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**D E C I S I O N**  
**of 22 December 2005**

**Case Number:** T 0805/04 - 3.3.06

**Application Number:** 97934909.9

**Publication Number:** 0915959

**IPC:** C11D 11/00

**Language of the proceedings:** EN

**Title of invention:**

Preparation of low density detergent agglomerates containing silica

**Patentee:**

THE PROCTER & GAMBLE COMPANY

**Opponent:**

HENKEL KGaA

**Headword:**

Low density agglomerate/PROCTER & GAMBLE

**Relevant legal provisions:**

EPC Art. 83, 54, 56

**Keyword:**

"Sufficiency of disclosure (yes) "  
"Novelty (yes): use of a mixer not implicitly disclosed"  
"Inventive step (yes) "

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0805/04 - 3.3.06

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.06  
of 22 December 2005

**Appellant:**  
(Opponent)

HENKEL KGaA  
VTP (Patente)  
D-40191 Düsseldorf (DE)

**Representative:**

-

**Respondent:**  
(Proprietor of the patent)

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**Representative:**

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**Decision under appeal:**

Decision of the Opposition Division of the  
European Patent Office posted 27 April 2004  
rejecting the opposition filed against European  
patent No. 0915959 pursuant to Article 102(2)  
EPC.

**Composition of the Board:**

**Chairman:** P. Krasa  
**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. 0 915 959, concerning the preparation of low density detergent agglomerates containing silica.

This European Patent was granted with a set of 10 claims, claim 1 of which reading as follows:

"1. A process for preparing a low density detergent composition characterized by the steps of:

(a) agglomerating a liquid acid precursor of a detergent surfactant and dry starting detergent material in a high speed mixer to obtain detergent agglomerates, wherein said dry starting detergent material includes a silica material and an alkaline inorganic material; and

(b) drying said detergent agglomerates so as to form said detergent composition having a density of less than 500 g/l."

The dependent claims 2 to 10 relate to particular embodiments of the claimed process.

II. In its notice of opposition the Opponent sought revocation of the patent on the grounds of Articles 100(a) and (b) EPC and referred *inter alia* to the following documents:

(1): WO-A-96/04359; and

(2): CAV 1976, November, pages 119 to 123: "Mechanisch erzeugte Wirbelschicht" by Dr.-Ing. R. Lücke.

III. In its decision, the Opposition Division found that

- the patent in suit disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art;
- the claimed subject-matter was novel over the teaching of document (1) as the process described in that document *inter alia* did not involve the use of a high speed mixer;
- document (2) taught that a process involving a chemical reaction had to be carried out preferably in a fluidised zone obtained by mechanical means rather than in one obtained by pneumatic means; therefore, the skilled person could have envisaged to obtain a fluidised zone as required in document (1) by using mechanical means;
- however, the prior art did not suggest that it would have been possible to obtain a detergent agglomerate containing a silica material and having a low density of less than 500 g/l by using a high speed mixer in a process as described in document (1);
- the claimed subject-matter thus involved an inventive step.

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

During the written proceedings the Appellant referred additionally to

document (3): EP-A-367339.

The Respondent (Patent Proprietor) filed three amended sets of claims to be considered as first, second and third auxiliary request, respectively, under cover of the letter of 15 December 2004.

Oral proceedings were held before the Board on 22 December 2005.

V. The Appellant submitted in writing and orally essentially that

- the process claimed in the patent in suit required the step of drying the obtained agglomerate up to a degree sufficient for achieving the desired low density;
- since the patent in suit did not explain how this drying step had to be carried out in order to arrive at the desired density, the claimed process was not sufficiently disclosed;
- document (1) described a process containing all the features of claim 1 with the exception that it did not mention explicitly the use of a high speed mixer;
- however, document (1) taught to carry out the agglomeration step in a fluidisation zone;

moreover, it was common general knowledge that a fluidisation zone could be formed pneumatically, e.g. in a fluid bed as explicitly described in document (1), or by mechanical means as explained, e.g., in document (2);

- document (2) taught, in particular, that a fluidisation zone could be produced by means of a high speed mixer; this feature was thus comprised implicitly in the teaching of document (1);
- therefore, document (1) disclosed all the features of the process of claim 1 of the patent in suit; the claimed subject-matter thus lacked novelty.

As regards inventive step the Appellant submitted that

- document (2) already suggested that it was preferable to produce a fluidisation zone by mechanical means, for example, by means of a high speed mixer, in a case wherein the agglomeration involved a chemical reaction;
- since the agglomeration disclosed in document (1) involved a neutralisation reaction, it was thus obvious for the skilled person to try a high speed mixer alternatively to the fluid bed explicitly described in document (1) in order to carry out this agglomeration;
- it was moreover known from document (3) that the operative conditions of a high speed mixer could be adjusted in dependence of the density to be achieved;

- it was further known from document (1) that it was possible to obtain a product having a low density by mixing and that a flow aid like silica could be used for reducing the density of the final product;
- it was thus an obvious step for the skilled person to adjust the process conditions and the quantity of the flow aid used in order to obtain a product having a density below 500 g/l;
- the claimed subject-matter thus lacked an inventive step.

VI. The Respondent submitted that

- the achievement of the density required by claim 1 of the patent in suit was not due to a specific drying step but depended on the combination of all process steps and, in particular, on the presence of silica during these steps;
- therefore, the claimed process was sufficiently disclosed;
- the apparatus described in document (2) and used for producing a fluidisation zone by mechanical means could not be considered to be a high speed mixer since a mixer, and in particular a high speed mixer, produced huge impact forces and could not lead to the formation of a fluidising zone as explained, for example, in documents (3) and (1);

- document (1) thus did not disclose explicitly or implicitly the use of a high speed mixer; the subject-matter of claim 1 was thus novel;
  
- since the process disclosed in document (1) required the formation of a fluidisation zone and document (2) did not disclose the possibility of forming a fluidisation zone by means of a high speed mixer, the prior art did not suggest the use of a high speed mixer in a process as described in document (1) for arriving at a product having a low density;
  
- therefore the skilled person, starting from the teaching of document (1), would have had to abandon its teaching in order to select a high speed mixer for carrying out the agglomeration described therein;
  
- the claimed subject-matter thus involved an inventive step.

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

The Respondent requests that the appeal be dismissed or auxiliarily that the patent be maintained on the basis of the claims according to any of the first to third auxiliary requests filed with letter of 15 December 2004.



## Reasons for the Decision

### 1. *Respondent's main request (claims as granted)*

#### 1.1 Sufficiency of disclosure

- 1.1.1 The claimed process requires a step of agglomerating a liquid acid precursor of a detergent surfactant and dry starting detergent material in a high speed mixer to obtain detergent agglomerates and a step of drying said detergent agglomerates so as to form a detergent composition having a density of less than 500 g/l.

Both parties agreed that the agglomeration step and the drying step were carried out by conventional means and that the skilled person knew how to carry out such steps.

The Appellant, however, objected that the wording of claim 1 of the patent in suit and the description (page 3, lines 37 to 38) required the step of drying the obtained agglomerate up to a degree sufficient for achieving the desired low density of 500 g/l and that the patent in suit did not explain how this drying step had to be carried out in order to arrive at the desired density or how the skilled person would have to modify the chosen drying conditions if a product having a higher bulk density was obtained (see point V above).

- 1.1.2 The description of the patent in suit explains that the claimed process produces a free-flowing, low density detergent agglomerate having a density below 500 g/l (page 3, lines 49 to 50) and that the presence of silica in the agglomerate rather than as a coating is

responsible for forming a low density agglomerate having a hollow structure (page 4, lines 12 to 19); the final drying step enhances the free flowability of the obtained agglomerate and facilitates its puffy characteristics; therefore, sufficient drying by any suitable apparatus must occur in order to produce the desired low density agglomerate (page 4, lines 21 to 24).

The description of the patent in suit teaches therefore, in the Board's judgement, that the desired low density does not depend on a specific drying step but on the combination of all process steps and, in particular, on the presence of silica during these steps; it is in fact this presence during agglomeration and in the following drying step which is considered responsible for the formation of a product having a hollow structure and thus a low density.

Since the agglomeration step and the drying step of the claimed process can be carried out by conventional means, the Board finds that the description of the patent in suit contains all the essential information to enable the skilled person to carry out the claimed invention.

1.1.3 The Board finds therefore that the claimed invention is sufficiently disclosed.

1.2 Novelty

1.2.1 Both parties agreed that document (1) discloses a process for preparing a low density detergent composition characterized by the steps of agglomerating

a liquid acid precursor of a detergent surfactant and dry starting detergent material in a fluidisation zone to obtain detergent agglomerates, wherein said dry starting detergent material may include a flow aid such as a silica material and includes an alkaline inorganic material; and drying said detergent agglomerates so as to form a detergent composition having a bulk density of 350 to 650 g/l (see claims 2 in combination with claims 4, 5, 7 and 8; page 5, lines 25 to 29; page 6, lines 8 to 14).

The Appellant submitted that a fluidisation zone could be produced only by two ways, i.e. pneumatically as explicitly disclosed in document (1) or by mechanical means as explained in document (2). Since the mechanical means implied the use of a high speed mixer, document (1) thus disclosed implicitly also an agglomeration by means of a high speed mixer.

- 1.2.2 High speed mixers for use in the detergent field were known in the prior art. The patent in suit identifies, for example, a Lödige CB 30 Recycler or other similar equipment as a high speed mixer (page 4, lines 26 to 27). Both parties referred also to document (3) for a description of the constructional features of a high speed mixer such as a Lödige CB30 Recycler.

This document teaches that such a high speed mixer consists of a large static hollow cylinder having a rotating shaft in the middle and can rotate at speeds between 100 and 2500 rpm. The shaft has several different types of blades mounted thereon and the blades on the shaft provide a thorough mixing action of the solids and the liquids (page 4, lines 47 to 52).

Document (3) identifies also a moderate speed mixer as being a mixer distinguishable from a high speed mixer. Such a mixer consists also of a horizontal, hollow static cylinder having a rotating shaft in the middle. However, it can rotate at speeds between 40 and 160 rpm and the shaft has various plough-shaped blades mounted thereon (see page 5, lines 15 to 24).

The apparatus described in document (2) and used for producing a fluidisation zone, though having mixing means, is nowhere indicated in that document as being a mixer or, in particular, a high speed mixer and is instead identified as being a fluid bed reactor (see page 119, right column, second and third line below figure 2; figure 9). This reactor consists of a large static hollow cylinder and has a rotating shaft in the middle as the mixers described in document (3) (see figure 2 of document (2)). However, the rotating shaft supports only one kind of blade and, precisely, one plow-shaped blade which is so built that it scraps away particles near the wall of the reactor and throws them into the middle of the reactor wherein the fluidisation zone has to be formed and they are not subjected to any mixing action by means of the blade (see page 120, figure 3 and passage bridging middle and right column).

Moreover, the mixing means of this reactor should not be operated at a too high speed since a fluidisation zone can only be formed at an  $Fr$  (Froude number) between 1 and 3. The absolute rotational speeds of the mixing means contained in the fluid bed reactor of document (2) are not specified in this document.

The constructional features of this reactor are thus different from those of the mixers described in document (3) wherein **various** blades are mounted on the shaft in order to assure a thorough mixing of liquids and solids and, in particular, from that of a high speed mixer which has **different types** of blades mounted on the shaft.

Furthermore, as explained in document (1), a mixing apparatus subjects the particles to compressive forces (page 2, lines 15 to 18 and page 7, lines 26 to 30) which would not allow, in the Board's judgement, the formation of a fluidization zone. The fluidizing means to be used in the process described in document (1) cannot thus be assumed to be mixers (see page 7, lines 24 to 30).

1.2.3 The Board concludes therefore that the apparatus described in document (2) cannot be either considered to be a high speed mixer and thus that document (1) does not describe implicitly or explicitly the use of a high speed mixer.

1.2.4 The claimed subject-matter is thus novel over the cited prior art.

1.3 Inventive step

1.3.1 The patent in suit and, in particular, the subject-matter of claim 1, relates to the preparation of detergent particles having low density by agglomeration and without using a spray-drying technique (page 2, lines 46 to 53).

As explained in the patent in suit the alternative processes of the prior art for preparing detergent particles by agglomeration and without using a spray-drying technique led to products of rather higher density. It was thus the goal of the patent in suit to provide an alternative agglomeration process able to provide directly from starting detergent ingredients a product having low density and in particular a density below 500 g/l (page 2, lines 48 to 57 and page 3, lines 14 to 16).

- 1.3.2 Since document (1) relates to a similar technical problem (page 1, lines 3 to 15 and page 2, lines 20 to 23), the Board, in agreement with both parties, takes this document as the most suitable starting point for evaluating inventive step.
- 1.3.3 Since the process of document (1) could already provide by agglomeration products having a density below 500 g/l directly from starting detergent ingredients (see claim 2 in combination with claims 4, 5, 7 and 8; page 5, lines 25 to 29; page 6, lines 8 to 14), the technical problem underlying the claimed invention can only be defined as the provision of an alternative process which would also lead to detergent agglomerates having a density below 500 g/l.

The examples of the patent in suit show that this technical problem has been convincingly solved by means of the claimed process.

- 1.3.4 As already explained in points 1.2.1 to 1.2.3 above, the process disclosed in document (1) required the formation of a fluidisation zone and thus did not suggest the use of a high speed mixer.

On the contrary, this document contained a warning against the use of any mixer since this could lead to an increase of the bulk density because of the compressive forces to which the particles are then subjected (see page 2, lines 15 to 18 and page 7, lines 24 to 30).

Moreover, even though document (1) suggests that low density particles had been obtained by using a mixer in a process of the prior art (page 2, lines 8 to 15), there is no teaching in this document that a product having a low density below 500 g/l could have been obtained by using a high speed mixer when silica is incorporated into the agglomerating material.

Even the teaching of document (1) that the addition of a flow aid helps in reducing the bulk density of the final product (page 5, line 31 to page 6, line 2) cannot be considered to suggest the use of such a flow aid in a mixing step since the process of document (1) requires the formation of a fluidisation zone and warns against the use of a mixing apparatus.

- 1.3.5 The Board finds therefore that the skilled person, starting from the teaching of document (1), would have had to abandon its teaching in order to select a high speed mixer for carrying out the agglomeration described therein.

Since the teaching of document (1) leads away from the claimed subject-matter, the Board concludes that the subject-matter of claim 1 involves an inventive step.

1.3.6 The dependent claims 2 to 10 involve an inventive step for the same reasons.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

P. Cremona

P. Krasa