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D E C I S I O N
of 24 May 2006

Case Number: T 0325/04 - 3.3.06

Application Number: 95939350.5

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Language of the proceedings: EN

Title of invention:
Thickened peracid compositions

Patentee:
SOLVAY INTEROX LIMITED

Opponent:
HENKEL KGaA

Headword:
Thickened peracid composition/SOLVAY

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - (yes) "

Decisions cited:
-

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-



Case Number: T 0325/04 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 24 May 2006

Appellant: HENKEL KGaA
(Opponent) VTP (Patente)
D-40191 Düsseldorf (DE)

Representative:

Respondent: SOLVAY INTEROX LIMITED
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 15 January 2004
rejecting the opposition filed against European
patent No. 0799297 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: P. Krasa
Members: P. Ammendola
J. Van Moer

Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition division rejecting the opposition against European patent No. 0 799 297.

II. The patent as granted comprised thirty claims, whereby claims 1, 2 and 30 were independent and read:

"1. *Thickened aqueous compositions comprising a soluble peracid in solution together with a thickener, characterised in that the thickener comprises:*

(a) *one or more hydrophobic aliphatic alcohol ethoxylates having the general formula:*



in which R¹ and R² are each either hydrogen or linear or branched alkyl such that R¹ plus R² has a total of from 7 to 22 carbon atoms, and n is selected in the range of 1 to 15, such that the number ratio of carbon atoms in R¹ plus R² : n is greater than or equal to 3 : 1;

(b) *a co-surfactant selected from the group consisting of anionic surfactants, amine oxides, quaternary ammonium compounds and amphoteric surfactants, and*

(c) *one or more hydrophilic aliphatic alcohol ethoxylates in which the ratio of the number*

of carbon atoms in the alcohol moiety to the average number of ethoxylate groups is less than 3:1, and/or alkylphenol ethoxylates,

the amounts of (a), (b) and (c) above being effective to increase the viscosity of the composition."

"2. A process for thickening soluble peracid solutions, characterised in that the process comprises introducing:

(a) one or more hydrophobic aliphatic alcohol ethoxylates having the general formula:



in which R¹ and R² are each either hydrogen or linear or branched alkyl such that R¹ plus R² has a total of from 7 to 22 carbon atoms, and n is selected in the range of 1 to 15, such that the number ratio of carbon atoms in R¹ plus R² : n is greater than or equal to 3 : 1;

(b) a co-surfactant selected from the group consisting of anionic surfactants, amine oxides, quaternary ammonium compounds and amphoteric surfactants, and

(c) one or more hydrophilic aliphatic alcohol ethoxylates in which the ratio of the number of carbon atoms in the alcohol moiety to the

average number of ethoxylate groups is less than 3:1, and/or alkylphenol ethoxylates,

the amounts of (a), (b) and (c) above being effective to increase the viscosity of the composition."

"30. *A method for disinfecting and/or disinfecting hard surfaces, characterised in that it comprises contacting the hard surface with a composition according to claim 1 or any one of claims 3 to 29."*

Claims 3 to 29 defined preferred embodiments of the composition of claim 1 and/or of the process of claim 2.

III. The Opponent had sought revocation of the patent in suit on the grounds of lack of inventive step (Article 100(a) in combination with Articles 52(1) and 56 EPC). It had cited *inter alia* the following documents:

(1) = EP-A-0 147 207

(2) = WO-A- 94/11474

(3) = EP-A-0 596 493

IV. In its decision, the Opposition division found *inter alia* that the Opponent had not proven that the compositions disclosed e.g. in example 1 of document (2) contained peracetic acid generated *in situ* and that the skilled person could not foresee that storage stable viscous compositions based on peracids could be

obtained by adding the peracid and the co-surfactant used in the compositions of document (1) to the thickened hydrogen peroxide-containing compositions disclosed in document (2).

V. The Opponent (hereinafter "Appellant") lodged an appeal against this decision and filed with the grounds of appeal *inter alia* an experimental report labelled as document (8).

VI. Oral proceedings were held before the Board on 24 May 2006 in the presence of both parties.

VII. The Appellant argued substantially as follows.

The patent in suit aimed at obtaining viscous bleaching compositions based on peracids.

Since, as demonstrated by the data reported in document (8) and by some examples of the patent in suit acids and hydrogen peroxide would readily react to form peracids, the viscous compositions disclosed in the examples of document (2) comprising citric acid and hydrogen peroxide would also necessarily contain percitric acid and, thus, would represent the most relevant prior art.

On the other end, the features characterising the compositions claimed in the patent in suit resulted in the increased viscosity and peracid stability which had already been respectively attributed to the same features in document (1) or (2). Hence, the subject-matter claimed lacked an inventive step vis-à-vis the

combination of these two citations regardless of which thereof was chosen as starting point.

In particular, it was obvious for the skilled person to increase the viscosity of the chemically stable peracid bleaching compositions disclosed in document (1) - and already containing a co-surfactant according to the definition of ingredient "(b)" in claim 1 of the patent in suit - by adding thereto hydrophobic and hydrophilic alkyl alcohol ethoxylates (hereinafter jointly indicates as "the AAEs") according to the definitions of "(a)" and "(c)" in the same claim, because these latter ingredients, beside being already disclosed in document (2) as suitable thickeners for peroxide bleaching compositions, were also known to be stable towards peracids e.g. from document D3.

VIII. The Patent Proprietor (hereinafter "Respondent") submitted *inter alia* that the experimental evidence relied upon by the Appellant was not representative of the experimental conditions of the relevant examples of document (2), since these latter additionally contained the AAEs.

Moreover, this citation was totally silent as to the shelf life of the thickened compositions disclosed therein. Hence, the skilled person searching for storage stable compositions based on peracids, could not foresee that the AAEs disclosed in document (2) could be used to stably increase the viscosity of compositions containing peracids and would not impair the chemical stability of these latter ingredients.

Even the statement in document (3) on the stability of the AAEs towards oxidizing agents would neither imply that the reaction of hydrogen peroxide with citric acid possibly occurring in the examples of document (2) is unaffected by the presence of AAEs, nor that the peracid compositions added with such ingredients would enjoy a stable viscosity increase.

IX. The Appellant requested that the decision under appeal be set aside and that the European patent No. 0 799 297 be revoked.

X. The Respondent requested that the appeal be dismissed.

Reasons for the Decision

Inventive step (Article 100(a) EPC in combination with Articles 52(1) and 56 EPC)

1. *Claim 1*

1.1 This claim (see above section II) defines aqueous thickened compositions comprising a dissolved peracid, the hydrophobic and hydrophilic AAEs "(a)" and "(c)" and the further surfactant "(b)".

1.2 As observed by the Appellant, the more general technical problem addressed in the patent in suit is defined in the first sentence of paragraph 10 as that of providing viscous compositions based on soluble peracids.

The Board notes however that the whole patent disclosure reminds the skilled reader also of the additional technical problem of rendering stable these compositions. Indeed, as recalled also in the preceding paragraphs 3 and 5 of the patent in suit, peracid ingredients, whose extreme reactivity ensures excellent bleaching, oxidative and/or disinfecting properties, are also well known to be intrinsically unstable and potentially very reactive towards other ingredients of their compositions, such as thickening agents. This has not been contested by the Appellant.

The Board notes also the statement at paragraph 13 of the patent in suit that the compositions of the invention enjoy "*both physical and chemical stability*", and the fact that the peracid concentration and the increased viscosity obtained in examples 5 and 6 (see paragraph 52) have been checked after two-month storage time.

Hence the Board concludes that the technical problem actually addressed in the patent in suit may be identified as that of **providing viscous compositions based on peracids displaying chemical and physical stability for at least some months.**

- 1.3 The Appellant has argued that the experimental data reported in the patent in suit (see paragraph 51) and in document (8) would demonstrate that percitric acid is readily formed even at room temperature and in the absence of any strong acid catalyst.

Moreover, the fact that AAEs are explicitly recognised in document (3) (see page 4, lines 41 to 43, in

combination with example 62) as being stable towards peracid oxidizing agents, would confirm that these ingredients would not interfere with the peracid formation.

Therefore, in the Appellant's opinion document (2) would disclose bleaching compositions **implicitly** containing percitric acid, as this latter component resulted unavoidably from the reaction of hydrogen peroxide and citric acid (see in particular page 8, lines 12 to 17, page 9, lines 1 to 5, and the examples, such as example 1, wherein water, two AAEs, hydrogen peroxide and citric acid are simply mixed, presumably at room temperature).

Hence, the prior art disclosed in this citation would solve the technical problem of providing stable viscous compositions containing peracid, ie the same problem of the patent in suit (see above point 1.2).

- 1.3.1 The Board observes however that the implicit disclosure alleged by the Appellant of peracid compositions in document (2) would require the existence of **common general knowledge** suggesting to the skilled reader of this citation that the conventional reaction of hydrogen peroxide and acid to form the corresponding peracid would also occur under the conditions present in the examples of document (2) (ie room temperature, no strong acid catalyst and in the additional presence of AAEs).

Since the Respondent has disputed the existence of this common general knowledge, the burden of providing supporting evidence for it remained with the Appellant.

The Board notes, however, that technical information contained **only** in document (3) - that is no general textbook, handbook or encyclopaedia, but a specific patent document - does not belong to the common general knowledge of the skilled person. This is even more evident for the technical information contained only in the patent in suit or only in document (8), as these citations do not even belong to the prior art.

Thus, the evidence relied upon by the Appellant cannot demonstrate that document (2) implicitly disclosed the formation of peracetic acid to the skilled person applying its common general knowledge when reading it at the filing date of the patent in suit.

- 1.3.2 Therefore, the Appellant's statement that document (2) implicitly discloses thickened compositions containing peracids amounts to an unsupported allegation contested by the Respondent and is, thus, disregarded by the Board.

Accordingly, the Board concludes that document (2) does **not** disclose compositions containing peracids and, thus, addresses a different technical problem, ie that of rendering available viscous compositions based on hydrogen peroxide.

- 1.4 The Board observes instead that document (1), ie the other citation considered by the Appellant as possible starting point for the assessment of inventive step, discloses bleaching compositions undisputedly containing a peracid and which are stable over about six months (see the tables at pages 10 and 13 of

document (1)). It is also undisputed that this document is silent as to the viscosity of the compositions disclosed therein and as to the possible presence of a thickener.

Hence, this prior art addresses the technical problem of providing storage stable compositions based on peracids, ie substantially the same technical problem of the patent in suit, although only in respect of non-thickened compositions. This has not been disputed by the Appellant.

Accordingly, the Board finds this prior art more appropriate than that disclosed in document (2) as starting point for the assessment of inventive step.

1.5 The Board has no reason for doubting that the compositions according to claim 1 of the patent in suit actually enjoy the chemical and physical stability stated in paragraph 13 and supported by the results of examples 5 and 6 (as already commented above at point 1.2). This has not been disputed by the Appellant either.

Hence, the Board concludes that the subject-matter of the present claim has credibly solved vis-à-vis the prior art disclosed in document (1) the technical problem of **stably increasing the viscosity of the storage stable peracid compositions of the prior art.** Of course this also implies to retain the chemical stability of the peracid ingredient already achieved in this prior art.

1.6 It is undisputed that the subject-matter claimed differs from the prior art disclosed e.g. in the examples of document (1) only for the additional presence of the two AAEs.

Hence, the assessment of inventive step boils down to establishing whether or not the skilled person would have reasons to expect that the viscosity of the storage stable compositions disclosed in document (1) could be stably increased by adding thereto two AAEs as defined under "(a)" and "(c)" in claim 1 of the patent in suit.

1.7 The Board notes that none of the available citations disclose ingredients which are able to increase stably the viscosity of peracid compositions.

In particular, as discussed above (see point 1.3.2) the examples of document (2) disclose to the skilled person the use of AAEs exclusively for thickening bleaching compositions containing hydrogen peroxide.

An influence of the AAEs on the viscosity of peracid compositions is also undisclosed in document (3).

1.8 The Appellant has argued however that

a) even if (as already established by the Board) the examples of document (2) would not implicitly disclose the presence of percitric acid, still the hydrogen peroxide contained therein is a well-known peroxide bleaching agent, ie belongs to the same class of oxidants as peracids,

and

b) document (3) explicitly confirms that AAE surfactants (such as the mixture thereof used in example 62 of this citation) are "*relatively stable in the oxidizing system*" containing peracids at least for 20 day storage at 40°C, during which the compositions containing both ingredients retain peracid content and "*appearance stability*" (see document (3) page 4, lines 41 to 43, all the examples and in particular the AAEs used in example 62).

Hence, a skilled person combining the disclosures of documents (2) and (3) would reasonably expect also in compositions containing other peroxides, such as peracids, the same effect on viscosity provided by the AAEs in the compositions containing hydrogen peroxide disclosed in document (2).

1.9 The Board observes that, even assuming for the sake of an argument that this alleged expectation of the skilled person would be justified (see however the following point 1.10), still the problem to be solved is the achievement of a **stable** increase of viscosity. Instead, documents (2) and (3) do not even indirectly suggest how to stably increase the viscosity of compositions based on peroxides.

In particular, document (2) is totally silent as to the stability of the viscosity of the compositions disclosed therein. Therefore, it cannot be concluded neither that the viscosity achieved in this prior art is retained upon storage nor that it is lost. For instance, it cannot be excluded that the level of

viscosity provided by the AAEs to these hydrogen peroxide compositions might rapidly be lost, for instance, for reasons unrelated to the presence of peroxide ingredients.

On the other end, in document (3) the AAEs are not disclosed to produce any viscosity increase and the "*appearance stability*" considered in this citation does not equate to or necessarily imply stability of a viscosity increase.

Hence, in the disclosures provided by documents (2) and (3) could not have suggested to the skilled person that AAEs thickening agents could provide to peracid compositions a viscosity increase **stable** over storage of e.g. two or more months.

- 1.10 The Board wishes additionally to stress that the expectation of the skilled person alleged by the Appellant in the reasoning reported above at point 1.8 is not supported by convincing evidence.

In particular, the substantial stability of peracids and AAEs in compositions containing both as suggested in document (3) does not necessarily imply that the properties possibly provided by the AAEs are totally unaffected by presence or absence of peracids in the same compositions. An effect on these properties may actually be due to interactions of the peracid with the rest of the composition other than the oxidation of the AAEs.

On the other hand, the possible differences in chemical properties among hydrogen peroxide and peracids do not

lay only in the notably stronger oxidative activity of these latter, but also e.g. in their sensitivity towards basic ingredients and, thus, to basic pH and/or to the ionic strength of the composition.

Hence, the Board concludes that neither document (2), nor document (3), nor their combination justifies expecting also in compositions containing other peroxides, such as peracids, the same effect on viscosity provided by the AAEs in the compositions containing hydrogen peroxide disclosed in document (2).

- 1.11 Under these circumstances, the Board concludes that the skilled person could not derive from the disclosure of documents (2) and/or (3) that the addition of AAEs to the storage stable compositions disclosed in document (1) would have produced a stable increase of viscosity without impairing the peracid chemical stability.

Hence, the presently claimed compositions provide a non-obvious solution to the existing technical problem.

- 1.12 Therefore, the Board finds that the subject-matter of claim 1 is based on an inventive step and, thus, complies with the requirements of Article 56 EPC.

2. *Claims 2 to 30*

The reasoning given above in respect of the thickening composition of claim 1 applies also the process for thickening solutions of soluble peracids as defined in claim 2, as well as, to the preferred embodiments of this composition and/or process as defined in claims 3

to 29 and to the method as claimed in claim 30 for
disinfecting hard surfaces by using this composition.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P. Krasa