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Datasheet for the decision of 17 September 2010

Case Number: T 1621/08 - 3.3.06

Application Number: 02784458.8

Publication Number: 1444316

IPC: C11D 3/00

Language of the proceedings: EN

Title of invention:
Acid sanitizing and cleaning compositions containing protonated carboxylic acids

Patentee:
ECOLAB INC.

Opponent:
Diversey, Inc.

Headword:
Sanitizing and cleaning compositions/ECOLAB

Relevant legal provisions:
EPC Art. 56
RPBA Art. 12(4)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Admissiblity of new documents and experimental evidence submitted with the statement of grounds of appeal: yes"
"Inventive step (all requests): no - experimental evidence that the alleged technical problem is not solved throughout the whole extent of claim 1"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1621/08 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 17 September 2010

Appellant: (Opponent)	Diversey, Inc. 8310 16th Street M.S. 509 Sturtevant WI 53177-0902 (US)
Representative:	den Hartog, Jeroen H.J. Howrey LLP Rembrandt Tower, 31st Floor Amstelplein 1 NL-1096 HA Amsterdam (NL)
Respondent: (Patent Proprietor)	ECOLAB INC. Ecolab Center 370 North Wabasha Street St. Paul MN 55102-2233 (US)
Representative:	Polypatent Postfach 40 02 43 D-51410 Bergisch Gladbach (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted 10 June 2008 rejecting the opposition filed against European patent No. 1444316 pursuant to Article 102(2) EPC 1973.**

Composition of the Board:

Chairman: P. Ammendola
Members: L. Li Voti
J. Van Moer

Summary of Facts and Submissions

I. The present appeal is from the decision of the Opposition Division to reject the opposition against the European patent no. 1 444 316 concerning a sanitizing and cleaning composition.

Claim 1 of the set of 53 claims of the patent as granted reads as follows:

"1. A sanitizing and/or cleaning composition comprising:
a) at least one aliphatic short chain antimicrobially effective C_5 to C_{14} fatty acid or mixture thereof;
b) at least one weak C_1 to C_4 carboxylic acid; and
c) a strong acid which is nitric acid or a mixture of nitric and phosphoric acids."

II. In its notice of opposition the Opponent sought revocation of the patent on the grounds of Article 100(a) EPC, because of lack of novelty and inventive step of the claimed subject-matter, and of Article 100(b) EPC, because of insufficiency of disclosure.

The Opponent referred during the opposition proceedings *inter alia* to the following documents:

(E5): US-A-5 391 379;
(E6): US-A-5 234 719.

III. The Opposition Division found in its decision that

– the claimed invention was sufficiently disclosed;

– the claims of the granted patent were novel over the cited prior art;

– document (E5) represented the closest prior art;

– the Opponent had failed to demonstrate with the experimental data supplied in the Annexes 1 to 4 that the claimed compositions were not stable at low temperature and high water hardness and that phosphoric acid was so effective as nitric acid in reducing fatty acid build up;

– the subject-matter of claim 1 differed from that of document (E5) insofar as it comprised nitric acid or a mixture of nitric and phosphoric acids;

– even though it was known from the prior art to use nitric acid or combinations of nitric and phosphoric acids in sanitizing compositions, the skilled person would not have had any motivation to add nitric acid to the compositions known from document (E5) with the expectation of decreasing the fatty acid build up on the treated surfaces and of solving therewith the technical problem underlying the invention, i.e. the provision of a sanitizing and/or cleaning composition which was stable in diluted form at low temperature and high water hardness;

– therefore, the subject-matter of claim 1 as well as that of the other independent claims 35, 37, 39 and 43 involved an inventive step.

IV. An appeal was filed against this decision by the Opponent (Appellant).

The Appellant submitted with the statement of the grounds of appeal an experimental report (annex 5) and documents (E17) to (E21), wherein documents (E20) and (E21) are the following:

(E20): "CIP: Cleaning in Place", 2nd edition (1990), edited by A.J.D. Romney, pages 17 to 40 and 52 to 55;
(E21): Ullmanns Encyklopädie der technischen Chemie, 4th edition (1981), volume 20, pages 152 to 156.

Furthermore the Appellant submitted with letters of 27 July 2009 and 25 February 2010, respectively, two declarations by Dr. Kany (hereinafter referred to as (E23) and (E23a), respectively).

The Respondent (Patent Proprietor) submitted with the letter of 12 March 2009 amended sets of claims according to the first to fifth auxiliary requests and Mr. Richter's Declaration (E22) dated 5 March 2009.

During the oral proceedings held on 17 September 2010 the Respondent withdrew the previously filed second auxiliary request and submitted amended sets of claims according to the second to sixth auxiliary requests, wherein the fourth to sixth auxiliary requests corresponded with the third to fifth auxiliary requests submitted with letter of 12 March 2009.

V. Claim 1 of the set of 36 claims according to the **first auxiliary request** differs from claim 1 of the granted patent insofar as it requires the presence of at least

one organic hydrotrope wherein said organic hydrotrope is an anionic sulfonate or corresponding disulfonate.

Claim 1 of the set of 9 claims according to the **second auxiliary request** corresponds to a combination of claims 43 and 52 as granted and reads as follows:

"1. A cleaning composition comprising:
a) about 0.5 wt-% to about 10 wt-% of at least one short chain fatty acid; wherein said at least one fatty acid comprises about 0.1 wt-% to about 5 wt-% decanoic acid and about 0.5 wt-% to about 10 wt-% nonanoic acid.
b) 0 wt-% to about 40 wt-% phosphoric acid;
c) about 5 wt-% to about 50 wt-% nitric acid;
d) about 0.5 wt-% to about 50 wt-% of at least one surfactant; and
e) about 5 wt-% to about 50 wt-% of the concentrate of a C_1 to C_4 weak carboxylic acid;
with the proviso that the concentration of nitric acid and phosphoric acid does not exceed about 50 wt-% of the concentrate."

Claim 1 according to the **third auxiliary request** differs from claim 1 according to the second auxiliary request insofar as it requires that the at least one short chain fatty acid comprises about 0.1 wt-% to about 1 wt-% decanoic acid and about 1 wt-% to about 5 wt.-% nonanoic acid".

Claim 1 of the set of 25 claims according to the **fourth auxiliary request** reads as follows:

"1. A sanitizing and/or cleaning composition comprising:
a) 3-12 wt.-% of at least one aliphatic short chain

antimicrobially effective C5 to C14 fatty acid or mixture thereof wherein said aliphatic short chain fatty acid is decanoic, nonanoic or a mixture thereof, and said mixture comprises 0.25 to 1 wt.-% of the composition decanoic acid and 2 to 10 wt.-% of the composition nonanoic acid and
b) 10-40 wt.-% of at least one weak C1 to C4 carboxylic acid; and
c) a strong acid which is nitric acid or a mixture of nitric and phosphoric acids wherein the amount of nitric acid is 15-50 wt.-%, the composition further comprising at least one organic hydrotrope wherein said organic hydrotrope is an anionic sulfonate or corresponding disulfonate."

Claim 1 according to the **fifth auxiliary request** differs from claim 1 according to the fourth auxiliary request insofar as it requires as component d) an effective amount of urea to reduce nitrogen peroxide to nitrogen.

Claim 1 according to the **sixth auxiliary request** reads as follows:

"1. A clean-in-place method of cleaning a beverage or food processing unit including conduits, surfaces and containers, comprising the steps of:

a) providing a sanitizing and/or cleaning composition comprising:

i. 3-12% of at least one aliphatic short chain antimicrobially effective C5 to C14 fatty acid or mixture thereof wherein said aliphatic short chain fatty acid is decanoic,

nonanoic or a mixture thereof, and said mixture comprises 0.25 to 1 wt.-% of the composition decanoic acid and 2 to 10 wt.-% of the composition nonanoic acid and

ii. 10-40 wt.-% of at least one weak C1 to C4 carboxylic acid; and

iii. a strong acid which is nitric acid or a mixture of nitric and phosphoric acids wherein the amount of nitric acid is 15-50 wt.-%, the composition further comprising at least one organic hydrotrope wherein said organic hydrotrope is an anionic sulfonate or corresponding disulfonate.

iv. an effective amount of urea to reduce nitrogen peroxide to nitrogen.composition; and

b) diluting said composition with water at a ration of about 1:100 to about 1:1500 of the composition to water

c) contacting conduits, surfaces and containers in said beverage processing unit

d) removing said composition from said unit for the purpose of reinitiating processing."

VI. The Appellant admitted during oral proceedings that the claimed subject-matter was novel over the cited prior art and submitted *inter alia* that

– the new documents and experimental evidence submitted with the statement of the grounds of appeal had been filed as a reply to the reasons of the decision under appeal and supported the arguments already submitted before the department of first instance; therefore, they were admissible;

– the claimed invention was not sufficiently disclosed;

– the experimental evidence submitted in the annexes 1 to 5 and, in particular, the experiments repeating and modifying examples 80 and 81 of document (E5), which related to compositions very close to the examples of the patent in suit, showed that not the entire range of compositions encompassed by the wording of claim 1 as granted or by that of claim 1 according to any of the first to third auxiliary requests solved the alleged technical problem of the invention, i.e. the provision of a sanitizing and/or cleaning compositions stable in concentrated and diluted form at low temperature and high water hardness; moreover, document (E22) did not contain any evidence to the contrary;

– therefore, starting from the teaching of document (E5), the technical problem underlying the invention could only be seen in the provision of a similar alternative sanitizing and/or cleaning composition;

– since it was common general knowledge in the technical field of document (E5) to use nitric acid as an alternative to phosphoric or sulphuric acids (see documents (E20) and (E21)), it was obvious for the skilled person to try as an alternative a composition as disclosed in document (E5), for example the composition of examples 80 or 81, wherein some or all of the phosphoric and/or sulphuric acids were replaced with nitric

acid; moreover, it was also obvious to modify the amount of decanoic acid used in such examples by following the overall teaching of document (E5);

– therefore, the subject-matter of claim 1 according to the main request and the first to third auxiliary requests lacked an inventive step.

As regards the inventiveness of claim 1 according to the fourth to sixth auxiliary requests no additional arguments were submitted during oral proceedings.

VII. The Respondent submitted *inter alia* that

– documents (E17) to (E21) and annex 5, submitted for the first time in the statement of the grounds of appeal, should not be admitted;

– the invention was sufficiently disclosed;

– the Appellant's experimental evidence submitted as annexes 1 to 5 did not contain any correct reworking of any of the examples of the patent in suit and did not contain any tests on compositions diluted with hard water as in the patent in suit; moreover, the compositions of tables 14 and 15 of annex 5 were not comparable with each other since they did not contain the same amount of water;

– therefore, this experimental evidence was not apt to show that the claimed subject-matter did not solve the technical problem of providing a cleaning and/or sanitizing composition stable in concentrated and diluted form at low temperature

and high water hardness; moreover, this evidence did not show that the use of nitric acid did not provide an improvement of such a stability; to the contrary, the examples contained in the patent in suit showed that the claimed subject-matter brought about such technical advantages;

– therefore, starting from the teaching of document (5), which dealt only with the stability of concentrated cleaning and sanitizing compositions at low temperature, the skilled person would not have tried to replace the phosphoric or sulphuric acid used in these known compositions with nitric acid in order to improve the stability of the diluted compositions at low temperature and high water hardness;

– moreover, as regards the claims according to the second to sixth auxiliary requests, which required the presence of a mixture of decanoic and nonanoic acids, the patent in suit and document (E22) explained the technical advantages obtained by reducing the amount of decanoic acid with respect to nonanoic acid, which advantages had not been recognised in the prior art;

– therefore, the subject-matter of claim 1 according to all requests involved an inventive step.

VIII. As regards the Board's remarks made during oral proceedings that

– component (a) of each claim according to the fourth to sixth auxiliary requests encompassed the

possibility of using decanoic or nonanoic acid alone and not necessarily the mixture of them outlined in these claims and

– therefore embodiments of these claims relating to the use of the water-insoluble decanoic acid alone might not solve the alleged technical problem underlying the invention,

the Respondent submitted that these claims were in its opinion limited to the use of the mixture of decanoic and nonanoic acids specified.

Moreover, as regards the addition of urea as a component of the compositions of claim 1 according to the fifth auxiliary request, the Respondent submitted that urea was added in order to reduce nitrogen peroxide to nitrogen as explained in the patent in suit.

IX. The Appellant requests that the decision under appeal be set aside and that the patent be revoked.

X. The Respondent requests that the appeal be dismissed or, in the alternative, that the patent be maintained on the basis of the first auxiliary request submitted with letter of 12 March 2009 or any of the second to sixth auxiliary requests filed during oral proceedings.

Reasons for the Decision

1. *Admissibility of documents (E17) to (E21) and annex 5*

1.1 Documents (E17) to (E21) as well as the experimental report called annex 5 were submitted by the Appellant for the first time in the statement of the grounds of appeal.

According to Article 12(4) RPBA, the Board shall take into account all facts, evidence and requests submitted by the parties with the statement of the grounds of appeal and the reply to it and has the power to hold inadmissible facts, evidence and requests which could have been presented during the first instance proceedings.

However, since appeal proceedings are for the right of the losing party of providing new valid arguments against the reasoned decision, which arguments may include the filing of additional documents, the Board finds that documents (E17) to (E21), filed in order to improve the arguments already submitted by the Appellant and Opponent before the department of first instance, are to be admitted into the proceedings.

1.2 Furthermore, the Opposition Division found in its decision to reject the opposition that the Opponent had failed to demonstrate with the Annexes 1 to 4 that the claimed compositions were not stable at low temperature and under dilution with water of high hardness (see point III above).

Therefore, the Board finds that annex 5, containing experimental evidence dealing with this deficiency of the Opponent's case identified in the decision under appeal, was submitted with the statement of the grounds of appeal as a response to the decision of the department of first instance to reject the opposition and thus is also to be admitted.

1.3 The Board remarks that no objections were raised by any of the party against the admission into the proceedings of documents (E22), (E23) and (E23a).

The Board has also no objections to their admission for the reasons put forward hereinabove.

2. *Respondent's main request (patent as granted)*

2.1 Inventive step

2.1.1 The present invention relates to acid sanitizing and/or cleaning compositions comprising antimicrobially effective C_5 to C_{14} carboxylic acids (see paragraph 1 of the patent in suit).

As explained in the description of the patent in suit, the invention is directed to both concentrated and water diluted use solutions which can be used by means of automated clean-in-place and sanitize-in-place systems, for example in the food and drink processing industry, for the routine cleaning of residuals from surfaces and for an effective sanitation to reduce microbial population (see page 2, lines 6, 10, 15, 16, 33 and 34).

It was already known that protonated short chain fatty acids offer excellent antimicrobial activity and combine both mineral deposit control and antimicrobial effect into one treatment solution (paragraph 13).

However, one problem associated with the use of such protonated carboxylic acid sanitizers was their poor use dilution phase stability, particularly at lower water temperatures. In particular, the solubility of typically water insoluble fatty monocarboxylic acids having alkyl chains containing 5 or more carbon atoms tends to decrease with decreasing water temperature and increasing ionic concentration, resulting in oiling out or precipitation from solution as a gelatinous flocculant and leading to a film formation on the treated surfaces over time which significantly lowers biocidal efficacy (paragraph 14).

Even though it was known that short chain C_1-C_4 carboxylic or hydroxycarboxylic acids and organic hydrotropes, such as low molecular weight sulphonates, solubilise and thus stabilize longer chain fatty acids in high actives composition concentrates, these classes of compounds are less effective at normal use dilution concentrations or at low temperature (paragraphs 15 and 16).

Therefore, the technical problem underlying the invention is reported in the description of the patent in suit as the provision of an improved sanitizing composition which utilizes a carboxylic fatty acid which has high antimicrobial efficacy, has good phase stability, exhibits low toxicity, and is not

detrimental to the environment (paragraph 17), wherein such a good phase stability is meant in the description as being excellent stability in concentrated and diluted solutions even at low temperature and at increased ionic concentration, i.e. also at high water hardness (see paragraphs 14 and 18).

2.1.2 Both parties agreed during oral proceedings that document (E5) represents the most suitable starting point for the evaluation of inventive step.

In fact, this document deals with the technical problem of providing high antimicrobially active acid sanitizer compositions containing fatty acids and being more stable in concentrated and diluted form even at low temperature (see column 1, lines 12 to 24), i.e. with a technical problem which is similar to that indicated in the description of the patent in suit.

Therefore, the Board takes also document (E5) as starting point for the evaluation of inventive step.

2.1.3 As regards the technical problem underlying the invention, the Respondent submitted that the use of nitric acid, which is undisputedly the only distinctive feature of claim 1 as granted with respect to the disclosure of document (E5), brought about an improvement of the stability (see page 3, line 34 of the patent in suit) and that the claimed compositions gave more stable diluted use solutions at low temperature and high water hardness as shown in the examples of the patent in suit.

Therefore, it must be evaluated if it is credible that the claimed subject-matter relates throughout its whole extent to compositions which are superior to those of document (E5) insofar as they are more stable at low temperature and high water hardness.

2.1.4 The Board has no reason to doubt that the compositions of examples 1, 3 and 5 to 25 of the patent in suit are stable as a concentrate and as diluted compositions at low temperature and high water hardness. However, the Board remarks that the patent in suit does not contain any comparison with compositions differing from those of claim 1 only insofar as they comprise another strong acid instead of nitric acid. Moreover, all the compositions of the above mentioned examples are similar insofar as they contain a mixture of nonanoic and decanoic acids at a ratio of 6:1 or 7:1, acetic acid and sodium 1-octane sulfonate, which is hydrotrope and surfactant at the same time (see page 5, lines 39 to 42, and page 6, lines 39 to 42 of the patent in suit). Therefore, the examples contained in the patent in suit are representative of just a small portion of the whole range of compositions encompassed by the much broader wording of claim 1 and do not render plausible any technical advantage with respect to a prior art differing only in the use of another strong acid instead of nitric acid such as the compositions of document (E5).

Document (E5) teaches that the disclosed compositions are stable at low temperature in concentrated and diluted form (column 1, lines 12 to 24). However, this document does not contain any test relating to diluted compositions; therefore, it does not teach if the

diluted compositions maintains stability at low temperature and high water hardness.

However, the Appellant submitted in annex 5 experimental evidence concerning *inter alia* the compositions of examples 80 and 81 of document (E5), differing from those of claim 1 as granted only insofar as they do not contain nitric acid, and the same compositions modified to comply with the requirements of claim 1 of the patent in suit either by replacing the sulphuric acid used in these examples with nitric acid and maintaining the phosphoric acid or by replacing both the sulphuric and phosphoric acid with nitric acid (see table 14, examples 8A to 8C and table 15, examples 9A to 9C). By considering that the used strong acids contain water as indicated in the right column of each example and that the middle column report only the amounts of each active component without water, the concentrations of all the other components of these compositions and also of the used water are maintained throughout the sequences 8A to 8C and 9A to 9C. Therefore, these tests are a correct comparison of two compositions according to claim 1 as granted (8B and 8C and 9B and 9C, respectively) with a composition according to document (E5) (8A or 9A).

Moreover, the compositions 8A, B and C contain also sodium 1-octane sulfonate, acetic acid and a mixture of nonanoic and decanoic acids like all the examples of the patent in suit mentioned above and the compositions 9A, B and C contain, beside sodium 1-octane sulfonate and a mixture of nonanoic and decanoic acids, propionic acid instead of acetic acid, which propionic acid is

indicated in the patent in suit as an equally suitable alternative of acetic acid (see page 4, lines 52 to 53).

Therefore, there is no doubt that the compositions 8B, 8C, 9B and 9C represent very well the claimed invention and that these sets of comparisons of annex 5 are relevant for establishing the presence of the alleged technical advantages.

From the comparisons of examples 8A, B and C result that all these compositions are stable as a concentrate but are unstable and undergo phase separation by dilution with deionised water and with hard water. A similar result is observed in the series of compositions 9A to 9C. As regards the hard water used in these tests, it is certain in the light of documents (E23) and (E23a) that the dilution with hard water was carried out as described in the patent in suit (paragraphs 65 to 68) and that the difference in the final pH observed cannot detract from the validity of these tests since the claimed subject-matter does not contain any limitation as to the exact type of dilution or to the pH after dilution. Therefore, the tested diluted compositions of annex 5 are undoubtedly diluted compositions in accordance with the invention of the patent in suit.

By considering the experimental evidence of annex 5, it must be concluded that even by replacing the acids used in document (E5) with nitric acid no improvement of the stability at low temperature and high water hardness has been made credible and that compositions according to claim 1 of the patent in suit which contain also all the components used in the examples of the patent in

suit in different concentrations do not bring about the alleged technical advantages invoked by the Respondent.

Finally, even though the inventor of the patent in suit declared in (E22) that the claimed subject-matter has a better stability than the compositions of document (E5), this generic statement of the inventor cannot be considered to be credible in the absence of any supporting evidence. To the contrary, since the experimental evidence of annex 5 shows that there are compositions within the extent of claim 1 and very close to those exemplified in the patent in suit which are no better than the compositions of document (E5) and do not achieve the alleged improved stability, the Board concludes that the claimed subject-matter does not solve the alleged technical problem throughout its whole extent.

Therefore, the technical problem underlying the invention can only be defined as the provision of an alternative sanitizing and/or cleaning acid composition based on carboxylic fatty acids.

The Board has no doubt that this technical problem has been solved by means of the claimed subject-matter.

2.1.5 As already explained above, document (E5) discloses compositions differing from those according to claim 1 as granted only insofar as they do not contain nitric acid (see claim 1 as well as examples 80 and 81 of document (E5)).

However, it was common general knowledge of the skilled person at the priority date of the patent in suit that

the strong mineral inorganic acids commonly used in the technical field of document (E5), i.e. the sanitizing in the food industry (see column 1, lines 29 to 32), were only sulphuric acid, phosphoric acid (i.e. the two acids used in document (E5)) and nitric acid (see document (E20) relating to the common general knowledge in the field of cleaning dairy equipment, cover page iii, right column, lines 1 to 4; page 25, right column, paragraph 3.26, lines 1 to 3 as well as document (E21), extract from an encyclopaedia, page 153, right column, paragraph 2.1, last full paragraph).

Moreover, it is also undisputed that there existed in the prior art sanitizing compositions containing nitric acid or nitric and phosphoric acids as found in the decision under appeal (see point III above).

Therefore, it was obvious for the skilled person, starting from the teaching of document (E5) and faced with the technical problem of providing an alternative cleaning and/or sanitizing acid composition based on the same type of fatty acids, to try as strong inorganic acid component another acid commonly used in the same technical field and considered to be an equally effective alternative in the prior art.

It thus was obvious for the skilled person to try as alternative a composition in which part or all of the phosphoric and sulphuric acids used in examples 80 or 81 of document (E5) have been replaced with nitric acid.

The Board thus concludes that the subject-matter of claim 1 as granted does not involve an inventive step.

2.1.6 Since this request fails on these grounds there is no need to discuss the other independent claims.

3. *Respondent's first auxiliary request*

3.1 Inventive step

3.1.1 Claim 1 according to the **first auxiliary request** differs from claim 1 of the granted patent insofar as it requires the presence of at least one organic hydrotrope wherein said organic hydrotrope is an anionic sulfonate or corresponding disulfonate.

The Board remarks that the compositions 8A to C and 9A to C tested in annex 5 by the Appellant contain sodium 1-octane sulfonate which is such an anionic sulfonate hydrotrope (see point 2.1.4 above). Therefore, for the same reasons put forward with regard to the main request, the alleged technical problem underlying the invention has not been solved throughout the whole extent of claim 1 and the technical problem underlying the invention can only be defined as the provision of an alternative sanitizing and/or cleaning acid composition based on carboxylic fatty acids.

Since anionic sulphonate hydrotropes were already used in examples 80 and 81 of document (E5) and even required by its claim 1, the only difference of the subject-matter of claim 1 according to the first auxiliary request with respect to the disclosure of document (E5) consists in the absence of nitric acid.

Therefore, for the same reasons put forward in point 2.1.5 above, the subject-matter of claim 1 according to the first auxiliary request does not involve an inventive step.

4. *Respondent's second auxiliary request*

4.1 Inventive step

4.1.1 Claim 1 according to the **second auxiliary request** requires that the cleaning composition comprises:

a) about 0.5 wt-% to about 10 wt-% of at least one short chain fatty acid; wherein the at least one fatty acid comprises about 0.1 wt-% to about 5 wt-% decanoic acid and about 0.5 wt-% to about 10 wt-% nonanoic acid.
b) 0 wt-% to about 40 wt-% phosphoric acid;
c) about 5 wt-% to about 50 wt-% nitric acid;
d) about 0.5 wt-% to about 50 wt-% of at least one surfactant; and
e) about 5 wt-% to about 50 wt-% of the concentrate of a C_l to C_4 weak carboxylic acid;
with the proviso that the concentration of nitric acid and phosphoric acid does not exceed about 50 wt-% of the concentrate.

The Board remarks that examples 8A to 8C and 9A to 9C tested in annex 5 by the Appellant and, therefore, also the compositions of examples 80 and 81 of document (E5), contain all the components (a), (d) and (e) listed above in the required concentrations, in particular, 3% by weight of each nonanoic and decanoic acids (component (a)), 12% 1-octane sulfonate (component (d)) and 15% acetic acid or 10% propionic acid (component

(e)). Moreover, they contain 18.30% of strong acids, an amount in accordance with the requirements of claim 1 according to the second auxiliary request, and in particular, 8.5% phosphoric acid and 9.8% sulphuric acid in the compositions 8A and 9A, 8.5% phosphoric acid and 9.8% nitric acid in the compositions 8B and 9B and 18.3% nitric acid in the compositions 8C and 9C.

Therefore, also in this case the only difference of the subject-matter of claim 1 according to the second auxiliary request with respect to the disclosure of document (E5), represented by examples 80 or 81, consists in the absence of nitric acid.

The Board thus finds that the reasons put forward in points 2.1.4, 2.1.5 and 3.1.1 with regard to the main and the first auxiliary requests apply also to claim 1 according to the second auxiliary request.

Consequently, the subject-matter of this claim 1 also does not involve an inventive step.

5. *Respondent's third auxiliary request*

5.1 Inventive step

5.1.1 Claim 1 according to the **third auxiliary request** differs from claim 1 according to the second auxiliary request insofar as it requires that the at least one short chain fatty acid comprises about 0.1 to about 1% by weight of the composition of decanoic acid and about 1 to about 5% by weight of the composition of nonanoic acid.

The subject-matter of this claim thus differs from the compositions of examples 80 and 81 of document (E5) not only insofar as it requires the presence of nitric acid but also because it requires an upper limit for the decanoic acid of about 1% by weight whilst the above examples contain 3% by weight of this acid.

5.1.2 The Board remarks that the examples of the patent in suit in which the stability of the compositions was tested do not contain any composition falling within the extent of this claim since the amount of nonanoic acid used is of 6 or 7% by weight (see point 2.1.4 above). Moreover, the description of the patent in suit teaches that the phase stability of the compositions is improved by using more nonanoic than decanoic acid (see page 4, lines 47 to 49) whilst the wording of claim 1 encompasses compositions having similar amounts of nonanoic and decanoic acid of about 1% by weight. Furthermore, the description indicates for decanoic acid a highly preferred range of 1 to 3% by weight (page 4, lines 47), which is largely outside the range selected in claim 1 according to the third auxiliary request.

As regards the statement contained in document (E22) according to which stability is improved by simply reducing the amount of decanoic acid, this generic statement cannot be taken into account in the absence of any supporting evidence, as already explained above (see point 2.1.4).

Therefore, there is no available evidence that a composition according to claim 1 containing similar amounts of decanoic and nonanoic acid of about 1% by

weight is stable if diluted at low temperature and high water hardness.

To the contrary, since the examples 8A to C and 9A to C of annex 5, relating to the compositions of examples 80 and 81 of document (E5) as such and modified to comply with the patent in suit, containing equal amounts of 3% by weight of nonanoic and decanoic acids are not stable upon dilution with water, the Board finds that it has to be expected that similar compositions containing lower but equal amounts of these two acids, for example 1% by weight of each acid, are also unstable upon dilution.

Therefore, for the same reasons put forward above with regard to the main request (point 2.1.4), the alleged technical problem underlying the invention can only be defined as the provision of an alternative sanitizing and/or cleaning acid composition based on carboxylic fatty acids.

5.1.3 Even though the compositions of examples 80 and 81 of document (E5) contain 3% of decanoic and nonanoic acids, the description of this document teaches that the preferred fatty acids are decanoic and nonanoic acids and mixtures thereof and that they can be present in amounts of 2 to 12% (column 2, lines 16 to 21). This teaching encompasses a 2% by weight mixture of these two acids. Therefore, even if a mixture of 3% by weight each of decanoic and nonanoic acids is preferred according to the teaching of this document (column 2, lines 24 to 26) and is used in examples 80 and 81, a skilled person, looking for an alternative composition, would not have been led away from the examples of

document (E5) from considering the whole teaching of the description. By following this teaching, it would have been obvious for the skilled person to try as alternative smaller similar amounts of these acids, for example, 1% by weight of both acids.

Taking into account the reasons given in points 2.1.5, 3.1.1 and 4.1.1 above, the Board concludes that the subject-matter of claim 1 according to the third auxiliary request does not involve an inventive step.

6. *Respondent's fourth auxiliary request*

6.1 Inventive step

6.1.1 Claim 1 according to the fourth auxiliary request requires the presence of a) 3 to 12% by weight of at least one aliphatic short chain antimicrobially effective C_5 to C_{14} fatty acid or mixture thereof wherein said aliphatic short chain fatty acid is decanoic, nonanoic or a mixture thereof, and said mixture comprises 0.25 to 1% by weight of the composition of decanoic acid and 2 to 10% by weight of the composition of nonanoic acid and
b) 10 to 40% by weight of at least one weak C_1 to C_4 carboxylic acid; c) a strong acid which is nitric acid or a mixture of nitric and phosphoric acids wherein the amount of nitric acid is 15 to 50% by weight and d) at least one organic hydrotrope wherein said organic hydrotrope is an anionic sulfonate or corresponding disulfonate.

As regards component (a) it is clear from the wording of the claim "...of at least one aliphatic short chain

antimicrobially effective C_5 to C_{14} fatty acid **or mixture thereof** wherein said aliphatic short chain fatty acid is decanoic, nonanoic **or a mixture thereof..."** that this component consists of one fatty acid or of a mixture of fatty acids, wherein the fatty acids are selected from decanoic and nonanoic acids, the composition of the mixture of acids being specified. Therefore, the claims indicate explicitly three alternatives for this component: 3 to 12% by weight of decanoic acid; 3 to 12% by weight of nonanoic acid; or 0.25 to 1% by weight of decanoic acid and 2 to 10% by weight of nonanoic acid.

The Board thus cannot agree with the Respondent's submission that this claim would be read by the skilled person as requiring only a mixture of decanoic and nonanoic acid as component (a).

6.1.2 The Board remarks that the examples of the patent in suit relate only to compositions containing a mixture of decanoic and nonanoic acids and do not relate to compositions containing only decanoic acid as fatty acid.
Therefore, there is no evidence available that compositions of claim 1 containing, for example, 12% by weight of decanoic acid are stable upon dilution with water at low temperature and high hardness.

To the contrary, since the Appellant's annex 5 discussed hereinabove shows that compositions containing both decanoic and nonanoic acid at the amount of 3% by weight are not stable upon dilution, it is not credible that a similar composition containing a greater amount of decanoic acid and no nonanoic acid at

all as encompassed by claim 1 could have a better stability.

Therefore, also in this case the technical problem underlying the invention can only be defined as indicated in point 2.1.4 above.

6.1.3 Examples 80 and 81 of document (E5) disclose compositions containing by weight 3% of nonanoic and decanoic acids (component (a) of claim 1), 15% of acetic or 10% of propionic acid (component (b)), 12% of sulphonate hydrotrope (component (d)) and 18.3% of strong inorganic acids (component (c)) (see point 4.1.1 hereinabove). Moreover, document (E5) teaches that the preferred fatty acids are decanoic and nonanoic acids and mixtures thereof and that they can be present in amounts of 2 to 12% (column 2, lines 16 to 21). Therefore, according to the teaching of document (E5) decanoic acid can also be used alone.

The Board concludes that it was obvious for the skilled person to try as alternative a composition as in examples 80 and 81 wherein the mixture of fatty acids was replaced with decanoic acid alone.

Therefore, taking into account the reasons given in points 2.1.5, 3.1.1, 4.1.1 and 5.1.3 with respect to the previous requests, the subject-matter of claim 1 according to the fourth auxiliary request lacks also an inventive step.

7. *Respondent's fifth auxiliary request*

7.1 Inventive step

7.1.1 Claim 1 according to the **fifth auxiliary request** differs from claim 1 according to the fourth auxiliary request insofar as it requires as component d) an effective amount of urea to reduce nitrogen peroxide to nitrogen.

The Respondent submitted during oral proceedings that urea is used in order to prevent degradation due to the presence of products originating from nitric acid such as nitrogen peroxide; a similar teaching is present in the patent in suit (paragraph 41). However, the rest of the patent in suit is silent on any possible technical effect due to the presence of urea.

Moreover, the patent in suit does not contain any experimental evidence that the presence of urea would effectively solve the additional technical problem mentioned above throughout the whole extent of claim 1 or would bring about any advantage with regard to the stability upon dilution.

Therefore, the alleged technical improvement cannot be considered to have been achieved by means of the claimed composition and the technical problem underlying the invention can only be formulated in the same way as for the previous requests (see point 2.1.4 above).

7.1.2 The Board remarks that urea was already known as suitable matrix forming chemical in food additive

sanitizing compositions containing fatty acids, strong mineral acids and short chain carboxylic acids for providing a solid concentrated composition capable of being diluted with water (see document (E6), cited with the grounds of appeal, column 7, line 65 to column 8, line 2; claim 13 and example VII); such matrix forming chemicals are in fact also components possibly present in the solid compositions of the patent in suit (see page 7, lines 18 to 19).

Therefore, it would have been also obvious for the skilled person to add urea to the sanitizing compositions of examples 80 and 81 of document (E5) in order to provide them in a solid form which can be diluted with water.

Therefore, taking into account the reasons given in point 6.1.3 above, the subject-matter of claim 1 according to the fifth auxiliary request lacks also an inventive step.

8. *Respondent's sixth auxiliary request*

8.1 Inventive step

8.1.1 Claim 1 according to this request relates to a clean-in-place method of cleaning a beverage or food processing unit wherein it is used a composition as claimed in the fifth auxiliary request (see point V above).

The Board remarks that it had not been disputed that a clean-in-place method of cleaning a beverage or food processing unit of the type claimed was well known to

the skilled person at the priority date of the patent in suit (see also paragraphs 5 and 59 of the patent in suit); moreover, the claim does not contain any processing technical feature which would not be already known to the skilled person; for example, a ratio of dilution with water between 1:100 and 1:1500 was already disclosed in document (E5) (see column 3, lines 20 to 22).

Therefore, the Board finds that it would have been obvious for the skilled person to use the compositions of document (E5) which are suitable, for example, for sanitizing milk handling equipment (column 1, lines 29 to 35 and 55 to 62), in a known clean-in-place system and to adapt the conditions of this system as desired. Moreover, it would have obvious to modify the compositions of document (E5) for the reasons given with respect to the previous requests.

Therefore the subject-matter of claim 1 according to the sixth auxiliary request lacks an inventive step also.

9. Since all the requests lack an inventive step, there is no need to discuss the other grounds submitted by the Appellant.

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:

G. Rauh P. Ammendola