BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

A		B		C	X

File Number: T 182/91 - 3.3.1

Application No.: 83 300 439.3

Publication No.: 0 095 825

Title of invention: Process for preparing lubricating greases

Classification: C10M 7/28

D E C I S I O N
of 27 August 1992

Applicant: Montedison S.p.A.

Headword: Lubricating greases/MONTEDISON

EPC Art. 56, Art. 111(1)

Keyword: "Inventive step, main request (no) - mere collocation"; "Auxiliary request remitted"

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 182/91 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 27 August 1992

Appellant : Montedison S.p.A.
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Decision under appeal : Decision of Examining Division of the European Patent Office dated 5 September 1990 refusing European patent application No. 83 300 439.3 pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : K.J.A. Jahn
Members : R.K. Spangenberg
J.A. Stephens-Ofner

Summary of Facts and Submissions

I. The Appellant is the applicant of European patent application No. 83 300 439.3, corresponding to EP-A-095 852, filed on 27 January 1983.

II. The appeal, which was filed on 31 October 1990, lies from the decision of the Examining Division of the EPO dated 5 September 1990 refusing the application. The appropriate fee was paid on 1 November 1990.

III. The decision under appeal was based upon a combination of Claims 1 and 3 as filed, as requested in a letter received on 27 November 1986, and a further modification requested in a letter received on 21 August 1989. The claimed subject-matter related to the production of a lubricating grease from polytetrafluoroethylene (PTFE) and a liquid dispersant selected from oligomers of trifluorochloroethylene and certain perfluoropolyethers, containing anti-corrosion additives. The following documents were cited:

D1: LU-A-81460;

D2: US-A-4011267;

D3: US-A-4194983;

D4: US-A-4324673.

The Examining Division considered that D1 was the closest state of the art. The technical problem was seen to be the improvement of the mechanical stability and the corrosion resistance of the fluorinated greases described therein. The solution offered to that problem by the claimed subject-matter resided in the addition of specific

stabilising and corrosion-preventing agents, such as those disclosed in D2 and D3 for a similar purpose, to the lubricating greases of D1. Since D4 was not found to suggest to the skilled person that the anti-corrosive agents of D2 and D3 would not work with the PTFE-thickened greases of higher molecular weight specified in the amended Claim 1, this solution was held to be obvious at least insofar as the corrosion inhibitors of groups (c) and (d) of original Claim 3 were concerned.

IV. The Appellant filed two sets of claims (A and B) as his main and auxiliary requests with his statement of grounds of appeal, received on 7 January 1991. Claim 1 of Set "A" was substantially identical with the request refused by the Examining Division. Claim 1 of Set "B", after correction of a clerical error in the definition of anti-corrosion additive (d) during oral proceedings on 27 August 1992, reads as follows:

"A process for preparing a lubricating grease based on polytetrafluoroethylene and on a liquid dispersant selected from oligomers of trifluorochloroethylene or from perfluoropolyethers of the general formula:

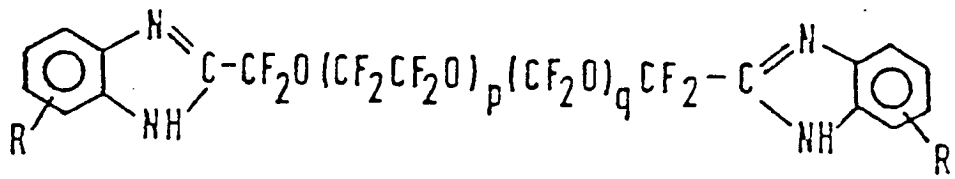
(III) $A\text{-}O\text{-}(C_2F_4O)_r(CF_2O)_s(C_tF_{2t}O)_u\text{-}B$

wherein:

A and B are terminal $-CF_3$, $-C_2F_5$, $-CF_2Cl$ or $-CF_2CF_2Cl$ groups; r, s and u are integers, and r + s + u = 10 - 3000, u/r+s = 0.01 - 0.3, and r/s = 0.1 - 10; and t >= 3; wherein a polytetrafluoroethylene having a molecular weight in the range of from 500 000 to 1 000 000, comprising particles of the aggregated type, previously heated under vacuum to remove volatile products which may be contained therein, is mixed, under reduced pressure and

at a temperature higher than room temperature, with an oligmer of CF_2CFCl having a viscosity, at 20°C, from 100 to 1000 cst, or with a perfluoropolyether as defined above and having a viscosity, at 20°C, from 40 to 30,000 cs, and also with a perfluorinated surfactant of the anionic type, the amount of polytetrafluoroethylene being from 15% to 40% by weight of the total mix, the amount of perfluoropolyether being from 60% to 85% by weight of the total mix, and the amount of surfactant being from 0.1% to 0.4% by weight of the polytetrafluoroethylene; and characterised in that to the mixture of components is added a stabilizing and corrosion prevention agent selected from

(a) fluorinated bis-benzimidazoles of the formula:



wherein

R may be F or CF_3; and p and q are integers, and the sum p + q = 10-100, and the ratio p/q = 0.1-2;

(b) esters of phosphorous acid with a perfluorcalkoxy-alcohol;

(c) perfluoropolyethers with phosphinic groups at one or both ends;

(d) perfluoropolyethers with perfluoropolyoxyperfluoro-alkyl-substituted phosphotriazinic groups."

Oral proceedings took place on 27 August 1992, during which the Appellant submitted a further set of three claims, designated as Set "D". Claim 1 of this set was further amended by limiting the sum of r+s+u to "3000" and the viscosity of the perfluoropolyether of formula III to "29 500 cs".

In his written submissions and during oral proceedings, the Appellant essentially argued that the compositions claimed in Claim 1 of Set B differed from those of D1 in that they contained, as liquid dispersant, materials nowhere suggested in that document, namely a perfluoroether of class (III) (as defined in original Claim 1) or an oligomer of trifluoro-chloroethylene, and that it would not have been obvious to replace the perfluoropolyether component of the compositions of D1 by another perfluoropolyether or the trifluorochloro-ethylene oligomer and, in addition, to introduce an anti-corrosion additive, even though such anti-corrosion additives had been suggested for use with certain polyethers per se as evidenced by documents D2 and D3, for the sole reason that two steps were necessary in order to arrive at the claimed process, starting from that of D1.

An additional highly significant difference was, according to the Appellant, incorporated in Claim 1 of Set "D", namely the viscosity of the perfluoropolyether, which was much higher than that of the dispersants used in D1 and, as could be inferred from Examples 4 to 6 of the application, contributed to the high mechanical stability of the greases obtained according to these examples.

V. The Appellant requested that the decision under appeal be set aside and a patent be granted on the basis of either the claims designated as set "B", submitted with the statement of grounds of appeal (main request), or of the

claims designated as set "D", submitted in the course of oral proceedings (auxiliary request).

VI. At the end of the oral proceedings the decision of the Board was announced to remit the case to the Examining Division for further prosecution on the basis of the auxiliary request.

Reasons for the Decision

1. The appeal is admissible.

2. Main request

2.1 The set of claims according to this request no longer comprises the embodiments which the Examining Division expressly held obvious. However, in the decision under appeal it was stated that "at least" the claimed process, insofar as it uses the dispersants of formulae I and II, lacked inventive step and, in the Board's judgment, the reasons of the decision under appeal also apply mutatis mutandis to the process now claimed, comprising the use of the dispersants of formula III. Therefore, the present request does not constitute a "fresh case" (see T 97/90 of 13 November 1991, paragraph 2, to be published in OJ EPO) which the Board would normally remit to the Examining Division in order to have the matter considered by two instances.

2.2 No objection under Art. 123(2) EPC arises against the wording of the present Claims. Claim 1 is based on the disclosure in Claims 1 and 3 as filed; Claims 2 and 3 correspond to Claims 2 and 4 as filed. Claim 4 is based on the description as filed, page 15, line 16 to page 16, line 6 where it is stated that the load resistance of the "fluids" is increased "by the presence of the additives in

the cited amount, as can be measured by the "4-ball Shell test". On page 13, lines 24 to 26 of the application as filed reference is made to the "perfluoropolyether fluids", which are the above liquid dispersants, and that their mechanical resistance is measured by the same "4-ball Shell test".

However, the Board is not convinced that Claim 1 meets the requirements of Art. 84 EPC, but, since this matter is not relevant for the present decision, the Board leaves this question undecided.

2.3 The Board is satisfied that the claimed subject-matter is novel. Since novelty is not in dispute, no detailed reasons for this finding need to be given.

2.4 The essential issue which remains to be considered is that of inventive step.

2.4.1 There is no dispute that D1, which describes a process for preparing a lubricating grease based on polytetrafluoroethylene of the molecular weight-range recited in Claim 1 and perfluoropolyether compounds having a chemical composition very similar to those of formula III, comprising the same process steps as the present Claim 1, represents the closest state of the art. In his written submissions and during oral proceedings the Appellant did not submit evidence showing that the replacement of the known dispersants by those of formula III provided any technical advantage, since the reference to the high viscosity of the dispersant used in Examples 4 to 6 had to be disregarded in view of the range of viscosity indicated in Claim 1, which overlapped with the range of viscosities disclosed in D1.

2.4.2 In respect of this state of the art, the technical problem with which the claimed process is concerned can therefore be seen in finding a process for the production of lubricating greases having lubricating properties similar to those of the greases disclosed in D1, and, in addition, improved corrosion resistance.

The proposed solution of this problem consists in replacing the perfluoropolyether dispersant of formula I or II by that of formula III and the addition of specific stabilising and corrosion-preventing agents to the modified lubricating greases.

2.4.3 The process according to the present Claim 1 is illustrated by Examples 4 to 6 of the application, which use a dispersant of formula III, and, according to the results of standard tests, show an excellent anti-corrosive behaviour. It is therefore credible that the above technical problem is solved.

2.4.4 There is no evidence before the Board that the structural modification of the dispersant contributes to the improvement of the anti-corrosion behaviour. In the Board's judgment, therefore, the above twofold technical problem is solved by two separate measures which both solve one part of the problem and do not influence the solution of the other one.

2.4.5 The first part of the above technical problem, viz. the modification of the composition without impairing the lubricating properties, is solved by replacing the dispersants disclosed in D1 (see Claim 1, formulas A and B), having the following structures:

(A) $X\text{-}O\text{-}(C_3F_6O)_m(CF_2O)_n\text{-}Y$

(B) $A\text{-}O\text{-}(C_2F_4O)_p(CF_2O)_q\text{-}B$

wherein:

X and Y are a terminal $-CF_3$ or $-C_2F_5$ group;
m and n are integers, and m + n = 10 -100, and m/n = 10 - 50;
A and B are terminal $-CF_3$, $-C_2F_5$, $-CF_2Cl$ or $-CF_2CF_2Cl$ groups;
p and q are integers, and p + q = 10 - 200, and p/q = 0.1 - 10;

by the dispersants of formula III.

The only structural difference between the above dispersants of formula B and that of formula III is the presence of a minor amount of monomer units of the formula C_3F_6O in formula III, which already formed part of the structure of the dispersants of formula A. Furthermore, a person skilled in the art would, in the Board's judgment, infer from D1, page 7, line 20 to page 8, line 5, that perfluoropolyethers in general, provided their viscosity exceeds 10, preferably 30, centistokes at 20°C are suitable in the process of D1. Thus the skilled person would have considered that the dispersants of formula III would solve the first part of the present technical problem.

2.4.6 The Board agrees with the decision under appeal in that the solution of the second part of this problem, viz. the improvement of the anti-corrosion behaviour, was obvious insofar as additives of groups (c) and (d) of Claim 1 are concerned, having regard to the disclosure in D2 and D3.

D2 discloses the use of perfluoropolyethers with phosphinic groups at one end, corresponding to stabilizing and corrosion preventing agent (c) of Claim 1, as

anticorrosion-antioxidation additives in perfluoroalkylether fluids (also greases) of the same type as in the present application (column 1, lines 19 and 36 to 39; Claim 1). The amounts in which these additives are to be used include the range indicated in the present application (see column 8, lines 50 to 57).

D3 discloses the use of perfluoropolyethers with perfluoropolyoxy-perfluoroalkyl substituted phosphotriazinic groups, corresponding to the stabilizing and corrosion-preventing agents (d) of Claim 1, in an amount of 0,05 to 5 weight percent, as corrosion inhibitor in perfluorinated polyalkylether lubricants and greases (see column 4, line 35; Claims 1 and 2).

Both documents refer to perfluoroalkylether-based lubricating fluids and greases in general. On the other hand, D4 does not relate to the use of these additives but to the use of those of a structure similar to type (a) of Claim 1. Thus a person skilled in the art would not have been deterred from using the additives disclosed in D2 and D3 in the amounts specified in these documents by the fact that D4 recommended other amounts for another type of additive. The person skilled in the art would therefore have used these additives for the envisaged improvement the greases disclosed in D1.

2.4.7 On the other hand, the Board does not agree with the Appellant's submission that the presence of an inventive step should be acknowledged for the sole reason that the claimed process differed from that known from D1 by two features, so that two steps had to be taken in order to arrive at it. On the contrary, it is the consistent jurisprudence of the Boards of Appeal of the EPO, that a mere collocation of technical features, which, as in the present case, all would have been considered by a person

skilled in the art with a view to solving separate parts of the relevant technical problem, is obvious (see e.g. T 130/89, OJ EPO 1991, 514, Chapters 5 and 6 of the reasons).

2.5 Since the Board cannot see any contribution to a possible inventive step in the additional technical features contained in the dependent Claims 2 to 4, the main request is not allowable.

3. Auxiliary request

3.1 Claim 1 according to this request differs from that of the main request in that its subject-matter is now limited to the use of such perfluoroalkylether dispersants of formula III which have a viscosity of 29 500 centistokes and in which the sum of r+s+u is 3000. This limitation is based on the disclosure in Example 4 of the application as filed and is, therefore, in agreement with the requirement of Art. 123(2) EPC. Claims 2 and 3 correspond to Claims 3 and 4 of the main request and meet the requirements of Art. 123(2) EPC for the reasons given in point 2.2 above.

3.2 The Board is satisfied that by the above limitation the grounds for refusal stated in the decision under appeal are removed, and that the case has now changed to such an extent that the possibility to grant a patent is no longer definitively excluded. Therefore, the Board, in exercising its discretion under Rules 86(3) and 66(1) EPC, has decided to allow the late filing of these claims, albeit it is at present not convinced, on the basis of the evidence and arguments put before it, that they meet all the requirements of the EPC (Art. 97(2) EPC).

3.3 In this respect, in the Board's opinion the present Claim 1 does not meet the requirements of Art. 84 EPC

since it lacks clarity and conciseness. Any claim directed to a process should clearly set out the sequence of steps to be followed, and the materials to which they apply. In this context it is normally not appropriate to draft the claim in a two-part form which requires lengthy repetitions. Moreover, Claim 1 obviously fails to recite process steps, which, according to the description, (see the paragraph bridging pages 10 and 11 as well as page 12, lines 2 to 9), are essential for obtaining the desired result. However, in the Board's view these matters should only be considered if it is clear that, in principle, the grant of a patent can be envisaged, i.e. after having examined the question of inventive step.

3.4 In respect of this question, the Appellant has submitted that the use of dispersants having a viscosity much higher than that of the dispersants disclosed in D1 had a further beneficial effect on the mechanical stability of the greases produced. Although he admitted that D1 contained more general information concerning the influence of viscosity on page 7, line 20 to page 8, line 5, he further submitted that this information could not suggest the use of the dispersants indicated in the present Claim 1, since this information should be seen in the context of the maximum viscosity indicated in e.g. Claim 1 of that document. This issue, which the Examining Division has not yet had an opportunity to consider, constitutes a "fresh case" with respect to the decision under appeal (see T 97/90 referred to above) and the Board therefore finds it appropriate, in exercising its power according to Art. 111(1) EPC, to remit the case to the Examining Division in order to give the Appellant an opportunity to have the matter considered by two instances.

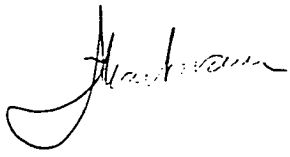
Order

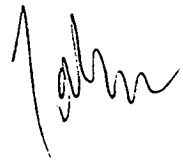
For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division for further prosecution on the basis of the auxiliary request.

The Registrar: The Chairman





P. Martorana A. Jahn