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D E C I S I O N
of 20 June 2005

Case Number: T 0073/01 - 3.3.06

Application Number: 89304242.4

Publication Number: 0340013

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Language of the proceedings: EN

Title of invention:
Detergent compositions and process for preparing them

Patentee:
UNILEVER PLC, et al

Opponents:
Henkel KGaA Patente (TTP)
The Procter & Gamble Company
Hakawerk W. Schlotz GmbH

Headword:
Flow properties/UNILEVER

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0073/01 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 20 June 2005

Appellant: (Opponent)
Henkel KGaA
Patente (TTP)
Henkelstrasse 67
D-40191 Düsseldorf (DE)

Representative:
Schneller, Stephan N.
Maiwald Patentanwalts-GmbH
Elisenhof
Elisenstrasse 3
D-80335 München (DE)

Appellant: (Opponent)
The Procter & Gamble Company
One Procter & Gamble Plaza
Cincinnati, OH 45202 (US)

Representative:
Lawrence, Peter Robin Broughton
GILL JENNINGS & EVERY
Broadgate House
7 Eldon Street
London EC2M 7LH (GB)

Party of Right: (Opponent)
Hakawerk W. Schlotz GmbH
Bahnhofstrasse 28
D-71111 Waldenbuch (DE)

Representative:
Weller, Erich W.
Patentanwälte Ruff, Wilhelm,
Beier, Dauster & Partner
Postfach 10 40 36
D-70035 Stuttgart (DE)

Respondents: (Proprietors of the patent)

UNILEVER PLC
Unilever House
Blackfriars
P.O. Box 68
London EC4P 4BQ (GB)

UNILEVER N.V.
Weena 455
NL-3013 AL Rotterdam (NL)

Representative:

Bristow, Stephen Robert
Unilever PLC
Patent Division
Colworth House
Sharnbrook
Bedford MK44 1LQ (GB)

Decision under appeal:

Interlocutory decision of the Opposition Division of the European Patent Office posted 17 November 2000 concerning maintenance of European patent No. 0340013 in amended form.

Composition of the Board:

Chairman: P. Krasa
Members: G. N. C. Raths
U. J. Tronser

Summary of Facts and Submissions

I. This appeal is from the interlocutory decision of the Opposition Division concerning the maintenance in amended form of European Patent No. 0 340 013 according to the second auxiliary request submitted during oral proceedings before the Opposition Division on 26 September 2000.

II. The proprietor's second auxiliary request comprised a set of 9 claims, wherein claim 1 read:

"1. A process for the preparation of a granular detergent composition or component having a bulk density of at least 650 g/litre, which is characterised by the step of treating a particulate starting material comprising:
(a) from 5 to 35 wt% of non-soap detergent-active material, at least part of said non-soap detergent-active material being anionic detergent-active material, and
(b) from 28 to 45 wt% (anhydrous basis) of crystalline or amorphous sodium aluminosilicate, the weight ratio of (b) to (a) being at least 0,9:1, and optionally other detergent components to 100 wt%,
in a high-speed mixer/granulator having both a stirring action and a cutting action, in the presence of a liquid binder but in the absence of a finely divided particulate agent for improving surface properties, whereby granulation and densification to a bulk density of at least 650 g/litre are effected."

Dependent claims 2 to 9 represent specific embodiments of the process according to Claim 1.

III. Three opponents had sought revocation of the granted patent, all three opponents on the grounds of lack of novelty and inventive step (Articles 100(a), 52(1), 54(1),(2) and 56 EPC) and opponent 1 in addition on the ground of lack of sufficiency of disclosure (Articles 100(b), 83 EPC).

IV. During the opposition proceedings the parties had filed, among others, the following documents:

(2) US-A 4 663 194;

(5) DE-A-3 617 756 and

(8) English translation of JP-A-61-69897.

V. The Opposition Division found *inter alia*

- that the requirements of Article 83 EPC were fulfilled since a skilled person would understand the meaning of the feature "high-speed mixer having both a stirring and a cutting action" and would know which method is suitable to measure the bulk density;

- that in respect of novelty, *inter alia*, example 3 of document (2) and example 5 of document (5) did not anticipate the subject-matter of Claim 1 since

according to example 3 of document (2) neither the particulate starting material did comprise the surfactant and the sodium aluminosilicate nor was a high-speed mixer/granulator disclosed; and

according to example 5 of document (5) the granulation was performed by the disintegration of the pellets in a mill and in the absence of a binder.

The Opposition Division further found that, starting from the most relevant prior art represented by document (8), the technical problem underlying the patent in suit was to improve the flow rate of powders. This problem was solved by the ratio of aluminosilicate to non-soap detergent active material of at least 0,9:1 and by performing the granulation step without adding a finely divided particulate agent for improving surface properties. This technical solution would involve an inventive step.

VI. Opponent 01 (hereinafter appellant I) and opponent 02 (hereinafter appellant II) lodged an appeal against this decision.

Appellant I argued orally and in writing that all the features of Claim 1 of the disputed patent were disclosed *inter alia* by documents (2) and (5) and that further in view of documents (2), (5) and (8) the claimed subject-matter lacked an inventive step.

The builder, the flow aid agent and the finely divided particulate agent for improving surface properties were always the same component, namely aluminosilicate, i.e. zeolite. Therefore, the difference with respect to document (8) according to which a surface modifier e.g. aluminosilicate was used is no more essential since according to the patent in suit zeolite can also be added during the granulation process, the only

difference being that it is now called flow aid and not surface modifier.

Appellant II submitted further documents and argued

- that there was a lack of disclosure of the invention, since a particular "high speed mixer/granulator having both a stirring action and a cutting action" to be used was not specified;

- that the claimed subject-matter was not novel over document (5) since inter alia the actual zeolite concentration used according to this citation was 28,1 wt.-% (on an anhydrous basis) and moisture present in this zeolite was to be considered as water acting as a binder;

- that the invention lacked an inventive step since the invention amounted merely to the combination of using a well known equipment for making detergent compositions with known particulate starting materials, both the equipment and the detergent compositions being part of the common general knowledge as illustrated by the additional documents submitted by appellant II.

Further, the appellants argued that the problem underlying the patent in suit, namely to perform the granulation in the absence of a finely divided particulate agent for improving surface properties was already solved by comparative example 1 of document (8).

The post-addition of AluSil disclosed in example 1 of the patent in suit was not a feature of Claim 1;

therefore the relevant part of this example was the process conducted in the absence of the AluSil addition.

The flow rates achieved according to the examples of the patent in suit - in the absence of the post-addition of AluSil - were either disastrous or bad.

VII. The respondents refuted the Appellants' arguments as follows:

Document (2) did not disclose the treatment of a particulate starting material comprising anionic detergent and zeolite as defined in Claim 1 of the patent in suit.

According to the process of example 3 of document (2) no high-speed mixer granulator (as required by the patent in suit) but a mixing drum was used.

Document (5) did not disclose a process step comprising the granulation of particulate starting material in a high-speed mixer/granulator in the presence of a liquid binder. The amount of zeolite introduced in the disintegrating machine would be below 28% by weight (on anhydrous basis). The temperatures at which pellets were formed were so high to cause a loss of water so that moisture, being synonymous of water mentioned by appellant II, would be missing.

Whether starting from document (8) or (2), the invention involved an inventive step.

Document (8) would teach to run the granulation step in the presence of a surface modifier; comparative

example 1 of document (8) would be a hint to employ a surface modifier during the granulation step because in the absence of a surface modifier the bulk density and the flow rate would worsen in comparison with compositions obtained by a process involving the presence of a surface modifier.

The comparison examples B and D of the patent in suit would show that in the absence of a flow aid which was added to a spray dried powder, problems with over-granulation and lump formation were encountered if relatively low levels of aluminosilicate were used.

To change any of the essential process conditions according to document (2) such as the use of nonionic surfactants of high levels, the wet mixing with the carbonate/bicarbonate powder followed by the zeolite coating, would be a fundamental departure from the teaching of document (2) and would completely ignore what document (2) was attempting to achieve. The use of nonionic surfactants, which are liquid and pasty would make it difficult to provide free flowing properties to the detergent granulates. This would explain the use of mixed carbonate/bicarbonate powder in the process disclosed in document (2) (letter 10 December 2001, passage bridging pages 10 and 11).

VIII. Oral proceedings took place on 20 June 2005.

IX. The Appellants requested that the decision under appeal be set aside and the patent be revoked.

The respondents requested that the appeal be dismissed.

Reasons for the Decision

1. *Articles 54, 83, 84 and 123 EPC*

The Board is satisfied that the requirements of Articles 54, 83, 84 and 123 EPC are met. Since the patent is revoked for other reasons, a detailed reasoning is not necessary.

2. *Inventive step*

2.1 The objective of the patent in suit was to provide a process for manufacturing granular detergent compositions of high bulk density having good washing performance and good powder properties (page 2, lines 5 to 6). Also, it was a goal to obtain a product having no tendency towards caking and balling (page 2, line 34).

This problem was solved with the process as defined in Claim 1 of the second auxiliary request as maintained by the Opposition Division.

Two features regarding the amounts of ingredients such as the builder and the surfactant are said to be essential:

> "The detergent composition of the invention owes its combination of excellent properties and ready process ability to a moderate content of surfactant, at least part of which is anionic, and a relatively high level of sodium aluminosilicate builder." (page 3, lines 18 to 20)

Also, an important process step has been outlined in the patent in suit:

> "It is an essential feature of the process of the invention, that during granulation no agent for improving surface properties as defined in the mentioned JP 61 069897A (Kao) be present. When processing a formulation having a relatively high ratio of aluminosilicate builder to surfactant, in accordance with the present invention, the use of a finely divided particulate material such as fine sodium aluminosilicate during the granulation step is not only unnecessary but can with some formulations make granulation more difficult, or even impossible." (page 5, lines 40 to 44)

In summary good flow properties are obtained if the amount of builder (i.e. aluminosilicate) is high and the amount of surfactants is low, and if no aluminosilicate (in form of finely divided powder) is used during the granulation step.

2.2 Since document (8) aims at producing high density granular detergent compositions having very good flow properties, the Board takes this document as the starting point for evaluating inventive step.

The flow rates of the products according to the examples 1 to 4 of document (8) obtained by using a surface modifier are 14,7, 12,8, 15,2 and 14,1 ml/s, respectively, the bulk densities 682, 672, 673 and 674 g/l respectively; the bulk density of the product manufactured in the absence of a surface modifier

according to comparative example 1 of document (8) is 665 g/l, its flow rate 10,6 ml/s.

Document (8) disclosed the evaluation method of flow properties.

> "Flow properties were evaluated in terms of the time required to flush out powders that were 100 ml from a hopper used to evaluate specific gravity in accordance with JIS K 3362." (document (8), page 25, lines 13 to 15).

The granular products according to examples 1 and 11 of the patent in suit have a dynamic flow rate of 65 ml/s and 80 ml/s, respectively; the bulk density of the product according to example 1 has not been indicated, but - in view of Claim 1 - can be assumed to be at least 650 g/l; the bulk density of the product according to example 11 is 750 g/l.

2.3 A direct comparison between the flow rates of the products obtained according to the patent in suit and document (8) is however not possible since the method for measuring the flow rate has not been indicated in the patent in suit. Thus, no beneficial effect of the process of Claim 1 can be acknowledged and taken into consideration for defining the technical problem.

2.4 Therefore, the problem underlying the patent in suit in the light of document (8) may be defined as the provision of a further process for obtaining granular detergent compositions having a high bulk density and good flow properties.

The data under point 2.2 (last paragraph) prove that this technical problem was solved.

2.5 The question which remains to be decided is whether the claimed process for preparing such a granular composition involved an inventive step.

2.6 According to document (8) mixing and granulation take place in the presence of a surface modifier and a binder so that the technical solution according to the patent in suit differs from that of document (8) in that a surface modifier is absent during the granulation step and in that the weight ratio of (b) sodium aluminosilicate to (a) non-soap detergent-active material is at least 0,9:1.

According to comparative example 1 in document (8) mixing and granulation are also effectuated in the absence of a surface modifier so that the skilled person was aware of this process variation.

The question is whether this comparative example gave a hint to the skilled person to omit the addition of a surface modifier from the process in question.

2.7 The respondents had argued in their letter dated 10 December 2001 (passage bridging pages 8 and 9) that comparative example 1 of document (8) had shown that in the presence of a surface modifier the bulk density and the flow property had been improved in comparison with the results obtained in the absence of a surface modifier. Therefore, in view of these results a skilled person would run the process in the presence of a

surface modifier when aiming at improved flow properties of the detergent granulate.

2.8 The Board does not agree with the respondents' reasoning.

The question of whether the flow property improves or does not improve is no more relevant since the problem underlying the patent in suit does not aim at an improvement of flow properties but at an alternative process for the preparation of granular detergent compositions.

In respect to the prior art to be considered it is noted that a skilled person is not only aware of the literature in the field of the invention and in related fields, but it is also within the ordinary skill of such a practitioner seeking and recognising technical developments which can be derived from simple combinations of such pertinent documents which were available to the public at the priority date.

The state of the art, in this case, embraces more documents than just document (8). Consequently all previously published embodiments, which offered a suggestion to the skilled practitioner for solving the technical problem addressed, such as those disclosed by document (2), must be taken into consideration.

3. A relevant issue in this case was to avoid that granules become too sticky what would prevent them from flowing. In this respect document (8) drew the attention to the fact that a good handling and easy processing require "that powders and granules will

readily flow and will resist clogging and caking." (page 3, lines 20 to 22).

The same problem was already mentioned in document (2) which relates to a process for making free flowing particulate heavy duty laundry detergents having a bulk density of at least 600 g/l (Claim 1, column 16, lines 11 to 12) and indicates that zeolite powders favour free flow:

> "The zeolite powders on the surfaces of the particles, in addition to preventing the nonionic detergent from causing tackiness or poor flow, also protect product interiors against the action of external moisture under humid conditions" (column 11, lines 7 to 12).

3.1 The beneficial influence of zeolite on the flow properties of the respective granules being already known, it remains to be investigated whether the skilled person gets information about the amounts of nonionic detergents (i.e. surfactants) and zeolite (i.e. the builder) for designing the manufacturing process of the detergent composition and whether the ratio (b):(a) given in the patent in suit, i.e. the ratio aluminosilicate : non soap detergent-active material, would render the claimed subject-matter inventive.

According to the patent in suit the ratio (b):(a), i.e. aluminosilicate (or zeolite) : non-soap detergent is at least 0,9:1, at least part of the non-soap detergent being anionic detergent; the condition regarding the ratio is always fulfilled if the zeolite content is higher than the non-soap content whereby the ratio of

0,9 : 1, falling just below the 50:50 barrier, is tolerable.

3.1.1 According to claim 1 of document (2) (column 16, lines 10 to 31) the concentration of zeolite particles (i.e. component (b)) having a moisture content from 17 to 22% is from 40 to 60% and that of nonionic detergent (i.e. component (a)) is from 10 to 30%, which may be partially replaced by anionic detergents (column 7, lines 16 to 19 and lines 22 to 25). Also in the examples of document (2) the zeolite is used in excess over the non-soap detergent (on a weight% basis).

It was also known that nonionic detergents cause tackiness or poor flow of the detergent granules (document (2), column 11, lines 7 to 12).
The skilled person understands therefrom that the amount of zeolite should be higher than the amount of nonionics to prevent the composition "from forming into large balls or cakes" (patent in suit, page 2, line 32).

Thus, the use of high amounts of zeolite and more moderate levels of nonionics having been known in the prior art, the weight ratio (b):(a) being at least 0,9:1 given in Claim 1 of the patent in suit cannot render the claimed subject-matter inventive.

3.1.2 The respondents submitted that a skilled person would not have combined the technical teaching of document (2) with that of document (8) since he would have expected any deviation from the process conditions disclosed in document (2) to result in difficulties. In particular not to use the high amounts of carbonate/bicarbonate as required in the process of document (2) would be a

fundamental departure from the teaching of document (2) and would completely ignore what document (2) was attempting to achieve, i.e. free flowing particulate detergent compositions with high levels of non-ionic surfactants. The use of these nonionic surfactants, which are liquid and pasty made it difficult to provide free flowing properties, what explained the use of large amounts of mixed carbonate/bicarbonate powder. Therefore there would be no incentive for a person skilled in the art to depart from the teaching of document (2).

The Board cannot accept this counter-argument since Claim 1 of the patent in suit allows for optional ingredients e.g. carbonate and bicarbonate. Therefore, Claim 1 of the patent in suit covers the use of mixed carbonate/bicarbonate powder as disclosed by document (2).

3.1.3 The respondents also pointed to the processes according to comparison examples B and D of the patent in suit which were run with ratios of zeolite (b) to non-soap surfactant (a) of 0,53 and 0,31, respectively, and lead to over-granulation and lump formation in example B and to a dough in example D. Both processes were run in the absence of a flow aid.

However, these comparative examples cannot support an inventive step by referring to the avoidance of a dough and lump formation when running the process according to the patent in suit because they corroborate only what was already known from the prior art, namely that in case the quantity of non-soap surfactants, i.e. nonionics (component (a)) is higher than that of the

zeolite (component (b)) then problems of stickiness arise because the origin of stickiness results from the nonionics (document (2), column 11, lines 7 to 11; discussion of the prior art in the patent in suit: page 2, lines 33 to 34).

3.2 In view of the above considerations the Board concludes that neither the amount of aluminosilicate nor the ratio (b):(a) as required by Claim 1 were unusual and, consequently, that the subject-matter of said claim was obvious in view of document (8) in combination with document (2) and, therefore, does not involve an inventive step.

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