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**D E C I S I O N**  
of 10 October 2002

**Case Number:** T 0445/99 - 3.3.6

**Application Number:** 91300422.2

**Publication Number:** 0438320

**IPC:** C11D 11/00

**Language of the proceedings:** EN

**Title of invention:**

Detergent compositions and process for preparing them

**Applicant:**

UNILEVER PLC, et al

**Opponent:**

-

**Headword:**

High bulk density/UNILEVER

**Relevant legal provisions:**

EPC Art. 54, 56, 84, 123

EPC R. 29(1)

**Keyword:**

"Main and auxiliary requests: inventive step (no) - process suggested in the prior art"

**Decisions cited:**

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**Catchword:**

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Case Number: T 0445/99 - 3.3.6

D E C I S I O N  
of the Technical Board of Appeal 3.3.6  
of 10 October 2002

**Appellants:**

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**Representative:**

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**Decision under appeal:**

Decision of the Examining Division of the  
European Patent Office posted 27 November 1998  
refusing European patent application  
No. 91 300 422.2 pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** P. Krasa  
**Members:** G. N. C. Raths  
C. Rennie-Smith

## Summary of Facts and Submissions

I. This appeal is from the Examining Division which refused European patent application No. 91300422.2 concerning detergent compositions and process for preparing them.

During the examination procedure the following documents were cited inter alia:

- (1) EP-A-0 352 135;
- (2) EP-A-0 340 013;
- (3) GB-A-1 369 269;
- (4) A.S. Davidsohn and B. Milwidsky in Synthetic Detergents, seventh edn., Longman, 1987, pages 200-209;
- (6) A. Davidsohn, Spray drying and dry neutralisation of powdered detergents, Journal of American Oil Chemists' Society, January 1978, vol. 55, pages 134, 138 to 140.

During the appeal procedure, a third party submitted document

- (7) Letter dated 22 December 1998 with an experimental report.

II. The Examining Division held the subject-matter of the then pending claims of the main request not to be novel over document (3) since the reproduction of Examples 1 and 3 yielded a product with a bulk density of above

650 g/l; it held the subject-matter of the auxiliary requests 1 to 3 to be novel over document (2) since the neutralisation of the acid precursor was performed in the high-speed mixer/granular.

Further the Examining Division held the subject-matter of the then pending claims of auxiliary requests 1 to 3 not to involve an inventive step in view of documents (2), (3), (4) and (6).

III. The appellants (applicants) lodged an appeal against this decision. During oral proceedings before the Board, the appellants filed a main request and an auxiliary request, each comprising 15 claims.

Claim 1 of the main request read:

"1. A batch process for the preparation of a granular detergent composition or component having a bulk density of at least 650 g/l, which process includes the step of neutralising a liquid acid precursor of an anionic surfactant with a solid water-soluble alkaline inorganic material, the process being characterised by the steps of:

(I) fluidising a particulate solid water-soluble alkaline inorganic material in an amount in excess of that required for neutralisation, optionally in admixture with one or more other particulate solids, in a high-speed mixer/granulator having both a stirring action and a cutting action;

(ii) adding the acid precursor to the high-speed mixer/granulator at a rate and in a manner such that the acid precursor will be consumed immediately and will not accumulate in the mixer in unreacted form whereby neutralisation of the acid precursor by the water-soluble alkaline inorganic material occurs at a

water-soluble alkaline inorganic material occurs at a temperature above 55°C but not exceeding 75°C while the mixture remains in particulate form this step taking from 0.5 to 12 minutes;

(iii) granulating the mixture while it is still in the high speed mixer/granulator, in the presence of a liquid binder, whereby a granular detergent composition or component having a bulk density of at least 650 g/l is formed;

the high speed mixer/granulator being operated with a stirrer speed of at least 60 rpm and a cutter speed of at least 1000 rpm during the steps (I), (ii) and (iii)."

Claim 1 of the auxiliary request differed from Claim 1 of the main request in that the passage "and 14% or less by weight of particles smaller than 180 µm" was added after "at least 650 g/litre" in the first sentence and in step (iii).

IV. The appellants' arguments submitted in writing and during the oral proceedings, which took place on 10 October 2002, can be summarized as follows:

Document (7) disclosing the reproduction of the examples of document (3) should be disregarded because the reproduction was inaccurate. Therefore the claimed subject-matter was novel.

The combination of documents (2), (4) and (6) could only be made with hindsight; while document (2) was aiming at a detergent composition having a bulk density of at least 650 g/l, the neutralisation step was missing. Although the neutralisation step was known from document (3), no temperature control was disclosed

for said step. The addition of the neutralising agent and the addition of the acid did not take place in two successive steps as required by the invention. Document (3) did not disclose a granulating step. Therefore, a fine detergent powder was obtained whereas according to the present invention a granular detergent composition was obtained. Consequently, the claimed subject-matter was not obvious to a person in the art.

V. Pursuant to Article 115 EPC a third party filed two sets of observations dated 10 December 1999 and 2 August 2002.

VI. The appellants requested that the decision under appeal be set aside and that a patent be granted either on the basis of the main request or the auxiliary request filed during oral proceedings and a description to be adapted thereto.

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

### **Reasons for the Decision**

1. Main request

1.1 Articles 84 and 123(2) EPC; Rule 29(1) EPC

The Board is satisfied that the amended claim 1 finds adequate support in the application as filed, is clear and now also properly supported by the description; moreover it contains the technical features of the invention. Consequently, Claim 1 complies with the requirements of Articles 84 and 123(2) and Rule 29(1) EPC.

The same holds for the dependent claims 2 to 15.

It is not necessary to give further details, since the request fails for other reasons. However the Board deems it appropriate to comment briefly on the feature of Claim 1 directed to "a bulk density of at least 650 g/l", which appears to represent an open ended range.

The Board accepts the appellants' submission at the oral proceedings that in fact there exists an (implicit) upper limit of the maximum obtainable bulk density which limit is dictated by the bulk density of the starting material. Therefore, and considering the circumstances of this case, the Board did not raise an objection in relation to this feature.

#### 1.2 Novelty

The Board accepts in the appellants' favour that the temperature range now mandatory for the process of Claim 1 of the application in suit distinguishes this process from that disclosed in document (3) without giving detailed reasons.

#### 1.3 Inventive step

- 1.3.1 According to the application in suit the technical problem to be solved was to prepare granular detergent compositions having a bulk density of at least 650 g/l (page 2, lines 4 to 5 and 9 to 10, and page 3, line 26). As the solution the claimed dry neutralisation process was suggested. It is carried out without any addition of water at the neutralisation stage, and without control of the temperature throughout the neutralisation stage to  $\leq 55^{\circ}\text{C}$  (page 2, lines 49 to 51 and page 4, lines 48 to 50).

1.3.2 Document (6) relates to the production of powdered detergent by spray-drying and dry neutralisation. In respect of the latter method it discloses that it "aims at a powder with relatively high density but with a structure to make it adhere strongly to the surface of beads coming from a spray tower." (page 140, left-hand column, lines 9 to 12).

A bulk density of 600 to 900 g/l is specified. It is further stated that "The process may be carried out in such a manner that powders, either with a granular or a finer structure, are produced. The process is flexible enough to produce powders in a wide range of particle size." (page 140, left-hand column, lines 1 to 4 and 9 to 11 from the bottom).

The Board takes this document as the starting point for evaluating inventive step. The appellants agreed to this approach.

1.3.3 The application in suit aims at a product having "good flow properties...and little tendency towards caking..." (sentence bridging pages 5 and 6).

It further states that "A very important characteristic of the process of the invention is that the reaction mixture remains throughout in particulate or granular form. Caking, balling and dough formation are avoided..." (page 3, lines 30 and 31). In other words, the product should not be tacky.

The problem underlying the application in suit can therefore be reformulated as the preparation of a detergent composition having a bulk density of at least 650 g/l while avoiding tackiness.



The powders obtained according to Examples 4 to 6 of the application in suit were described as free-flowing and that of Example 8 as having exceptionally good flow properties. Therefore, the Board accepts that the technical problem as defined above was plausibly solved by the claimed process.

The question remains to be decided whether the subject-matter of Claim 1 involves an inventive step or not.

1.3.4 The avoidance of excessive tackiness was addressed by document (3) relating - as did document (6) - to a detergent composition manufactured by dry neutralisation. "Because heated detergent acid and partially neutralized detergent have generally been considered to be tacky products which should be avoided at all costs, during experimental work cooling water was used in the mixer jacket to hold the reaction temperature down. However, it was found that with the present method excessive tackiness does not result...." (document (3), page 5, left hand column, lines 33 to 41). Therefore, the Board concludes that a skilled person confronted with the above defined technical problem and looking to particular process parameters within the broad frame provided by citation (6) would have turned to this document. This was not contested by the appellant.

1.3.5 The process for preparing a detergent composition according to document (3) was as follows:

- (a) Excess neutralising material, e.g. sodium carbonate is maintained as a rapidly moving mass, intimately mixed with air in a light shear mixer displaying both a stirring and a cutting action e.g. a Lödige mixer (page 2, lines 15 and 38 to 41).

(b) Detergent acid is added to the moving fine dispersion of the neutralising powder in air so that there is little opportunity for an excess of acid to be in contact with the (partially neutralised) detergent. During this neutralisation step, which takes preferably from 2 to 10 minutes, the temperature in the mixer will rise from e.g. about room temperature up to a range of 50 to 110°C (page 4, lines 91 to 96 and page 5, lines 32, 34, 63 and 69).

(c) Thereafter mixing is continued for another 30 seconds to 5 minutes yielding a free flowing product with a moisture content of from 0.1 to 3% (page 5, lines 70, 71 and 76 to 78).

1.3.6 The process steps (a), (b) and (c) disclosed by document (3) correspond to the process steps (i), (ii) and (iii) according to Claim 1.

Therefore, a bulk density of at least 650 g/l is also obtained in the process disclosed by document (3).

1.4 Consequently, the subject-matter of Claim 1 does not involve an inventive step and, hence, does not meet the requirements of Article 56 EPC.

Thus the main request is not allowable.

2. *Auxiliary request 1*

2.1 Articles 84 and 123(2) EPC

Claim 1 of the auxiliary request differs from Claim 1 of the main request in that the passage "and 14% or less by weight of particles smaller than 180 µm" was

inserted between "at least 650 g/litre" and "which process" in the first sentence and between "at least 650 g/litre" and "is formed" in step (iii) of Claim 1.

In Example 7 the product obtained was characterized by "Fines content (<180 µm) 14 wt%" (application as originally disclosed, page 31, line 34). According to the description "the level of fines (particles <180 µm) is low" (page 5, line 56).

Example 7 was an invention example; hence the term "low" was exemplified by "14 wt%". In this case, the Board accepts that the expression "14% or less by weight of particles smaller than 180 µm" does not violate Article 123(2) EPC.

The Board is satisfied that Claim 1 meets the requirements of Articles 84 and 123 EPC.

## 2.2 Novelty

Due to the similarity of the process features disclosed by document (3) and the application in suit (see 1.3.5 and 1.3.6), the size distribution of the product obtained by the process according to document (3) cannot deviate substantially from that obtained according to the application in suit. It is however true that the feature "14% or less by weight of particles smaller than 180 µm" was not disclosed verbatim by document (3).

The Board accepts in favour of the appellants that document (3) does not anticipate the claimed process. Since the auxiliary request fails for other reasons, no detailed reasons need to be given.

### 2.3 Inventive step

The reasoning under 1.3.5 and 1.3.6 applies mutatis mutandis to the subject-matter of Claim 1 of the auxiliary request.

The appellants wanted to stress the granular form by indicating the low level of fines (particle size <180 µm). They did not indicate any particular process feature to obtain a detergent composition being characterized especially by said size range. Hence the skilled person is supposed to be able to run the process in such a way that he obtains the detergent composition in the desired form. This assumption is corroborated by document (6): "The process may be carried out in such a manner that powders, either with a granular or a finer structure, are produced. The process is flexible enough to produce powders in a wide range of particle size." (page 140, left-hand column, lines, 1 to 4 and 9 to 11 from the bottom).

Consequently, the subject-matter of Claim 1 does not involve an inventive step. Claim 1 does not meet the requirements of Article 56 EPC.

The auxiliary request is not allowable.

**Order**

**For these reasons it is decided that:**

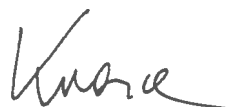
The appeal is dismissed.

The Registrar:

The Chairman:



G. Rauh



P. Krasa