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D E C I S I O N
of 30 April 2002

Case Number: T 0436/97 - 3.3.6
Application Number: 90202429.8
Publication Number: 0420317
IPC: C11D 17/06

Language of the proceedings: EN

Title of invention:

Process for preparing high bulk density detergent compositions

Patentees:

UNILEVER N.V., et al

Opponents:

Henkel Kommanditgesellschaft auf Aktien
PROCTER & GAMBLE E.T.C.

Headword:

High bulk density/UNILEVER

Relevant legal provisions:

EPC Art. 56, 84, 114(2)

Keyword:

"Admissibility of further requests after oral proceedings (no)
- framework for further submissions set by the Board during
oral proceedings"

"Inventive step - main, first and second auxiliary requests
(no) - process derivable from prior art documents"

Decisions cited:

T 0201/83

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 0436/97 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 30 April 2002

Appellant 01: Henkel
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 20 March 1997
rejecting the opposition filed against European
patent No. 0 420 317 pursuant to Article 102(2)
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 Opposition Division's decision rejecting the Appellants' opposition against European patent No. 420 317 relating to a process for preparing high bulk density detergent compositions.

Claim 1 of the patent as granted read:

"Process for the continuous preparation of a granular detergent composition or component having a bulk density of at least 550 g/l, which comprises
(i) feeding a liquid acid precursor of an anionic surfactant, a solid water-soluble alkaline inorganic material and optionally other materials into a high-speed mixer/densifier, the mean residence time being from about 5 to 30 seconds;
(ii) subsequently treating the granular detergent material in a moderate-speed granulator/densifier, whereby it is brought into or maintained in a deformable state, the mean residence time being from about 1 - 10, preferably 2 - 5 minutes; and finally
(iii) drying and/or cooling the product."

- II. Three oppositions were filed on the grounds of Article 100(a) EPC, in particular for lack of novelty and inventive step, and based on the following documents:

- (1) GB-A-1 404 317
- (2) EP-A-0 264 049 = US-A 4 846 409
- (3) Naviglio and Moriconi, "Detergents manufacture", Soap/Cosmetics/Chemical Specialities, September 1987, 34-7, 54

(6) DE-C-29 18 820

(7) GB-A-1 369 269

In the course of the opposition proceedings, the appellants (opponents) further relied on

(17) Photograph of the apparatus described in Bayer EP-264 049 and used by the Opponent and part of the Loedige exhibit at June 1988 Achema Exhibition (doc. without date)

(40) Statement by Jean Wevers

(47) Copy of the opposition against European patent EP-A-0 367 339

(48) English translation by Procter & Gamble of the Opposition Notice by Lödige

The Opposition Division was of the opinion that the subject-matter of Claim 1 was novel and inventive, since the skilled person would not have relied on documents (1), (3) or (7) in combination with documents (2) or (6). In particular the feature of bringing the detergent material into or maintaining it in a deformable state was said not to be suggested in any of the cited documents. The Opposition Division rejected the oppositions.

III. Two opponents filed an appeal. In its grounds of appeal appellant I (opponent 01) submitted that the subject-matter of Claim 1 did not involve an inventive step in view of documents (1), (2), (3) and (7) because:

- document (2) should be considered as a starting point for evaluating inventive step because at the date of that document there existed no comprehensive literature on detergent granulation;
- the respondents (patent proprietors) copied the equipment disclosed in document (2) with the result that the materials passed through a deformable state and that water, or water together with a surfactant, could be added as a granulating liquid;
- in view of documents (1), (3) and (7) it would have been obvious to perform a dry neutralisation in the equipment of document (2);

Appellant II (opponent 02) submitted

- that the subject-matter of Claim 1 was not only anticipated by document (3) which disclosed a turbo reactor which was a high speed mixer/densifier but also lacked an inventive step in view of documents (2), (6), (17), (47) and (48);
- that, inter alia, a photograph at the Achema exhibition proved that the sequential use of relevant mixers was part of common general knowledge;
- that the heat of reaction and the carbon dioxide evolution according to the process of document (3) did not result in high density granules, but in low density granules;
- that document (3) suggested that dry neutralisation led to the required bulk density;

- that the person skilled in the art would have combined the mixers in the manner as claimed since such a combination was common general knowledge (see documents (2), (6), (17) and (18);
- that the expressions "high-speed mixer/densifier", "moderate-speed granulator/densifier", "component", "deformable state" and "mean residence time" were not clear;
- that the term "mixer/densifier" did not imply the presence of blades;

IV. The respondents refuted the arguments of both appellants.

They argued in essence

- that all the terms used in Claim 1 would be understood by a skilled person and were clear in the light of the description;
- that the photograph taken at the Achema exhibition did not prove prior public disclosure;
- that document (3) did not disclose or suggest a high-speed mixer/densifier;
- that the process according to document (3) resulted in a reduced bulk density (0.35-0.45 kg/l), since heat and carbon dioxide caused the granules to swell and thus become lighter, whereas according to Claim 1 of the patent in suit the bulk density was at least 550 g/l;

- that the process of the patent in suit allowed for using acid precursors of alkyl sulphates, which are chemically unstable, immediately after their production; no pre-conversion to another form was necessary;
- that document (2) was not the most relevant prior art since anionic and cationic dyestuffs disclosed by document (2) were not comparable to surfactants for detergents;
- that the acid precursor used according to the patent in suit differed from the non-reactive granulating liquid according to document (2), because the acid precursor was highly acid, highly reactive with the solid components, and substantially non-aqueous;
- that the combination of mixers selected by the Proprietor was not rendered obvious by the citations but was the result of a trial and error process.

V. In its letter dated 12 April 2001 appellant II submitted further comments and drew attention to case T 201/99, concerning the patent EP-B-0 367 339, in which the expressions "deformable state" and "deformability" were an issue.

The respondents by letter of 27 April 2001 requested remittal of the case to the first instance if documents relating to case T 201/99 should be admitted into the proceedings.

In a letter of 1 May 2001 appellant II requested that the date for oral proceedings be changed in order to deal with case T 201/99 first and with the present case the following day.

VI. During oral proceedings, which took place before the Board on 30 May 2001, the respondents filed a main request and two auxiliary requests. The main request consisted of Claims 1 to 9, but not claim 10, as granted; the first auxiliary request and the second auxiliary request also both comprised 9 claims.

Claim 1 of the first auxiliary request differed from Claim 1 as granted in that the passage "; and wherein the detergent composition in the second step has a compression modulus of less than 30, preferably, less than 20 MPa" was added at the end of the claim after the word "product".

Claim 1 of the second auxiliary request differed from the first auxiliary request in that the words "or component" in the first line were replaced by the passage "comprising 5 to 60 wt.% of a builder, 5 to 25 wt.% carbonate, 5 to 40 wt.% anionic surfactant, 0 to 20 wt.% nonionic surfactant and 0 wt.% soap, and".

VII. The appellants requested that the decision under appeal be set aside and the patent be revoked. Appellant II also requested that the respondents' second auxiliary request, unless refused by the Board, be the subject of continued proceedings in writing or alternatively remittal of the case to the first instance.

The respondents requested, as main request, that the appeal be dismissed and that the patent be maintained as granted (*claim 10 as granted being deleted*); or that the decision under appeal be set aside and that the patent be maintained as amended in accordance with the first or second auxiliary requests.

VIII. At the end of the oral proceedings the Chairman announced the following:

1. The proceedings are to be continued in writing for the purpose only of further submissions relating to the respondents' second auxiliary request.
2. The appellants are directed to file such submissions in writing within two months of the date of these oral proceedings.

IX. Appellants I and II filed their submissions with the letters of 18 June 2001 and 4 July 2001, respectively.

Appellant I filed the document

(46) W.Pietsch, "Size Enlargement by Agglomeration",
John Wiley & Sons, Salle + Sauerländer, 1990;

X. The respondents' reply of 24 July 2001 to these submissions comprised a further set of three requests, labelled main request bis, first auxiliary request bis, second auxiliary request bis. The main request bis and the first auxiliary request bis differed from the main request and the first auxiliary request in that in Claim 1 the bulk density value "550 g/l" was replaced by "805 g/l". Auxiliary request 2 bis differed from auxiliary request 2 in that in Claim 1 the bulk density value "550 g/l" was replaced by "811 g/l". The respondents stated that the three requests labelled "main, first auxiliary and second auxiliary requests" were not withdrawn and justified their new submissions by arguing that appellant I had submitted a new document with the letter of 18 June 2001. In its letter dated 7 August 2001 appellant II raised an objection with respect to the admissibility of the requests bearing the addendum "bis".

Reasons for the Decision

1. Procedural issues

1.1 Documents of case T 201/99

Appellant II sought to introduce in the present proceedings all the documents relating to case T 201/99 because in that case the word "deformable state" of Claim 1 of the main, first auxiliary and second auxiliary requests were at issue, and to reschedule the oral proceedings so that case T 201/99 would be decided first and the present case subsequently.

The Board, exercising its power of discretion under Article 114(2) EPC, did not admit these late filed documents into the proceedings because they did not appear to be more relevant than the documents on file which were thus sufficient for deciding the issue at stake. Further, the Board did not see any procedural necessity to give priority to case T 201/99.

1.2 Main request bis, First auxiliary request bis, Second auxiliary request bis

The respondents had filed these three requests while replying to the appellants' I and II comments on the respondents' second auxiliary request submitted during oral proceedings which took place on 30 May 2001.

The proceedings had been continued in writing for the purpose only of further submissions relating to the respondents' second auxiliary request.

With its letter of 18 June 2001 appellant I (opponent 01) filed such submissions and document (46). In their reply the respondents mentioned this document, but the amendments made to their main, first auxiliary and second auxiliary requests were not justified by that document.

In Claim 1 of the respective amended requests, the values of "550 g/l" of the bulk density were replaced by "805 g/l" and "811 g/l"; these are concrete bulk density values resulting from a specific combination of ingredients at specific concentrations in Examples 1 and 4 of the patent in suit, respectively.

The respondents did not rely on the passage(s) of the citation (46) as a basis for the amendments which cannot therefore be accepted as a reaction to the citation of document (46).

The respondents referred to T 201/83 in order to show that these amendments should be admissible.

However T 201/83 dealt not with the admissibility of late filed requests but with the compliance of amendments with the requirements of Article 123(2) EPC. It therefore has no bearing on the present case,

The respondents' reply of 24 July 2001 to the appellants' submissions of 18 June 2001 and 4 July 2001 can only be considered in so far as it commented on the appellants' submissions (Article 113(1) EPC).

Therefore, the Board does not admit the three requests labelled "bis" into the proceedings (Article 114(2) EPC).

2. *Article 84 EPC*

Appellant II was of the opinion that in Claim 1 the words (a) "high-speed", "moderate-speed" (b) "deformable state" and (c) "mean residence time" were not clear.

The Board does not agree.

- (a) A high speed mixer/densifier is said to rotate at speeds between 100 and 2500 rpm; a moderate-speed granulator/densifier at 40 to 160 rpm (patent in suit, page 4, lines 14, 17, 50, 51, 57 and 58). These values indicate the performance range of the mixer and the granulator, respectively; even, if the values between "100 rpm" and "160 rpm" form an overlapping range between the high-speed densifier and the moderate-speed granulator, the skilled person has no technical problem to make a distinction between the high-speed mixer and the moderate-speed granulator; the teaching is also clear as far the sequence of operations is concerned; so, the possibility that a moderate-speed granulator could work at a higher rotating speed than a high-speed mixer does not amount to a question of technical comprehension or to a lack of clarity regarding the operability of the mixers; the skilled person will know how to adjust the respective speeds.

- (b) The powder can be considered in a "deformable state" if the compression modulus is less than 30 MPa (patent in suit, page 5, lines 28 and 29). This definition illustrates the deformable state in a quantitative manner, and is therefore, comprehensible and verifiable. Further, the deformable state may be measured in a heatable sample holder (page 5, lines 18 to 21).

(c) Apart from the fact that the expression "mean residence time" was used by an employee of appellant II in document (40), submitted by appellant II itself, the skilled person with doubts as to the interpretation of the expression can refer to the operating procedures of Examples 1 to 5 of the patent in suit which mention a mean residence time of 10 seconds in the high-speed rotating mixer and 3 minutes in the moderate-speed granulator. These values do not leave room for an unlimited number of interpretations; the values indicate the period during which the ingredients are present in the mixer and in the granulator, respectively, the period being limited by the times of entrance and of leaving. Since the invention addresses a continuous process, the residence time is controlled by the feeding speed. The means for adjusting the feeding speed are known to the process engineer. The expression is comprehensible from a technical point of view.

The interpretation of the above mentioned expressions applies to all the requests.

3. *Main request*

3.1 *Novelty*

Appellant II argued that the subject-matter of Claim 1 was not novel over document (3) and pointed to document (46); documents (3) and (46) however did not mention the mean residence time and the deformable state. It was of the opinion that these features were so vague that they did not provide a distinction with respect to document (3).

However since it was shown that the expressions "mean residence time" and "deformable state" are features which are clear, they are considered as essential technical features which are not disclosed by or derivable from both documents.

The photograph taken at the Achema exhibition was not clear; the apparatus as such could not be identified, let alone the claimed process; as no further useful evidence was available, the claimed process is not derivable from that photograph, and no further arguments need to be given.

The Board is satisfied that the subject-matter of Claim 1 is not anticipated by any of the cited documents.

3.2 Inventive step

3.2.1 Claim 1 of the patent in suit concerns a process for preparing high bulk density detergent compositions.

According to the state of the art as described in the patent in suit detergent powders were generally prepared by dry spraying or by dry mixing (page 2, lines 14 to 17).

Bulk density is dependent on (a) the chemical composition of the slurry (dry-spraying process) or (b) on the starting materials (dry-mixing process).

In case of dry mixing, it was known to increase bulk density by increasing the content of dense sodium sulphate.

Densification by post-tower treatment involving pulverization of the powder by cutters and agglomeration of the pulverized powder with a liquid was also known.

The longer the residence time, the denser the product (see patent in suit, page 2, lines 18 to 40).

3.2.2 The objective of the patent in suit was to provide an improved continuous process for obtaining high bulk density detergent compositions having a bulk density of at least 550 g/l. The process should be suitable for large scale production (patent in suit, page 2, lines 48 and 49).

3.2.3 A continuous process for granulating solids with liquids that was capable of controlling the bulk density of the granules was disclosed by document (3) (page 34, middle column, second paragraph, first sentence). The principal effect of the process occurred in a turbo reactor where all powder ingredients met in a continuous intimate mixture dispersed in the air (page 36, middle column, last paragraph to left hand column, first sentence). This process led to a continuous production of light granules, because of the dry neutralization among liquids and powders. A rotating agglomerator was connected in line with the turbo reactor and provided for the aging of the product and allowed the control of the density of the granules (page 36, right hand column, second last paragraph). An acid liquid, such as alkylbenzenesulfonic acid, and sodium carbonate met continuously within the turbo reactor so as to become intimately mixed and to interact while suspended in the air flow. As an effect of the reaction heat and of the carbon dioxide evolved, the granules swelled so that they became lighter. The final density could be controlled by addition of the acid mixtures at many points in the plant. The bulk

density achievable with common raw materials was up to 700 g/l in case of machine laundry detergents based on ternary active ingredient systems (document (3), page 54, left column, second paragraph to middle column, line 10).

The fact that a turbo reactor may work differently from a high-speed mixer/densifier would not prevent the skilled person from considering document (3) since he would be looking for methods to increase the bulk density of detergent powders.

Therefore, in contrast to appellant I who started from document (2) relating to dye stuffs, the Board considers document (3) as the most promising starting point for someone seeking a continuous process suitable for increasing the bulk density of granular detergent powders.

Considering that document (3) disclosed the manufacturing of machine laundry detergents involving a neutralization step leading to a bulk density of 700 g/l, the technical problem to be solved against this document (3) amounts to providing a further process for increasing the bulk density of granular detergent powders.

- 3.2.4 The solution to this problem suggested by Claim 1 of the patent in suit is a process utilizing, inter alia, a high-speed mixer and a moderate-speed granulator.
- 3.2.5 As is shown in the examples, the above mentioned technical problem has plausibly been solved by the process as defined in claim 1.

- 3.2.6 It remains to be decided whether, in view of the available prior art documents, it was obvious for someone skilled in the art to solve this technical problem by the means claimed.

As the increase in bulk density of granular detergent powders is the objective, all information relating to granulometry and to methods comprising the increase of bulk density of granules are of interest.

- 3.2.7 Document (2) related to a process for manufacturing granules. The process comprised the steps of mixing materials in powder form together with a granulating liquid in a high-speed mixer (800 to 3000 rpm) for 0.5 to 60 seconds and thereafter in a moderate-speed granulator/densifier (60 to 250 rpm) for 60 to 300 seconds, both being mixers made by Loedige, which is also the company mentioned in the patent in suit. The bulk density of the product made according to Example 1 was 720 g/l after leaving the high speed mixer and 830 g/l after leaving the moderate speed mixer; so, the skilled person was aware of the increase in bulk density resulting from treating the materials in the two step process comprising a high-speed mixer and a moderate-speed mixer (page 2, column 2, line 48; page 3, column 3, lines 5 to 15; page 3, column 4, lines 4 and 27).

The skilled person looking for a further process to increase the bulk density of detergent powders need only to run the process of document (3) in the mixer arrangement of document (2). He would have done so because the increase of bulk density realized according to Example 1 of document (2) was encouraging, as follows from comparing the bulk density at the start (650 g/l) with the final bulk density (830 g/l).

3.2.8 The respondents submitted that the process of the patent in suit allowed for using acid precursors of alkyl sulphates, which are chemically unstable, immediately after their production and that dyestuffs disclosed by document (2) were not comparable to surfactants for detergents.

However, as the Board has taken document (3), which relates to detergent powders, as the starting point for evaluating inventive step, the argument relating to dye stuffs does not hold, and alkyl sulphates can also be used immediately after their production in the process resulting from the combination of documents (3) and (2).

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

4. *Auxiliary request 1*

4.1 Articles 84 and 123 EPC

Claim 1 of the first auxiliary request differed from Claim 1 as granted in that the passage "; and wherein the detergent composition in the second step has a compression modulus of less than 30, preferably, less than 20 MPa" was added at the end of the claim after the word "product".

This amendment finds its support in Claim 9 as originally disclosed and as granted.

The Board is satisfied that the requirements of Article 123(2) EPC are met; the wording is also clear (Article 84 EPC; see above point 2).

4.2 Novelty

The addition of the definition of the expression "deformable state" does not amount to a change of the technical features. Therefore the same arguments apply as given in respect to Claim 1 of the main request.

Hence, the subject-matter of Claim 1 is novel; the requirements of Article 54(1) EPC are met.

4.3 Inventive step

The technical character as already mentioned under point 4.2 not having changed, the reasoning made under points 3.2.1 to 3.2.9 applies mutatis mutandis to auxiliary request 1.

The subject-matter of Claim 1 does not meet the requirements of Article 56 EPC.

5. Auxiliary request 2

5.1 Article 84 and 123 EPC

Claim 1 of the auxiliary request 2 differs from auxiliary request 1 in that the words "or component" in the first line were replaced by the passage "comprising 5 to 60 wt.% of a builder, 5 to 25 wt.% carbonate, 5 to 40 wt.% anionic surfactant, 0 to 20 wt.% nonionic surfactant and 0 wt.% soap, and".

This amendment finds its support in the description: "The final high bulk density detergent product may for example comprise 5 to 60 wt.% of a builder, 5 to 25 wt.% carbonate, 5 to 40 wt.% anionic surfactant, 0 to

20 wt.% nonionic surfactant and 0 to 5 wt.% soap"
(application as originally filed, page 5, line 35 to
page 6, line 1; patent in suit, page 3, lines 50 to
52).

The Board is satisfied that Claim 1 meets the
requirements of Articles 84 (see point 2) and 123(2)
EPC.

5.2 Novelty

The scope of Claim 1 was limited to an embodiment which
was disclosed by the originally filed disclosure as an
optional embodiment, namely a composition having no
soap.

The Board is satisfied that none of the documents
anticipates the subject-matter of Claim 1 of the patent
in suit. Since no objections were raised in this
respect, no further observations are necessary.

5.3 Inventive step

The feature directed to the absence of soap appears
unessential since the originally disclosed range was 0
to 5% soap. There was no information on file that, in
comparison to compositions containing soap, the absence
of soap would produce a particular effect. The bulk
densities of the compositions of Examples 3, 4 and 5
which did not contain soap were 840, 811 and 868 g/l,
respectively: the bulk density of those containing soap
were 805 and 867 g/l. Two soap-free compositions had a
bulk density, namely 811 and 840 g/l, lying within the
range of 805 to 867 g/l of the soap containing
compositions, one soap-free composition having a bulk
density, namely 868 g/l, exceeding the upper limit
(867 g/l) by one unit. However, these results do not
exhibit a specific technical effect; they rather show

that soap, for the claimed process, was a technically irrelevant feature. Whether present or not, soap does not influence the process in a specific manner so that a bulk density is obtained which would differ completely from the values of soap-containing compositions. The absence of soap does not amount to a feature from which a particular effect results.

Therefore, the reasoning regarding inventive step under points 3.2.1 to 3.2.9 applies mutatis mutandis to the compositions of Claim 1 of auxiliary request 2.

Claim 1 does not involve an inventive step and, therefore, does not meet the requirements of Article 56 EPC.

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. Krasa

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