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File Number: T 0409/91 - 3.3.1  
Application No.: 87 308 436.2  
Publication No.: 0 261 958  
Title of invention: Middle distillate compositions with reduced wax crystal size

Classification: C10L 1/24

**D E C I S I O N**  
**of 18 March 1993**

Applicant: Exxon Chemical Patents Inc.

Headword: Fuel oils/EXXON

**EPC** Arts. 83, 84; Rules 29(1), 29(3)

Keyword: "Support by the description (no), clarity (no)" -  
"Sufficiency of disclosure (no)"

**Headnote**

*The questions of sufficiency and of support by the description are questions of fact which have to be answered on the basis of the available evidence having regard to the balance of probabilities in each individual case. Although the requirements of sufficient disclosure of the invention (Art. 83 EPC) and support by the description (Art. 84 EPC) are related to different parts of the patent application, they give effect to the same legal principle that the patent monopoly should be justified by the technical contribution to the art. Therefore, the extent to which an invention is sufficiently disclosed is also highly relevant for the answer to the question of support (points 3.3 to 3.5 of the Reasons).*



Case Number : T 0409/91 - 3.3.1

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.1**  
**of 18 March 1993**

**Appellant :** Exxon Chemical Patents Inc.  
1900 East Linden Avenue  
Linden  
New Jersey 07036 (US)

**Representative :** Uexküll & Stolberg  
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**Decision under appeal :** Decision of the Examining Division of the European Patent Office announced orally on 6 June 1990, with written reasons delivered on 7 January 1991, refusing European patent application No. 87 308 436.2 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. 87 308 436.2, corresponding to EP-A-0 261 958. The appeal was filed on 13 March 1991 and lies against the decision of the Examining Division of the EPO announced on 6 June 1990, with written reasons delivered on 7 January 1991, by which the application was refused. The appropriate fee was paid on 14 March 1991.

II. The decision under appeal was based upon Claims 1 to 5 as filed and published. Claim 1 read as follows:

"Distillate fuel oil boiling in the range 120°C to 500°C which has a wax content of at least 0.3 weight% at a temperature of 10°C below the Wax Appearance Temperature, the wax crystals at that temperature having an average particle size less than 4000 nanometres."

Claims 2 to 5 defined smaller upper limits of the particle size down to 1000 nanometers.

The first reason for refusal was that the application only taught a method to obtain a fuel oil containing wax particles having a size of 1200 nm when tested at 6.4°C below the Wax Appearance Temperature (WAT). Since there was no information available as to how to obtain smaller wax particles at a temperature of 10°C below WAT, the subject-matter of Claim 1, insofar as it related to particle sizes below 1000 nanometers, was not disclosed in the application in a manner sufficiently clear and

complete for it to be carried out by a person skilled in the art.

The second and more important reason was that a part or parts of that claimed subject-matter which was not open to objection under Article 83 EPC, did not meet the requirement of Article 84, first sentence in combination with Rule 29(1), so that the claim as a whole did not define (state all the essential elements of) the matter for which protection was sought, i.e. the fuel oil, in terms of **technical** features. Referring to document

(1) FR-A-2 256 235

it was stated that the principle of crystal size reduction, which was an essential feature of the claimed subject-matter, in other words the need to have crystals as small as possible, was already known in the art of preventing the so-called "cold filter plugging". Therefore, the contribution which the present patent application made to the art was not this principle of smallness, but rather a particular manner of achieving this desired result. In these circumstances, the indication of the "critical" upper limit of the particle size of 4000 nm was not considered to involve an inventive step. Thus, any patentable invention could only lie in the choice of the superior additive described in the patent, which produced the desired small particles.

II. In the statement of grounds of appeal received on 16 May 1991 and during oral proceedings, which took place on 18 March 1993, the Appellant argued that the present

claims did define the subject-matter for which protection was sought in such a manner that any person skilled in the art of fuel distillates could easily find out whether a particular fuel oil was or was not covered by these claims. Therefore, the clarity requirement of Article 84 EPC was met. In respect of Article 83 EPC, the Appellant admitted that the application did not contain any disclosure enabling a skilled person to obtain fuel oils of the claimed type containing wax crystals of an average particle size of less than 1000 nanometers. In his opinion, however, it was not necessary to indicate a **lower** limit of the particle size in the claims, since the solution of the technical problem to avoid filter plugging was the indication of a suitable **upper** limit. Thus, the lower limit was not an essential feature of the invention.

The Appellant further contested the Examining Division's opinion that document (1) disclosed the principle underlying the present application, i.e. to make the wax crystals so small that they were able to pass the main filter of a diesel engine. This document, having a 1973 priority and originating from the same company, Exxon, should, so he argued, be construed in its historical context. On this construction, it taught the modification of the **shape** of the wax crystals, rather than the reduction of their **size**. Moreover, this document was solely concerned with quite different types of filters, having mesh widths of e.g. 44000 nm, i.e. having pores tenfold larger than those described and claimed in the application in suit.

Since the particle size as well as the boiling range of the fuel oil, and the wax content as defined in the present claims were technical features, and were the only ones necessary for solving the technical problem of avoiding the clogging of the main filter of a diesel engine, he submitted that the requirements of Article 84 and Rule 29(1) were also met. The Appellant also strongly emphasised that before the priority date of the application in suit nobody had thought of solving the problem of filter clogging ("plugging") by the reduction of the crystal size. Thus it was this new principle of solving an old technical problem that was the real contribution to the art made by the claimed invention, even if the description did not clearly say so. At the same time the Appellant admitted that the description did not disclose any other method of obtaining the desired crystal size than the addition of certain additives to the fuel oil and also that there was no common general knowledge of making fuel oils of this kind available to the person skilled in the art. However, he argued that it was settled jurisprudence that the availability of **only one** way of carrying out an invention was sufficient to meet the requirement of Art. 83 EPC, and that the disclosure of the invention was therefore sufficient.

For the same reasons, he submitted, the requirement of support by the description as stipulated by Art. 84 EPC was also met. In his opinion the situation here under consideration was comparable with the invention of a new chemical compound, where it was settled jurisprudence that the disclosure of **only one** method of preparing it was sufficient to obtain product protection per se,

implicitly covering **all** methods of preparation, including those which were neither disclosed, nor were available by common general knowledge.

- IV. The Appellant requested that the decision under appeal be set aside and that the patent be granted on the basis of the claims as filed, or, as an auxiliary request, that the patent be granted on the basis of Claims 1 to 4 submitted during oral proceedings. Claim 1 of this set of claims contained a lower limit of 1000 nanometers for the size of the wax crystals.

At the end of the oral proceedings the decision of the Board to dismiss the appeal was announced.

### **Reasons for the Decision**

1. The appeal is admissible.
2. Main request

The set of claims according to this request was objected to because Claim 5 of this request related to subject-matter which was not sufficiently disclosed as required by Article 83 EPC. The Board observes that this objection does not only relate to the subject-matter of Claim 5, but applies equally to the subject-matter of Claims 1 to 4, on which Claim 5 depends. In other words, in the present case there is absolutely no doubt that all these claims must be so construed as to relate to fuel oils containing wax crystals smaller than 1000 nanometers. The Appellant has admitted that no way of obtaining such fuel oils was disclosed or could be found

in the body of relevant common general knowledge. However, in the Board's judgment, in order to fulfil the requirement of Art. 83 EPC, the application as filed must contain sufficient information to allow a person skilled in the art, using his common general knowledge, to carry out the invention within the **whole area** that is claimed. Therefore, the decision under appeal correctly found that the claims of the main request related to an invention which was not sufficiently disclosed, as required by Article 83 EPC.

The Appellant's submission that the lower limit in the present case is not an essential feature of the invention, and need not, therefore, be mentioned in the claim, does not relate to the requirement of Art. 83, but rather to Art. 84 EPC. However, the Board cannot agree with this submission, since the essential features of the invention, which must be used for defining the matter for which protection is sought, in accordance with Art. 84 EPC in combination with Rule 29(1) and (3), are all those technical features which are necessary to define an invention which is patentable under the EPC, including any feature which is necessary to define matter which also meets the requirement of sufficient disclosure pursuant to Article 83.

Therefore, the main request must fail.

### 3. Auxiliary request

- 3.1. Claim 1 of this request differs from Claim 1 of the main request by the introduction of the lower limit of the particle size of 1000 nm. This limit is disclosed as an

upper limit in original Claim 5, which depended on original Claim 1. Thus the range now claimed is the difference of the ranges disclosed in original Claims 1 and 5 and therefore meets the requirement of Art. 123(2) EPC.

- 3.2. The introductory part of the description (page 2, lines 1 to 49) sets out the historical development of the technical field of improving the fluidity of diesel fuel at low temperatures. It states that untreated distillate diesel fuel tends to form plate-like wax crystals at low temperatures which then congeal to form a spongy mass, entrapping oil, thereby preventing the oil from pouring. This problem had at first been overcome by additives which acted as pour-point depressants, by the modification of both the size and the shape of the wax crystals, in order to reduce the cohesive forces between the wax crystals themselves and between the wax and the oil, in such a manner as to permit the oil to remain fluid at a lower temperature, so remaining pourable and thus able to pass through coarse filters. Later developments concentrated on the improvement of filterability, again by modifying both the size and the shape of the wax crystals forming at low temperatures, in such a manner as to produce mostly needle-like crystals which formed a permeable cake on the filter, thereby allowing the liquid fuel to pass. The wax crystals are then dissolved when the fuel is heated up during the operation of the diesel engine. The description goes then on to state that it has now been surprisingly found that waxy fuels forming wax crystals of sufficiently small size at low temperatures, enabling them to pass through paper main filters typically used

in diesel engines, may be obtained **by the addition of certain additives** (lines 50 to 53) and that "the present invention **therefore** provides distillate fuel oil ... having an average particle size of less than 4000 nanometres". In the Board's judgment, this part of the description of the invention is of a fuel oil composition which **must** contain, as an **essential** constituent, "certain additives". It is precisely this feature that is missing from the present claims, which, therefore, do not meet the requirement of Art. 84 EPC, first sentence, since they do not **define** the claimed subject-matter by reference to **all** its essential technical features. Insofar as these claims omit to include this essential feature, they are not definitions of the invention actually described in the body of the description, but mere incomplete descriptions of it. Accordingly, if there be a definition in these claims, it is of some other invention of which the nature of the additives is not an essential part; namely the invention of the principle of smallness, referred to in item I above.

- 3.3. Furthermore, Art. 84 EPC also requires that the claims must be supported by the description, in other words it is the definition of the invention in the claims that needs support. In the Board's judgment, this requirement reflects the general legal principle that the extent of the patent monopoly, as defined by the claims, should correspond to the **technical contribution** to the art in order for it to be supported, or justified (see T 133/85, OJ EPO 1988, 441). This means that the definitions in the claims should essentially correspond to the scope of the invention as disclosed in the

description. In other words, as was stated in Decision T 26/81 (OJ EPO 1982, 211, point 4 of the reasons), the claims should not extend to subject-matter which, after reading the description, would still not be at the disposal of the person skilled in the art. Consequently, a technical feature which is described and highlighted in the description as being an essential feature of the invention, must also be a part of the independent claim or claims defining this invention (see also Decision T 133/85, point 2 of the reasons). Since the Board could not find in the rest of the description anything which might be inconsistent with the above clear statement of what the claimed invention is, in particular because all the worked examples describe fuel oils containing additives, and, furthermore, all those examples which do not contain an additive of the group of "preferred additives" mentioned in the paragraph bridging pages 3 and 4, are marked "comparative examples" and produce, after cooling, wax crystals which do not meet the requirements set out in Claim 1, the description does not support (or justify) a claim which is directed to a fuel oil without any additives. Therefore, the present Claim is not supported by the description and, therefore, offends Art. 84 EPC.

- 3.4. The Board has also considered (Article 114(1) EPC) whether the present Claim 1 could be construed to imply the presence of certain additives, giving rise to the stated particle size as the functional feature. However, even assuming such a construction to be permissible, the Board has serious doubts that such a functional definition would, in the present circumstances, meet the requirements of Art. 84 EPC,

since such a functional definition, even if it would be more clearly related to the corresponding **technical** feature, i.e. the additives, would only be allowable if a number of alternatives capable of performing the said function would be at the disposal of the person skilled in the art, either after reading the description or on the basis of his common general knowledge. However, the description discloses **only one** possibility of obtaining the desired particle sizes, i.e. the use of additives of the chemical structure indicated on page 3, line 48 to page 4, line 14 of the published application, and does not contain any guidance enabling the person skilled in the art to find other suitable additives or additive combinations being capable of producing the desired small wax crystals. The Appellant has further admitted during the oral proceedings that he was not aware of any common general knowledge which might have enabled the skilled person to find further ways for obtaining fuel oils having the claimed particle size.

In these circumstances, the Board finds that such a functional definition cannot be regarded as the most concise way of defining the invention as described in the body of the specification, but is rather an attempt to claim not only the technical contribution to the art actually described, but also to monopolise a technical area extending well beyond it. However, as it has already been stated above, this would be contrary to the requirement of "support" set out in Art. 84 EPC, which prevents such overtly "covetous" claiming. Put another way, the description, on its proper construction, would only support claims which contained the above structural definition of the suitable additives.

Furthermore, the Board is not convinced that the crystal size is a **clear** functional definition of the claimed fuel oil compositions, i.e. that a person skilled in the art can find out without undue burden, i.e. by routine testing, whether or not a certain fuel oil composition falls within the terms of the claim (see also T 68/85, OJ EPO 1987, 228), since a comparison of Examples 3 and 4 of the application in suit reveals that a simple repetition of Example 3 resulted in a crystal size of 2000 instead of 1500 nm, leading to a pressure drop across the filter of 35.5 instead of 6.5 kPa. Hence the crystal size produced in identical fuel oil compositions varies substantially, depending on unknown factors, and cannot, therefore, clearly and unambiguously define these compositions.

- 3.5. Lastly, the present claims relate to an invention which does not meet the requirement of Art. 83 EPC either. Although the requirements of Art. 83 and Art. 84 are directed to different parts of the patent application, since Art. 83 relates to the disclosure of the invention, whilst Art. 84 deals with the definition of the invention by the claims, the underlying purpose of the requirement of support by the description, insofar as its substantive aspect is concerned, and of the requirement of sufficient disclosure is the same, namely to ensure that the patent monopoly should be justified by the actual technical contribution to the art. Thus, a claim may well be supported by the description in the sense that it corresponds to it, but still encompass subject-matter which is not sufficiently disclosed within the meaning of Art. 83 EPC as it cannot be performed without undue burden, or vice versa. In the

present case, however, the reasons why the invention defined in the claims does not meet the requirement of Art. 83 EPC are in effect the same as those that lead to their infringing Art. 84 EPC as well, namely that the invention extends to technical subject-matter not made available to the person skilled in the art by the application as filed, since it was not contested by the Appellant that no information was given to perform the claimed invention successfully without using the structurally defined class of additives. Therefore, the Board does not find that the description discloses the invention defined in the present claims in the manner prescribed by Art. 83 EPC.

In this respect, the Board does not accept the Appellant's submission that sufficiency should be acknowledged simply because one way of performing the invention was disclosed. In the Board's judgment, the disclosure of one way of performing the invention is only sufficient within the meaning of Art. 83 EPC if it allows the person skilled in the art to perform the invention **in the whole range that is claimed**, as was already stated in point 2 above. However, the question whether the disclosure of one way of performing the invention is sufficient to enable a person skilled in the art to carry out the invention in the whole claimed range is a question of fact that must be answered on the basis of the available evidence, and on the balance of probabilities in each individual case. In the present case, the claimed invention concerns a class of fuel oil compositions characterised by a common feature, i.e. the presence of wax crystals of a certain size under certain conditions. In the Board's judgment, this case differs

from those where a class of chemical compounds is claimed and only one method of preparing them is necessary to enable a skilled person to carry out the invention, i.e. to prepare all compounds of the claimed class. Rather, the present case is comparable to cases where a group of chemical compounds is claimed, and not all of the claimed compounds can be prepared by the methods disclosed in the description or being part of the common general knowledge (see e.g. T 206/83, OJ EPO 1987, 5). In the latter case, it was not held sufficient for the purpose of Art. 83 EPC to disclose a method of obtaining **only some** members of the claimed class of chemical compositions. Thus, the Board's finding that the disclosure of the claimed invention is only sufficient if it enables the skilled person to obtain substantially **all** embodiments falling within the ambit of the claims, is consistent with the earlier jurisprudence of the Boards of Appeal of the EPO (see also T 226/85, OJ EPO 1988, 336).

- 3.6. For these reasons the auxiliary request must fail, regardless of whether or not the alleged "principle" to avoid the so-called "cold filter plugging" (or clogging) by reducing the size of the wax crystals would be novel and inventive. Furthermore, the Appellant has admitted during the oral proceedings that it was possible to construe the meaning of the - in his opinion ambiguous - statement in document (1) that "the fuel oil should produce, upon cooling, only small wax crystals which do not plug the filter" (see page 1, lines 18 to 22) in such a way as to disclose precisely just this allegedly "new principle".

**Order**

**For these reasons, it is decided that:**

The appeal is dismissed.

The Registrar:

Chairman:

E. Görgmaier:

K.J.A. Jahn