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**Datasheet for the decision
of 30 June 2020**

Case Number: T 0942/17 - 3.3.03

Application Number: 10828382.1

Publication Number: 2500366

IPC: C08F214/26, C08F2/24, C08J9/00

Language of the proceedings: EN

Title of invention:

AQUEOUS POLYTETRAFLUOROETHYLENE EMULSION AND PROCESS FOR PRODUCTION THEREOF, AQUEOUS POLYTETRAFLUOROETHYLENE DISPERSION OBTAINED USING THE EMULSION, POLYTETRAFLUOROETHYLENE FINE POWDER, AND STRETCH-EXPANDED BODY

Patent Proprietor:

AGC Inc.

Opponent:

Daikin Industries, Ltd.

Relevant legal provisions:

EPC Art. 54, 83, 56

Keyword:

Sufficiency of disclosure - main request (yes)
Novelty - main request (yes)
Inventive step - main request (yes)



Beschwerdekammern

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Case Number: T 0942/17 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 30 June 2020

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 20 February
2017 revoking European patent No. 2500366
pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman D. Semino
Members: D. Marquis
C. Brandt

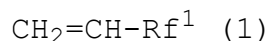
Summary of Facts and Submissions

- I. The appeal by the patent proprietor lies from the decision of the opposition division to revoke European patent No. 2 500 366.
- II. A notice of opposition against the patent was filed in which revocation of the patent was requested.
- III. The decision of the opposition division was based on the claims as granted as the main request, on the first and second auxiliary requests filed on 18 November 2016, on the third to fifth auxiliary requests filed during oral proceedings on 18 January 2017 and on the sixth to ninth auxiliary requests also filed during said oral proceedings which corresponded to the third to sixth auxiliary requests filed on 18 November 2016.

Claim 1 of the main request (claim 1 as granted) read as follows:

"1. A process for producing a polytetrafluoroethylene aqueous emulsion, which comprises emulsion-polymerizing tetrafluoroethylene by means of at least one fluorinated emulsifier selected from the group consisting of a C₄₋₈ fluorinated carboxylic acid having from 1 to 4 etheric oxygen atoms in its main chain, and its salts, to obtain an aqueous emulsion containing polytetrafluoroethylene microparticles having an average primary particle size of from 0.1 to 0.3 μm , wherein at the beginning of the emulsion polymerization of tetrafluoroethylene, a (polyfluoroalkyl) ethylene (a) represented by the following formula (1), and/or a comonomer (b) having a monomer reactivity ratio r_{TFE} of

from 0.1 to 8 in copolymerization with tetrafluoroethylene, is incorporated to the emulsion polymerization system, so as to be from 0.001 to 0.01 mass% relative to the final amount of polytetrafluoroethylene produced,

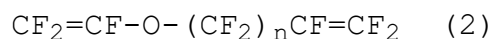


(in the formula (1), Rf^1 is a C_{1-10} polyfluoroalkyl group)".

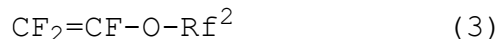
Claim 1 of the first auxiliary request differed from claim 1 of the main request in that the emulsion-polymerizing tetrafluoroethylene was conducted "at a polymerization temperature of from 10 to 95°C and a polymerization pressure of from 0.5 to 4.0 MPa".

Claim 1 of the second auxiliary request differed from claim 1 of the main request in that at the end of that claim the following was added:

"[...] wherein the comonomer (b) is at least one member selected from the group consisting of the following formula (2), the following formula (3), perfluoro(2-methylene-4-methyl-1,3-dioxolane), perfluoro(2,2-dimethyl-1,3-dioxole) and perfluoro(5-methoxy-1,3-dioxole),



(in the formula (2), n is an integer of 1 or 2),



(in the formula (3), Rf^2 is a C_{1-2} perfluoroalkyl group)".

All requests included additional independent claims directed to a polytetrafluoroethylene aqueous emulsion (claim 5 of the main request and first auxiliary request; claim 4 of the second auxiliary request), a polytetrafluoroethylene fine powder (claim 7 of the main request and first auxiliary request and claim 6 of

the second auxiliary request) and to a stretched porous material (claim 9 of the main request and first auxiliary request; claim 8 of the second auxiliary request).

The wording of the further auxiliary requests is not relevant to the present decision.

IV. The following documents were *inter alia* filed during the opposition procedure:

D4: JP 11-240917 A

D4a: English translation of JP 11-240917 A

D5: EP 1 939 222 A1

D6: WO 2005/061567

D6a: English translation of WO 2005/061567

D14: Daniel W. Brown and Leo A. Wall, Amer. Chem. Soc., Div. Polymer Chem., Preprints 7(2), pages 1116-1127 (1966)

D15: Daniel W. Brown, Robert E. Lowry, and Leo A. Wall, J. Polymer Sci., A-1, 8, pages 2441-2452 (1970)

D16: L, G. Kochkina, V, A. Erokhova, and N. N. Loginova, J. Applied Chem. of the USSR, pages 1042-1044 (1984)

D17: Morton Fineman and Sidney D. Ross, J. Polymer Sci., Vol. V, NO. 2, pages 259-262 (1950)

D18: EP 1 172 379 A1

V. The decision of the opposition division, as far as it is relevant to the present one, can be summarized as follows:

- Claim 1 of the main request lacked sufficiency of disclosure as the patent in suit did not provide the necessary guidance for the determination of the monomer reactivity ratio r_{TFE} characterizing comonomer (b). In particular, it was shown in D14-D16 that the determination of the monomer reactivity ratio r_{TFE} depended on conditions used for its determination during polymerization with tetrafluoroethylene (TFE) that were not provided in the patent in suit. The same conclusion applied to claim 1 of the first auxiliary request which contained the same condition on the monomer reactivity ratio r_{TFE} .

- Claim 1 of the second auxiliary request met the requirements of Article 123(2) and (3) EPC.

- Since in claim 1 of the second auxiliary request the comonomer (b) was identified by a list of specific monomers for which the patent in suit established that their monomer reactivity ratio r_{TFE} was within the claimed range, the definition of comonomer (b) was sufficiently disclosed.

- Claims 1, of the second auxiliary request was novel over D5 since a threefold selection was necessary within the disclosure of D5 to arrive at the subject-matter claimed.

- Among D4, D5 and D6 that were cited as closest prior art, D5 was the only document that concerned the problem of providing aqueous polytetrafluoroethylene (PTFE) emulsions free from ammonium perfluorooctanoate (AFPO) and that were environmentally friendly. D5 was therefore the closest prior art. Claim 1 differed from D5 in that tetrafluoroethylene (TFE) was copolymerized with a comonomer (a) and/or (b) as defined in claim 1 of the second auxiliary request and in that the average primary particle size of the PTFE particles was 0.1 to 0.3 μm .

- There was no evidence in the patent in suit that the claimed process was more advantageous than that of D5. In particular, it was not shown that the selection of a (polyfluoroalkyl)ethylene (a) of formula (1) with a C₁₋₁₀ alkyl group had any effect over D5. The problem in view of D5 was thus the provision of an alternative process for the preparation of PTFE aqueous emulsions.

- D5 taught that TFE could be copolymerized with perfluoro(2,2-dimethyl-1,3-dioxole) which was a comonomer according to claim 1 of the second auxiliary request. D5 also taught PTFE particles having a primary particle size of from 0.18 to 0.50 μm , overlapping with the range in the claim. Claim 1 lacked therefore an inventive step over D5.

- The third to ninth auxiliary requests were either not admitted into the proceeding or found not to meet the requirements of the EPC.

VI. The patent proprietor (appellant) lodged an appeal against that decision and filed with the statement of grounds of appeal a main request as well as first to fifth auxiliary requests. The main request corresponded

to the second auxiliary request filed on 18 November 2016, the first auxiliary request corresponded to the third auxiliary request filed on 18 January 2017 and the second to fifth auxiliary requests were new to the appeal proceedings. A sixth auxiliary request was filed with letter of 29 May 2020.

- VII. The opponent (respondent) filed a rejoinder to the statement of grounds of appeal.
- VIII. With letter of 29 May 2020, the appellant filed Annexes B (Supplementary experimental data) and C (Conversion of mol% values from documents D4 and D6 to mass% values).
- IX. With letter of 4 June 2020 the respondent filed a declaration of Mr. Kato, dated 29 May 2020.
- X. Oral proceedings were held on 30 June 2020 in the presence of both parties.
- XI. The appellant's arguments, insofar as relevant to the present decision, may be summarised as follows:

Main request

Sufficiency of disclosure

- Claim 1 of the main request defined that the comonomer (b) had an r_{TFE} of from 0.1 to 8 and that it was selected from a limited group of specific compounds. Thus, each of the specific comonomers (b) listed in claim 1 had an r_{TFE} falling within the range claimed. Measuring the r_{TFE} was not necessary for carrying out the invention. The claims of the

main request were therefore sufficiently disclosed.

Novelty

- At least four selections (homo- or copolymer, nature of comonomer, range of primary particle size, and amount of comonomer) were necessary in order to arrive at the subject matter of claim 1 according to the main request from the disclosure of document D5, so that a skilled person could not clearly and unambiguously derive the claimed subject matter from D5. As a matter of fact, the range of 0.001 to 0.01 mass% in comonomer established novelty vis-a-vis document D5 since even if the comonomer amount had an influence on the particle size, it could not be said that a preferred particle size falling within the range of 0.19 to 0.40 μm corresponded to a comonomer amount of 0.001 to 0.01 mass% as the particle size was not only determined by the comonomer amount. Claim 1 of the main request was thus novel over D5.

Admittance of Annexes B, C and the declaration of Mr. Kato filed with letter of 4 June 2020

- The declaration of Mr. Kato was filed late into the proceedings and for this reason it should not be admitted into the proceedings.

Inventive step

- D5 was the closest prior art since that document dealt with the same technical problem as the patent

in suit.

- Claim 1 of the main request differed from D5 in the selection of a homo- or copolymer, the choice of specific comonomers in specific amounts and in the range of primary particle size.
- The examples of the patent in suit showed the presence of an effect, a good balance between stability and processability of the emulsion, the environmental friendliness, and a high heat resistance of the resulting PTFE. Comparative examples 2 and 5 were relevant to the question of inventive step. Also, it could not be concluded that these comparative examples were according to claim 1 of the main request. In particular, the rounding rule could not be applied to the range defining the amount of comonomer as defined in claim 1 of the main request. Doing so would lead to a nonsensical interpretation of claim 1.
- The problem underlying the present invention was to provide a PTFE aqueous emulsion that was environmentally friendly, had a good balance between stability and processability as well as a high heat resistance of the resulting PTFE.
- The experimental evidence provided, including Annex A, established that the advantageous balance of properties was due to the specific selections of reaction conditions as well the type and amount of comonomer. The examples of the patent in suit showed that using a comonomer could result in either a decrease or an increase of the stress relaxation time. The use of a comonomer did not always result in a reduction of the stress

relaxation time. Using a comonomer also resulted in a low dispersion stability. D5 merely described a general relation between the primary particle size and the comonomer addition amount. D5 did not describe the surprising effect that using a comonomer in an amount exceeding 0.01 mass% resulted in a decreased heat resistance.

- The respondent's additional example merely demonstrated that a comonomer addition amount exceeding 0.01 mass% (i.e. 0.019 mass%) could result in a product having a good balance between stress relaxation time and dispersion stability. However, claiming less in a patent than what was justified in view of experimental evidence did not take away inventive step, as shown in Annex B. Also, the table provided on page 25 of the statement setting out the grounds of appeal showed that the emulsifier, the primary particle size of the emulsion particles and the properties of the emulsion were related to one another.

- D4 and D6 did not concern PTFE emulsion polymerization methods that did not require the use of APFO as emulsifier. The solution provided in the patent in suit was thus inventive in view of the cited prior art.

- D4/D6 concerned an old technology that was not relevant to the technical problem addressed in the patent in suit. These documents could not represent the closest prior art. It had furthermore not been shown in the reply to the statement setting out the grounds of appeal why it should be deviated from the choice of document D5 as closest prior art by the opposition division. The respondent's arguments

based on closest prior art selections different from D5 should therefore be disregarded.

XII. The respondent's arguments, insofar as relevant to the decision, may be summarised as follows:

Main request

Sufficiency of disclosure

- The parameter r_{TFE} defining comonomer (b) in claim 1 of the main request represented the reactivity ratio of the comonomer only under the process conditions under which the process was actually conducted. It was not a property that was intrinsically linked to the structure of comonomer and that was then realized under all reaction conditions. The calculated value for r_{TFE} defining claim 1 of the main request thus depended on the pressure and temperature employed during polymerization for forming the copolymer, as shown in documents D14-D18. The patent in suit did however not disclose the conditions needed for carrying out the process of claim 1 of the main request. Even in view of the definition of the comonomers in claim 1 of the main request by way of a list of compounds, a skilled person still needed to make sure that the process was conducted such that r_{TFE} was satisfied. The skilled person was however left with the task of identifying suitable reaction conditions under which these structural defined monomers actually had the required r_{TFE} value, which he could not because the conditions under which the r_{TFE} had been obtained in the patent in suit were far remote from the preferred reaction conditions. This represented an undue burden.

Novelty

- Each of the features of claim 1 of the main request were per se disclosed in D5. In particular, D5 disclosed a PTFE homopolymer and a PTFE copolymer for which the nature of the comonomer was not a distinguishing feature over D5 since there was a significant overlap between the comonomers recited in D5 and those recited in claim 1 of the main request. Also, the range of 0.001-0.01 mass% recited in the claims of the main request in appeal was not novel over the range of "0.4 mass% or less" disclosed in D5 since the amount of comonomer taught in D5 had to be such as to bring the average particle size of the PTFE microparticles in the range of 0.19-0.40 μm , which overlapped with the range of 0.1-0.3 μm defined in claim 1 of the main request. Hence, only a single selection of comonomers within D5 had to be made to arrive at claim 1 of the main request. That selection anticipated claim 1 of the main request as the choice of a particle size in the range disclosed in D5 corresponded to an amount of comonomer that was also according to claim 1 of the main request.

Admittance of Annexes B, C and the declaration of Mr. Kato filed with letter of 4 June 2020

- No objection was filed against the admittance of Annexes B and C. The declaration of Mr. Kato should be admitted into the proceedings as it merely brought further details concerning D4.

Inventive step

- D5, D4 or D6 were relevant as closest prior art documents.
- Considering D5 as closest prior art, either the PTFE copolymers or the PTFE homopolymers according to the examples were equally valid starting points for the assessment of inventive step. No effect was shown to result from any of the distinguishing features of claim 1 of the main request.
- In particular, the preparations according to comparative examples 2 and 5 which did not result in PTFE emulsions having satisfying properties were in fact according to claim 1 of the main request since the amount in comonomer, by application of the rounding rules, fell under the range of 0.0001 to 0.001 mass%. The same applied to the preparations according to comparative examples 6 and 8 of Annex B which thus lacked relevance. That showed that the comonomer amount was not associated with any effect.
- The patent in suit showed that the higher the amount of comonomer was, the larger the reduction in primary particle size was and the larger the increase in stability time was. That relationship was however already taught in D5. It was also not shown in the patent in suit that the choice of any of the comonomers according to claim 1 of the main request was critical to the stability time.

- Moreover, the additional example filed with the reply to the statement setting out the grounds of appeal (page 13) showed that when PMVE was used as comonomer, optimum properties were obtained for an amount that was outside claim 1 of the main request. This showed that the selection of the amount of comonomer as defined in the main request was merely arbitrary and could not justify an inventive step.

- D5 also taught that the amount of comonomer to be used in the emulsion polymerization was dependent on the chemical structure of the comonomer. It was also not shown that an amount of e.g. 0.001 mass% of PPVE resulted in acceptable properties. It was furthermore not credible that all the comonomers according to claim 1 of the main request, which could differ substantially in their chemical structure, resulted in any effect.

- Starting from the homopolymers of D5, the problem was to provide a process that resulted in an increase of the stability time of the aqueous PTFE emulsions by reducing the primary particle size of the emulsion.

- D5 disclosed that the larger the amount of comonomer introduced the higher the stability of the resulting aqueous emulsion was, which also meant that the average primary particle size decreased. Starting from the examples of D5 using no comonomer at all, the use of a smaller amount of comonomer was not inventive if one only wanted to increase the stability time of the emulsion. Claim 1 of the main request therefore lacked inventive

step over D5 alone.

- The solution to the problem posed was also disclosed in D4 (example 8) or D6 (Table, page 51, examples 2 and 8). Claim 1 of the main request therefore also lacked an inventive step in view of D5 combined with any of D4 or D6.

- Starting from any of the copolymers of D5 no inventive skill was required to choose a small amount of comonomer in order to obtain aqueous PTFE emulsions with satisfying stability and heat resistance.

- Although D4 and D6 used APFO as emulsifier, these documents were also relevant alternative closest prior art documents as they were generally concerned with the preparation of the same types of PTFE copolymer particle emulsions as in the patent in suit. D4 was also relevant in that it suggested limiting the initial amount of comonomer within a range largely overlapping with the one disclosed in claim 1 of the main request and to a degree that did not have a major impact on processability. In particular, the examples of D4 revealed that adding the comonomer in an amount of that range led to a decrease of the particle diameter, and that a larger amount of comonomer led to a larger reduction in particle diameter, as taught in D5. As such, the same trend as that described in D5 was seen for a process employing the APFO-based emulsifier in D4. A skilled person would thus have had a reasonable expectation that the same effect as described in D4 was also be obtained in the system of D5, thereby arriving at the use of the specified comonomers in an amount falling within

claim 1 of the main request.

- D6 also taught to use of a "very small amount" of comonomer and disclosed that the obtained material had a good stress relaxation time, i.e. had sufficient heat resistance. Example 1 of D6 also used perfluoro (methyl vinyl ether) (PMVE) as a comonomer in an amount falling within the range of claim 1 of the main request. A skilled person would thus realize that the same effect as in D5 was observed in D6. A skilled person looking at the examples of D6 would thus in a first attempt choose the comonomer and amount that led to the best properties, i.e. Example 2, which then lead straight to an embodiment falling within the scope of claim 1 of the main request. Since it had not been shown that replacing the emulsifier of D6 by that of D5 required any modification to the polymerization process, the skilled person would have considered D6 to solve the problem posed from D5.

- Starting from either D4 or D6, the difference was the use of the specified emulsifier, providing a more environmentally friendly replacement for APFO. The technical effect caused by this difference was that the process was more environmentally friendly. The question to be asked was thus whether it was obvious to replace the emulsifier APFO of D4/D6 by the emulsifier specified in D5.

- In this regard, the emulsifier was already disclosed in D5 as being more environmentally friendly and providing a solution to the problem of replacing APFO. Further, whenever a given hazardous chemical was to be replaced by a more

environmentally friendly solution, a skilled person would always, at least in a first attempt, try to replace the chemical but keep the same process conditions and the same co-reagents. While a skilled person may not have had an absolute certainty of success that the emulsifier suggested in D5 had the same effect under the conditions of D4 or D6, a skilled person would have tried, with a reasonable expectation of success, to replace the emulsifier of D4 or D6 by the emulsifier of D5. Claim 1 of the main request therefore lacked inventive step starting from D4 or D6 as well.

XIII. The appellant requested that the decision of the opposition division be set aside and that the patent be maintained on the basis of the main request, or, in the alternative, of one of the first to fifth auxiliary requests, all filed with the statement of grounds of appeal, or on the basis of the sixth auxiliary request filed with letter dated 29 May 2020.

XIV. The respondent requested that the appeal be dismissed. It was also requested not to admit the first to sixth auxiliary requests into the proceedings.

Reasons for the Decision

Main request

1. Sufficiency of disclosure

1.1 The objection of lack of sufficiency of disclosure against claim 1 of the main request concerned the definition of comonomer (b) by its monomer reactivity ratio r_{TFE} . It was argued on the basis of D14-D18 that the monomer reactivity ratio r_{TFE} depended on pressure

and temperature conditions applied during its determination in the course of the polymerization of TFE with the selected comonomer (b). These conditions were not disclosed in the patent in suit, so that in order to reduce the claimed process into practice, the skilled person had to determine experimentally, for any given set of comonomer (b) and fluorinated emulsifier, the temperature and pressure to be applied during polymerization to select a monomer reactivity ratio r_{TFE} according to claim 1 of the main request.

1.2 In that regard, the question that had to be answered by the Board was whether the determination of these polymerization temperature and pressure conditions was at all shown to be an undue burden for the skilled person.

1.3 The patent in suit provides, in paragraph 19, a definition of the monomer reactivity ratio r_{TFE} as a parameter obtained by dividing the rate constant in the reaction of propagating radicals with TFE by the rate constant in the reaction of the propagating radicals with the comonomer when the propagating radicals are repeating unit terminals derived from TFE. The determination of the monomer reactivity ratio r_{TFE} is made, according to the same paragraph by calculation using the Fineman-Ross formula applied to the composition of the polymer formed immediately after initiation of the copolymerization of TFE with the comonomer. In that regard, the patent in suit provides some guidance as to the method that can be used to determine the monomer reactivity ratio r_{TFE} .

1.4 There is no disclosure in the patent in suit of a dependency of the monomer reactivity ratio r_{TFE} upon the polymerization temperature and pressure conditions

but, as r_{TFE} involves propagation rates of species generated in a polymerization reaction, it can be expected that that parameter depends to some extent on the temperature and pressure applied during polymerization, as suggested in D14-D18.

1.5 An emulsion polymerization process used in the patent in suit is broadly disclosed in paragraphs 34-51 including the steps concerning the introduction of the comonomers, the initiators, the catalyst, the fluorinated emulsifier and the stabilizing assistant as well as their amounts during polymerization. With regard to the conditions for the emulsion polymerization during the copolymerization of TFE with the comonomer, the patent in suit further provides preferred ranges of polymerization temperatures, pressures and polymerization time in paragraph 47 as well as general guidance as to how the emulsion polymerization is to be carried out (paragraph 48).

1.6 Paragraph 47 of the patent in suit indicates that a preferred range of polymerization temperature is from 10-95°C and a preferred range of polymerization pressure is 0.5-4.0 MPa. The temperature and pressure applied in the preparations according to examples 1-8 of the patent in suit are within these ranges (70°C in all examples and 1.765 MPa in example 1, 1.746 MPa in examples 2-3, 1.275 MPa in examples 4-8). Both preferred ranges of temperature and pressure given in the description of the patent in suit are relatively narrow and do not appear to be uncommon in that field of polymerization. In fact, these conditions correspond to those used in D18 cited by the respondent in appeal, which discloses the same type of emulsion polymerization of TFE (temperature of 10-95°C in paragraph 42 and pressure of 0.5-3.9 MPa in paragraph

49). In that regard, it cannot be concluded that the monomer reactivity ratio r_{TFE} defined in claim 1 of the main request would involve temperature and pressure conditions that would be far remote from the preferred ranges given in the patent in suit or from conditions generally used in the field.

- 1.7 It can be derived therefrom that the preferred ranges of polymerization temperature and pressure can serve as a first guidance for the selection of polymerization conditions from which the monomer reactivity ratio r_{TFE} depends. Beyond the argument of a dependency of the monomer reactivity ratio r_{TFE} on the temperature and pressure conditions, the respondent did not establish that the selection of the pressure and temperature conditions to determine a monomer reactivity ratio r_{TFE} in the range of 0.1-8 and for the comonomers according to claim 1 of the main request would have been an undue burden for a skilled person also relying on the common general knowledge of the field. That however would have been critical to establish a lack of guidance as to the determination of the monomer reactivity ratio r_{TFE} . Under these circumstances, the Board does not find evidence of an undue burden regarding the determination of the monomer reactivity ratio r_{TFE} defining claim 1 of the main request and therefore finds no reason to overturn the decision on sufficiency of disclosure.

2. Novelty

- 2.1 The opposition division concluded in their decision that a threefold selection was necessary within D5 in order to arrive at claim 1 of the main request, namely the selection of a copolymerization reaction over the homopolymerization of TFE, the selection of specific comonomers falling within the definition of comonomer

(b) according to claim 1 and the selection of a range of average primary particle size of the polytetrafluoroethylene microparticles that overlapped with that defined in claim 1.

2.2 It was not disputed by the respondent in appeal that D5 did not provide a single disclosure falling within claim 1 of the main request. Rather, it was contended that a threefold selection was not needed within D5 to arrive at claim 1 of the main request. In particular, the nature of the comonomer used for the preparation of polytetrafluoroethylene copolymers would not constitute a distinguishing feature over D5 as the list of comonomers recited in paragraph 20 of D5 largely overlapped with that according to claim 1 of the main request.

2.3 Paragraph 20 of D5 discloses a list of comonomers that may be used in the copolymerization of TFE. In that list however only the perfluoro(2,2-dimethyl-1,3-dioxole) corresponds to a specific comonomer defined in claim 1 of the main request, the term (perfluoroalkyl)ethylene being more generic than the definition provided for the comonomer of type (a) in claim 1 of the main request. The list of the other comonomers disclosed in paragraph 20 of D5 does not fall under the definitions provided in claim 1 of the main request for the comonomers (a) and (b). It can therefore not be concluded from that paragraph of D5 that the list of comonomers defined in claim 1 of the main request largely overlaps with that disclosed in D5. In order to arrive at claim 1 of the main request, a first selection is thus necessary in the list of comonomers used in the copolymerization of TFE according to D5.

- 2.4 The respondent also considered that D5 disclosed average primary particle sizes of produced polytetrafluoroethylene microparticles of 0.18 μm and 0.19 μm in paragraphs 23 and 36 of D5. While it is not disputed that these values, which represent specific end points of ranges disclosed in D5 (0.18-0.50 μm and 0.19-0.40 μm), fall under the range of 0.1 to 0.3 μm defined in claim 1 of the main request, there is nothing in D5 that explicitly links these two individual values of average primary particle sizes to comonomers of D5 that are also according to claim 1 of the main request.
- 2.5 In particular, the mention in paragraph 23 of D5 that raising the amount of comonomer in the copolymer would increase the stability of the emulsion obtained and result in a smaller particle size of the produced PTFE microparticles is a general statement that as such does not imply that microparticles of average primary particle sizes of 0.18 μm or 0.19 μm specifically were made or even be possible with (perfluoroalkyl)ethylene or perfluoro(2,2-dimethyl-1,3-dioxole) as comonomers in the emulsion process according to D5.
- 2.6 As to the amount of comonomer in D5, it is generally defined as being 0 to 0.5 mass% in paragraphs 22 and 24, a range that encompasses but is also significantly broader than the range according to claim 1 of the main request (0.001-0.01 mass%). It is apparent therefrom that the range of comonomer amounts according to claim 1 of the main request corresponds to the lowest part of the range according to D5, which would, according to paragraph 23 of D5, not necessarily correspond to the lowest average primary particle sizes of the range 0.18-0.5 μm defined in that paragraph. There is therefore also with respect to the choice of comonomer

amount and average primary particle size no clear and unambiguous disclosure of values that would fall under claim 1 of the main request.

2.7 The Board thus finds that in order to arrive at claim 1 of the main request, a three fold selection at least must be performed within D5 and there is no pointer towards a selection that takes away the novelty of claim 1 of the main request. Under these circumstances, claim 1 of the main request is novel over D5.

3. Admittance of Annexes B, C and the declaration of Mr. Kato filed with letter of 4 June 2020

3.1 The admittance of Annexes B and C into the proceedings was not contested by the respondent which also based part of their argumentation of inventive step on the data of these annexes. The Board sees no reason not to admit Annexes B and C into the proceedings.

3.2 The declaration of Mr. Kato filed with letter of 4 June 2020 can be seen as having been filed in reply to the issues raised in points 8.5 and 8.6 of the communication of the Board, mentioning that neither D4 nor D6 appeared to address the problem of heat resistance of the molded materials obtained from the PTFE polymers. In that regard, the declaration of Mr. Kato filed with letter of 4 June 2020 is not filed late and the Board finds it appropriate to admit the document into the proceedings.

4. Inventive step

4.1 The opposition division concluded in their contested decision that D5 and not D4 or D6 was the closest prior art. The respondent in their reply to the statement

setting out the grounds of appeal addressed inventive step in view of D5 and additionally provided objections of lack of inventive step based on D4 or D6 as closest prior art documents. In the following decision, when the prior art documents D4 and D6 are cited, reference is always made to the respective English translations D4a and D6a.

4.2 The patent in suit concerns a process for producing aqueous polytetrafluoroethylene emulsions whereby the environmental load is little, the stability of the emulsions is sufficiently high and to such an extent as not to impair the subsequent processability and moldability of PTFE, and from which a molded product is produced that is excellent in heat resistance as well as a stretched porous material (paragraph 12). The process of the patent in suit concerns more particularly the preparation of PTFE copolymers obtained from the emulsion polymerization of TFE with comonomers that are as defined in claim 1 of the main request.

4.3 The object of D5 is to provide aqueous polytetrafluoroethylene emulsions that do not contain ammonium perfluorooctanoate (APFO) for environmental reasons (paragraph 4) and to provide emulsions that contain polytetrafluoroethylene having a high molecular weight and which have an increased average primary particle size at a level of from 0.18 to 0.50 μm (paragraph 15). D5 is in the same field as the patent in suit and addresses the same problem of providing polytetrafluoroethylene aqueous emulsions that are environmentally friendly and from which a porous material can be obtained (paragraph 15). D5 therefore qualifies as a suitable starting point for the analysis of inventive step. Since the decision of the opposition

division on inventive step was also based on document D5 as closest prior art and this selection was not contested by the appellant, it is reasonable to consider first whether claim 1 of the main request is inventive over D5.

D5 as closest prior art

- 4.4 The respondent argued at the oral proceedings that within D5, the examples of D5 relating to PTFE homopolymers or alternatively the disclosure of copolymers in the description could equally be seen as relevant starting points for the assessment of inventive step and that the arguments provided starting from either starting points were similar.
- 4.5 D5 is concerned with aqueous polytetrafluoroethylene emulsions obtained by carrying out emulsion polymerization of tetrafluoroethylene alone or together with another copolymerizable monomer in an aqueous medium wherein the fluorinated emulsifier is defined by formula (1) disclosed in claim 1 of that document. The fluorinated emulsifier of formula (1) used in D5 contains 6 carbon atoms and 1 or 2 etheric oxygen atoms in its main chain and includes a carboxylic group. The generic emulsifier of formula (1) of D5 is thus according to claim 1 of the main request. As the patent in suit, D5 pertains to a process for producing PTFE aqueous emulsions that are based on copolymers of TFE. A list of possible comonomers is disclosed in paragraph 20 of D5 which contains perfluoro(2,2-dimethyl-1,3-dioxole), a fluorinated comonomer that is according to claim 1 of the main request. That copolymer and in particular the preparation of an aqueous emulsion of that copolymer in the presence of any fluorinated emulsifier of formula (1) appears to be

the disclosure in D5 that is the most relevant to the process according to claim 1 of the main request.

4.6 With respect to that disclosure the process of claim 1 of the main request is characterized in that

- (i) the comonomer is incorporated to the emulsion polymerization system so as to be present in an amount of from 0.001 to 0.01 mass% relative to the final amount of polytetrafluoroethylene produced and
- (ii) the aqueous emulsion contains PTFE microparticles having an average primary particle size of from 0.1 to 0.3 μm .

4.7 D5 discloses in paragraph 24 that the amount of comonomer introduced at the beginning of the emulsion polymerization is preferably from 0 to 0.5 mass% based on the final yield of PTFE. That amount is also linked to the average primary particle size of the aqueous PTFE emulsion since according to paragraph 23 of D5, the amount of the comonomer to be introduced at the beginning, is set to bring the average primary particle size to a level of from 0.18 to 0.50 μm .

4.8 The patent in suit contains examples disclosing the preparation of copolymers of TFE with a number of comonomers. The stability time of the PTFE aqueous emulsion (the time measured in seconds until a standardized PTFE aqueous emulsion submitted to a paddle mixing is destroyed to form hydrophobized PTFE) and the stress relaxation time (the time in seconds required for breaking a stretched bead of PTFE left in an oven at 390°C) are reported in Table 1 for each of

the copolymers produced.

4.9 Among the examples reported in Table 1, examples 1, comparative example 2, example 4 and comparative example 5 which are all based on the same comonomer (PFBE) appear to be relevant to the question of the determination of the effect resulting the features characterizing claim 1 of the main request with respect to the process disclosed in D5. Example 1 and comparative example 2 used the same process for producing the aqueous PTFE emulsions. Example 4 and comparative example 5 also used the same process for producing the aqueous PTFE emulsions. Example 1 and comparative example 2 on the one hand and example 4 and comparative example 5 on the other hand can therefore be directly compared to one another.

4.10 In examples 1 and 4, aqueous PTFE emulsions were produced by carrying out a polymerization reaction respectively with 0.0087 mass% (example 1) and 0.0023 mass% (example 4) of PFBE, which amounts are according to claim 1 of the main request (0.001-0.01 mass%). In comparative examples 2 and 5, the amounts of PFBE were 0.013 mass% (comparative example 2) and 0.011 mass% (comparative example 5). These amounts are not according to claim 1 of the main request but are still according to the range of D5 (0-0.5 mass%). For all these examples and comparative examples, the average primary particle size of the aqueous emulsion was according to claim 1 of the main request.

4.11 With regard to the scope of the claim and in particular what is covered by the wording "from 0.001 to 0.01 mass% relative to the final amount of polytetrafluoroethylene produced" with regard to the quantity at which the comonomer is incorporated, the

Board sees no reason to consider every value which formally may be mathematically rounded to 0.01 (e.g. 0.0149 if rounded to the second decimal) to be included by the scope of the claim.

4.12 In the present case there is no doubt that the skilled person is able to dose the comonomer in such a way as to obtain a very precise incorporation rate according to its desire (e.g. at least with the precision of the lower limit of the range 0.001), so that the skilled person would not understand the upper limit of the range as covering values which may deviate from the nominal value of up to almost 50% of it just in view of possible rounding rules at the second decimal position. Indeed this would make the indication given in the claim almost meaningless and not according to a sensible reading of it. While there may be cases in which considerations with respect to the relevance of rounding values may be appropriate in order to make a comparison with the prior art (which is not under scrutiny here as far as rounding is concerned) possible, the Board finds that in view of the considerations above this is not appropriate here.

4.13 In view of this the Board does not consider that comparative examples 2 and 5, which are indicated as being comparative in the patent in suit, may be seen as falling under the claim. On the contrary the indication that they are comparative provides a confirmation that the sensible reading of the claim which is made based on the wording of the claim alone is appropriate.

4.14 A comparison of example 1 and comparative example 2 shows that the process of example 1 leads to a PTFE copolymer having an improved stress relaxation time (516 seconds) compared to the copolymer of comparative

example 2 (454 seconds). The same effect is observed for the PTFE copolymer of example 4 (538 seconds) compared to comparative example 5 (475 seconds).

- 4.15 The examples of the patent in suit therefore show that the process according to claim 1 of the main request and in particular the selection of the amount in comonomer within the range defined therein (0.001-0.01 mass%) results in an improved stress relaxation time, which is disclosed to be an indicator of heat resistance of the PTFE copolymers according to the definition provided in paragraph 31 of the patent in suit.
- 4.16 Since the average primary particle size of the aqueous PTFE emulsions produced in the examples and comparative examples considered above is in all cases according to claim 1 of the main request, it cannot be concluded that these examples show any effect linked to that parameter.
- 4.17 The problem that can thus be formulated over the process for producing the PTFE copolymers of D5 is the provision of PTFE copolymers having an improved heat resistance.
- 4.18 It was argued based on the example provided on page 13 of the reply to the statement of grounds of appeal that in view of the structural variation allowed in claim 1 of the main request for the kind of comonomer, it would be surprising if the same amount of comonomer would lead to the same effect in the same magnitude for all types of comonomers. In this respect, the respondent referred to an additional example in which perfluoro methyl vinyl ether (PMVE) was used as comonomer. The properties of the aqueous TFE emulsion measured in that

example, which was obtained in the presence of PMVE in amount of 0.019 mass% (i.e. almost double the amount allowed in claim 1 of the main request) in respect of stress relaxation time and stability time were comparable to those obtained in examples 1, 2 and 3 of the patent. Since there is however no information provided for the preparation of that additional example in the reply to the statement of grounds of appeal, it is doubtful whether the data reported on page 13 for the produced aqueous PTFE emulsion can at all be compared to the emulsions disclosed in the examples of the patent in suit. Furthermore, the patent in suit does not contain an example involving the same amount of comonomer as that used in the additional example of the respondent so that it could also not be concluded that any effect observed in the properties of that example would be attributed to the nature of the comonomer. The Board finds therefore that the additional example provided by the respondent is not relevant to the examples of the patent in suit.

- 4.19 Heat resistance is a concern of D5, as shown by the measurement of the stress relaxation time in the examples of that document. There is however no teaching in D5 relating to an improvement of heat resistance of PTFE copolymers as a result of a selection of the amount of comonomer introduced at the beginning of the emulsion polymerization. In fact, D5 is rather unspecific as to the amount of comonomer as it only discloses two preferred ranges (0-0.5 mass% and 0-0.4 mass%) without specifically limiting the amount of comonomer in any way.
- 4.20 The passage in paragraph 23 of D5 mentions that the amount of comonomer is set to bring an average primary particle size to a level of from 0.18 to 0.50 μm and

that "the larger the amount of comonomer introduced, the higher the stability of the resulting aqueous emulsion becomes, so that the average primary particle size will decrease".

- 4.21 There is therefore no teaching in D5 from which the skilled person would have arrived at the amount of comonomer according to claim 1 of the main request in the expectation to solve the problem posed.
- 4.22 Since D5 indicates that the amount of comonomer is linked to the average primary particle size and that the particle size was linked to the stability of the emulsion, one question was whether the skilled person would have arrived to an amount of comonomer according to claim 1 of the main request in the expectation to improve the stability of the emulsion.
- 4.23 It was however not shown that even if the skilled person of D5 would have considered adjusting the amount of comonomer in order to improve stability of the emulsion, he would have arrived to an amount as defined in claim 1 of the main request (0.001-0.01 mass%). In that regard the range according to claim 1 of the main request corresponds to the lower part of the range disclosed in D5 (0 to 0.5 mass% in paragraph 24). It was also not shown that selecting the amount of comonomer in that lower part of the range according to D5 would have still retained an average primary particle size within the range of 0.1-0.3 μm (claim 1 of the main request). On the contrary, the passage of D5 suggests that an improvement of the stability of the aqueous emulsion could have led to amounts of comonomer and average particle sizes outside the ranges defined in claim 1 of the main request. The Board finds therefore that D5 does not render claim 1 of the main

request obvious.

- 4.24 D4 and D6 were also considered to render the solution provided in claim 1 of the main request obvious.
- 4.24.1 It was argued, based on the declaration of Mr. Kato submitted by the respondent, that D4 and in particular its paragraphs 7-11 were relevant to the question of inventive step since D4 concerned the heat resistance of PTFE copolymers. While D4 indeed mentions heat resistance there is little information as to the effect of the comonomer amount on the heat resistance of the PTFE copolymers according to D4. The passage of paragraph 7 cited by the respondent mentions heat resistance but that passage relates to a different prior art document (JP 3-66926, B) for which it is unclear whether it concerns an emulsion polymerization that is relevant to the process disclosed in D4 or the closest prior art D5. That passage of D4 is therefore not seen as a teaching of D4 that was shown to be relevant to the closest prior art D5.
- 4.24.2 It was also argued that the calculation of the comonomer amounts of the examples of D4 in the table filed on pages 18 and 19 of the letter of the respondent dated 4 June 2020 and Figures 3-5 on pages 20 and 21 of that letter would show that increasing the amount of comonomer at the beginning of the emulsion polymerization would lead to a reduction of particle size of the emulsion and a deterioration of the heat resistance of the produced PTFE copolymers. In particular, the respondent based their argument on the measurement of strength reported in that table as an indication of heat resistance.

4.24.3 The process for producing the aqueous PTFE emulsions according to the examples of D4 however all use APFO as emulsifier. APFO is the emulsifier that the closest prior art D5 excludes (paragraph 15) and replaces with an emulsifier that provides an aqueous PTFE emulsions able to provide PTFE having a high molecular weight, and able to increase the average primary particle size to be relatively large at a level of from 0.18 to 0.50 μm . The closest prior art D5 also teaches, in paragraphs 23 and 25, that the stability of the aqueous emulsion increases with the amount of comonomer introduced and that the stability of the aqueous emulsion is also dependent on the use of an emulsifier of formula (1) during the emulsion polymerization. D5 in the view of the Board therefore establishes a teaching linking the stability of the aqueous emulsion, which is one of the goals of D5, with the nature of the emulsifier used and an amount of comonomer as large as possible, for instance within the preferred range of 0-0.5 mass%. In that regard, the consideration of the examples of D4 which all use APFO as emulsifier and a comonomer amount (in the case of example 8) calculated to be in the lower part of the range of D5, runs contrary to the teaching of the closest prior art D5. For that reason, the Board finds that the skilled person would not have considered the teaching of D4 when starting from D5 as closest prior art.

4.24.4 Also, the data reported for the strength of PTFE copolymer samples in that table do not reliably show that the selection of a comonomer amount according to claim 1 of the main request would lead to a PTFE copolymer having an improved heat resistance. Apart from example 8, all the other examples use an amount of comonomer that is well above the range defined in claim 1 of the patent in suit. Whether any trend observed in

that higher range of comonomer would still apply to the lower range of 0.001-0.01 mass% is not derivable from D4. That is compounded by the fact that the only example involving a comonomer amount that is according to claim 1 of the main request (example 8, 0.0098 mass%) has the worst measured strength from all samples. There is thus in the examples of D4 no indication that a range of comonomer amount according to claim 1 of the main request would lead to an improvement of heat resistance.

4.24.5 D6 and within that document the process for producing the aqueous PTFE emulsions and the resulting PTFE copolymers of examples 2 and 8 (Table page 51) were seen as particularly relevant when starting from D5 as the closest prior art. It is however apparent from paragraphs 118 and 124 that in the process used in both examples, APFO was used as emulsifier during the aqueous emulsion polymerization of TFE with the comonomer PMVE. As explained above under section 4.24.3, the aim of the closest prior art D5 is to exclude APFO from the emulsion polymerization and replace it with an emulsifier of formula (1) which is able to provide stability to the obtained aqueous emulsion. For the same reasons as above, the consideration of examples 2 and 8 of D6 which both use APFO as emulsifier and a comonomer amount calculated to be in the lower part of the range of D5 runs contrary to the teaching of the closest prior art D5. For that reason, the Board finds that the skilled person would not have considered the teaching of D6 when starting from D5 as closest prior art.

4.25 Under these circumstance, the Board arrives at the conclusion that no hint can be found in the available prior art to solve the posed problem by selecting the

quantity of comonomer according to the range in claim 1 so that the subject-matter of claim 1 of the main request is inventive over the process for producing PTFE copolymers disclosed in D5.

- 4.26 The respondent also argued that claim 1 of the main request lacked an inventive step when starting from the homopolymers disclosed in the examples of D5. Starting from any of the homopolymers of D5 however requires, in order to arrive at claim 1 of the main request, that a comonomer be added at the beginning of the emulsion polymerization reaction in an amount that is in the range of 0.0011-0.01 mass%. That is not suggested in D5 and it has been shown above in sections 4.8-4.17 that the use of a comonomer in the critical amount of 0.001-0.01 mass% resulted in an improvement of the heat resistance. The presence of a comonomer in that specific amount being a distinguishing feature over the homopolymers of D5 as well, it follows that the problem starting from these homopolymers is the provision of PTFE copolymers having an improved heat resistance. It was argued at the oral proceedings that the same arguments relating to the teachings of D5, D4 and D6 also applied when starting from the homopolymers of D5. In that regard, the Board finds that the same reasoning given above under sections 4.18 to 4.23 regarding the non obviousness of the selection of a comonomer amount in the range of 0.0011-0.01 mass% also applies when starting from the homopolymers of D5. The Board thus concludes that the subject-matter of claim 1 of the main request is inventive over D5 also when starting from the homopolymers it discloses.

- 4.27 It was further considered in appeal that any of D4 or D6 could be considered as closest prior art documents for claim 1 of the main request. Both D4 and D6 concern

the preparation of PTFE aqueous emulsions and PTFE fine powder from which porous stretched materials could be obtained (D4, paragraphs 1, 8 and 55, claim 6; D6, paragraphs 13, 42 and 43; claims 1 and 10). In that regard both D4 and D6 are in the same field as the patent in suit and both qualify as closest prior art document.

- 4.27.1 With regard to D4 in particular, example 8 discloses a process for producing a PTFE copolymer by aqueous emulsion polymerization of TFE with PFBE added in an amount of 0.0098 mass% in the presence of APFO as emulsifier and resulting in an average primary particle size of 0.236 μm .
- 4.28 With regard to D6, example 2 concerns a process for producing colloidal particles of PTFE and PTFE fine powder from an aqueous emulsion polymerization of TFE with 0.0035 mass% of perfluoro methyl vinyl ether (PMVE) as comonomer and in the presence of APFO as emulsifier. The particles obtained in aqueous emulsion are disclosed to have an average primary particle size of 0.228 μm in the table on page 51.
- 4.29 It was argued by the respondent that the process according to claim 1 of the main request only differed from D4 and D6 in the specific emulsifier, defined as a fluorinated emulsifier selected from the group consisting of a C₄₋₈ fluorinated carboxylic acid having from 1 to 4 etheric oxygen atoms in its main chain and its salts in claim 1 of the main request, providing a more environmentally friendly replacement for ammonium perfluorooctanoate (APFO) (section 3.2 of the reply to the statement of grounds of appeal and section 3.1 of the letter dated 4 June 2020) which was seen as the

problem solved with regard to D4 and D6.

- 4.30 D5 was considered relevant for the question of obviousness. In particular, that document discloses fluorinated emulsifiers of formula (1) as defined in claim 1 of that document in a process for producing TFE homopolymers or copolymers by an aqueous emulsion polymerization process. The fluorinated emulsifiers of formula (1) disclosed in D5 and in particular the specific compound of formula $\text{CF}_3\text{CF}_2\text{OCF}_2\text{CF}_2\text{OCF}_2\text{COONH}_4$ (referred to as EEA), are according to the definition provided in claim 1 of the main request. Also, paragraph 18 of D5 discloses that the use of the fluorinated emulsifiers of formula (1) solves the environmental problem so that according to the appellant this would result in a lack of inventive step.
- 4.31 The Board can follow the reasoning of the respondent as far as the identification of the difference and the formulation of the technical problem are concerned, but does not come to the same conclusion with regard to inventiveness for the reasons which follow.
- 4.32 Fluorinated emulsifiers are generally known to be used in emulsion polymerization (D5, paragraph 2). It is also known in the art, as shown in paragraph 22 of D4, and in paragraph 29 of D5, that the nature and amount of the selected emulsifier has an impact on the shape of the particles present in the aqueous emulsion. In that regard, the skilled person would have expected that changing the fluorinated emulsifier used in example 8 of D4 or example 2 of D6 would have an effect on the aqueous emulsion and in particular on the size of its constituting particles. That effect is confirmed by the examples provided in the statement of grounds of

appeal (Table on page 25). It was in particular made plausible in these examples that, all other things being equal, the use of EEA as emulsifier in a process according to comparative example 1 of D5 instead of APFO leads to a significant increase of the particle size of the obtained aqueous PTFE emulsion (from 0.196 μm when APFO was used to 0.268 μm when the same quantity of EEA was used) which is also associated with a significant reduction of the stability of the emulsion (from 102 seconds when APFO was used to 54 seconds when EEA was used).

- 4.33 The question with regard to obviousness in view of D4 and D6 was thus whether the skilled person would have changed the emulsifier used in these documents by that of D5 in the expectation to solve the problem posed but also in the expectation of obtaining an aqueous emulsion that was still satisfactory (and according to claim 1) in terms of its average primary particle size and its stability. That was however not established by the respondent and the evidence provided by the appellant in the statement of grounds of appeal shows that that would not have been the case. In particular, the skilled person would not have expected that the change of APFO used as emulsifier in example 8 of D4 and example 2 of D6 by any emulsifier of D5 would have still resulted in an aqueous emulsion with an average primary particle size in the range defined in claim 1 of the main request (0.1-0.3 μm). That is particularly relevant since D5 already established a link between the stability of the emulsion and the nature of the emulsifier used during its production (see discussion under section 4.24.3 above). Then, the primary average particle sizes of the aqueous emulsions according to example 8 of D4 (0.236 μm) and according to example 2 of D6 (0.228 μm) are already close to the upper value

defining the range in claim 1 of the main request. It can thus not be excluded that an increase of the primary average particle size resulting from the change of emulsifier as observed in the examples provided by the appellant would have caused the primary average particle size of the aqueous emulsions to increase to such an extent that the particle size would have been outside the range according to claim 1 of the main request. It can therefrom not be concluded that the skilled person would have considered the emulsifiers of D5 as a means to solve the problem and still obtain a process according to claim 1. In order to obtain a process according to claim 1 further adaptations would have been needed which would have resulted from an *ex-post facto* analysis. Under these circumstances, the Board finds that the subject-matter claim 1 of the main request cannot be considered as obvious also when starting from D4 or D6.

- 4.34 In view of the above, the subject-matter of claim 1 of the main request satisfies the requirements of Article 56 EPC. As no separate attack was formulated for any of the further independent claims, the Board has no reason to come to a different conclusion for the subject-matter of these claims.

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 the main request (claims 1 to 8) as filed with

the statement of grounds of appeal and after any necessary consequential amendment of the description.

The Registrar:

The Chairman:



B. ter Heijden

D. Semino

Decision electronically authenticated