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**D E C I S I O N**  
**of 8 March 2005**

**Case Number:** T 0668/02 - 3.3.1

**Application Number:** 94301584.2

**Publication Number:** 0620268

**IPC:** C10M 163/00

**Language of the proceedings:** EN

**Title of invention:**

Use of overbased additives to improve the gear change properties of oils for synchromesh gears

**Patentee:**

AFTON CHEMICAL LIMITED

**Opponent:**

INFINEUM UK Ltd.

**Headword:**

Overbased metal salt/AFTON CHEMICAL

**Relevant legal provisions:**

EPC Art. 54(1)(2), 56, 83, 84

**Keyword:**

"Main request: amendments extending the protection conferred by the patent as granted (yes)"

"Auxiliary request: inventive step (yes) - non-obvious solution"

**Decisions cited:**

G 0002/88, T 0127/85, T 0893/90, T 0465/97

**Catchword:**

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Case Number: T 0668/02 - 3.3.1

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.1  
of 8 March 2005

**Appellant:** AFTON CHEMICAL LIMITED  
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**Representative:** Woods, Geoffrey Corlett  
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**Respondent:** INFINEUM UK Ltd.  
(Opponent) POB 1, Milton Hill  
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**Representative:** -

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 23 April 2002  
revoking European patent No. 0620268 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

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

## Summary of Facts and Submissions

- I. On 27 June 2002, the Appellant (Proprietor of the patent) lodged an appeal against the decision of the Opposition Division to revoke the European patent No. 0 620 268 (European application No. 94 301 584.2) in the form of the main request (patent as granted) and first to third auxiliary requests submitted in the course of the opposition proceedings. The prescribed fee was paid on the same day.
- II. The patent in suit was granted with a set of ten claims. Claim 1, the sole independent claim read as follows:

"1. Use of an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate in a formulated gear oil lubricant in an amount sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission."

- III. Claim 1 of the first and second auxiliary requests before the Opposition Division played no role in the appeal proceedings (see point VI below). It is, therefore not necessary to give details concerning them.

Claim 1 of the third auxiliary request before the Opposition Division, the sole independent claim, read as follows:

"1. Use of an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate having a TBN of at least 200 in a formulated gear oil lubricant in an amount sufficient to modify the

frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission, wherein the gear oil lubricant comprises the following components:

- a) oil of lubricating viscosity at least 80% by volume of which is mineral oil or synthetic ester oil or a blend thereof;
  - b) a Mannich base ashless dispersant;
  - c) a metal-free, sulphur-containing antiwear and/or extreme pressure agent;
  - d) a metal-free, phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent;
- said lubricant containing at most, if any, 100 ppm of metal as one or more metal-containing additive components other than said overbased alkali or alkaline earth metal component".

IV. In the notice of opposition revocation of the patent in suit in its entirety was sought on the grounds of insufficiency under Article 100(b) and lack of novelty and inventive step under Article 100(a) EPC. The opposition was supported by the following documents:

- (1) US-A-4 792 410
- (2) US-A-4 776 969
- (3) US-A-4 161 475

In the course of the opposition proceedings the Opponent (now Respondent) submitted three further documents:

- (4) US-A-4 253 977
- (5) US-A-4 744 920
- (6) US-A-5 098 587

V. By a decision announced at oral proceedings held on 19 October 2001 and issued in writing on 23 April 2002, the Opposition Division held that the subject-matter of Claim 1 as granted (see point II above) lacked novelty over document (1) on the ground that the addition of boron groups did not affect the chemical structure of the overbased alkali or alkaline earth metal phenates carboxylates or sulfonates. The definition of the overbased alkali or alkaline earth metal carboxylate, sulphionate and/or sulphurised phenate as set out in Claim 1 embraced, therefore, boronated over-based alkali metal or alkaline earth metal salts disclosed in document (1) and for this reason Claim 1 of the patent as granted lacked novelty over document (1).

Regarding Claim 1 of the third auxiliary request (see point III above), the Opposition Division held that it had not been shown that the distinguishing features of Claim 1, namely an overbased metal salt having a TBN > 200 and the specific additives (b) to (d), solved a technical problem related to the improvement of the gear shift performance. Since those additives were well-known in the art, the person skilled in the art could have used them in the formulations of synchromesh transmissions without implying any inventive ingenuity.

The Opposition Division further held that the requirements of Article 83 EPC were met because the impugned patent in its entirety gave the skilled person enough information to determine what was understood by an improvement of shift performance and to identify which amount of additive was to be used to achieve that result.

VI. At the oral proceedings before the Board which took place on 8 March 2005, the Appellant abandoned the previous requests and submitted two sets of eight claims as main and first auxiliary requests.

The main request contained eight claims. Claim 1, the sole independent claim, reads as follows:

"1. Use of an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate having a TBN of at least 200 in a formulated gear oil lubricant which comprises:

- a) oil of lubricating viscosity, at least 80% by volume of which is mineral oil or synthetic ester or a blend thereof;
- b) a Mannich base ashless dispersant;
- c) a metal-free, sulphur-containing antiwear and/or extreme pressure agent;
- d) a metal-free, phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent;

to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission, said lubricant containing at most, if any, 100 ppm of metal as one or more metal-containing additive components other than said overbased alkali or alkaline earth metal component".

The first auxiliary request contained eight claims. Claim 1, the sole independent claim, reads as follows:

"1. Use of an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate

having a TBN of at least 200 in a formulated gear oil lubricant which comprises:

- a) oil of lubricating viscosity, at least 80% by volume of which is mineral oil or synthetic ester or a blend thereof;
- b) a Mannich base ashless dispersant;
- c) a metal-free, sulphur-containing antiwear and/or extreme pressure agent;
- d) a metal-free, phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent; in an amount sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission, said lubricant containing at most, if any, 100 ppm of metal as one or more metal-containing additive components other than said overbased alkali or alkaline earth metal component".

VII. The Appellant submitted that the subject-matter of Claim 1 of the main request was in the "second non medical use" format as authorized by the Enlarged Board of Appeal (see G 2/88, OJ EPO 1990, 93). This amended claim was filed in response to the grounds of opposition and did not, furthermore, contravene the requirement of Article 123(2)(3) EPC.

Regarding the first auxiliary request, the Appellant contended that overbased alkali (earth) metal salts and boronated overbased alkali (earth) metal salts would be understood in the art to be separate and distinct additive products. No contradiction arose in that respect in view of documents (5) and (6) cited in the patent in suit. The reference to those documents was to

be understood in the context of the methods of manufacturing the overbased metal salts. Furthermore, the newly cited documents

(7) US-A-3 679 584

(8) US-A-5 262 140

established a clear difference between boronated and non-boronated salts. Document (7) taught that the micelles formed when an overbased metal salt is used in a lubricating oil will be quite different from those arising from the use in the oil of a boronated overbased metal salt. Document (8) showed that the boronated additives were effective for reducing friction whereas it was clear from the patent in suit that the overbased metal salts were used in the claimed invention to increase friction (see page 2, lines 43 to 44).

After an interruption, the Board announced at the oral proceedings that it had come to the conclusion that the overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate was not a distinguishing feature in view of the disclosure of document (1).

In view of that conclusion, the Appellant argued in support of inventive step that considering document (1) as the closest state of the art, the technical problem to be solved was to achieve good frictional properties in a gear oil lubricant which did not contain zinc dialkyl dithiophosphate (ZDDP) as an anti-wear agent. In view of document (2) the person skilled in the art would have been deterred from using a metal-free,



phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent as defined in Claim 1 and for that reason the claimed subject-matter involved an inventive step.

Regarding insufficiency, the Appellant relied upon the view expressed by the Opposition Division (see point V above)

VIII. According to the Respondent (Opponent), the absence in Claim 1 of the main request of the feature "in an amount sufficient" was an amendment which broadened the scope beyond that of Claim 1 as granted contrary to the requirements of Article 123(3) EPC.

Regarding the first auxiliary request, the Respondent argued that, in view of document (1), the technical problem to be solved was to provide a gear oil lubricant exhibiting good frictional properties when used in a synchromesh transmission.

The Respondent contended in that respect that the reference to an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate would be understood by a skilled reader as embracing boronated overbased metal compounds as disclosed in document (1). This was confirmed by documents (5) and (6) referred to in the patent in suit and, if necessary, by the newly cited documents

(9) WO-A-89/09811

(10) WO-A-88/08874

Contrary to the Appellant's view, document (2) related to a completely different technical field, namely that of improving the frictional properties of an automatic transmission fluid (ATF), so that it could not have been considered as deterrent for the person skilled in the art.

Document (1) alone rendered obvious the claimed subject-matter since the additives (b), i.e. Mannich base ashless dispersant and (d), i.e. metal-free, phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent, were well-known additives which the person skilled in the art would have both incorporated in the lubricating formulations of document (1), in particular that of example III, without inventive ingenuity to solve the technical problem defined above.

Regarding insufficiency, the Respondent argued in the written proceedings that the invention was not disclosed sufficiently "over the whole range claimed" due to the fact that all the examples of the opposed patent contained trihydrocarbyl dithiophosphate. Claim 1 did not require the presence of such compounds. Furthermore, document (2) taught that by themselves, overbased metal phenates (including sulfurized phenates) or sulfonates exhibited essentially no friction modification properties. Those compounds could not, therefore, improve the friction properties of a gear oil lubricant, contrary to the disclosure of the patent in suit.

At the oral proceedings before the Board, the Respondent did not rely any longer upon this

argumentation but referred to that submitted before the Opposition Division, namely that the person skilled in the art could not carry out the invention without undue burden since the description did not provide the relevant indication how to determine the amount of overbased metal salt sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission.

It was argued in that respect that the test according to Example 6 did not achieve 5,000 trouble-free cycles at a 0.1% dose, whereas it was not indicated whether or not this result was superior to a control for GL-5. Thus, the person skilled in the art was unable to carry out the invention because insufficient information was provided to establish the meaning of "in an amount sufficient" and "improved". Furthermore, Example 7, stated to be an example of the invention, achieved 4,539 cycles with 27 bad changes at 0.1% dosage, thereby reinforcing the view that the disclosure of the patent was insufficient to determine the amount to be used and what was understood by the feature "improved".

IX. The Appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the Claims 1 to 8 filed as main request or first auxiliary request during the oral proceedings.

The Respondent requested that the appeal be dismissed.

X. At the end of the appeal proceedings the decision of the Board was announced.

XI. With a letter dated 3 March 2005, the Appellant had requested the European Patent Office to record the change of company name from ETHYL PETROLEUM ADDITIVES LIMITED to AFTON CHEMICAL LIMITED. A print-out from the U.K Companies Registry online Official Register proving the change of company name was attached to that letter. By a communication dated 15 March 2005 the European Patent Office informed the Appellant of the registration of the changes with effect of 4 March 2005 (Rule 92(1)(f) EPC).

### **Reasons for the Decision**

1. The appeal is admissible.

#### *Main request*

2. *Article 123(3) EPC - Amendments*

2.1 The subject-matter of Claim 1 results from the combination of the subject-matter of Claims 1 to 3 as granted with the deletion of the feature "in amount sufficient" before the words "to modify the frictional properties of the gear oil lubricant....".

2.2 The Appellant argued that this amendment had been made in response to a ground of opposition in conformity with Rule 57(a) EPC.

2.3 However, irrespective of the relevance of such an amendment under Rule 57(a) EPC, deleting the feature "in amount sufficient" amounts to a broadening of the scope of Claim 1 as granted (see point II above)

because then any amount of overbased alkali or alkaline metal carboxylate, sulphonate and/or sulphurised phenate is covered. This amendment extends, therefore, the protection conferred by Claim 1 as granted contrary to the requirement of Article 123(3) EPC.

- 2.4 Since the Board can only decide on a request as a whole, the main request is not allowed.

*First auxiliary request*

3. *Article 123(2)(3) EPC - Amendments*

- 3.1 The Board observes that the subject-matter of Claim 1 is identical to the subject-matter of Claim 1 of the third auxiliary request before the Opposition Division (see point III above) which did not raise any objection under Article 123(2)(3) EPC against it.

- 3.2 The subject-matter of Claim 1 indeed finds support in the application as originally filed (see page 2, lines 1 to 17, Claims 1, 10 and 11).

The subject-matter of Claims 2 to 8 also finds support in the application as originally filed (see Claims 2 to 8).

The amendments, therefore, comply with the requirement of Article 123(2) EPC.

- 3.3 Since the subject-matter of Claim 1 results from the combination of the subject-matter of Claims 1 to 3 as granted, no objection under Article 123(3) EPC is to be made, either.

3.4 The above findings were not contested by the Respondent.

4. *Article 100(b) EPC - Sufficiency of disclosure*

4.1 Several arguments were put forward by the Respondent against sufficiency of disclosure, namely that the overbased calcium salt does not operate as a friction modifier, that trihydrocarbyl dithiophosphate is not recited in Claim 1 and that the description does not provide the relevant indication as to how to determine the amount of overbased metal salt sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission.

4.2 The question whether or not the claimed invention can be put into practice must be assessed on the basis of the European patent as a whole.

4.3 The description of the patent in suit defines, first, the various ingredients for producing the lubricating composition, namely a base oil, Mannich dispersants, sulphur-containing antiwear and/or extreme pressure agents, phosphorus-containing antiwear and/or extreme pressure agents, the overbased alkali and alkaline earth metal carboxylate, sulphonate and/or sulphurized phenate and in a preferred embodiment other additives such as trihydrocarbyl dithiophosphate (see page 2, line 24 to page 5, line 31). The description of the patent in suit also defines the proportions and concentrations of the various ingredients along with the method for blending them (see page 5, line 33 to page 6, line 24). Then, the synchronizer test for the

evaluation of the oil performance is described (see page 6, lines 30 to 55).

The general description, therefore, is sufficient to enable the person skilled in the art to make the lubricating composition and perform the test required to evaluate the oil performance in a synchromesh transmission.

Example 2 shows that with the defined additive package (see page 7, lines 1 to 14), containing in addition 0.15% of overbased calcium sulphurized alkyl phenate, employed at the GL-4 concentration level, the finished lubricant successfully completed 5,000 cycles in the synchronizer test with no bad gear changes. The same test performed without overbased calcium sulphurized alkyl phenate was discontinued after 406 cycles during which 20 bad gear changes had occurred (see example 1).

Examples 3 to 5 show that when example 2 was repeated with the exception that the additive package was employed at the GL-5 dosage level and the overbased calcium sulphurized alkyl phenate was employed at dosage levels of 0.30%, 0.35% and 0.50% respectively, the finished lubricant successfully completed 5,000 cycles in the synchronizer test with no bad gear changes. Example 6 which shows that under the same conditions but at a dosage level of 0.20% of overbased calcium sulphurized alkyl phenate the result is negative (inability to achieve 5,000 cycles of trouble-free gear changes) provides in contrast, a positive indication leading the person skilled in the art in the right direction as far the dosage level of overbased calcium sulphurized alkyl phenate is concerned.

Likewise, example 7 shows that an additive package containing 0.10% of overbased calcium alkyl benzene sulphonate employed at the GL-4 concentration level achieved 4,539 cycles with 27 bad gear changes whereas at 0.50% of overbased calcium alkyl benzene sulphonate (example 9), the lubricant passed successfully 5,000 cycles with no bad changes. Again those two examples give the person skilled in the art a clear indication in the direction of a lubricating composition liable to pass the synchronizer test successfully.

- 4.4 Those examples clearly show that the overbased salts defined in the patent in suit modify the frictional properties of the gear oil lubricant so that, on the basis of the comparison made in the patent in suit, it exhibits improved gear shift performance in a synchromesh transmission, contrary to the Respondent's contentions. The Board observes, furthermore, that the Respondent, on whom the burden of proof rests in respect of his contentions, never submitted any own experimental results or an expert's report in that respect. The fact that document (2) indicates that by themselves, overbased metal phenates (including sulfurized phenates) or sulfonates essentially exhibit no friction modification properties is not relevant in view of the above cited examples.

Furthermore, the examples give sufficient instructions to the person skilled in the art to determine the amount of overbased salt sufficient to achieve the required gear shift performance in a synchromesh transmission.



4.5 The Respondent's objections that the subject-matter of Claim 1 is too broad in that it does not recite the mandatory presence of trihydrocarbyl dithiophosphate necessary according to all the examples, and that Claim 1 does not define the "amount sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission", are not objections under Article 83 EPC for the following reasons:

4.5.1 Whilst an objection under Article 100(b) EPC must be related to sufficiency of disclosure of the invention in the patent as a whole, Article 84 EPC relates to the claims only and prescribes that the claims shall define the matter for which protection is sought. Furthermore, they shall be clear and concise and be supported by the description.

4.5.2 The requirements under Article 83/100(b) EPC (sufficiency) and Article 84 EPC (clarity) must therefore be clearly distinguished from one another, as only Article 83 EPC is related to an opposition ground within the meaning of Article 100(b) EPC, whilst Article 84 EPC is not (see T 465/97, reasons, point 3.2.1).

4.5.3 As long as the contested claim, on its proper interpretation, does not cover embodiments which cannot be carried out, the question whether more details about additives such as trihydrocarbyl dithiophosphate appropriate for achieving lubricating oils have to be incorporated into a claim has thus to be answered under Article 84 EPC. In that context, it is to be noted that nowhere in the description of the patent in suit, is

the trihydrocarbyl dithiophosphate prescribed as a necessary technical feature (see page 5, lines 32 to 31).

- 4.5.4 The same conclusion applies regarding the amount of overbased salt sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission. It is indeed not proper to argue that since in Claim 1 the meaning of "in an amount sufficient" and "improved" could not be established, the person skilled in the art was unable to carry out the invention. Such an approach amounts to use of Article 84 EPC as a stepping-stone for attacking the patent in suit under Article 83 EPC. A combination of Articles 84 and 83 EPC is in contravention with the requirements of the EPC (see point 4.5.2 above).

The Board observes incidentally that this feature constitutes a testable criterion which only involves routine trials according to the synchronizer test (see point 4.3 above) set out in the description (see T 893/90, point 3 of the reasons) and thus satisfies the clarity requirement.

The Board concurs with the Respondent that it is not clear whether or not example 7 purported to illustrate the claimed subject-matter is within the scope of Claim 1 (see point 4.3 above). However, even in that case, this is purely a question under Article 84 EPC (see T 127/85, OJ EPO 1989, 271, point 7.1).

- 4.6 Consequently, the patent in suit as a whole discloses sufficiently and completely the technical conditions by

which the person skilled in the art can reliably and effectively make the lubricating compositions defined in Claim 1 having the frictional properties required for being used in synchromesh-based transmissions.

5. *Article 54(1)(2) EPC - Novelty*

5.1 Document (1) relates to a lubricant composition suitable for manual transmission fluids.

5.1.1 Document (1) explicitly indicates that transmission fluids for synchromesh manual transmission based upon fluids described for other purposes such as automatic transmissions fluids (ATF) suffer deficiencies at cold temperatures given that the shifting characteristics for the manual transmissions are significantly hindered due to the thickened oil (see col. 1, lines 10 to 24). This document indicates further that synchromesh transmissions face double detent or double pump problems when the static coefficient friction is too high and the engaging sleeve chamber cannot engage readily with the cone chamber due to insufficient slippage to allow smooth engaging. A further problem arises if the dynamic coefficient of friction is too low as clashing is observed (see col. 1, lines 25 to 34).

5.1.2 The object of document (1) is to solve the problems of double detent, low temperature shift effort and clashing by providing a formulation of a manual transmission fluid which exhibits high dynamic friction properties as well as low static friction properties and through temperature viscosity controls (see col. 1, lines 35 to 44).

5.1.3 Although the problem addressed (see point 5.1.2 above) does not refer explicitly to a synchromesh transmission, it is undeniable that the detrimental effects to be overcome are directly related to those encountered in the synchromesh manual transmissions (see point 5.1.1 above).

Therefore, document (1) as recognized by the Opposition Division concerns the same technical field as the claimed subject-matter, namely lubricating compositions to be used in synchromesh transmissions.

5.1.4 In its broadest aspect, document (1) discloses a friction modifier system comprising

- a) a boronated overbased alkali metal or alkaline earth metal salt selected from the group consisting of sulfonates, phenates, oxylates, carboxylates and mixtures thereof;
- b) a friction modifier selected from the group consisting of fatty phosphites, fatty acid amides, boronated fatty epoxides, fatty amines, glycerol esters and their boronated derivatives, boronated alkoxyated fatty amines, sulfurized olefins and mixtures thereof

and an oil of lubricating viscosity (see col. 2, lines 45 to 57).

A preferred boronated product is a high carbonate content boronated product which means that the carbonate anions are not completely substituted by borate anions (see col. 4, line 55 to col. 5, line 2 and col. 6, lines 40 to 46).

The boronated overbased alkali metal or alkaline earth metal salt is useful to assist in the frictional properties in the manual transmission fluid compositions and results in the dynamic coefficient of friction being substantially increased (see col. 3, lines 8 to 12 and col. 17, lines 64 to 66).

5.2 The Appellant contended that overbased alkali (earth) metal salts and boronated overbased alkali (earth) metal salts would be understood in the art to be separate and distinct additive products.

5.2.1 However, the technical feature defined in Claim 1, i.e. "overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate" relates to a chemical product formed of an organo acid anion and its cationic alkali or alkaline earth metal counter-part having in excess an alkali or alkaline earth metal in cationic form and a counter-anion. Since Claim 1 does not define the precise nature of the counter-anion, the said technical feature cannot distinguish the boronated overbased alkali metal or alkaline earth metal salt from the counter-anion which consists of carbonate and borate (see col. 5, lines 14 to 15).

No evidence to the contrary in the form of common general knowledge in the field was submitted by the Appellant in that respect.

5.2.2 That finding is furthermore not in contradiction with what is stated in the patent in suit, namely that methods of manufacture of the foregoing overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate are intensively reported in

the literature, *inter alia* those which are obtained according to US-A-4 744 920 and US-A-5 098 587, respectively documents (5) and (6) of the present appeal proceedings (see section [0028]).

Document (5) describes in the summary of the invention a process for obtaining a high carbonate content boronated (emphasis added by the Board) product (col. 2, lines 15 to 44). Likewise, document (6) describes in the summary of the invention a process for preparation of overalkalinized additives with antiwear effects consisting in carbonating a reaction mixture composed of at least one detergent, one derivative of an alkaline or alkaline earth metal, at least one nitrogenized and/or oxygenated promoter in a diluent oil and a hydrocarbonated solvent, and wherein the operation is carried out in the presence of at least one boron (emphasis added by the Board) derivative (col. 2, lines 59 to 68).

In view of the above, the Appellant's later contention that boronated overbased materials are not within the definition of Claim 1, is at odds with what he had set out in the patent in suit.

5.2.3 The Appellant also referred to documents (7) and (8) which in contrast to documents (5) and (6) are patents not referred to in the patent in suit. Moreover, patents do not form part of the common general knowledge.

Furthermore, the argument of the Appellant that a boron compound serves to improve the...friction reducing properties...of a lubricating oil (see document (8)),

col. 1, lines 17 to 20), a use different from the overbased salts defined in Claim 1, is irrelevant. Indeed, the fact that a boron compound may be a friction reducing agent does not also mean that a boronated overbased salt has the same effect. In fact, it is known that a boronated overbased salt increases the coefficient of friction whereas boron decreases it (see document (1), col. 17, lines 64 to 66 and point 5.1.4 above). Likewise, even if document (7) does make a difference between the alkaline earth metal carbonate overbased alkaline earth metal sulfonate and borated overbased alkaline earth metal sulfonate, the carbonate and borate anions distinguishing both products, such a distinction cannot be found in the definition of Claim 1. In Claim 1 the anionic counterpart may be borate or carbonate or any other base.

5.2.4 In view of the above, the Board comes to the conclusion that the nature of the overbased salt is not a distinguishing feature.

5.3 Since document (1) concerns the same technical use as the claimed subject-matter, namely lubricating compositions to be used in synchromesh transmissions (see point 5.1.3 above) in which the boronated overbased alkali metal or alkaline earth metal salt according to document (1) assists in the frictional properties in the manual transmission fluid compositions and results in the dynamic coefficient of friction being substantially increased (see point 5.1.4 above) and since the overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate according to the claimed subject-matter cannot serve for distinguishing from the boronated overbased

alkali metal or alkaline earth metal salt of document (1) (see point 5.2 above), it follows therefrom that the technical feature related to the use of an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate in a formulated gear oil lubricant in an amount sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission, is not a distinguishing feature for assessing novelty.

5.4 However, the lubricants according to document (1) contain zinc salts such as zinc dithiophosphates as anti-wear agents at levels measured by weight of the zinc metal at from about 0.02% (200 ppm) to about 0.2% (2000 ppm) by weight (see col. 17, lines 42 to 47 and examples) whereas the claimed subject-matter according to Claim 1 provides that said lubricant contains at most, if any, 100 ppm of metal as one or more metal-containing additive components other than said overbased alkali or alkaline earth metal component.

For this reason already the claimed subject-matter is novel in view of the disclosure of document (1).

5.5 None of the other documents cited disclose the claimed subject-matter. Since that finding was never contested by the Respondent, there is no reason to give details in that respect.

5.6 In view of the above, the Board comes to the conclusion that the novelty requirement pursuant to Article 54 EPC is satisfied.



6. *Article 56 EPC - Inventive step*

6.1 Independent Claim 1 of the first auxiliary request relates to the use of an an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate having a TBN of at least 200 in a formulated gear oil lubricant in an amount sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits improved gear shift performance in a synchromesh transmission. (see point VI above).

6.2 The Board concurs with both parties that document (1) is the closest state of the art to start from in assessing inventive step.

That document discloses lubricating compositions to be used in synchromesh transmissions (see point 5.1.3 above).

6.3 Starting from document (1) as the closest state of the art, the technical results or effects successfully achieved by the claimed subject-matter vis-à-vis that of the prior art are to be determined for defining the technical problem to be solved by the invention.

6.3.1 To this end, the Respondent submitted to the Board additional experiments by J.L. Milner showing that no improvement in synchromesh performance was observed with an additive package containing a boronated overbased calcium sulphonate (Formulation B) whereas a substantial improvement was observed with an additive package containing a non-boronated overbased calcium phenate (Formulation C).

6.3.2 However, if comparative tests are chosen to demonstrate an inventive step on the basis of an improved effect, the nature of the comparison with the closest state of the art must be such that the said effect is convincingly shown to have its origin in the distinguishing feature of the invention (Case Law of the Boards of Appeal of the European Patent Office 4<sup>th</sup> edition 2001, I.D.7.7.2).

6.3.3 Since the nature of the overbased salt is not a distinguishing feature over document (1), the comparative tests are not relevant (see point 5.2.4 above).

6.3.4 Thus, in the absence of any improved technical effect successfully achieved vis-à-vis the closest state of the art for all embodiments falling under the claim, the objective technical problem to be solved starting from document (1) can only be seen in the use of an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate in a **further** gear oil lubricant composition in an amount sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits good gear shift performance in a synchromesh transmission.

6.4 As the solution to this problem, the patent in suit proposes a lubricating composition comprising an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate having a TBN of at least 200 and components a) to d) as defined in Claim 1 (see point VI above).

6.5 The Board, in view of the examples Nos. 2 to 5 and 9 of the patent in suit, is satisfied that the technical problem defined above is solved within the whole area claimed. The Appellant did not contest that finding.

6.6 It remains to be decided whether or not the proposed solution to the problem underlying the invention is obvious in view of the cited prior art. The question arises, in particular, whether or not it would have been obvious to replace in the known lubrication composition a zinc salt such as zinc dithiophosphate (ZDDP) as antiwear agent (see document (1) above) by a metal-free, phosphorus-containing and nitrogen-containing antiwear agent and/or extreme pressure agent (see component d) as now stated in Claim 1 resulting in a lubricant containing at most, if any, 100 ppm of metal as one or more metal-containing additive components other than said overbased alkali or alkaline earth metal component.

6.6.1 The Respondent merely contended that the claimed use was obvious in view of the disclosure of document (1) alone on the ground that the components b) to d) were well known additives in the art to be incorporated in a lubricating composition, taking up in that respect the reasoning of the Opposition Division (see point V above).

6.6.2 Regarding document (1), it is not denied that all the examples, in line moreover with the general description, provides the use of zinc dithiophosphate as antiwear agent. The Respondent's allegation that zinc dithiophosphate is not an essential feature since Claim 1 of this document does not recite this compound

amounts to confusing what a patent covers in terms of the protection conferred and what it actually provides as a technical teaching and is, therefore, unfounded.

Furthermore, the description of document (1) stating that

"zinc salts are also added to manual transmission lubricants. Zinc salts are ordinarily utilized as anti-wear agents such as zinc dithiophosphates. The zinc salts are added at levels measured by weight of the zinc metal at from about 0.02% to about 0.2%, preferably from about 0.04% to about 0.15% by weight" (see col. 17, lines 42 to 47)

and also all the examples I to V, leave no doubt that the presence of metal in an amount > 100pmm is an essential feature of the teaching of document (1).

Even though it may well be, as contended but not substantiated by the Respondent, that a metal-free, phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent was a well-known additive, the fact remains that the person skilled in the art in view of the sole document relied on by the Respondent, i.e. document (1), had no incentive to replace zinc dithiophosphate by a metal-free, phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent, to achieve a lubricant for synchromesh transmission containing at most, if any, 100 ppm of metal as one or more metal-containing additive components other than said overbased alkali or alkaline earth metal component.

- 6.6.3 Document (2) cannot, in that respect, rebut that finding. That document discloses cyclic phosphates of formula (I) as antiwear agents, friction modifiers and anti-oxydants as a substitute for ZDDP in a lubricating oil composition adaptable for use as a power transmitting fluid having dissolved in addition therein at least one succinate ester friction modifier or metal salt thereof and at least one overbased metal phenate, sulfurized metal phenate, or metal sulfonate friction stability improver (see col. 5, line 41 to col. 6, line 63; col. 23, lines 26 to 46).
- 6.6.4 The Appellant contended that document (2) taught away from the claimed subject-matter since it pointed out that by themselves, overbased metal phenates (including sulfurized phenates) or sulfonates exhibited essentially no friction modification properties (see col. 23, lines 26 to 28).
- 6.6.5 The Respondent argued that document (2) related to a completely different technical field, namely automatic transmission fluids, and for this reason was irrelevant.
- 6.6.6 Firstly, the Board observes that document (2) deals with the problem of finding new additives possessing properties which render them suitable for use in ATF (col. 3, lines 41 to 46). Document (2) points out, furthermore, that the friction modification characteristic of a fluid distinguishes automatic transmissions fluids (ATF) from other lubricants and that the friction requirements of an ATF are unique (see col. 1, lines 22 to 34). Therefore, whatever is taken up from the submissions of either the Appellant or the Respondent (teaching away or no relevance), the

Board concurs with both parties to the extent that the teaching of document (2) cannot contribute to the solution of the above-defined problem.

- 6.7 It derives from the above that it was not an obvious solution to the technical problem defined above (see point 6.3.4 above) to use an overbased alkali or alkaline earth metal carboxylate, sulphonate and/or sulphurised phenate in a formulated gear oil lubricant in an amount sufficient to modify the frictional properties of the gear oil lubricant so that it exhibits good gear shift performance in a synchromesh transmission, wherein in the said lubricant a zinc salt as antiwear agent such as disclosed in document (1) was replaced by a metal-free, phosphorus-containing and nitrogen-containing antiwear and/or extreme pressure agent, resulting in a lubricant containing at most, if any, 100 ppm of metal as one or more metal-containing additive components other than said overbased alkali or alkaline earth metal component.
- 6.8 Since the person skilled in the art would not have been directed in an obvious manner to the claimed solution, Claim 1 involves an inventive step. The same applies to dependent Claims 2 to 8 which represent particular embodiments of the subject-matter of Claim 1.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of Claims 1 to 8 submitted as first auxiliary request during oral proceedings and a description yet to be adapted.

The Registrar:

The Chairman:

N. Maslin

A. Nuss