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D E C I S I O N
of 15 November 1995

Case Number: T 0877/92 - 3.3.1

Application Number: 88300090.3

Publication Number: 0275148

IPC: C10M 177/00

Language of the proceedings: EN

Title of invention:

Removal of carcinogenic hydrocarbons from used lubricating oil

Applicant:

EXXON CHEMICAL PATENTS INC.

Opponent:

-

Headword:

Removal of carcinogenic hydrocarbons/EXXON

Relevant legal provisions:

EPC Art. 52(2) & (3), 54(1), 56

Keyword:

"Use claim - not related to a discovery as such"

"Novelty (yes) - functional technical feature"

"Inventive step (yes; after amendment) - unobvious improvement"

Decisions cited:

G 0002/88, G 0006/88, T 0958/90

Catchword:

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Case Number: T 0877/92 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 15 November 1995

Appellant: EXXON CHEMICAL PATENTS INC.
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Decision under appeal: Decision of the Examining Division of the European Patent Office of 25 March 1992, with written reasons delivered on 13 May 1992 refusing European patent application No. 88 300 090.3 pursuant to Article 97(1) EPC.

Composition of the Board:

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

Summary of Facts and Submissions

I. The appeal lies against the decision of the Examining Division of the EPO pronounced orally on 25 March 1992 and delivered in writing on 13 May 1992, by which European patent application No. 88 300 090.3 (published as EP-A-0 275 148) was refused.

II. The decision under appeal was based on an amended set of claims submitted during the oral proceedings on 25 March 1992. Claim 1 of this set read as follows:

"Use of a sorbent for removing polynuclear aromatic compounds (PNAs) from lubricating oil circulating in an internal combustion engine and passing in contact with the sorbent."

The stated ground of refusal was that the subject-matter of the above claim lacked novelty in respect of

D5: DE-A-1 786 334 and

D6: DE-A-2 251 130.

The Examining Division considered that the only feature of the above claim that was not anticipated by the above documents was the intended purpose of removing PNAs from the lubricating oil. It was held, however, that this purpose was always achieved when the method disclosed in D5 or D6 was performed, so that this feature, which did not imply any technical difference in respect of the disclosure of D5 or D6, was no more than an attempt arbitrarily to establish novelty over the state of the art with a parameter which was not previously used in this technical field. Thus, even in view of the reasoning given by the Enlarged Board of Appeal in decision G 2/88 this purpose could in the present

circumstances not be regarded as a technical feature (defined by its function) which was capable of distinguishing the claimed use from the known one. The Examining Division further expressed doubt as to whether the claimed subject-matter met the requirements of Article 52(2) and (3) EPC as well as that of Article 56 EPC. In respect of the latter finding reference was made to D5 and D6 and, in addition, to

D9: US-A-2 941 018.

III. With his statement of grounds of appeal the Appellant filed some further sets of claims to be considered as auxiliary requests and argued that the Examining Division had disregarded the essential points of decision G 2/88. He submitted that, according to this decision, the present use claims were to be considered as comprising not only features relating to a physical entity (the sorbent), and means relating to a physical activity (the means of realisation of the claimed use) but, in addition, to the novel function of achieving the purpose of removing PNAs from the lubricating oil.

In the course of the appeal proceedings the Board observed that the subject-matter of the present claims, even if its novelty could be accepted, might nevertheless lack support by the description and inventive step. The Board also asked the Appellant to submit documents relating to the state of the art acknowledged in the description.

In response to these observations the Appellant submitted on 31 August 1995 three fresh sets of claims (Sets R, S, and T) and requested that the decision under appeal be set aside and a patent be granted on the basis of Claims Set R (main request, comprising 9 claims) or any one of Claims Sets S or T. Claim 1 of all sets reads as follows:

"Use of a wood-based or peat-based activated carbon sorbent for removing dissolved polynuclear aromatic compounds (PNAs) from lubricating oil circulating in an internal combustion engine and passing in contact with the sorbent."

He further submitted the following documents:

- D10: Environmental Science & Technology, vol. 14 (1980), pages 71 - 79, and
- D11: Erdöl und Kohle - Erdgas -Petrochemie vereinigt mit Brennstoffchemie, Bd.33 (1980), 135,

in order to show that it was known since 1980 that polynuclear aromatic compounds, especially those containing three or more aromatic nuclei, are frequently present in relatively small quantities in used lubricating oil and accumulate during operation of an internal combustion engine.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request*

2.1 Claim 1 of Set R is based upon Claim 1 as filed and the disclosure in the description as filed, page 3, first paragraph, last sentence. Claims 2 and 3 are based upon the first three embodiments of Table 1 on page 6 of the description as filed. Claims 4 and 5 find support in the third paragraph of page 2 of the description as filed, whereas Claim 6 is based upon the last four lines of page 1 of the description as filed. Claims 7 and 8 are based upon the disclosure in the paragraph bridging pages 3 and 4 of the description as filed, as well as Claims 3 to 7 as filed. Claim 9 is based upon page 4, lines 13 to 26 of the description as filed. Therefore, no objection under Article 123(2) EPC arises against the wording of these claims.

3. It has been accepted in the decision under appeal that in the present case the function of achieving the technical effect to remove the toxic PNAs from the lubricating oil is a technical feature of the present Claim 1, and the Board has no reason to contest this finding.

4. Further, there is no dispute about the state of the art relevant for assessing the novelty of the claimed use.

4.1 Both the Examining Division and the Appellant agree, and the Board concurs therewith, that D5 discloses a filter element for removing oil-harmful contaminants from lubricating oil circulating in an internal combustion engine, wherein the filter element comprises a hollow cylinder of corrugated filter-paper surrounding and containing a mass of charcoal. During operation, engine oil passes through the filter paper into the charcoal mass. D5 discloses that the cylinder of filter-paper serves to purify the oil by physical separation of the oil-insoluble contaminants and the charcoal mass causes chemical cleansing and absorption of sulphuric acid and

thermal precursors thereof such as gasoline, soot, formic acid, etc. The filter is said to eliminate the necessity for changing the engine oil (see Claim 1 and Fig. 1).

4.2 It is also common ground that D6 discloses a filter element comprising a perforated cylindrical cardboard case, a cylindrical filter-paper roll surrounding that case, activated wood charcoal disposed in the annular space between the case and the roll and retained by paper discs at each end of the element. The element is received in a housing having a perforated base at one end communicating with a discharge outlet and the element is held against the outlet by compression from a spring-clip acting on a sealed piston at the other end of the housing. Lubricating oil enters the housing via an inlet, passes through the filter-paper roll and the charcoal, and is recovered via the discharge outlet. This filter element is intended, like that described in D5, for the physical and chemical cleansing of lubricating oil, particularly for the removal of sulphuric acid, water, gasoline, insoluble soot, metal abrasion chaff (see page 1, lines 1 to 7, and Fig. 1).

4.3 Therefore, both D5 and D6 relate to the technical problem of providing an oil-filter element construction which eliminates the necessity of changing the oil in an internal combustion engine. The solution of this technical problem offered by these documents is based on the idea to remove from the lubricating oil those materials which are harmful to the oil and to its engine-lubricating properties. Therefore, in the Board's judgment, these prior art documents do not make available the function of the activated wood charcoal to remove PNAs from the lubricating oil circulating in the engine. This is not contested in the decision under appeal.

4.4 However, the decision under appeal is, as the Board understands it, based upon the assumption that, in contrast to the cases underlying the decisions G 2/88 (see OJ EPO 1990, 93) and G 6/88 (see OJ EPO 1990, 114), in the present case the new function referred to in Claim 1 is of no technical relevance, since all lubricating oils in all kinds of combustion engines would always have accumulated PNAs, when the engine was operated under realistic operation conditions, and that these PNAs had under all circumstances been retained by the activated charcoal.

4.5 In this respect, the Board finds that there is no evidence before it that in a combustion engine operated at the priority dates of the above documents, and having been lubricated by lubricating oils then in use, significant amounts of carcinogenic PNAs were **always** formed. On the contrary, it may be inferred from documents D10 (see page 76) and D11 (see chapters 1 to 3) that the formation of PNAs depends on the type of the engine, the composition of the fuel and the type of lubricating oil used for operating the engine.

For this reason there is no basis for the finding in the decision under appeal that there is absolute identity among the physical entities and the physical activities involved in the disclosure of D5 and D6 on the one hand and the present patent application on the other hand, with the effect that the different technical purpose, taken according to decision G 2/88 as a technical feature defined by its function, cannot serve as a distinguishing feature. On the contrary, in the Board's judgment, in the circumstances of the present case it is likely that, at the priority dates of D5 and D6, combinations of combustion engines, operating conditions

and lubricating oil compositions existed, which did not result in the formation of amounts of carcinogenic PNAs high enough to render the disposal of the used oil hazardous.

4.6 In addition, there is no evidence before the Board that, as a consequence of the disclosure in the above documents, oil filters containing activated wood charcoal have become - prior to the priority date of the present patent application - standard equipment of conventional combustion engines, so that, regardless of the additional effect disclosed in the present patent application, lubricating oil circulating in a combustion engine was in any case filtered through wood based activated charcoal.

4.7 Therefore, the Board is satisfied that the use of wood based activated carbon for removing PNAs is more than just an additional reason for using the known material in the known way for the known purpose (see decision T 958/90 of 4 December 1992, not published in OJ EPO, No. 6.4 of the reasons). On the contrary, in the present case the function of removing PNAs has the technical consequence that a skilled person is taught to apply wood based activated charcoal in technical circumstances in which its application would not have been considered without the knowledge of the disclosure in the present patent application. For this reason the Board holds that this function is technically significant and distinguishes the claimed use from the use disclosed in D5 and D6.

The use of peat based activated charcoal not being mentioned in D5 and D6, the Board holds that for the above reasons the subject-matter of the present use claims is novel in respect of this state of the art, and that the question as to whether or not the reasoning in

decision G 2/88 would also apply in a case where the newly discovered function is always and inevitably performed, so that the discovery has absolutely no technical consequence, does not arise in the present case.

4.8 Furthermore, it follows immediately from the above considerations that the present claims do not relate to a **discovery as such**, as observed in the decision under appeal, since it is not directed to the discovered property of activated wood based charcoal, but to a **technical use** of the discovered property. Therefore, the claimed subject-matter is not excluded from being an "invention" in the sense of Article 52(1) EPC pursuant to Article 52(2) and (3) EPC.

4.9 The Examining Division has further stated, with reference to D5, D6 and D9, that the claimed subject-matter might be open to objection under Article 56 EPC. The Board deems it therefore appropriate to decide this issue in the present appeal proceedings, in view of its power under Article 111(1) EPC, although lack of inventive step was not a ground of refusal of the present patent application.

4.10 In the Board's judgment, D5 and D6 cannot represent the closest state of the art for the purpose of assessing the inventive step in the present case, since they relate to the technical problem of eliminating the necessity of changing the oil in an internal combustion engine (see point 4.3 above), which is unrelated to the technical problem addressed in the present patent application, i.e. the removal of carcinogenic PNAs from lubricating oil circulating in a combustion engine. For the same reason, D9 cannot be regarded as the closest state of the art either, since, although that document relates to the technical problem of removing PNAs, in

particular naphthalene, from liquid hydrocarbons (see column 1, line 69 to column 2, line 14), it does also not address the removal of carcinogenic PNAs from lubricating oil circulating in a combustion engine.

The Board therefore takes as the starting point for evaluating the inventive step the state of the art mentioned in D10 (see in particular page 75, last complete paragraph) or D11 (see in particular chapters 2 and 3). This state of the art corresponds to what is acknowledged in EP-A-275 148 on page 2, lines 5 to 8, where it is stated that polynuclear aromatic compounds, especially those containing three or more aromatic nuclei, are accumulating in used lubricating oil during engine operation, thereby rendering disposal of the used oil hazardous. In these documents, however, no way for avoiding or removing these undesirable by-products of the combustion process is disclosed or suggested.

- 4.11 In the light of this state of the art, the technical problem which the present patent application sets out to solve can be seen in providing a method for effectively removing the undesirable carcinogenic PNAs from the lubricating oil circulating in a combustion engine (see EP-A-275 148, page 2, lines 39 to 42). What is considered to be "effective" can be inferred from the results reported in Table 1 of the present patent application. It is stated there that three particular wood or peat based activated carbons were able to remove more than 80% of the PNAs, whereas other active carbons turned out to be significantly less effective. From these results it also follows that the above technical problem is solved by using wood or peat based activated carbons.

The issue to be decided in the present case in respect of inventive step is therefore whether a person skilled in the art would have applied wood or peat based activated carbons with a view to solving this technical problem.

- 4.12 In the Boards judgment, the cited state of the art would not have provided the skilled person with any incentive to solve this problem in the way proposed by the present patent application, since, as already set out in point 4.10 above, the relevant technical problem is not addressed in any of these documents. In addition, even if one would assume that a skilled person would have considered D9, since it proposes a solution to the more general technical problem of removing PNAs from a hydrocarbon feedstock of any kind, this skilled person would not have derived any incentive from D9 to select wood or peat based activated carbons for this purpose. D9 proposes to remove the PNAs by contacting the hydrocarbon mixtures with a silica gel absorbent containing a complexing agent having an affinity for PNAs. In D9 it is further mentioned, that "sundry forms of activated charcoal chars" had also been suggested for that purpose, but that their efficiency had been found insufficient (see column 1, lines 20 to 31 in combination with column 1, lines 56 to 68). Therefore, the skilled person would at most have inferred from this document, which proposes a totally different sorbent for absorbing PNAs, that the performance of any kind of activated charcoal would be insufficient. On the basis of the cited state of the art, the claimed subject-matter is therefore not obvious.

5. The stated grounds for refusal are thus not applicable to the present set of claims, so that the decision under appeal can be set aside and a patent can be granted on the basis of these claims and a description duly adapted thereto, taking into account the cited prior art, after the requirements of Rule 51, paragraphs (4) to (11) EPC have been met.


In these circumstances, there is no need to consider the auxiliary requests.

Order

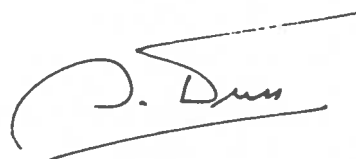
For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with the order to grant a patent on the basis of Claims Set R received on 31 August 1995 and a description yet to be adapted.

The Registrar:


E. Görgmaier

The Chairman:


A. Nuss

