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**D E C I S I O N**  
**of 20 August 2004**

**Case Number:** T 0726/02 - 3.3.6

**Application Number:** 97931059.6

**Publication Number:** 0929654

**IPC:** C11D 11/00

**Language of the proceedings:** EN

**Title of invention:**

Process for making a detergent composition by non-tower process

**Applicant:**

THE PROCTER & GAMBLE COMPANY

**Opponent:**

-

**Headword:**

Fluidized bed/THE PROCTER & GAMBLE COMPANY

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step - yes"

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0726/02 - 3.3.6

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.6  
of 20 August 2004

**Appellant:**

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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 2001  
refusing European application No. 97931059.6  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** G. Dischinger-Höppler  
**Members:** G. N. C. Raths  
G. E. Weiss

## Summary of Facts and Submissions

I. This appeal is from the Examining Division to refuse European patent application No. 97 931 059 concerning a process for making a detergent composition by a non-tower process.

II. The application as filed contained 10 claims, Claim 1 reading as follows:

"1. A non-tower process for preparing a granular detergent composition having a density of at least about 600 g/l, comprising the steps of:

(a) dispersing a surfactant, and coating the surfactant with fine powder having a diameter from 0.1 to 500 microns, in a mixer wherein conditions of the mixer include from (i) from about 2 to about 50 seconds of mean residence time, (ii) from about 4 to about 25 m/s of tip speed, and (iii) from about 0.15 to about 7 kJ/kg of energy condition, wherein first agglomerates are formed;

(b) spraying finely atomized liquid onto the first agglomerates in a mixer wherein conditions of the mixer include (i) from about 0.2 to about 5 seconds of mean residence time, (ii) from about 10 to about 30 m/s of tip speed, and (iii) from about 0.15 to about 5 kJ/kg of energy condition, wherein second agglomerates are formed; and

(c) granulating the second agglomerates in one or more fluidizing apparatus wherein conditions of each of the fluidizing apparatus include (i) from about 1 to about 10 minutes of mean residence time, (ii) from about 100 to about 300 mm of depth of unfluidized bed, (iii) not more than about 50 micron of droplet spray size, (iv)

from about 175 to about 250 mm of spray height, (v) from about 0.2 to about 1.4 m/s of fluidizing velocity and (vi) from about 12 to about 100°C of bed temperature."

Independent Claim 2 differs from Claim 1 in that

- the passage "(b') thoroughly mixing the second agglomerates in a mixer wherein conditions of the mixer include (i) from about 0.5 to about 15 minutes of mean residence time and (ii) from about 0.15 to about 7 kj/kg of energy condition, wherein third agglomerates are formed; and" is inserted between the steps (b) and (c);
- in step (c) the word "second" is replaced by "third".

Dependent claims 3 to 9 are directed to preferred embodiments of Claims 1 or 2. Claim 10 is directed to a granular detergent composition made according to the process of Claims 1 or 2.

III. During the examination procedure, the following documents were cited, *inter alia*:

(2) WO-A-9 609 370 and

(4) GB-A-2 209 172.

In its decision, which was based on an amended set of claims, 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 document (2).

In particular, it was held that the technical problem underlying the application in suit was already solved by the process disclosed in document (2) from which the claimed subject-matter was only distinguished by a second mixer introduced in the spraying step. A person skilled in the art would, however, regard this modification as a normal design procedure.

The Examining Division further remarked that no improvement with regard to the prior art processes was clearly described in the application in suit.

IV. The proprietor (hereinafter appellant) lodged an appeal against this decision. In annex to the statement setting out the grounds of appeal, the appellant submitted a new set of 9 claims and comparative examples to illustrate the efficiency of the claimed process in view of document (2).

V. In several communications the Board raised objections under Article 56 EPC and, referring to the appellant's comparative examples, the question of advantages in terms of economics and efficiency of the claimed process in comparison with a process not comprising the addition of liquid detergent material.

VI. In writing and during the oral proceedings held on 7 July 2003 the appellant argued, *inter alia*, that document (2) did not teach to add liquid detergent material to a fluidizing apparatus and that this addition of liquid detergent material, whilst being counter-intuitive since the fluidiser in document (2) was used for drying, would improve the efficiency of a non-tower process, an effect not hinted at in document (2).

- VII. The proceedings were continued in writing so as to give the appellant an opportunity to deal with issues under Articles 84 and 123 EPC and under Article 56 EPC, the latter in respect of any efficiency and economy of the claimed process in view of document (2).
- VIII. Under cover of the letter dated 7 June 2004 the appellant filed an experimental report comparing the claimed process with a process which in accordance with document (2) does not comprise the addition of aqueous silicate solution in step (c).
- IX. Under cover of the letter dated 20 July 2004 the appellant filed a new set of 9 claims, Claim 1 differing from Claim 1 as originally filed in that the passage "while spraying 2% to 20% liquid detergent material, by weight based on the weight of the second agglomerates," was inserted in step (c) between "fluidizing apparatus," and ", wherein conditions". The same amendment was made to Claim 2. In both claims the term "about" was deleted. Claims 3 to 9 were identical to Claims 3 to 9 as originally filed. Claim 10 as originally filed had been deleted.
- X. The appellant requested that the decision under appeal be set aside and that a patent may be granted on the basis of the claims filed under cover of the letter dated 20 July 2004.

## Reasons for the Decision

### 1. *Article 123(2) EPC*

The amendments made to the claims (see IX above) find their basis in the description as originally filed (page 4, line 21; page 10, lines 3 to 11).

The Board is, therefore, satisfied that the provisions under Article 123(2) EPC are met.

### 2. *Novelty*

The Board is satisfied that the claimed subject-matter is not anticipated by any of the cited prior art documents and complies with the requirements of Articles 54(1) and (2) EPC.

### 3. *Inventive step*

- 3.1 According to the state of the art as discussed in the application in suit (page 2, line 7 to page 3, line 6), processes were known which were limited in their ability to go higher in surfactant active level without any subsequent coating step. Treating or densifying by "post tower" was not favourable in terms of economics (high capital cost) and complexity of operation. All these processes involved primarily spray dried granules. The relative amounts and types of materials subjected to spray drying processes were limited. It was difficult to attain high levels of surfactant in the resulting detergent composition (page 2, lines 20 to 31). Such processes are also mentioned in the state of

the art of document (2) (see page 1, line 35 to page 2, line 17).

Further, it is stated in the application in suit that it was hitherto impossible to agglomerate detergents in pasty, liquid and dry form into crisp and free flowing detergent agglomerates (page 2, line 34 to page 3, line 6).

3.2 The objective stated in the patent application is to provide an agglomeration non-tower process for continuously producing a detergent composition having high density. The process should be efficient, flexible and economical to facilitate large-scale production of detergents (1) for flexibility in the ultimate density of the final composition, and (2) for flexibility in terms of incorporating several kinds of detergent ingredients, especially detergent ingredients in the form of liquid, into the process (page 3, lines 7 to 15).

3.3 The same problem as stated in the application in suit is mentioned in document (2) (page 2, line 35 to page 3, line 2 and page 5, lines 22 to 25) which qualifies, therefore, as the starting point for evaluating inventive step.

Document (2) also states that the known agglomeration processes did not provide crisp and free flowing detergent agglomerates and produced a wide range of particle sizes, for example "overs" and "fines" (page 2, lines 24 to 26). Whereas the "overs" reduce the solubility of the detergent composition, the "fines"



have a tendency to gel in the washing solution (page 2, lines 18 to 30).

Thus, it was also an aim of document (2) to avoid "overs" and "fines" and to improve flow and particle size properties (page 2, lines 35 and 36).

3.4 These problems are solved in document (2) by a process (page 6, line 6 to page 7, line 32) which - as agreed by the appellant - differs from that of Claim 1 only in that no liquid detergent material is sprayed to the fluidising apparatus.

3.5 The appellant had argued that the claimed process implied improved flexibility by offering the advantage to control and monitor the particle size distribution not only via two mixers as in document (2) but also via the fluidised bed as a third independent agglomeration. Moreover, it had been shown by way of comparison that the addition of a liquid detergent material to the fluidised bed made the process more efficient.

3.6 The Board accepts these arguments as convincing for the following reasons:

The experimental report filed under cover of the letter dated 7 June 2004 described two processes conducted under identical conditions except that one process included spraying aqueous silicate solutions in step (c) and the other did not. The energy and plant costs were identical in both processes. The addition of a liquid detergent material narrowed the breadth of the particle size distribution of the resultant granular detergent composition by 27,4%.

As to the efficiency increase, the report pointed to the extrapolation on a large scale production process. A narrowing of the distribution breath of the particle size distribution of 27,4% results in a plant production increase of 29% and a reduction in oversized/undersized recycle of 30%. The reduction in recycling implies an economical advantage.

3.7 Therefore, the technical problem credibly solved by the claimed process over that of document (2) can be considered to consist in the improvement of both, flexibility and efficiency.

3.8 The question remains to be decided whether or not the claimed solution to the above technical problem involved an inventive step, or in other words, whether or not it was obvious for someone skilled in the art to spray liquid detergent material in an amount of 2 to 20% by weight based on the weight of the second agglomerates into the fluidiser in order to improve the flexibility and the efficiency of the process.

3.8.1 Document (2) does not suggest spraying liquid detergent material into the fluidizing apparatus.

It is true that the production process according to document (4) involves spraying a detergent active compound onto a particulate builder material in a fluidised bed. However, said process is a single stage process and not a continuous one as in the case of the claimed subject-matter. Further, said document is silent on any effect caused by such spraying of liquid material, let alone an effect concerning the particle

size distribution. It does not, therefore, give any hint that the efficiency of the agglomeration process could be improved.

The other prior art cited in the examining proceedings is less relevant than document (4) since it does not disclose any addition of liquid into the fluidiser.

3.8.2 The Board, therefore, concludes that it was not obvious from the prior art documents to spray a liquid detergent into the fluidising apparatus used in the process of document (2) in the expectation to make the process not only more flexible but also more efficient.

3.8.3 Therefore, the Board is satisfied that the subject-matter of Claim 1 involves an inventive step.

4. Consequently, the subject-matter of Claim 1 meets the requirements of Articles 52(1) and 56 EPC.

The reasoning under points 3.1 to 3.8.2 applies, *mutatis mutandis*, to independent Claim 2 since it comprises the same feature as Claim 1, i.e. spraying 2 to 20% liquid detergent material, by weight based on the weight of the second agglomerates in a fluidizing apparatus. Dependent Claims 3 to 9 derive their patentability from Claim 1 or 2.

**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 under cover of the letter dated 20 July 2004 and a description to be adapted thereto.

The Registrar:

The Chairwoman:

A. Wallrodt

G. Dischinger-Höppler