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D E C I S I O N
of 23 January 1997

Case Number: T 0482/92 - 3.3.1

Application Number: 86303980.6

Publication Number: 0209228

IPC: C11D 3/39

Language of the proceedings: EN

Title of invention:

Stabilized liquid hydrogen peroxide bleach compositions

Patentee:

THE CLOROX COMPANY

Opponent:

Unilever N.V./Unilever PLC

Headword:

Bleach compositions/CLOROX

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (yes) - non-obvious alternative"

Decisions cited:

T 0133/92, T 0202/92

Catchword:

-



Case Number: T 0482/92 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 23 January 1997

Appellant:
(Opponent)

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Decision under appeal:

Interlocutory decision of the Opposition Division
of the European Patent Office posted
13 April 1992 concerning maintenance of European
patent No. 0 209 228 in amended form.

Composition of the Board:

Chairman: A. J. Nuss
Members: J. M. Jonk
R. E. Teschemacher

Summary of Facts and Submissions

I. The Appellants (Opponents) lodged an appeal against the interlocutory decision of the Opposition Division by which the European patent No. 0 209 228 (European patent application No. 86 303 980.6) was maintained in amended form.

II. The opposition was based on Article 100(a) EPC, and supported by several documents including:

- (1) DE-A-2 441 725,
- (2) US-A-4 430 236,
- (3) DE-A-2 152 741,
- (4) EP-A-0 009 839, and
- (8) US-A-3 951 839.

III. The decision was based on the Claims 1 to 13 of the main request filed on 15 October 1991, independent Claim 1 reading as follows:

"A stabilized liquid peroxide bleaching composition comprising an aqueous composition of a peroxygen compound, a metal chelating agent and an organic component selected from nonionic surfactants, fluorescent whiteners, a dye, and mixtures thereof, characterized in that there is also present a free radical scavenging agent and in that the chelating agent is an amino polyphosphonate."

IV. The Opposition Division held that the subject-matter of the claims was novel.

Concerning an inventive step they held that in view of the closest state of the art as represented by document (2), the problem to be solved by the patent in suit was to provide a stabilised liquid peroxide bleaching

composition comprising an organic component selected from a nonionic surfactant, a whitener and a dye, and mixtures thereof, in which not only the peroxide is stabilised against degradation but also the organic component is stabilised against oxidation caused by the peroxide. Moreover, they held that the solution of this technical problem by providing a composition in accordance with Claim 1, which is characterised in that the chelating agent is an amino polyphosphonate and in that it contains a free radical scavenging agent, could not be derived from the prior art documents. In this respect, the Opposition Division considered that the skilled person would have disregarded the teaching of document (1), since this document was related to a totally different technical field, namely, the technical field of mining where high levels of heavy metal ions and heavy metal sulphides occurred, and also concerned a different technical problem.

- V. The Appellants argued that the claimed subject-matter did not involve an inventive step, since the replacement of EDTA (ethylenediaminetetraacetic acid) in the compositions of document (2) by an amino polyphosphonate and the addition of a free radical scavenging compound was considered to be obvious to the skilled person in view of documents (1), (3), (4) and (8). In particular, they argued that it was known from document (4) that amino polyphosphonates were generally better than EDTA for stabilising hydrogen peroxide solutions, that document (8) disclosed the addition of free radical scavenging compounds to peroxygen-containing solutions in order to improve their stability, and that document (1) taught that the combination of an amino polyphosphonate and a radical scavenging agent lead to a synergistic effect in stabilising hydrogen peroxide solutions. In this context, they contended that stabilising agents in solutions of the type as claimed must stabilise both

the hydrogen peroxide and the organic compounds since stabilising of only the organic compounds would provide ineffective compositions. Thus, in their view, document (1) concerning stabilising of hydrogen peroxide was clearly of relevance.

Furthermore, the Appellants also argued that the patent in suit was related to compositions comprising hydrogen peroxide as the bleaching component and having an acid pH, whereas the present claims did not reflect these essential features.

VI. Oral proceedings (requested by the Respondent) were held on 23 January 1997, which the Appellants, after having informed the Board accordingly, did not attend.

VII. Having regard to the cited documents, the Appellants' objections and the Respondent's submissions, the Board noted during these oral proceedings in particular:

(a) that in view of the teaching of document (2), and the experimental evidence in the patent in suit which did not show any instability problem with respect to nonionic surfactants, it would appear to be unlikely that compositions in accordance with this prior art omitting a whitener and a dye were unstable;

(b) that the test-report as enclosed in document

(9) Affidavit by James P. Farr, filed by the Respondent on 22 January 1991,

showed that a number of free radical scavenging agents did not stabilise the dye in compositions in accordance with the claimed invention;

- (c) that in view of the Respondent's written submissions with respect to document (8) in that this document would not provide any incentive to use hydrogen peroxide, as well as the fact that the specification of the patent in suit did not mention any other bleaching agent than hydrogen peroxide, it would seem to be questionable whether the stabilising system in accordance with the claimed invention would provide the same effect with peroxy salts, such as sodium perborate, as specified in document (8); and
- (d) that bleaching compositions having a basic pH would appear to be likely unstable.

In order to respond to these objections, the Respondent filed during the oral proceedings new Claims 1 to 9. Claim 1 of this set of claims reads as follows:

"A stabilized liquid peroxide bleaching composition comprising an aqueous composition of hydrogen peroxide, a nonionic surfactant, a metal chelating agent and an organic component which is a fluorescent whitener and/or dye, and mixtures thereof, characterized in that the composition also contains as a free radical scavenging agent a partially hindered substituted hydroxybenzene and the metal chelating agent is an amino polyphosphonate, said composition having a pH of 1 to 8."

Regarding the inventive step, the Respondent submitted that the two types of stabilising compounds acted synergistically to stabilise hydrogen peroxide compositions which also contained organic compounds such as dyes and fluorescent whiteners. In support, he referred to the test-report enclosed in document (9). Moreover, the Respondent emphasised that the skilled person would not have considered document (1) for the

solution of the technical problem to achieve this synergistic effect, since this document concerned an unrelated technical field. Furthermore, he argued that documents (3) and (4) did not give any hint to the skilled person to use an amino polyphosphonate in order to stabilise organic compounds in hydrogen peroxide solutions. Concerning document (8), he submitted that the skilled person would not have had any reason to combine the teaching of this document with that of document (2), since document (8) did not relate to hydrogen peroxide solutions.

VIII. The Appellants requested in writing that the decision under appeal to be set aside, and the patent be revoked.

The Respondent requested that the patent be maintained on the basis of the set of claims as submitted at the oral proceedings.

IX. At the conclusion of the oral proceedings the Board's decision was pronounced.

Reasons for the Decision

1. The appeal is admissible.
2. The amendments to Claim 1 as granted are based on Claims 1, 2, 4, 5, 12 and 13 of both the patent in suit and the patent application as filed, as well as on page 6, lines 40 to 45, of the patent in suit and page 15, lines 15 to 22, of the originally filed application.

Present Claim 5 is based on Claims 1, 2, 4, 5, 6 to 9, 12 and 13 of both the patent in suit and the patent application as filed, and on the passages of the

specification of the patent as granted and the original application indicated above in support of present Claim 1.

Present Claims 2 to 4 and 6 to 9 correspond essentially to Claims 3 to 5, 10 and 14 to 16 respectively of both the patent as granted and the originally filed patent application.

Thus, all amendments made to the claims as granted comply with the requirements of Article 123(2) and (3) EPC.

3. After examination of the cited prior art, the Board has reached the conclusion that the subject-matter as defined in all claims is novel. Since this issue was not in dispute, it is not necessary to give reasons for this finding.
4. The remaining issue to be dealt with is whether the subject-matter of the present claims involves an inventive step.
 - 4.1 Article 56 EPC sets forth that an invention involves an inventive step if, having regard to the state of the art (within the meaning of Article 54(2) EPC), it is not obvious to a person skilled in the art.

For deciding whether or not a claimed invention meets this criterion, the Boards of Appeal consistently apply the "problem-solution-approach", which consists essentially in (a) identifying the "closest prior art", (b) assessing the technical results (or effects) achieved by the claimed invention when compared with the "closest state of the art" established, (c) defining the technical problem to be solved as the object of the invention to achieve these results, and (d) examining whether or not a skilled person, having

regard to the state of the art in the sense of Article 54(2) EPC, would have suggested the claimed technical features for obtaining the results achieved by the claimed invention.

Furthermore, in accordance with the established case law of the Boards of Appeal the "closest prior art" for assessing inventive step is normally a prior art document disclosing subject-matter conceived for the same purpose as the claimed invention and having the most relevant technical features in common.

4.2 Therefore, the Board considers that the compositions as described in document (2) represent the closest state of the art.

4.3 Document (2) relates to single phase liquid laundry products comprising a nonionic surfactant, a hydrogen peroxide bleach, a fluorescent brightening agent (i.e. a fluorescent whitener in accordance with the patent in suit, page 5, line 29), a dye, and a chelating agent which is preferably ethylenediaminetetraacetic acid (EDTA), in particular in the form of its sodium salt (see column 2, lines 16 to 29; column 3, line 66 to column 4, line 8; column 4, lines 36 to 45; and the Table in column 5). The compositions in accordance with this document have a pH of 3 to 8, preferably a pH of 4.0 to 4.5 (see column 5, line 66 to column 6, line 1; and column 6, lines 31 to 33). The products are useful as a bleach under prelaundering conditions for stain removal, and as a detergent and a bleach in cold, medium warm and hot water laundering conditions (see column 2, lines 40 to 45; and column 7, lines 8 to 14). Moreover, it emphasises that the compositions are stable for a long period of time, for instance 26 months at room temperature (see column 2, lines 23 to 26; column 4, lines 23 to 45; and Claim 22). In particular, the composition in accordance with

Example 1 of this document, containing the components as claimed in present Claim 1 of the patent in suit, except that EDTA (sodium) is used as a chelating agent and a scavenging agent is omitted, shows a percent loss of hydrogen peroxide of only 3.4% after a six-month storage at room temperature (see Claim 23, and Example 2).

- 4.4 In accordance with the Respondent's submissions, it has been found that the combination of the chelating agent and the free radical scavenging agent as claimed in present Claim 1 of the patent in suit possesses a synergistic action in improving the stability of the whitener and/or dye as contained in the bleaching compositions in question (see also document (9), page 2, under point 5; and the patent in suit, page 3, lines 14 to 16 and 48 to 51; page 4, lines 39 to 41; and page 9, lines 48 to 54).

However, the Respondent did not provide any evidence whether said combination of stabilising compounds as claimed in present Claim 1 produces a superior stabilising effect as compared with the sodium salt of EDTA, i.e. the most preferred stabilising agent in accordance with document (2).

- 4.5 Therefore, in the light of the closest state of the art as represented by document (2), in the Board's judgment, the technical problem underlying the patent in suit can only be seen in the provision of further liquid bleaching compositions comprising hydrogen peroxide, a nonionic surfactant, and a fluorescent whitener (brightener) and/or dye, in which the whitener and/or dye show an equally good long term storage stability.

- 4.6 According to present Claim 1 this technical problem is solved by compositions as defined therein containing

essentially a stabilising combination of a partially hindered substituted hydroxybenzene as a free radical scavenging agent and an amino polyphosphonate as a chelating agent.

4.7 Having regard to the examples of the patent in suit, and the test-report enclosed in document (9), the Board considers it plausible that the technical problem as defined above has been solved. Actually, the test-report of document (9) shows that Examples 2 to 4 using only metal chelating agents other than the sodium salt of EDTA, and Examples 5 to 11 using only scavenging agents, and Examples 17, 24 and 29 to 32 using combinations of chelating agents and scavenging agents other than those as claimed in present Claim 1 of the patent in suit do not provide a sufficient stabilisation of the dye and/or brightener (see in particular Table II, and the observations under point 9), whereas stabilising systems in accordance with present Claim 1 of the patent in suit provide a long term storage stability of about 5 months at room temperature (see page 5, second paragraph, of the patent in suit), which stability is comparable to that as claimed in Claim 23 of document (2). Moreover, the Appellants did not contest that the compositions according to the claimed invention show a good long term storage stability.

4.8 The question now is whether the cited prior art would have suggested to a person skilled in the art solving the above-indicated technical problem in the proposed way.

4.9 Although document (2) - like the patent in suit - relates to stable bleaching compositions comprising hydrogen peroxide, a nonionic surfactant, and a fluorescent brightener and/or dye, it is clear from the preceding considerations (see under point 4.2 above)

that this document does not give any pointer to the skilled person that the technical problem underlying the patent in suit as defined above could be solved by replacing the stabilising sodium salt of EDTA by the specific stabilising system consisting of a combination of a partially hindered substituted hydroxybenzene and an amino polyphosphonate.

In this context, the Board observes that this specific stabilising system is indeed essential and characteristic for the solution of said technical problem since - as indicated above under point 4.6 - the test-report of document (9) showed that stabilising agents consisting of a metal chelating agent other than the sodium salt of EDTA, or a scavenging agent, or a combination of a chelating agent and a scavenging agent other than those as claimed in present Claim 1 of the patent in suit, did not provide an adequate stabilisation of the dye and/or brightener.

- 4.10 Document (8) concerns bleaching compositions comprising as essential components an oxygen-type bleaching agent and at least one radical chain-inhibiting antioxidant selected from the group consisting of 4,4'-butylidene-bis (6-tert-butyl-3-methylphenol), 2,2'-butylidene-bis (6-tert-butyl-4-methylphenol), monostyrenated cresol, distyrenated cresol, monostyrenated phenol, distyrenated phenol and 1,1'-bis (4-hydroxyphenyl) cyclohexane (see column 1, line 62 to column 2, line 8; and column 4, lines 43 to 46). Suitable oxygen-type bleaching agents are sodium perborate, sodium percarbonate, sodium persulphate, hydrogen peroxide adduct of sodium tripolyphosphate and

hydrogen peroxide adduct of sodium pyrophosphate (see Claim 1, and column 2, lines 9 to 16). Moreover, additives normally used in detergent compositions such as optical brightening agents and dyes can be incorporated (see column 4, lines 39 to 46).

According to document (8), it has been found that by using such a specific antioxidant in combination with the oxygen-type bleaching agent an unexpected synergistic yellowing-preventing effect is obtained (see column 4, lines 39 to 43). However, there is no indication in this document that hydrogen peroxide would be a suitable oxygen-type bleaching agent in this respect.

Therefore, a skilled person, faced with the technical problem underlying the patent in suit as defined above, in the Board's judgment, would not have had any reason to take the teaching of document (8) into consideration for its solution. Moreover, even if the skilled person had done so, the teaching of this document would not have lead him to the use of the specific stabilising system as claimed.

- 4.11 Documents (3) and (4) both relate to hydrogen peroxide compositions containing certain amino polyphosphonates in order to stabilise the hydrogen peroxide (see document (3), page 1, first paragraph, and page 5, last paragraph; and document (4), page 1, lines 1 to 5, and page 4, lines 7 to 10). However, since these documents do not disclose hydrogen peroxide compositions which contain a whitener and/or a dye, there is no incentive to the skilled person that such organic compounds could adequately be stabilised by said amino polyphosphonates, let alone by the stabilising system as claimed in the patent in suit.

4.12 Document (1) relates to hydrogen peroxide compositions for mining and, in particular, for separating copper and lead impurities from molybdenite concentrates, in which applications high concentrations of heavy metal ions (such as 5% by weight) and metal sulphides are encountered (see page 5, first paragraph; page 8, first and second paragraph; and the Examples 11 to 16, and 18). In order to stabilise these hydrogen compositions, which do not contain a whitener and/or dye, a combination of an organic phosphor compound, such as an amino polyphosphonate, with an organic hydroxyl compound selected from allyl alcohol, methallyl alcohol, phenol, o-chloro phenol, o-nitro phenol, o-amino phenol, p-chloro phenol, p-nitro phenol, and p-amino phenol is applied (see page 4, second and third paragraph; and the claim).

However, this document emphasises that said stabilisation must be differentiated from a stabilisation of hydrogen peroxide compositions against "trace" amounts of destabilising metal ions for the purpose of storage and transport, which is considered to be already adequately achieved in commercial products (see page 8, third paragraph).

Thus, the teaching of document (1) as a whole concerns a technical field and a technical problem to be solved which are totally unrelated to those underlying the patent in suit. Moreover, it clearly suggests that the use of the particular stabilising system as described therein would not be needed for stabilising detergent bleaching compositions which are contaminated only with trace amounts of metal ions, such as those in accordance with document (2) (see page 4, lines 23 to 28 and 43 to 45).

Therefore, in the Board' judgment, a person skilled in the art faced with the technical problem to provide detergent bleaching compositions in which the whitener and/or dye are adequately stabilised, would have disregarded this document.

- 4.13 The Board also does not accept the Appellants' submission that the claimed subject-matter would be obvious in the light of the teaching of document (2) in combination with the teachings of documents (8), (3), (4) and (1).

In this respect the Board notes that in order to arrive at the compositions as claimed in present Claim 1 of the patent in suit, a person skilled in the art would have to replace the sodium EDTA as preferably used in accordance with document (2) by an amino polyphosphonate as described in documents (3) and (4) and, in addition, would have to combine such an amino polyphosphonate with a partially hindered substituted hydroxy benzene.

However, even if a skilled person **could** have done so in view of the combined disclosures of the cited documents, the Board observes that according to the established case law of the Boards of Appeal for determining lack of inventive step, it is necessary to show that considering the teaching of the relevant documents as a whole, without using hindsight based on the knowledge of the claimed invention, the skilled person **would** have arrived at the **claimed solution of the technical problem to be solved**. Thus, as is clear from the preceding considerations, this condition has not been met, since the decisive fact remains that

neither document (2) nor the combined teaching of documents (2), (3), (4), (8) and (1) comprise any suggestion that by doing so a **satisfying stabilisation of a whitener and/or dye would be achieved.**

- 4.14 In conclusion, the Board finds that the detergent bleaching compositions according to Claim 1 involve an inventive step in the sense of Article 56 EPC.

Independent Claim 5 relating to a method for stabilising a whitener and/or dye contained in a composition in accordance with Claim 1 is based on the same inventive concept and is therefore also allowable.

The dependent Claims 2 to 4, and 6 to 9 relating to particular embodiments of the subject-matter of Claims 1 and 5 are likewise allowable.

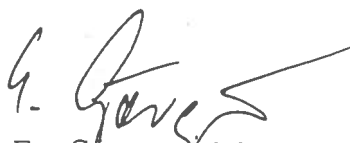
5. Finally the Board finds that the decision of the Enlarged Board of Appeal G 4/92 (OJ EPC 1994, 149) does not apply in the present case. According to this decision, a party who fails to appear at oral proceedings must have the opportunity, in accordance with Article 113(1) EPC, to comment on new facts and evidence submitted in these proceedings. In the present case, the Respondent's restrictions to the claims removed objections already raised by the Appellants. In such a situation, the Board sees no reason why the Appellants (the Opponents) could have been taken by surprise, in interference with Article 113(1) EPC, because they had to expect that the Respondent (Patentee) would try to overcome the objections (see also the unpublished decisions T 133/92 dated 18 October 1994 and T 202/92 dated 19 July 1994).

Order


For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the Claims 1 to 9 as submitted during the oral proceedings and a description to be adapted.

The Registrar:


E. Gorgmaier

The Chairman:


A. Nuss

