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D E C I S I O N
of 17 November 2000

Case Number: T 1154/97 - 3.3.5

Application Number: 86907158.9

Publication Number: 0245474

IPC: C08L 75/04

Language of the proceedings: EN

Title of invention:
Organoclay Composition

Patentee:
Süd-Chemie Inc

Opponent:
Southern Clay Incorporated

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 123(2)

Keyword:
"Novelty (yes): selected combination of substituents not clearly and unambiguously disclosed in prior art"
"Inventive step (no): obvious improvement"
"Disclaimer: not admissible"

Decisions cited:
T 0170/87, G 0001/93

Catchword:
-



Case Number: T 1154/97 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 17 November 2000

Appellant/other party: Southern Clay Incorporated
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 8 October 1997
rejecting the opposition filed against European
patent No. 0 245 474 pursuant to Article 102(2)
EPC.

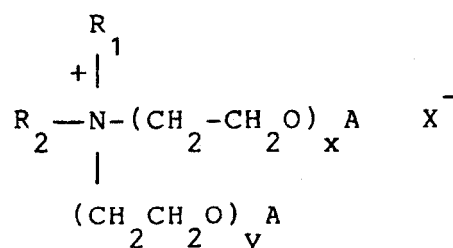
Composition of the Board:

Chairman: R. K. Spangenberg
Members: A.-T. Liu
J. H. van Moer

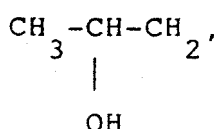
Summary of Facts and Submissions

I. The appeal is from the decision of the Opposition Division rejecting the opposition against European patent No. 0 245 474. Claim 1 as granted read as follows:

"Organoclay composition comprising the reaction product of a smectite clay having an ion exchange capacity of at least 50 meq.wt. per 100g clay (active basis), and quaternary ammonium compound having the following formula:



wherein A is H,



sulfate, carboxylate or phosphate, R₁ is methyl or an alkyl group with 10 to 22 carbon atoms, R₂ is an alkyl group with 10 to 22 carbon atoms or a benzyl or polyoxyethylene chain, (CH₂-CH₂O)_z A, with z repeating units where x + y + z = 5 to 200, and X⁻ is an anion selected from chloride, bromide, iodide, acetate, sulfate, borate and phosphate, the amount of the quaternary ammonium compound being from 5 meq.wt. to 150 meq.wt. per 100g of 100% active clay."

II. The impugned decision made reference to five prior art documents, in particular the following:

D1 = EP-A-133 071

D3 = US-A-3 298 849

The opposition division held that the specific combination of substituents of the quaternary ammonium compound as stipulated in claim 1 was not disclosed, neither in D1 nor in any of the other citations. The organoclay of claim 1 was therefore new.

Concerning inventive step, the opposition division started from document D3 as the closest prior art. The reason therefor was that D3 also related to organoclays for use in aqueous paint systems. The problem to be solved by the invention was the provision of a dispersible clay thickener to yield paint compositions having a good sag control and good leveling properties. Since the compounds as stipulated in claim 1 were new and solved the stated technical problem, they were held to involve an inventive step. The opposition division added that this finding also remained unchanged when D1 was taken to represent the closest prior art.

III. In the course of appeal proceedings, oral proceedings were held on 17 November 2000, at which the respondent submitted two new sets of claims as basis for auxiliary requests. In each case, claim 1 was amended with respect to claim 1 as granted by the incorporation of a proviso.

Claim 1 which served as basis for the auxiliary request I thus read as follows:

"... with the proviso that quaternary di-alkyl-dimethylammonium or di-alkyl-methyl benzyl ammonium salts are excluded as reactants in a quasi-stoichiometric amount."

Claim 1 of the auxiliary request II read as follows:

"... with the proviso that quaternary di-alkyl-dimethylammonium or di-alkyl-methyl benzyl ammonium salts are excluded as reactants in a quasi-stoichiometric amount, with the further proviso that the organoclay composition cannot be used in organic solvents containing non polar solvents."

IV. The appellant's arguments with respect to claim 1 as granted were essentially as follows:

- Claim 1 stipulated organic substituents for the quaternary ammonium compound which were merely a selection of most of what remained from the list of substituents disclosed in D1, avoiding the selection already made for the known examples.
- Since D1 already discussed the suitability of organoclay for aqueous systems, the compositions according to claim 1 were not new or at least lacked an inventive step.

V. The appellant also objected to the introduction of provisos as amendments to claim 1, on the ground that the aim of these provisos was not to remove an accidental lack of novelty, so that these amendments

contravened Article 123(2) EPC.

VI. The respondent's arguments may be summarized as follows:

- D1 exclusively concerned organoclays for non-aqueous systems.
- The problem to be solved by the claimed invention is the provision of organoclays for aqueous systems.
- The organoclay of claim 1 (as granted) was different from the preferred surfactant of D1 in the stipulation of at least two polyethyleneoxide groups as substituent for nitrogen.
- Since the skilled person did not have reason to select such compounds among those disclosed in D1 for use in aqueous systems, the claimed organoclay would involve an inventive step.
- The excluded features in the provisos were the main features of D1. They were introduced into claim 1 to establish novelty and to further increase the merit of inventive step of the claimed subject-matter over D1. The amendments should therefore be allowed.

VII. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed, or, in the alternative, that the patent be maintained on the basis of claim 1 of either auxiliary request I or II.

Reasons for the Decision

Main request

1. Novelty

1.1 Claim 1 is directed to an organoclay composition which is essentially characterised as comprising the reaction product of a smectite clay with a quaternary ammonium compound having at least two polyethyleneoxide groups attached to the nitrogen atom.

1.2 Generally speaking, D1 discloses compositions comprising the reaction product of smectite clay and a surfactant, the latter being either an amine or a quaternary ammonium (see page 3, lines 19 to 28). According to the general definition, the quaternary ammonium compound must carry one C₁₀ - C₂₄ alkyl group, wherein the alkyl chain may be linear or branched and saturated or unsaturated, and at least one polyalkyleneoxide group, wherein the alkylene chain may be linear or branched and contains 2 to 6 carbon atoms (page 4, lines 20 to 37 and claim 4). The remaining two substituents for the nitrogen central atom (R₂ and R₄) may be each separately or together benzyl, an alkyl chain containing 1 to 6 C atoms or one of the C₁₀ - C₂₄ alkyl and polyethyleneoxide group. It is thus common ground that the subject-matter of claim 1 includes a selection of a narrower range of variants from the broader range of D1. The question is therefore whether the selected range is clearly and unambiguously derivable from the teaching of D1 taken as a whole.

1.3 The only specific example in D1 of a quaternary ammonium compound is Noxamium M2SH 15 which has attached to the nitrogen atom a methyl group, two tallow alkyl chains and a polyethyleneoxide substituent (page 7, lines 12 to 15). It is thus irrefutable that D1 does not expressly disclose a quaternary ammonium compound substituted with two polyethyleneoxide groups.

1.4 The Board notes that D1 discloses a number of amines and that all the experiments are carried out with organoclays comprising one of these amine surfactants, with or without addition of the ammonium surfactant Noxamium M2SH 15 (see Tables: page 7, lines 20 to 37; page 8, lines 25 to 35; page 9, lines 20 to 27; page 10, lines 15 to 22; page 11, lines 1 to 20; page 12, lines 20 to 30; page 13, lines 1 to 12).

The specific combination as stipulated in present claim 1 would thus involve

- (i) the selection of including an ammonium surfactant into the organoclay composition of D1 and
- (ii) the selection among the variants of benzyl, a C₁ - C₆ alkyl, a C₁₀ - C₂₄ alkyl and a polyalkyleneoxide group, of polyethyleneoxide as substituent R₂ for this ammonium compound

(compare claim 1 and D1, page 4, lines 23 to 35).

On the other hand, the general teaching of D1 is indifferent as to the choice among these various possibilities and the preferred embodiment is the choice of tallow alkyl rather than polyethyleneoxide as R₂ substituent for the ammonium surfactant. In the

Board's judgement, the prior art thus does not clearly and unambiguously direct the skilled person to select an ammonium surfactant with two polyethyleneoxide substituents. In the instant particular case, the organoclay as stipulated in claim 1 can therefore be considered as new with regard to the disclosure of D1.

2. *Inventive step*

2.1 According to the respondent, the subject-matter of claim 1 relates to an organoclay composition suitable for use in aqueous systems.

2.2 The Board does not concur with the respondent in that D1 would be confined to organoclays to be exclusively used in non-polar solvents. In fact, examples are given in D1 with a polar solvent consisting of white spirit containing 50% of a mixture of 95 vol.% methanol and 5 vol.% water (page 8, lines 12 to 14). Thus, D1 clearly also relates to the application of organoclays in solvents containing water in addition to organic solvents. The Board therefore does not see reasons for deviating from the parties' approach, taking D1 as the starting point for the inventive step discussion.

2.3 The respondent has asserted that, with respect to D1, the claimed composition is intended to solve the problem of providing an efficient clay thickener for aqueous paint systems (see patent in suit, page 2, lines 3 to 4).

2.4 In order to solve the technical problem as stated above, the invention proposes in claim 1 an organoclay comprising a smectite clay and a quaternary ammonium compound having at least two polyethyleneoxide

substituents, compared to the organoclay of D1 comprising an ammonium surfactant requiring at least one such group.

- 2.5 It is remarked that claim 1 is directed to a composition comprising a smectite clay having an ion exchange capacity of at least 50 meq.wt. per 100g clay (active basis) and an ammonium compound in a proportion as low as 5 meq.wt. per 100g of 100% active clay. Claim 1 thus encompasses clay compositions including modifiers other than the quaternary ammonium compound specifically stipulated. On the other hand, the Board observes that the examples in the patent in suit are without exception carried out with organoclays uniquely modified with a dialkyl, di(polyethyleneoxide) ammonium salt.

Nevertheless, in the absence of any evidence to the contrary, the Board assumes in favour of the respondent that the composition according to claim 1 solves the technical problem as indicated in point 2.3 above within the whole ambit of the claim. The question is then whether the proposed solution is obvious to a person skilled in the art in view of D1.

- 2.6 Obviousness of the proposed solution

- 2.6.1 The Board agrees with the respondent's submission that D1 does not explicitly discuss the suitability of organoclays for aqueous paint systems. However, the experimental results discussed in D1 clearly show that the known organoclays are more efficient as thickeners in solvent systems comprising a mixture of methanol and water than in the non-polar solvent white spirit (see for example page 8, lines 12 to 35).

- 2.6.2 On the other hand, the paint formulation I of the patent in suit contains approximately equal amounts of organic solvents and water (page 6, lines 1 to 25). As is pointed out by the appellant and not refuted by the respondent, "aqueous paint systems" in the language of the patent in suit are thus mixtures containing high amounts of organic solvents besides water.
- 2.6.3 The teaching of D1 is that organoclays are generally used in systems comprising a solubiliser ("adjuvant de solvation"), the most common solubiliser being aqueous methanol (paragraph bridging pages 2 and 3). On that basis, the authors of D1 find it surprising that organoclays can swell in organic liquids without the addition of such an "adjuvant de solvation" (page 3, lines 19 to 21). In the Board's judgment, these statements in conjunction with the experimental results mentioned above would directly lead the skilled person to the premise that the organoclays containing any member of the group of quaternary ammonium compounds disclosed in claim 4 of D1 are also suitable for use in the presence of higher amounts of water, thus also in "aqueous paint systems" in the sense of the patent in suit.

As is established above, the group of ammonium compounds disclosed in D1 encompasses those compounds used in the patent in suit (see point 1.2). Furthermore, the Board agrees with the appellant in that it is basic knowledge for a chemist that a polyethyleneoxide group is more polar than an alkyl group. Thus, if there is a need for a more polar organoclay, for example for use in systems containing even higher amounts of water, it is obvious that the skilled person would necessarily contemplate replacing

the quaternary ammonium salt containing two unpolar long chain alkyl substituents, such as a tallow alkyl chains with a compound containing a second polyethyleneoxide group which also falls within the ambit of claim 4 of the same document D1 (see also point 1.2 above). The Board therefore holds that the selection from the group of compounds defined in claim 4 of D1 for the purpose envisaged in the patent in suit is obvious and does not involve an inventive step.

Auxiliary requests I and II

3. As is correctly noted by the parties, the subject-matter of claim 1 of both auxiliary requests differs from that of claim 1 of the main request through the incorporation of a disclaimer in the form of a proviso.
- 3.1 The respondent has not disputed that the subject-matter disclaimed by said proviso is not derivable from the content of the application documents as filed but is solely introduced in order to exclude subject-matter disclosed in D1 from the protection sought. These amendments are thus in principle not in conformity with Article 123(2) EPC.
- 3.2 The Board is aware that, under particular specified circumstances, the introduction of a disclaimer has been found to be permissible under the same article of the Convention, even if the original documents give no (specific) basis for such an exclusion. This practice is, however, conditional on the amendment excluding only novelty-destroying subject-matter from the scope of protection without changing the character of the claimed invention (see G1/93, OJ 1994, 541).

The prescribed specific condition is not met in the present case where the question of novelty is not at issue (see point 1.4 above). The sole purpose of the provisos is to exclude subject-matter which is rendered obvious by D1. In other words, the present provisos are introduced with a view to increase the inventive merit of the remaining claimed subject-matter with respect to this same most relevant prior art. In effect, such amendment would amount to a change in the character of the claimed invention. The requirement of Article 123(2) EPC is therefore not met here (see also point 8.4.1 to 8.4.4 of T 170/87, OJ 1989, 441). In consequence, the auxiliary requests are not admissible.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

S. Hue

R. Spangenberg