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D E C I S I O N
of 5 December 2002

Case Number: T 0983/98 - 3.3.6

Application Number: 92203220.6

Publication Number: 0540089

IPC: C11D 17/00

Language of the proceedings: EN

Title of invention:
Liquid cleaning products

Patentee:
UNILEVER N.V., et al

Opponent:
PROCTER & GAMBLE EUROPEAN TECHNICAL CENTER N.V.

Headword:
Liquid cleaning products/UNILEVER

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes) - general applicability not demonstrated of a technical effect (here: Farris effect) for predicting a property (here: viscosity of a liquid cleaning product; point 2.6.3)"

Decisions cited:
T 0606/89

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0983/98 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 5 December 2002

Appellant: (Opponent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 3 August 1998 rejecting the opposition filed against European patent No. 0 540 089 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: P. Krasa
Members: P. Ammendola
M. B. Tardo-Dino

Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition Division rejecting the opposition filed against the European Patent No. 0 540 089 relating to liquid cleaning product composition.

II. The patent as granted comprised 12 claims, the independent claims 1 and 5 reading as follows:

"1. *A liquid cleaning product composition, comprising no more than 10% by weight of water, a non-aqueous organic solvent, a deflocculant and particles of solid material dispersed in the solvent, wherein*
(a) from 25 to 75% by weight of the solid material has a D(3,2) average particle diameter of less than 10µm;
(b) from 75 to 25% by weight of the solid material has a D(3,2) average particle diameter of more than 10µm;
and the D(3,2) average particle size of all the solid material is more than 10µm."

"5. *A process for preparing a liquid cleaning product composition, comprising no more than 10% by weight of water, a non-aqueous organic solvent, a deflocculant and particles of solid material dispersed in the solvent, characterised in that the process comprises the mixing of solid material with a D(3,2) average particle diameter of more than 10µm and solid material with a D(3,2) average particle diameter of less than 10µm, wherein the total solid material has a D(3,2) average particle size of more than 10µm, and adding the organic*

solvent and/or the deflocculant before, during or after the mixing."

Claims 2 to 4 and 6 to 12 are dependent claims and define specific embodiments of the subject-matter of claim 1 or of claim 5, respectively.

III. The Appellant (Opponent) had filed a notice of opposition, based exclusively on lack of inventive step, citing *inter alia* the following documents:

Document (2): EP-A- 0 266 199

Document (4): EP-A- 0 444 858

Document (5): GB-A- 2 208 233

Document (7): "Minimize Solid-Liquid mixture viscosity by optimizing Particle Size Distribution", L.Y.Sadler *et al.*, Chem. Eng.Progress, vol. 3, 1991, pages 68 to 71.

Document (8): "An Introduction to Rheology", H.A. Barnes *et al.*, Elsevier Sci. Pub., 1989, pages 119 to 131.

Document (9): US-A- 4 929 380

IV. In its decision, the Opposition Division held that Document (2) disclosed the closest state of the art, i.e. a solid-containing non-aqueous liquid detergent composition which did not set or gel and which exhibited reduced clear layer separation (hereafter "CLS") and reduced viscosity. It found that the

examples in the patent in suit demonstrated further reduction in viscosity and in clear layer separation vis-à-vis such state of the art and concluded that none of the other available citations in combination with Document (2) would have led the skilled person to the subject-matter of the patent in suit.

V. The Appellant appealed against this decision presenting in writing and orally the following arguments.

The Appellant initially considered (see points 3 and 5.1 of the grounds of appeal) that the patent in suit aimed simultaneously at a reduction of viscosity **and** CLS of the non-aqueous liquid detergent compositions of the prior art, but at the oral proceedings before the Board, which were held on 5 December 2002, it derived from the expression used at page 2, lines 32 to 35, of the patent in suit that these two effects were separately pursued.

It objected additionally that the further improved property defined in the above identified expression - i.e. " *an improved tolerance to higher volume fractions of solid materials*" - was not relevant for the subject-matter of the independent claims as granted, which were not limited with respect to the volume fraction of solids.

Therefore, the Appellant considered that the liquid detergent compositions disclosed in any of Documents (4), (5) or (9) should be regarded as most relevant state of the art, since they dealt with improving at least one of the properties to be separately improved according to the patent in suit and required the minimum of structural and functional

modification to arrive at the claimed subject-matter. In support, it relied in particular on the reasons given in the decision T 606/89 for identifying the most relevant state of the art. The Appellant concluded that the claimed composition provided no credibly demonstrated technical effect or improvement with respect to those of any of Documents (4), (5) or (9) and, hence, amounted just to an obvious solution to the technical problem of rendering available further stable non-aqueous liquid detergent compositions comprising a finer and a courser particulate.

It additionally argued that the subject-matter of the claims of the granted patent was obvious even when regarding Document (2) as the closest state of the art in view of the common general knowledge as to the Farris effect: i.e. the possibility of reducing the viscosity of solid-fluid mixtures by changing the particle size distribution of the solid material from monomodal to bimodal.

The Appellant conceded that none of the available citations suggests the occurrence of such effect in non-aqueous liquid detergent compositions, but maintained that Documents (7) or (8) demonstrated the general applicability thereof to any solid-fluid mixture.

VI. The Respondent (Patent Proprietor) refuted orally and in writing the Appellant's objections, maintaining *inter alia* that the appealed decision identified correctly the closest state of the art in the compositions claimed in Document (2) and pointed to the comparison disclosed in example 1 of Document (5) as an evidence that the Farris effect is not applicable to

non-aqueous liquid detergent compositions.

The Respondent submitted that the person skilled in the art would not consider the teachings of Documents (7) or (8) as clearly relevant for the compositions of Document (2) in view of the different nature of the dispersions considered in these documents.

It additionally conceded that in the patent in suit there was neither an explicit statement nor experimental evidence that the claimed compositions were non-setting/non-gelling, but maintained that this would be self-evident, since Document (2) demonstrated the low viscosity detergent compositions comprising a deflocculant to be inevitably non-setting/non-gelling.

VII. The Appellant requested that the decision under appeal be set aside and the European patent No. 0 540 089 be revoked.

The Respondent requested that the appeal be dismissed and the patent be maintained as granted, or alternatively on the basis of claims 1 to 12 submitted with the letter of 31 October 2002 and designated first Auxiliary Request.

VIII. At the end of the oral proceedings the Chairman announced the decision of the Board.

Reasons for the Decision

Respondent's main request

1. *Novelty*

The Board is satisfied that the subject-matter of claims 1 to 12 of the patent as granted is novel (Articles 52(1) and 54 EPC). It is not necessary to give further details, since the Appellant never contested the novelty of the subject-matter of the claims of the granted patent.

2. *Inventive step concerning the subject-matter of claim 1*

2.1 Claim 1 as granted defines non-aqueous liquid cleaning compositions comprising a deflocculant and particles of solid materials with a specific bimodal particle size distribution.

2.2 According to the established case law of the Boards of Appeal of the EPO the "problem and solution" approach starts normally from the document disclosing subject-matter conceived for the same purpose - e.g. the same final use - as the claimed invention and having the most relevant technical features in common (see, for example, the decisions cited in "Case Law of the Boards of Appeal of EPO", fourth edition 2001, page 102, point I.D.3.1).

It is therefore necessary first to establish from the disclosure of the patent in suit which is the purpose of the invention under consideration in order to then assess which state of the art represents the most suitable starting point for the assessment of inventive step.

2.3 Purpose of the claimed invention

2.3.1 The patent in suit defines in general the gist of the invention as that of providing liquid non-aqueous

detergent compositions with "*an improved degree of clear layer separation and/or improved viscosity and/or an improved tolerance (with respect to viscosity and clear layer separation) to higher volume fractions of solid materials*" (see page 2, lines 33 to 35).

2.3.2 The Board finds that the person skilled in the art of non-aqueous liquid detergent compositions would immediately understand that the above cited expression "*clear layer separation*" refers to the conventional method for measuring the stability of dispersions of solid particles into fluids against any form of phase separation of the solids (such as those variably defined as sedimentation, settling, etc.).

The Board also finds that the expression "*improved viscosity*" in the patent in suit might in principle indicate one of or both the following two distinct improvements:

- a lower viscosity,

- a more stable viscosity.

This is evident considering the experimentally determined viscosity values (see the table at page 10) in combination with the description at page 3, lines 8 to 12, and at page 8, lines 5 to 6, as well as the discussion of the relevant prior art at page 2, lines 24 to 25.

However, even taking into account the above observations, the definition of the desired properties at page 2, lines 33 to 35, of the patent in suit is still found to be only partially relevant and unclear

for the following reasons.

Firstly, as maintained by the Appellant too, claim 1 does not define any minimum amount of solids and, therefore, an "*improved tolerance to higher volume fractions of solid materials*" cannot possibly represent a realistic purpose for all claimed detergent compositions according to present claim 1.

Secondly, it remains unclear whether the "*improved viscosity*" actually aimed at was a lower viscosity, or a more stable viscosity, or both.

2.3.3 On the other hand, the Board notes that the experimental data measured in the patent examples (see the figure in the patent) considered in the light of the discussion at page 2, lines 6 to 31, of the liquid detergent compositions of the prior art clearly demonstrate that the inventors of the patent in suit aimed **at least** to achieving reduced CLS **and** reduced viscosity in respect to the similar compositions of the prior art.

The Board also finds that the detergent compositions of claim 1 of the patent in suit - which mandatorily comprise a deflocculant - are implicitly assumed to have a viscosity at least as stable as to prevent gelling or setting, since according to the summary of the disclosure of Document (2) given to the patent in suit (see in the patent in suit page 2, lines 24 to 25) the presence of the deflocculant prevents a severe increase of viscosity.

2.3.4 Therefore, the Board concludes that the only clear and meaningful technical objective which is recognisable

from the whole disclosure of the patent in suit is that of **providing solid-containing non-aqueous liquid detergent compositions which do not set or gel upon storage, but whose CLS and viscosity are lower than those of the non-setting/non-gelling detergent compositions of the prior art**.

2.3.5 The Appellant has objected at the oral proceedings that the patent in suit did not require the **simultaneous** reduction of CLS and of viscosity. It pointed to the terms "and/or" contained in the sentence at page 2, lines 32 to 35, of the patent in suit.

2.3.6 The Board finds that this objection is exclusively based on the statement which has been found to be unclear and only partially relevant (see above point 2.3.2).

Hence, it would be unjustified to give more relevance to the "and/or" terms used in such not fully credible expression than to the undisputed fact that the patent in suit as a whole aimed clearly at the simultaneous achievement of reduced CLS and reduced viscosity (see above point 2.3.3).

2.4 The most relevant state of the art

2.4.1 The patent in suit describes the compositions claimed in Document (2) as relevant prior art.

The Board finds that this citation defines in the claims non-setting/non-gelling solid-containing non-aqueous liquid detergent compositions comprising a deflocculant and having both low CLS and low viscosity (see example 1B), i.e. these prior art compositions are

clearly conceived for the same purpose or use as the compositions of granted claim 1 (see above point 2.3.4) and have a very similar structural composition.

Hence, the liquid detergent compositions claimed in this citation are found to represent the most relevant state of the art for the evaluation of inventive step.

2.4.2 The Appellant instead maintained that the detergent compositions of any of Documents (4), (5) or (9) had to be considered as the most relevant state of the art, since their chemical composition was more close to that defined in claim 1 of the patent in suit than that of Document (2).

2.4.3 However, with respect to these citations the Board finds:

- that Document (4) is silent as to detergent compositions with low viscosities except for very generic statements that viscosity and anti-gelling properties may be controlled by the addition of organic solvents (see the paragraph bridging pages 12 to 13),

- that the composition of Document (5) which the Appellant explicitly identified at point 5.8 of the grounds of appeal as disclosing compositions having the closest structural relationship to those of the patent in suit (i.e. example 1A) has a higher viscosity than that of a comparative example in the same citation (i.e. example 1B), which may also be seen as an embodiment of prior art according to Document (2) and

- that the compositions of Document (9) display too high viscosities (see the minimum viscosity of 10.000mPa disclosed the sentence bridging columns 5 and 6 and the much higher viscosities of the examples).

Therefore, none of Documents (4), (5) or (9) discloses detergent compositions which are better or equivalent to those of Document (2) with respect to the combination of properties aimed at in the patent in suit (see above 2.3.4). Hence, these other prior art compositions have a purpose or use (see also the jurisprudence of the Boards of Appeal recalled above at 2.2) which is inevitably less similar than that of the compositions of Document (2) (see example 1B) to that of the compositions defined in claim 1 of the patent in suit.

The Board stresses that also the decision T 606/89 cited by the Appellant belongs to the above recalled established jurisprudence: it explicitly indicates that the most relevant state of the art is normally that directed to a similar use and being most similar to the invention with respect to the structure (see point 2 of the reasons for the decision "...*the invention should be compared with the art concerned* ***with a similar use*** *which requires the minimum of structural and functional modification...*", emphasis added).

2.4.4 The Board wishes also to stress that it is aware of Document (2) describing as well a comparative example (example 1A) having even a lower viscosity and CLS than the corresponding example according to the claims of this citation, but this comparative example comprises no deflocculant and, thus, shows an unacceptably high

setting upon storage. Hence, it cannot possibly represent a realistic starting point for the assessment of an inventive step for the patented compositions.

2.5 Technical problem solved by the claimed processes

2.5.1 The fact that the experimental comparison in the patent in suit shows that the compositions of the invention achieve a reduced CLS and viscosity with respect to the composition of the prior art was never contested by the Appellant (see, e.g. paragraph 3 of the grounds of appeal).

With respect to the non-setting/non-gelling properties of the compositions of claim 1 of the granted patent the Respondent conceded that the patent in suit does not provide any experimental evidence that the claimed compositions have the same negligible tendency to set and gel of the detergent compositions of Document (2).

In the absence of any evidence to the contrary, the Board has however no reason to doubt that the presence of the deflocculant produces in the compositions according to granted claim 1 the same effect that it ensures in the compositions of Document (2), i.e. absence of setting/gelling.

Hence the Board finds that the experimental evidence in the patent in suit is sufficient to credibly demonstrate that the combination of properties aimed at in the patent in suit (see above 2.3.4) was actually achieved by the claimed subject-matter vis-à-vis compositions according to Document (2).

2.5.2 The Board thus identifies the technical problem solved

by the compositions according to claim 1 of the patent in suit as granted vis-à-vis the prior art compositions according to Document (2) as that of providing improved solid-containing non-aqueous liquid detergent compositions which also do not set or gel upon storage and **whose CLS and viscosity are lower than those of the non-setting/non-gelling detergent compositions of this prior art**.

2.6 Inventive step

2.6.1 The composition according to claim 1 of the patent in suit differs from that disclosed in Document (2) in that the dispersed solids have a specific bimodal particle size distribution instead of a monomodal one.

The question to be answered in the assessment of inventive step is therefore whether it would have been obvious for the notional person skilled in the art of detergent compositions to change the particle size distribution in the detergent compositions of Document (2) so as to produce the specific bimodal particle size distribution defined in present claim 1 in the reasonable expectation to reduce CLS and viscosity of these prior art compositions (see above point 2.5.2).

2.6.2 The Appellant maintained that in view of the well known Farris effect (see above point V of the Facts and Submissions), whose general applicability was alleged to be evident from Documents (7) and (8), the person skilled in the art would have expected a reduction of viscosity when replacing a monomodal particle size distribution in the compositions of Document (2) by a bimodal one.

2.6.3 The Board notes the following undisputed facts:

- none of the available citations discloses explicitly or implicitly the occurrence of the Farris effect in solid-containing non-setting/non-gelling non-aqueous liquid cleaning compositions,

- none of the available citations discloses explicitly or implicitly that the Farris effect is applicable in general to any kind of solid-fluid dispersions, and

- the Farris effect is only described in Document (8) (see the heading of the whole section 7.2 at page 119) with respect to Newtonian liquids in general and in Document (7) (see page 68, left column, lines 6 to 13) with respect to certain other specific solid-fluid mixtures, such as coal-water mixture fuels to be pumped and atomized, mixtures from crystallizers to be transported, easily workable concrete or paints easy to formulate.

The Board concurs with the decision under appeal that the higher viscosity of example 1A of Document (5) (comprising solid particulate with bimodal particle distribution) in comparison to that of example 1B (with monomodal particle size distribution) represents an evidence in the technical field relevant for the present case contradicting the general applicability of the Farris effect alleged by the Appellant.

The Board thus concludes that, since Documents (7) and (8) disclose the Farris effect only with respect to technical fields different from that to which the

subject-matter of granted claim 1 belongs, this disclosure is not sufficient to convincingly demonstrate the alleged general applicability of such effect, in particular when a document belonging to the technical field relevant for the case provides evidence contrary thereto.

Therefore, the Board finds that none of the available citations suggests to the person skilled in the art that by changing the solid material particle size distribution of the setting/non-gelling non-aqueous liquid detergent compositions of Document (2) it is possible to obtain a reduction of viscosity.

Hence the subject-matter of claim 1 as granted provides a non obvious solution to the existing technical problem (see above point 2.5.2).

3. *Inventive step for the subject-matter of claims 2 to 4*

The same reasons given above for the inventive step of the subject-matter of claim 1 as granted apply as well to the granted claims 2 to 4 which define preferred embodiments of claim 1.

4. *Inventive step for claims 5 to 12*

Despite the fact that the percentages of the two solid materials with different particle size distributions are given in claim 1 but not in claim 5, the Board is satisfied that the subject-matter of claim 5 involves an inventive step for the same reasons given above for claim 1, since the non-aqueous liquid cleaning product composition resulting from the process of claim 5 are - in the absence of any evidence to the contrary -

reasonably expected to have the same combination of improved properties of those defined in claim 1.

The same applies to the dependent claims 6 to 12.

Since the Appellant raised the objection of inventive step only for the subject-matter common to claims 1 and 5, no further reasons need to be given.

5. The Board therefore comes to the conclusion that granted claims are based on an inventive step and, thus, that the patent as granted complies with the requirements of Articles 52(1) and 56 EPC.

6. Since the claims according to the Respondent's main request have been found to comply with the requirements of the EPC there is no need to deal with the Respondent's first auxiliary request.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman:

G. Rauh P. Krasa