S I O N
of the Technical Board of Appeal 3.3.1
of 15 May 2002

Appellant: Hitachi, Ltd.
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Decision under appeal:  Decision of the Opposition Division of the
revoking European patent No. 0 485 979 pursuant
to Article 102(1) EPC.

Composition of the Board:
Chairman:  R. Freimuth
Members:  P. P. Ranguls
J. P. B. Seitz
Summary of Facts and Submissions

I. The Appellant (Proprietor of the patent) lodged an appeal against the decision of the Opposition Division to revoke the European patent No. 0 485 979 (European patent application No. 91 119 342.3) in the form as amended during opposition proceedings.

II. The then pending main request (submitted on 4 August 1998) comprised seven claims. Independent Claim 1 read as follows:

"1. A refrigerating apparatus which comprises a refrigeration cycle comprising at least

a compressor, comprising a closed vessel stored with a refrigerating machine oil which accommodates a motor composed of a rotor and a stator having a winding wire and an insulating film, a rotating shaft fitted in the rotor, and a compressor section connected to the motor through the rotating shaft, and from which a high pressure refrigerant gas discharged from the compressor section is exhausted out of the closed vessel,

a condenser,

a dryer,

an expansion machine and

an evaporator,

wherein a synthetic zeolite comprising a composite salt composed of alkali metal silicates and alkali metal aluminates which has a pore diameter of 3.3 angstrom
(0.33 nm) or less and a carbon dioxide adsorption capacity at 25 °C at a carbon dioxide gas partial pressure of 250 mmHg (≈33.3 kPa) of 1.0 % or less, is packed into the dryer as a drying agent,

wherein a mixture of a refrigerant comprising a chlorine-free fluorocarbon and/or hydrofluorocarbon and having a critical temperature of 40 °C or higher, and a refrigerating machine oil is circulated in the refrigeration cycle,

said refrigerating machine oil comprising

an ester oil of one or more fatty acids, containing at least two ester linkages

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in the molecule and having a viscosity at 40 °C of 2 to 70 cSt and a viscosity at 100 °C of 1 to 9 cSt, wherein said ester oil comprises at least one member selected from the ester oils represented by the following general formulae (1) to (5)

\[
\begin{align*}
(R_1 CH_2)_2 C(CH_2 OCO R_2)_2 & \quad \ldots \ (1) \\
R_1 CH_2 C(CH_2 OCO R_2)_3 & \quad \ldots \ (2) \\
C(CH_2 OCO R_2)_4 & \quad \ldots \ (3) \\
(R_2 COOCH_2)_3 CCH_2 OCH_2 C(CH_2 OCO R_2)_3 & \quad \ldots \ (4) \\
R_3 & \quad R_3 \\
R_2 COOCH_2 C-CH_2 OCO CH_2(CH_2)_n-CH_2 COOCH_2 C-CH_2 OCO R_2 & \quad \ldots \ (5) \\
R_3 & \quad R_3
\end{align*}
\]
wherein $R_1$ is H or an alkyl group having 1 to 3 carbon atoms, $R_2$ is a straight- or branched chain alkyl group having 5 to 12 carbon atoms, $R_3$ is an alkyl group having 1 to 3 carbon atoms, and $n$ is an integer of 0 to 5,

with the proviso that

(a) in the case of ester oils represented by formula (2) the compound trimethylolpropane-triheptanoate is excluded, and

(b) in the case of ester oils represented by formula (3) pentaerythritol tetraesters of a mixture of alkanolic acids having 7 to 9 carbon atoms are excluded;

optionally an extreme pressure agent, and, provided that said extreme pressure agent is present, optionally one member selected from acid-capturing agents, antioxydants and defoaming agents;

with the further proviso that said refrigerating machine oil does not contain a polyether polyol of the formula

$$Z-[\text{(CH}_2\text{-CH(R}_x\text{-O-)}_a-\text{(CH}_2\text{-CH(CH}_3\text{-O-)}_b\text{-R}_y\text{-)}_c$$

wherein

$Z$ is the residue of a compound having 1 to 8 active hydrogens,

$R_x$ is hydrogen, ethyl, or mixtures thereof,

$a$ is 0 or a positive number,

$b$ is a positive number,
a + b is a number having a value which will give a polyether polyol with a number average molecular weight range from about 400 to about 5000,

R_y is hydrogen or an alkyl group of 1 to 6 carbon atoms, and c is an integer having a value equal to the number of active hydrogen of Z."

III. The oppositions filed by five Opponents sought revocation of the patent in suit on the grounds that the claimed subject matter extended beyond the content of the application as filed (Article 100(c) EPC), and lacked novelty and did not involve an inventive step (Article 100(a) EPC). The oppositions were supported by several documents including:

(6) WO-A- 90 12849

(20) US-A- 4 851 144

IV. The Opposition Division held that the three disclaimers (a), (b) and (c) present in Claim 1 of the main request (cf. point II above) did not contravene the requirements of Article 123(2) EPC. It was, however, held that document (6) disclosed in generic terms the claimed kind of esters to be used as lubricating oils in a refrigeration device comprising chlorine-free hydrofluorocarbons as refrigerating fluids. In the absence of evidence showing an unexpected advantageous effect of the selected group of esters defined in Claim 1, the subject matter of Claim 1 did not involve an inventive step (Article 56 EPC).

V. Oral proceedings took place on 15 May 2002. The Respondents 2, 4 and 5 (Opponents 2, 4 and 5 respectively) had previously informed the Board that
they would not be represented at these oral proceedings. The Respondent 3 (Opponent 3) withdrew his opposition by a letter dated 26 March 2002.

During oral proceedings, the Appellant, while maintaining his main request, filed four fresh sets of claims as auxiliary requests 1 to 4, each containing six claims.

Claim 1 of the first auxiliary request was amended with respect to the Claim 1 of the main request to replace the term "comprising" by "consisting of", and to delete the disclaimer (c), i.e. "said refrigerating machine oil does not contain a polyether polyol of the formula...".

Claim 1 of the second auxiliary request was amended with respect to the Claim 1 of the main request to replace the term "comprising" by "consisting of", to delete the esters of formula (4) and (5) and the disclaimer (c), i.e. "said refrigerating machine oil does not contain a polyether polyol of the formula...".

Claim 1 of the third auxiliary request was amended with respect to the Claim 1 of the main request to replace the term "comprising" by "consisting of", to delete the esters of formula (3), (4) and (5) and the disclaimers (b), i.e. "in the case of ester oils represented by formula (3) pentaerythritol tetraesters of a mixture of alkanolic acids having 7 to 9 carbon atoms are excluded", and (c), i.e. "said refrigerating machine oil does not contain a polyether polyol of the formula...".

Claim 1 of the fourth auxiliary request was amended with respect to the Claim 1 of the main request to replace the term "comprising" by "consisting of", to delete the esters of formula (2), (3), (4) and (5) and
the disclaimers (a), i.e. "in the case of ester oils represented by formula (2) the compound trimethylolpropane-triheptanoate is excluded", (b), i.e. "in the case of ester oils represented by formula (3) pentaerythritol tetraesters of a mixture of alkanoic acids having 7 to 9 carbon atoms are excluded", and (c), i.e. "said refrigerating machine oil does not contain a polyether polyol of the formula...".

VII. The Appellant's submissions in the written proceedings and during oral proceedings may be summarised as follows:

- The disclaimers (a), (b) and (c) had been introduced into Claim 1 during Examination proceedings in order to distinguish the claimed subject matter from the disclosure of document (20). However a detailed examination of this document showed that it was neither novelty-destroying for the claimed subject-matter nor relevant for the assessment of inventive step. According to the decision of the Enlarged Board of Appeal G 1/93 (OJ EPO 1994, 541), a feature providing a technical contribution was a feature which would give an unwarranted advantage to the Patentee such as one creating an inventive selection. By contrast, a feature which did not give an advantage to the Patentee had to be seen as a feature not providing a technical contribution. It was actually the case here since those disclaimers did not serve to distinguish the claimed invention over document (20). It followed that the disclaimers present in Claims 1 of the main request and auxiliary requests 1 to 3 could only be seen as merely limiting the protection conferred and did not contravene Article 123(2) EPC as held by the decision G 1/93.
The claimed refrigerating apparatus was not explicitly disclosed in document (6). Furthermore, the ester oils defined in Claim 1 of each request resulted from a multiple selection among the ester oils encompassed by the generic formula

$$R[OC(O)R']_n$$

of this document. Document (6) was, therefore, not novelty-destroying.

Regarding inventive step, the Appellant submitted with respect to the auxiliary request 4 that in view of document (6) as the closest state of the art, the technical problem to be solved was to provide refrigerating machine ester oils used in a refrigerating apparatus, which ester oils were improved with regard to the total acid number as a measure for their stability. The comparative experiments submitted on 10 April 2002 showed that there was after use no increase in the total acid number for the ester oil of Claim 1 of the auxiliary request 4, while the total acid number of the esters of the examples of document (6) showed a strong increase. Those results were surprising and could not be expected by the person skilled in the art.

VIII. The Respondent submitted that the disclaimers present in Claims 1 of the main request and auxiliary requests 1 to 3 did not meet the requirements of Article 123(2) EPC. A disclaimer was only allowable if the state of the art to be excised was novelty-destroying and an accidental disclosure, thus, without providing a technical contribution. The disclosure of Document (20) was novelty-destroying for the claims without disclaimers and this disclosure was not accidental since the teaching of that document still remained
relevant for the assessment of inventive step. Therefore, those disclaimers vis-à-vis document (20) provided a technical contribution and could not be considered as merely limiting the protection conferred in the sense of the decision G 1/93. The Respondent held furthermore that the Appellant could not rely on decision G 1/93 as he was not caught in an inescapable trap since he formulated claims in his auxiliary request 4 being devoid of any disclaimer.

He argued, furthermore, that the subject-matter of Claim 1 of the auxiliary request 4 was anticipated by the disclosure of document (6). The ester oils defined in Claim 1 of the auxiliary request 4 were within the definition of the ester oils of document (6). Neopentyl glycol was explicitly disclosed as alcohol and there was a substantial overlap, with regard to the mentioned aliphatic acids, between the claimed subject-matter and this document. Furthermore, the claimed subject-matter related to a conventional compression refrigerating cycle and conventional zeolite as drying agent which were implicitly disclosed in document (6) as set out on page 27, second paragraph.

Even though, novelty could be acknowledged, the claimed subject matter was nevertheless obvious since it merely amounted to an arbitrary selection over the generic disclosure of document (6).

IX. The Respondents 2 and 4 did not file any submissions as to the substance. The Respondent 5 contested the inventive step of the claimed subject-matter over document (6), essentially for the reasons given in point VIII above.

X. The Appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis, of either

1692.D .../...
- Claims 1 to 7 of his main request filed on 4 August 1998 or,

- Claims 1 to 6 of one of the four auxiliary requests filed during the oral proceedings.

The Respondents requested that the appeal be dismissed.

XI. At the end of the oral proceedings the decision of the Board was given orally.

Reasons for the Decision

1. The appeal is admissible.

Main request, auxiliary requests 1 to 3

2. Articles 100(c) and 123(2) EPC - Amendments

2.1 The question to be decided is whether the disclaimers present in Claims 1 of the main request and the auxiliary requests 1 to 3 (cf. points II and VI above) comply with the requirements of Article 123(2) EPC or give rise to objections pursuant to Article 100(c) EPC.

2.2 The Board observes that the disclaimers have no basis in the application as filed, and this was conceded by the Appellant.

2.3 According to the established jurisprudence of the Board of Appeal, it may be permissible in exceptional cases to exclude a specific prior art from the claimed invention by means of a disclaimer, even if the original application provides no basis for such an exclusion. However, the first condition to allow such an amendment is that the prior art to be disclaimed
must be novelty-destroying to the subject-matter claimed without the incorporation of the disclaimer (cf. Case Law of the Boards of Appeal of the European Patent Office, 4th edition 2001, III.A.1.6.3, pages 210 to 212, in particular, T 1071/97, point 3.2 of the reasons and T 934/97, point 2.3 of the reasons). In the present case, the Board concurs with the Appellant that document (20) is not novelty-destroying since a refrigerating apparatus which comprises a refrigeration cycle comprising a compressor comprising a particular closed vessel in combination with the ester oils as defined in Claim 1 does not emerge unambiguously from this document. For this reason, the disclaimers cannot find a basis in document (20) since that document is not an anticipation of the claimed invention. It follows that the disclaimers are not allowable as they extend the subject-matter claimed beyond the content of the application as filed which is a ground for opposition pursuant to Article 100(c) EPC and contrary to the requirements of Article 123(2) EPC.

2.4 The Board does not concur with the Appellant that the present case was an inescapable trap as addressed in the decision of the Enlarged Board of Appeal G 1/93. Nor can the Board accept, in the present case, the view of the Appellant that in line with this decision the ground for opposition under Article 100(c) EPC does not prejudice the maintenance of the patent in suit since the disclaimers would merely limit the scope of protection conferred without providing a technical contribution to the subject-matter of the claimed invention.

2.4.1 Firstly, the decision G 1/93 relates to the situation where an undisclosed limiting, technically meaningful feature cannot be deleted or replaced by any other feature properly disclosed in the application as filed
without extending the protection conferred by the patent as granted in contravention of Article 123(3) EPC. Thus, that decision refers only to the situation of a Patentee being caught in an inescapable trap (cf. points 4 and 13 of the reasons). However, it appears immediately that the situation in the present case does not correspond to an inescapable trap as dealt with in decision G 1/93. The Appellant (Patentee) could redraft Claim 1 such that the subject matter thereof is properly disclosed in the application as filed. Thus, he did so in submitting e.g. amended Claim 1 according to the auxiliary request 4 which extends neither the subject-matter claimed beyond the content of the original application nor the protection conferred beyond the patent in suit as granted (cf. point 3 below). Already on that ground the Appellant cannot successfully rely on decision G 1/93 in order to maintain in Claim 1 the disclaimers objected to.

2.4.2 Secondly, the Board observes that the disclaimers provide a technical contribution to the subject matter claimed and, give an unwarranted advantage to the Patentee.

Document (20) discloses ester oils as defined in formulae (2) and (3) of Claim 1 useful for lubricating heat pumps and air conditioning compressors operating with hydrofluorocarbon refrigerants as defined in Claim 1. Therefore, in the absence of any disclaimer in Claim 1, document (20) is highly relevant for the assessment of inventive step and would even qualify as the closest state of the art.

However, when a disclaimer, as in the present case, aims at distancing the patent further from the state of the art (here: from document (20)) which is highly relevant when assessing inventive step, it provides a
technical contribution to the claimed invention and its admissibility would give the patent proprietor an unwarranted advantage (cf. T 526/92, point 6.2 of the reasons and T 934/97, point 2.7 of the reasons). Therefore, the disclaimers in Claim 1 according to the main request and the auxiliary requests 1 to 3, also in the light of the decision G 1/93, are to be considered as subject matter which extends beyond the content of the application as filed.

2.5 For those reasons the main request and auxiliary requests 1 to 3 must fail as their Claim 1 contravenes the requirements of Article 123(2) EPC, thereby, supporting the ground for opposition pursuant to Article 100(c) EPC.

Auxiliary request 4

3. *Articles 123(2) and (3) EPC - Amendments.*

3.1 The question to decide is whether the amendments in Claim 1 regarding the replacement of the term "comprising" by "consisting of" in combination with the restriction of the ester oil to the esters of formula (1) may be derived directly and unambiguously from the application as filed.

3.2 The Board observes that in *all* the original examples related to oils containing esters of formula (1), namely Examples No. 1 to 5, said oils *consist of* esters of formula (1) without any other ester. For this reason, the Board concludes that the person skilled in the art derives directly and unambiguously that feature from the application as filed, so that the requirements of Article 123(2) EPC are satisfied.
3.3 Furthermore, that amendment also restricts the scope of the protection conferred and thus satisfy the requirements of Article 123(3) EPC.

4. Articles 54(1) and (2) EPC - Novelty

4.1 Document (6) discloses liquid compositions useful as refrigeration liquids comprising a major amount of at least one fluorine-containing hydrocarbon (chlorine-free or not), and a minor amount of at least one soluble lubricant comprising at least one carboxylic ester of a polyhydroxy compound containing at least 2 hydroxy groups and characterized by the general formula

\[ R[OC(O)R']_n \]

wherein \( R \) is the rest of a polyhydroxy compound such as neopentyl glycol and \( R' \) is hydrogen, independently a straight chain alkyl group containing from 1 to about 5 carbon atoms, a branched chain alkyl group containing from about 5 to about 20 carbon atoms, or a straight chain alkyl group containing from 8 to about 12 carbon atoms, provided that at least one \( R' \) is hydrogen, a straight chain alkyl group containing 1 to about 5 carbon atoms or a branched chain alkyl group containing from about 5 to about 20 carbon atoms, \( n \) is an integer of from 3 to about 10 (cf. page 1, "field of the invention"; pages 5 and 6, "summary of the invention"; page 9, Table I and first paragraph; page 11, last line; Claim 18). Those liquid compositions are particularly useful as refrigerants in various refrigeration systems which are compression-type systems such as refrigerators, freezers, and air-conditioners (cf. page 27, second paragraph).
4.2 The Board finds, and it was not contested by the Appellant, that the subject matter of the present Claim 1 is generally encompassed by the disclosure of document (6). However, in the present case, the Board observes that the claimed particular refrigerating apparatus operating with a particular hydrofluorocarbon and using a particular ester as refrigerating machine oil is not disclosed in that document. In view of the silence about any feature characterizing the refrigerating apparatus in document (6), the general disclosure of the refrigerating apparatus does not reveal to the skilled reader the presence of a particular compressor, namely a specific closed vessel, and a particular drying agent, namely a specific synthetic zeolithe, indicated in Claim 1 of the patent in suit. Furthermore, the particular combination claimed of a chlorine-free hydrofluorocarbon having a critical temperature of at least 40°C with the ester oil of formula (1) results from a multiple selection, within optional and alternative features given in document (6), namely of particular hydrofluorocarbons from the list of individual, optionally chlorine containing hydrofluorocarbons on page 9, paragraph 2 and of neopentyl glycol from the list of individual polyhydroxy compounds forming the ester oil on page 11, last paragraph to page 12, first paragraph. For these reasons, the Board concludes that the claimed embodiment does not emerge unambiguously for the skilled reader from the prior art. Hence the general disclosure of document (6) does not destroy the novelty of the particular subject-matter claimed (cf. T 651/91, points 4.3 and 4.4 of the reasons).
5. Article 56 EPC - Inventive step

5.1 The Board considers, as held by the Opposition Division and in agreement with both parties, that document (6) represents the closest state of the art and, thus, the starting point in the assessment of inventive step for the subject matter of Claim 1 according to the auxiliary request 4. Indeed, this document aims at the same objective as the claimed invention, namely to provide ester oils for use as machine oil in refrigerating apparatus (cf. point 4.1 above).

5.2 The Appellant submitted that, in view of document (6), the technical problem to be solved was to provide a refrigerating apparatus comprising improved refrigerating machine oils exhibiting after use no increase in the total acid numbers which was a measure for their stability. To formulate that technical problem, he relied upon the experiments submitted during the appeal proceedings comparing the acid numbers of some of the ester oils exemplified in document (6) and of an ester oil according to Claim 1.

5.3 The patent in suit proposes as the solution to this problem a refrigerating apparatus which comprises a mixture of a refrigerant comprising a chlorine-free (hydro) fluorocarbon having a critical temperature of 40°C or higher and of a refrigerating machine oil which is characterized by the presence of an ester oil according to formula (1). The Appellant conceded at the oral proceedings that the features defining the refrigerating apparatus, including the specified drying agent, provided no inventive ingenuity; these features are thus disregarded when assessing inventive step (cf. T 955/93, point 3.5 of the reasons).
5.4 In the present case, the solution proposed by the patent in suit comprises the preferred embodiment of adding an acidic extreme pressure agent, namely a phosphoric acid partial ester, to the refrigerating machine oil in an amount of 0.05 to 10 wt% (cf. dependent Claim 5). Contrary to the submissions of the Appellant, it cannot be a critical issue for the claimed invention to avoid a slight increase of the total acid number of the machine oil which increase results from the ester oil comprised therein where, as it is preferred, a so substantial amount of acidic agent is present in the refrigerating machine oil. It follows that the formulation of the technical problem as put forward by the Appellant cannot be accepted, since the purported improvement does not arise within the whole area of the subject matter of Claim 1. When defining the technical problem, an effect cannot be retained if the promised result is not attainable throughout the entire range covered by the claimed subject matter (cf. T 626/90, point 4.3.2 of the reasons). Thus, the objective technical problem to be solved can only be seen in the provision of a further refrigerating apparatus comprising an ester oil.

5.5 The Examples No. 1 to 5 of the patent in suit show convincingly that this technical problem is solved within the claimed area. This finding has never been contested by the Respondents.

5.6 It remains to be decided whether or not the claimed solution is obvious over the cited prior art.

The relevant question is whether the person skilled in the art having studied the document (6) and being guided by the technical problem as defined in point 5.4 above would have been directed to select ester oils of formula (1) for use in a refrigerating apparatus. The
specific choice neopentyl glycol (page 11, last line) as alcohol and of an aliphatic carboxylic acid having a hydrocarbyl group of 5, 6, 7 or 8 carbon atoms (page 13, penultimate line; page 14, lines 1 and 2) which results in an ester of formula (1) is within the scope envisaged by the disclosure of document (6). The Board observes that document (6) teaches that the ester oils including neopentylglycol hydrocarbyl esters, and refrigerants, including chlorine-free (hydro) fluorocarbons (page 9, paragraph 1) form compatible and stable mixtures over a wide temperature range. The presumption prevails, therefore, that the selected ester oils of formula (1) will exhibit the same valuable properties. In the absence of evidence to the contrary, the Board concludes that it would have been obvious for the person skilled in the art, faced with the technical problem defined in point 5.4 above, to select arbitrarily neopentyl glycol and a C₅₋₈ aliphatic carboxylic acid, thereby arriving without inventive ingenuity at the ester oils of formula (1) comprised in a refrigerating apparatus which is the solution proposed by the patent in suit. This finding was actually conceded by the Appellant during the oral proceedings before the Board. For this reason, Claim 1 does not meet the requirements of Article 56 EPC.

5.7 Since the Board can only decide on a request as a whole, the patent in suit cannot be maintained in the form as submitted in this auxiliary request and this request must be rejected for lack of inventive step.
Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: 

E. Görgmaier

The Chairman:

R. Freimuth