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D E C I S I O N
of 19 March 1996

Case Number: T 1120/92 - 3.3.1

Application Number: 87870040.0

Publication Number: 0240481

IPC: C11D 3/39

Language of the proceedings: EN

Title of invention:
Stable liquid diperoxyacid bleach

Patentee:
THE PROCTER & GAMBLE COMPANY

Opponent:
Henkel Kommanditgesellschaft auf Aktien

Headword:
Bleach composition/PROCTER & GAMBLE

Relevant legal provisions:
EPC Art. 56

Keyword:
"Definition of the technical problem - alleged problem not supported"
"Inventive step (no) - obvious alternative"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1120/92 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 19 March 1996

Appellant: (Proprietor of the patent)
THE PROCTER & GAMBLE COMPANY
One Procter & Gamble Plaza
Cincinnati,
Ohio 45202 (US)

Representative:
Ernst, Hubert
PROCTER & GAMBLE
EUROPEAN TECHNICAL CENTER
Temselaan 100
B-1853 Strombeek-Bever (BE)

Respondent: (Opponent)
Henkel
Kommanditgesellschaft auf Aktien
TFP/Patentabteilung
D-40191 Düsseldorf (DE)

Representative:
-

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 30 October 1992 revoking European patent No. 0 240 481 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: A. J. Nuss
Members: J. M. Jonk
W. Moser

Summary of Facts and Submissions

I. The Appellant (Proprietor of the patent) lodged an appeal against the decision of the Opposition Division to revoke European patent No. 0 240 481 in response to an opposition based on Article 100(a) EPC and filed against the patent as a whole.

II. The Opposition Division held that the subject-matter of Claims 1 to 10 of the patent in suit, with Claim 1 reading as follows:

" A stable liquid bleach composition comprising, by weight:
(a) from 10% to 25% of water-insoluble diperoxyacid particles of the formula $HOOOC(CH_2)_nCOOOH$, wherein n is from 7 to 14, said particles having an average size of from 0.5 to 15 micrometers;
(b) from 2% to 6%, on an acid basis, of a water-soluble C_{11}-C_{13} linear alkylbenzene sulfonate surfactant;
(c) from 0% to 8%, on an acid basis, of a water soluble cumene sulfonate;
(d) from 0% to 7% sodium or potassium sulfate; and
(e) from 40% to 78% water;

characterized in that it further contains from 5% to 15% of magnesium sulfate, provided that the total of (b) and (c) is from 3% to 14%; the total of magnesium sulfate, sodium sulfate and potassium sulfate is from 5% to 16%; and the total of (b), (c), magnesium sulfate, sodium sulfate and potassium sulfate is from 12% to 30%; the weight ratio of (a) to magnesium sulfate being less than 3:1; and said composition having a pH of from 2 to 4.5

and a viscosity of from 50 to 1000 mPa·s at 20°C, the viscosity being measured with an LTV Brookfield Viscometer, using a No. 3 spindle and a setting of 60 rpm."

did not involve an inventive step in the light of documents

(1) DK 85/4382 (corresponding to EP-A-0 176 124),

(2) DE-A-2 422 691 and

(3) DE-A-2 423 466.

The Opposition Division was in particular of the opinion that the bleach compositions according to Claim 1 of the patent in suit differed from those described in the closest state of the art, i.e. document (1), only in that they comprised $MgSO_4$, instead of or in addition to Na_2SO_4. However, given the fact that, in the absence of any unexpected effect with respect to this closest state of the art, the technical problem underlying the patent in suit was to provide an alternative liquid bleach having about the same chemical and physical stability as those achieved by the compositions described in document (1), and having regard to the equivalence of $MgSO_4$ to Na_2SO_4 shown in documents (2) and (3), the claimed subject-matter was considered to be obvious to the skilled person.

III. The Appellant argued in the statement of the grounds of appeal that the bleach compositions containing magnesium sulphate according to Claim 1 of the patent in suit showed an improvement in chemical stability compared with those of document (1). In support to this argument, he referred to the results of comparative tests. In his view, this effect was entirely unexpected and a clear

indication for inventiveness. However, he did not provide any argument to dispute the decision of the first instance in case that the presence of the alleged improvement could not be accepted by the Board.

IV. The Respondent maintained his view that lack of inventive step was substantiated in the proceedings before the first instance by combining the teaching of document (1) with that of documents (2) and (3) describing a stabilising effect of magnesium sulphate in solid bleaching compositions comprising peroxyacids. Moreover, he disputed the cogency of the experimental results filed by the Appellant by referring to the compositions indicated in Table 1 of document (1) demonstrating - contrary to these experimental results - a good chemical stability at storing for 2 weeks at 40°C.

V. Oral proceedings, requested by both parties, were held on 19 March 1996; the parties, after having informed the Board accordingly, did not attend.

In the summons to the oral proceedings, the Board informed the parties that the application of the "problem-solution-approach" for deciding whether or not the claimed compositions involved an inventive step implied: (i) answering the question whether the compositions as claimed in the patent in suit showed an improved chemical stability compared to those of document (1), (ii) subsequently defining the technical problem which is credibly solved, and (iii) finally examining the question whether the claimed solution to this technical problem involved an inventive step in the light of the cited prior art.

VI. The Appellant requested (in writing) that the decision under appeal be set aside and that the patent be maintained as granted on the basis of his written submissions.

The Respondent requested (in writing) that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. After examination of the cited prior art, the Board is satisfied 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.

3. The remaining issue to be dealt with is whether the subject-matter of the present claims involves an inventive step.

3.1 Article 56 EPC sets forth that an invention involves an inventive step if, having regard to the state of the art (in the sense 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 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 the claimed solution to this technical problem involves an inventive step in view of the state of the art in the sense of Article 54(2) EPC, or expressed in an other way, whether or not a skilled person, having regard to the state of the art, would have suggested the claimed technical features for obtaining the results achieved by the claimed invention.

3.2 In the present case, both parties and the Board consider document (1) to represent the closest state of the art. It relates to pourable liquid bleach compositions comprising a diperoxyacid (such as DPDA, i.e. 1,12-diperoxydodecanedioic acid) in an amount such that the active oxygen content of the composition is between 0.1 to 4%, an alkali metal salt of an alkyl benzene sulphonic acid (such as sodium dodecyl or sodium tridecyl benzene sulphonate) in an amount of 0.5 to 15% (preferably 2 to 10%) by weight, preferably a particular inorganic salt (such as sodium sulphate) in an amount of 0.01 to 20% (preferably 2 to 10%) by weight, and water. Moreover, it describes that these compositions are chemically stable, i.e. after storage for two weeks at 40°C they still have the same or practically the same active oxygen content (cf., in particular, page 2, last paragraph; and page 6, lines 27 to 29).

Document (1) further teaches that by using an alkali metal salt of an alkyl benzene sulphonic acid instead of a thickening agent the physical stability of the compositions is improved, and the chemical stability remains the same or substantially the same (cf. page 1, lines 4 to 23; and page 2, lines 22 to 27).

These compositions differ - in the Board's judgment and in conformity with the opinion of both parties - essentially from the compositions of the patent in suit in that they do not contain magnesium sulphate (cf. page 3, line 7 to page 4, line 27; and Example 1, compositions 1 to 6).

3.3 The Appellant argued essentially that the bleach compositions according to this closest state of the art have an unsatisfying chemical (i.e., peroxyacid) stability and that the compositions as claimed in the patent in suit do not show this drawback. In this respect, he relied on experimental results submitted in the statement of grounds of appeal (see point III above).

According to the Appellant, the compositions 3, 4 and 6 in Table 1 of document (1) were reproduced and the available oxygen (AvO) was measured. The compositions were then stored for 2 weeks at 37.8°C, and the AvO was then measured again. The compositions and the results expressed as the % of the initial AvO lost during the test are indicated in the table below:

Ingredients (100% act.)	**Compositions**		
	3	4	6
DPDA	13.52	25.00	27.00
HLAS	5.74	4.93	5.61
Sodium sulphate	-	1.70	3.70
Magnesium sulphate	-	-	-
Dequest 2010	0.50	0.40	0.40
H_2O/NaOH	-------Balance------		
% AvO lost	54%	19%	84%

In addition, comparative experiments were carried out by using the same compositions wherein magnesium sulphate was added on top (compositions 3',4' and 6'). These compositions and the test results are indicated in the Table below:

Ingredients (100% act.)	**Compositions**		
	3'	4'	6'
DPDA	13.52	25.00	27.00
HLAS	5.74	4.93	5.61
Sodium sulphate	-	1.70	3.70
Magnesium sulphate	12.00	6.80	8.30
Dequest 2010	0.50	0.40	0.40
H_2O/NaOH	-------Balance------		
% AvO lost	5%	0%	15%

3.4 However, these test results submitted to show an improvement of the chemical stability, i.e. a reduction of the percentages of the initial available oxygen lost during the storage period from 54%, 19% and 84% to 5%, 0% and 15% respectively, were disputed by the Respondent. He contended that, in view of the striking discrepancy between the test results described in document (1) for the compositions 3, 4 and 6 (indicating that after storage for two weeks at 40°C these compositions still had the same or practically the same active oxygen content) and those submitted by the Appellant for the same compositions (demonstrating that these compositions after storage under the same conditions showed - as indicated in the first Table above - a reduction of the initial available oxygen of 54%, 19% and 84% respectively), it could only be concluded that the test conditions applied by the Appellant in carrying out these experiments were

apparently not comparable to those used in document (1), so that the test results provided by the Appellant could not be considered as an indication of the presence of an inventive step.

3.5 In this context, the Board observes that, according to the established jurisprudence of the Boards of Appeal, the existence of an alleged improvement is decided on the basis of the overall balance of probability, i.e. that one set of facts is more likely to be true than another, and that each of the parties to the proceedings carries the separated burden of proof of any fact it alleges.

3.6 In the present case, the alleged improvement in chemical stability is based on a reproduction of the compositions 3, 4 and 6, and the finding that these compositions show losses of the initial available oxygen of 54%, 19% and 84%, respectively.

However, losses up to 84% as determined by the Appellant, are clearly at variance with the teaching in document (1) which indicates for the same compositions **no or substantially no reduction of chemical stability** under the same test conditions (see point 3.2 above). Moreover, the Appellant did not make any comment to explain this discrepancy and also did not provide proper information about the details of the preparation of the compositions in question, such as the way of mixing and the order of addition of the components, which are likely to have an impact on their physical and chemical stability. Therefore, in view of this serious discrepancy and in the absence of any explanation thereof, as well as in the absence of a detailed and unambiguous description of the way the compositions were reproduced and the loss of initial oxygen was measured rendering it impossible to verify the test results, in

the Board's judgment, the test results submitted by the Appellant cannot be regarded as being of relevance in the present context.

In addition, it is observed by the Board that **the reported serious losses up to 84% in initial available oxygen**, as well as **the large difference between the reported losses in initial available oxygen of 19% and 84% for the compositions 4 and 6 respectively**, which compositions contain - as indicated in the first Table above - about the same amount of DPDA and differ essentially only in their contents of HLAS (4.93 vs. 5.61) and sodium sulphate (1.70 vs. 3.70), are also in contradiction to the teaching of document (1) concerning the technical effects of an alkali metal salt of an alkyl benzene sulphonic acid and of sodium sulphate in the bleach compositions as described therein. Document (1) clearly teaches that the presence of an alkali metal salt of an alkyl benzene sulphonic acid as emulsifier has **no or hardly any detrimental effect** on the active oxygen content, i.e. on the chemical stability, of the bleach compositions and that by using an inorganic salt, such as sodium sulphate, bleach compositions containing less of this emulsifier, **but having the same properties**, can be prepared (cf. page 2, lines 24 to 27; page 4, second paragraph, particularly lines 13 to 16; and the indication on page 6, lines 27 to 29 that composition 7, that does not contain these emulsifiers, has the same chemical stability as the other compositions 1 to 6 in Table 1). The Board considers this contradiction to be a further indication that the data submitted by the Appellant are not valid.

In these circumstances, the test results provided by the Appellant, on the balance of probabilities, cannot be accepted by the Board as sufficient proof that the alleged improvement of chemical stability was indeed achieved.

3.7 In this context, the Board observes that the Appellant did not dispute the test results concerning the compositions 1 and 2 in Table 1 of document (1) indicating that these compositions containing diperoxydodecanedioic acid, sodium dodecyl benzene sulphonate and sodium sulphate had retained, after 2 weeks at 40°C, their active oxygen content (cf. Table 1 and lines 27 to 29 on page 6), so that - even if the Appellant's test results concerning the compositions 3, 4 and 6 were acceptable, i.e. that with respect to these compositions the alleged "improvement" would be convincingly achieved - the bleach compositions according to the patent in suit compared to these two compositions merely show about the same chemical and physical stability.

3.8 Therefore, the Board perceives the technical problem underlying the patent in suit, in the light of the closest state of the art as represented by document (1), in providing an alternative bleach composition having about the same physical and chemical stability.

3.9 According to Claim 1 of the disputed patent, this technical problem is solved by providing a bleach composition which is essentially characterised in that it contains magnesium sulphate instead of or in addition to sodium sulphate and/or potassium sulphate.

3.10 Having regard to the description of the patent in suit indicating that magnesium sulphate helps to suspend the diperoxyacid particles and reduces the viscosity in replacing sodium and/or potassium sulphate (cf. page 3, lines 12 to 23), as well as in view of the technical data given in Examples 1 and 3 of the patent in suit showing no loss of initial oxygen after storage of the composition at 32.2°C for 17 days and a small loss, i.e. from 18.0% to 16.3%, at 20°C for 8 months, respectively (cf. particularly page 4, line 59, page 5, lines 5 to 9, and page 6, lines 32 to 54), the Board is satisfied that the technical problem as defined above has been solved by the compositions as claimed in present Claim 1. These results as such were not contested by the Respondent.

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

3.12 However this question has already been answered by the Opposition Division deciding that the solution of this technical problem was obvious to the skilled person in the light of the disclosure of document (1) in combination with that of documents (2) and (3) showing the equivalence of magnesium sulphate to sodium sulphate. Furthermore, the Board sees no reasons to question the findings in this decision. The Appellant did not challenge the correctness of the decision under appeal either.

4. In conclusion, the Board finds that the liquid bleach composition according to Claim 1 of the patent in suit does not involve an inventive step.

The dependent Claims 2 to 10 relating to particular embodiments of the composition claimed in Claim 1, fall together with Claim 1, since the Board can only decide on the request as a whole.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

E. Görgmaier A. Nuss