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# D E C I S I O N
## of 22 January 2004

**Case Number:** T 0977/99 - 3.3.6

**Application Number:** 93402276.5

**Publication Number:** 0589761

**IPC:** C11D 3/22

**Language of the proceedings:** EN

**Title of invention:**
Thickened acid microemulsion composition

**Applicant:**
Colgate-Palmolive Company

**Opponent:**
-

**Headword:**
Xanthan/COLGATE-PALMOLIVE

**Relevant legal provisions:**
EPC Art. 56

**Keyword:**
"Inventive step (yes) - addition of xanthan gum to microemulsion not obvious"

**Decisions cited:**
-

**Catchword:**
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**Case Number:** T 0977/99 - 3.3.6

# D E C I S I O N
## of the Technical Board of Appeal 3.3.6
## of 22 January 2004

**Appellant:** Colgate-Palmolive Company
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**Representative:** Bernasconi, Jean Raymond
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted 12 May 1999 refusing European application No. 93402276.5 pursuant to Article 97(1) EPC.**

**Composition of the Board:**

**Chairman:** P. Krasa
**Members:** G. N. C. Raths
P. Mühlens

## Summary of Facts and Submissions

I. This appeal is from the decision of the Examining Division refusing European patent application No. 93 402 276.5 concerning a thickened acid microemulsion composition.

During the examination procedure, the following documents were cited

(1) EP-A-0 411 708

(3) GB-A-2 069 516

(4) W. H. McNeely and K. S. Kang, "Xanthan and some other biosynthetic gums, Editor: Roy L. Whistler, Academic Press, New York, 1973

(6) Edward Arnold, "What every chemical technologist wants to know about..." Volume III, Plasticizers, Stabilizers and Thickeners; page 350; March 1989.

The Examining Division held the subject-matter of the then pending claims to be novel but not to involve an inventive step, in view of, *inter alia*, documents (1),(3) and (6). In particular, the Examining Division found that it was obvious for a skilled person to use xanthan gum disclosed in document (3) as a thickener in emulsion compositions according to document (1)(reasons, point 2 of the decision).

II. The appellant (applicant) lodged an appeal against this decision and filed comparative data in support of inventive step under cover of the letter dated

21 September 1999. The appellant, in writing and orally, refuted all the arguments raised against lack of patentability; in particular, it would not have been obvious to improve the stability of the microemulsion cleaning compositions by the addition of xanthan gum.

III. During oral proceedings which took place before the Board on 21 January 2004, the appellant filed a set of 9 Claims as its sole request whereof independent Claims 1 and 9 read as follows:

"1. A sprayable shear thinning acidic thickened microemulsion composition for bathtubs and other hard surfaces items, which are acid resistant or of zirconium white enamel, comprising:

(a) 3 to 5 percent of an anionic surfactant;

(b) 2 to 4 percent of a nonionic surfactant;

(c) 0 to 0,7 percent of a preservative;

(d) 0,1 to 0,7 percent of a xanthan gum thickener having a molecular weight of about 1,000,000 to 10,000,000;

(e) 0 to 0,3 percent of an alkali metal hydroxide ;

(f) 0 to 1,0 of phosphoric acid, more preferably 0,05 to 1,0 percent;

(g) 0 to 0,5 percent of amino trismethylene phosphoric acid;

(h) 0 to 0,1 percent of a dye;

(i) 0 to 2,0 percent of a perfume;

(j) 2 to 8 percent of an acid mixture of succinic acid; glutaric acid and adipic acid of 1:1:1; and

(k) balance being water, wherein the composition has a pH of 1 to 4, more preferably 2,7 to 3,3 and a Brookfield viscosity of 200 to 1000 cps at Room Temperature using a #2 spindle and 50 rpms."

"9. A process for removing any or more of lime scale, soap, scum, and greasy soil from bathtubs or other hard surfaced items, which are acid resistant or are of zirconium white enamel, which comprises applying to such a surface a composition in accordance with any of claims 1 to 8 and removing such composition and the lime scale and/or soap scum and/or greasy soil from such surface."

Depending claims 2 to 8 represent preferred embodiments of the sprayable shear thinning acidic thickened microemulsion composition as defined in Claim 1.

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

## Reasons for the Decision

1. *Article 123(2) EPC*

Claim 1 as filed during oral proceedings before the Board differs in essence from Claim 1 as originally filed in that

- the terms "sprayable shear thinning" have been inserted between "A" and "acidic thickened" in the first line;

- the passage starting after "enamel" is new.

These amendments find their support in the application as originally filed (page 2, lines 8 and 9; page 5

line 10 to page 6, line 2). The other amendments are of stylistic and orthographic nature only.

In Claim 2 the term "detergent" has been replaced by "surfactant"; the basis is found in the description as originally filed (page 5, lines 10 and 12, respectively).

Therefore, the Board is satisfied that claims 1 to 9 meet the requirements of Article 123(2) EPC.

2. *Novelty*

2.1 The Board is satisfied that claims 1 to 9 meet the requirements of Article 54(1)(2) EPC. Since novelty was not disputed, no further reasons need to be given.

3. *Inventive step*

3.1 Claim 1 of the application in suit mainly concerns a sprayable shear thinning acidic thickened microemulsion composition, which is acid resistant or of zirconium white enamel, comprising, *inter alia*,
(a) an anionic surfactant
(b) a nonionic surfactant
(d) 0.1 to 0.7% of a xanthan gum thickener having a molecular weight of about 1,000,000 to 10,000,000
(j) an acid mixture of succinic acid, glutaric acid and adipidic acid of about 1:1:1,
(k) balance being water, wherein the composition has a pH of 1 to 4 and a Brookfield viscosity of 200 to 1000 cps (room temperature, #2 spindle, 50 rpms).

3.2 Similar safe acidic hard surface cleaners which do not damage zirconium white enamel, also called European enamel, were known from document (1) (see e.g. Claims 1, 5 and 16) which the Examining Division took as the starting point for evaluating inventive step. The Board can agree with this starting point.

3.3 The problem to be solved according to document (1) was to provide acidic microemulsions that can be sprayed onto a surface (e.g. European enamel surfaces) to be cleaned and wiped off without usual rinsing and still will leave the cleaned surface being bright and shiny (page 2, lines 1 to 5, 41 to 44).

The compositions suggested in document (1) as a solution to this technical problem differ from those of the application in suit in that document (1) discloses emulsions, whereas the application in suit concerns microemulsions. The viscosity of the cleaner emulsions is controllable by adding a thickener such as lower alkyl cellulose or a water soluble resin (page 7, lines 19 to 24), but xanthan gum is not mentioned as a thickener by document (1).

3.4 In the light of document (1) and in view of the experimental results filed by the appellant under cover of the letter dated 21 September 1999, the problem underlying the application in suit was to improve the stability of a cleaning composition in microemulsion form at a higher viscosity while simultaneously providing a thickening effect and a shear thinning effect.

3.5 According to table 1 filed under cover of the above mentioned letter composition A of table 1 which comprises xanthan gum and is an embodiment of Claim 1 of the application in suit, showed a stability over 30 days, a thickening effect and a shear thinning effect. Composition B, representing the state of the art exemplified by document (1), comprising a methyl hydroxy propyl cellulose thickener showed no thickening effect, no shear thinning effect and its stability was inferior to 1 hour.

Therefore, the Board concludes that the subject-matter of Claim 1 solves the existing technical problem.

3.6 The question which remains to be decided is whether the addition of xanthan gum to microemulsion compositions for bathtubs and other hard surface items which are acid resistant or of zirconium white enamel involved an inventive step or not.

3.7 The viscosity of the cleaners in **emulsion** form according to document (1) was controllable by addition of a thickener such as lower alkyl cellulose, e.g. methyl cellulose, hydroxypropyl methyl cellulose...(page 7, lines 19 to 4). However, in document (1) no example was given of an emulsion composition, let alone of a microemulsion composition, comprising a thickener.

The claimed invention concerns, however, the use of xanthan gum as a thickener in a **microemulsion**.

Therefore, the thickener (i.e. xanthan gum) and the medium to which the thickener was added (i.e. the microemulsion) constituted two essential distinguishing features with respect to document (1).

The question is whether there was a hint (a) to replace the thickeners suggested in document (1) by xanthan gum and (b) whether xanthan gum, added to a microemulsion, would improve the stability thereof.

3.8 Xanthan gum is addressed in document (3). Xanthan gum is described as a material having excellent stability in the presence of acids. The relevant passages read as follows: "The stability of xanthan is an important feature which has contributed to its adoption in a wide variety of products and uses..." (page 1, lines 14 to 17) and "While there are some differences depending on the source, the Xanthan gums commercially available at the present time all have essentially the same high thickening power." (page 1, lines 19 to 20).

With respect to viscosity, document (3) reads: "To some extent, the lack of choice of viscosity grades explains why xanthan gum has not been wholly adopted as a suitable alternative to hydroxyethylcellulose and the other water-soluble polymers which are available in different viscosity grades for use as thickening agents." (page 1, lines 29 to 33).

However, in document (3) there was no information on the behaviour of **micro**emulsions when xanthan gum is added.

The Board concludes that the skilled person who was aware of xanthan gum as an alternative to hydroxyethylcellulose and who would have tried this thickener also with **micro**emulsions would in any case have expected only an effect similar to that one obtained with the thickeners suggested in said document (1) but not an improved performance of the respective microemulsions. Such an improved performance of the claimed composition was, however, demonstrated by the appellant (see points 3.4 and 3.5).

3.9 Document (3) mentions in passing the addition of xanthan gum to cleaning compositions (page 2, lines 33 and 34) but does not mention the addition of xanthan gum to **micro**emulsions. Adding xanthan gum to cleanser compositions was also known from document (4) (page 493; "Cleaners and polishes"). However document (4) relates to suspensions. Since document (4) is silent on emulsions, let alone microemulsions, the skilled person would have disregarded document (4).

In absence of any evidence showing that the physical chemistry of surface tension in emulsions is, without any problem, applicable to **micro**emulsions, the achievement of improved stability in microemulsions according to document (1) was not to be expected from the teaching of documents (1),(3) and (4).

In contrast to the compositions of the examples B to K of tables 1 and 2, which all contained usual thickeners, only composition A comprising xanthan gum met three requirements:

(a) stability over a longer time period (in particular more than 30 days);

(b) a thickening effect and

(c) a shear thinning effect

Hence it is xanthan gum which contributes to the improvement of the stability of a sprayable shear thinning acidic microemulsion composition, an effect which the skilled person could not foresee and for which he had no pointer in any of the cited prior art documents.

3.10 Therefore, the subject-matter of Claim 1 involves an inventive step and the requirements of Articles 52(1) and 56 EPC are fulfilled.

Dependent Claims 2 to 9 derive their patentability from Claim 1.

## 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 grant a patent on the basis of claims 1 to 9 filed in the oral proceedings and a description to be adapted.

The Registrar: The Chairman:

G. Rauh P. Krasa