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D E C I S I O N
of 8 May 2006

Case Number: T 1410/04 - 3.3.06

Application Number: 97950085.7

Publication Number: 0942958

IPC: C11D 17/06

Language of the proceedings: EN

Title of invention:

Process for the production of a detergent composition

Patentees:

UNILEVER PLC, et al

Opponent:

HENKEL KGaA

Headword:

-

Relevant legal provisions:

EPC Art. 56, 87

Keyword:

"Priority (validly claimed) - same invention (acknowledged)"
"Inventive step (yes) - effects not derivable from the prior art"

Decisions cited:

-

Catchword:

-



Case Number: T 1410/04 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 8 May 2006

Appellant: HENKEL KGaA
(Opponent) VTP (Patente)
D-40191 Düsseldorf (DE)

Representative: -

Respondents: UNILEVER PLC
(Patent Proprietors) Unilever House
Blackfriars
London EC4P 4BQ (GB)

and

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

Representative: James, Helen Sarah
Unilever Patent Group
Colworth House
Sharnbrook
Bedford, MK44 1LQ (GB)

Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
9 November 2004 concerning maintenance of
European patent No. 0942958 in amended form.

Composition of the Board:

Chairman: P. Krasa
Members: G. Raths
J. Van Moer

Summary of Facts and Submissions

I. This appeal is from the interlocutory decision of the Opposition Division concerning maintenance in amended form of European patent No. 0 942 958 relating to a process for the production of a detergent composition and granted on the European patent application 97 950 085.7 claiming priority of 2 December 1996 (GB 96 25 066).

II. A notice of opposition, based *inter alia* on the documents

- (1) EP-A-0 367 339,
- (2) EP-A-0 544 365 and
- (3) WO-A-97/02 338

was filed against the granted patent wherein the opponent sought revocation of the patent on the grounds of Article 100(a) EPC for lack of novelty and inventive step (Articles 52(1), 54 and 56 EPC).

During the opposition proceedings the opponent further relied, *inter alia*, on the following documents:

- (6) W.H. de Groot, I.Adami, G.F. Moretti, "The manufacture of Modern Detergent Powders". Herman de Groot Academic Publisher, 1995, pages 116 to 122;
- (9) DE-A-4 132 906;
- (10) EP-A-0 265 203;
- (11) GB-A-1 595 769;
- (12) GB-A-1 595 770 and
- (13) EP-A-0 221 776.

III. Claim 1 of the patent as granted read:

"1. A process for the production of a detergent powder composition having a bulk density of no more than 750 g/l, the process comprising mixing a particulate starting material which contains no more than 10% by weight of the starting material of detergent active material together with a liquid component comprising a detergent active material or a precursor therefor in a mixer/granulator having both a stirring and a cutting action characterised in that the starting material has a d_{50} average material particle diameter of from 100 μm to 1000 μm and a particle porosity of at least 0.4."

IV. The decision of the Opposition Division was based on the set of claims of the then pending auxiliary request, Claim 1 thereof differing from Claim 1 as granted in that the passage

"and that the stirrer is operated at a rate of 25 to 250 rpm and the cutter is operated at a rate of 300 to 3000 rpm"

was added at the end of Claim 1.

V. In its decision the Opposition Division held that the subject-matter of the claims of the said auxiliary request fulfilled the requirements of the EPC.

In particular, in respect of inventive step, the Opposition Division took document (1) as the closest prior art, in the light of which the technical problem underlying the patent in suit was the provision of an

alternative process for the production of a detergent composition having a bulk density of no more than 750 g/l.

The process according to document (1) comprised 3 steps wherein in the first step a high-speed mixer/densifier, in the second step a moderate-speed granulator/densifier and in the third step a drying and/or cooling apparatus were used.

None of the documents on file gave the skilled person a hint that a process comprising a mixer having mixing tools rotating at 25 to 250 rpm and cutting tools rotating at 300 to 3000 rpm led to a detergent composition having a medium bulk density powder.

Therefore, the skilled person could not expect without hind-sight that by changing the type of mixer used according to document (1) and by simultaneously lowering the detergent active material content a detergent product could be obtained having the desired medium bulk density and good flow properties as shown in the examples of the contested patent.

VI. This decision was appealed by the opponent (hereinafter the appellant).

In support of its arguments in respect of lack of inventive step, the appellant submitted with the grounds of appeal the following documents:

(14) Wolfgang Pietsch, "Agglomeration Processes - Phenomena, Technologies, Equipment", Wiley-VCH Verlag GmbH Weinheim, 2002, chapter 7.4.2, pages 164 to 187;

and

(15) DE-A-41 24 984.

The appellant's arguments can be summarized as follows:

Document (1) disclosed a process comprising, *inter alia*, treating the starting material in particulate form which had a detergent active material content of 15.1 wt. % to 19.2 wt. % (document (1), page 6, table 1, alkylbenzene sulfonate (ABS) and nonionic surfactant (NI.7EO)) with a liquid component in a mixer/granulator, a Lödige recycler CB30, at a rotation speed of 1600 rpm (page 6, last paragraph).

The process according to the patent in suit differed from that according to document (1) in the concentration of the detergent active material of the starting material and the rotation speed of the mixing tools.

The problem underlying the patent in suit in the light of document (1) was, thus, to provide an alternative process for manufacturing detergent active particles having a medium bulk density.

- The process claimed in the patent in suit differed from that disclosed in document (1) (which resulted in bulk densities of e.g. 591 and 699 g/l; table 3 on

page 9) by the reduced content of detergent active component in the particulate starting material and by different rotation velocity of the mixing tools. Both modifications were arbitrary and did not result in an unexpected technical effect. Therefore, the claimed process was obvious for those skilled in the art.

Moreover, document (1) did not advise against the use of low levels of active detergent material since low and high contents were envisaged (page 4, lines 40 to 42).

Also, document (2) taught the use of low amounts of active detergent material:

"The level of detergent active material... is preferably less than 10% by weight, more preferably less than 5% by weight."
(page 4, lines 29 to 31)

The skilled person could lower the active detergent material of the particulate starting material in routine experiments by relying on documents (10) to (13) which all concerned spray dried detergent compositions, spray drying being one of the possible methods of preparation of the starting material according to the patent in suit.

- The speed of the mixing tools in both document (1) and the patent in suit were identical.

- Although in step 1 of the process according to document (1) a Lödige CB 30 recycler (i.e. a mixer/densifier) mixer having mixing tools rotating at

100 to 2500 rpm and in step 2 a Lödige KM 300 mixer (also called plough share mixer) having mixing tools rotating at 40 to 160 rpm were used, the difference between these mixers was not relevant since both mixers belonged to the category of high speed mixers. The mixing tools also had implicitly a cutting action which allowed the porosity of the starting material to be reduced and thus increased the bulk density (document (1), page 4, line 56 to page 5, line 4). The interchangeability of the mixers was corroborated by documents (9) and (15). Document (9) disclosed a mill which actually was a Lödige KM 300 and referred to document (15) describing a mixer/granulator which actually was a Lödige CB 30, so that a skilled person would not differentiate between those two mixers and use either the one or the other in the process at stake.

According to document (14) the knife heads of the mixer were used as accelerators and intensifiers for the mixing action and were operated at a speed of 1800 rpm (page 178, lines 7 to 9). According to document (6) plough shaped mixing tools operated at 80 to 160 rpm, the choppers at 3600 rpm (page 118, lines 7 to 9), so that a skilled person was aware of the possibility of adjusting different speeds for different actions.

- According to document (9) relating to the crushing of plaster cement plates the process comprised a Lödige CB mixer (column 1, lines 3 to 14) which could be replaced by a ploughshare mixer which was mentioned in document (15), to which document (9) referred explicitly, so that a skilled person looking for compressing material and hence increasing the bulk density thereof would use a Lödige plough share mixer.

- Example 3 of the application as filed showed that the same effect was obtained with a mixer which was not covered by Claim 1 of the patent in suit; in other words, the mixer characteristics of the patent in suit provided products having effects known in the art.

- Any attempt by the Respondent to rely on other effects like the flow properties of the products obtained by the claimed process had to fail because the flow properties of the alleged invention were not indicated as an objective and were not determined for all the examples of the patent in suit.

For all these reasons the subject-matter of Claim 1 of the patent in suit did not involve an inventive step.

VII. The patent proprietors (respondents) refuted all the arguments of the appellant and argued in essence as follows:

Document (1) neither suggested lowering the concentration of the detergent active material in the particulate starting material to below 10% by weight nor applying mixer and cutter tools at different speed in order reliably to obtain a bulk density below 750 g/l in a controlled process.

Document (14), published in 2002 i.e. after the effective filing date of the patent in suit which was the priority date (2 December 1996), disclosed a Lödige Ploughshare mixer having separately controllable cutting and mixing tools. Even if assuming that document (14) was accepted as evidence that such a

mixer had already been made available to the skilled person before the effective filing date of the patent in suit, document (1) taught that the Lödige KM 300 mixer (also called ploughshare mixer) was not interchangeable with the Lödige CB 30. Therefore, a skilled person would not have used the latter (or a mixer of that type) in the claimed process and, thus, would not have arrived at the claimed subject-matter by following the teaching of document (1).

None of the documents cited by the appellant suggested the key issue which was to manufacture detergent compositions having a bulk density of no more than 750 g/l by operating the cutting and the mixing tools at different speeds as indicated in Claim 1 of the patent in suit.

The claimed subject-matter involved, therefore, so the respondents concluded, an inventive step.

VIII. By a fax dated 4 May 2006 the appellant pointed to document (3) disclosing a stirrer operating at a rate of 20 to 95 rpm and a cutter operating at 200 to 2000 rpm (page 7, lines 1 to 5). This document, considered up to now as being part of the state of the art under Article 54(3) EPC, would become relevant under Article 56 EPC, because the priority document

(16) GB 96 250 66

did not disclose the feature regarding the cutter rotating at 300 to 3000 rpm, so that the priority date of the patent in suit was not validly claimed.

IX. Oral proceedings before the Board took place on 8 May 2006.

X. The appellant requested that the decision under appeal be set aside and the European patent No.0 942 958 be revoked.

The respondents requested that the appeal be dismissed or, in the alternative, that the patent be maintained on the basis of an auxiliary request filed under cover of the letter dated 20 July 2005.

Reasons for the Decision

Main request

1. *Article 87 EPC*

1.1 Concerning the right to priority, the relevant basic question to be considered in this case is whether there was a disclosure of all the claimed features of the invention in the priority document (16).

The feature at stake related to the speed of the cutting tools. The passage under consideration of Claim 1 as granted reads as follows:

"....the cutter is operated at a rate of 300 to 3000 rpm".

1.2 The relevant passages of the priority document read as follows:

"The stirrer and the cutter may be operated independently of one another, and at separately variable speeds."

(page 6, lines 1 and from the bottom)

"Suitably the stirrer is operated at a rate of 25 to 250 rpm, e.g. from 100 rpm to 200 rpm or even as low as 30 to 50 rpm. However, this speed is dependent on the size of the apparatus. Independently the cutter is suitably operated at a rate of 200 to 2500 rpm, preferably 300 to 2200 rpm.The rate of stirring and/or cutting is suitably adjusted according to the stage of the process."

(page 7, lines 10 to 16)

In examples 9 and 10 of the priority document the mixing speeds of the mixing and cutting tools are indicated as follows:

example	9	10
rpm (agitator)	100	200
rpm (chopper)	3000	3000

1.3 The appellant argued that the priority document did not disclose the intermediate values of the range 2500 to 3000 rpm and, therefore, the feature

"the cutter is operated at a rate of 300 to 3000 rpm"

was not disclosed.

1.4 The question is whether the teaching of the priority document allows to combine the value of "3000" with the range "300 to 2500" so that it is allowable to form a range of 300 to 3000 rpm.

1.5 It was not disputed that the skilled person was aware that cutting tools of the mixers as used according to the patent in suit could be operated at high speeds.

It was further not disputed that the value of "3000 rpm" as specified in examples 9 and 10 of the priority document was an illustration of these "high" speeds.

Since according to the description of the priority document (see point 1.2) the cutter was "suitably" operated at a rate of 200 to 2500 rpm, preferably 300 to 2200 rpm, the skilled person knew that all these speeds were appropriate. He also knew that the operating velocity of the mixer was not limited to these speeds. In other words, these speeds were not the only ones at which the cutter is operated. Since the speed of 3000 rpm was representative for high speeds, the range of 2500 to 3000 rpm also met the definition of "high speeds" in this context. Therefore, the range

of "2500 to 3000 rpm" was made available to the skilled person in the priority document.

- 1.6 The Board concludes that the range of speeds at which the cutters are revolving, namely 300 to 3000 rpm is directly and unambiguously derivable from the priority document (16), which is thus a valid basis for the claimed priority right under Article 87(1) EPC.

It follows that document (3) is considered as comprised in the state of the art under Article 54(3) EPC and has to be disregarded for assessing inventive step under Article 56 EPC.

2. *Inventive step*

- 2.1 An objective of the patent in suit was to provide a process for the production of a detergent composition having a medium or low bulk density ([001], page 2, lines 5 to 7).

- 2.2 Document (1) concerns a process for the production of a detergent composition having a bulk density of at least 650 g/l (page 3, line 41).

Since the patent in suit defined medium or low bulk density with "no more than 750 g/l" ([0011], page 2, lines 52 to 55), it was not disputed that the objective of obtaining a bulk density of from 650 to 750 g/l was a common goal in both the patent in suit and document (1).

The process according to document (1) comprises two steps. In the first step of the process, the particulate starting material is thoroughly mixed in a high-speed mixer/densifier for a relatively short time of about 5 to 30 seconds. In the second processing step the detergent material is treated for 1 to 10 minutes in a moderate-speed mixer/densifier. The second processing step can be successfully carried out in a Lödige KM 300 mixer, also referred to as Lödige ploughshare. This apparatus essentially consists of a horizontal, hollow static cylinder having a rotating shaft in the middle. On this shaft various plough-shaped cutters can be rotated at a speed of 40 to 160 rpm. Optionally, one or more high-speed cutters can be used to prevent excessive agglomeration (document (1), page 5, lines 13 to 25).

Therefore, the Board takes document (1) as the starting point for evaluating inventive step.

2.3 The process according to document (1) differs in essence from that of the patent in suit in that the detergent active material according to the patent in suit contains less than 10 wt. % of detergent active material and that the mixer/granulator according to the patent in suit has mixing and cutting tools rotating at different speeds as indicated in Claim 1 of the patent in suit.

2.4 In the light of document (1) the problem underlying the patent in suit can be seen in the provision of an alternative process for the production of a detergent composition having a bulk density of less than 750 g/l.

- 2.5 The compositions according to examples 3 and 4 of the patent in suit (agitator: 100 and 200 rpm, respectively; chopper: 3000 rpm in both examples; bulk density: 576 g/l and 688 g/l, respectively) prove that this problem is plausibly solved.
- 2.6 The question which remains to be answered is whether the solution to this technical problem involves an inventive step or not.
- 2.7 The appellant argued that in the light of the teaching of documents (1), (2) and (10) to (13) the skilled person would have reduced the level of active detergent material to below 10 wt.%.

The Board does not agree.

Documents (10) to (13) deal with the contents of nonionic surfactants in spray-dried material which could, in principle, serve as starting material for the claimed process. They disclose various contents of the nonionic surfactants in the said spray-dried products as follows:

- at least 25% by weight of nonionic surfactant (document (11), page 1, column 1, lines 40 to 45 and column 2, lines 58 to 62);
- 28% by weight of nonionic surfactant in a premix (document (12), example on page 2, column 1, lines 41 to 43);
- 23 parts of liquid nonionic surfactant were sprayed on 77 parts of the spray-dried carrier

material (containing already 1% nonionic surfactant and 0.5% anionic surfactant) to give 100% adjunct, of which 10% were used together with 3% + 1% nonionic surfactant and 9.0% sodium linear alkylbenzene sulphonate (i.e. an anionic surfactant) (all "%" are by weight) (document (13), example 14, page 17, lines 36 and 37; page 18, lines 5 to 9 and 30).

The Board notes that document (10) tolerates amounts of up to 2% by weight of anionic surfactant or up to 5% by weight of nonionic surfactant (page 4, lines 14 to 15).

Neither of these documents (10) to (13) nor document (2) contains a hint of a relationship between the detergent concentration of the starting material and the bulk density of the end product. Therefore, the skilled person cannot infer from documents (2) (see point VI) and (10) to (13) that the concentration of detergent active material of the compositions should be reduced according to document (1) to less than 10% by weight. In the light of the teachings of said documents he would also not reduce said concentration in routine experiments with a reasonable expectation of solving the existing technical problem.

Therefore, the appellant's conclusion to the contrary cannot be based on the said citations and is the result of an inadmissible *a posteriori* analysis.

Neither can the Board accept the appellant's further argument that documents (1), (9) and (15) as well as (14) and (6) taught the skilled person to operate the mixer/granulator in such a way that the cutters

revolved at a speed range of 300 to 3000 rpm and the mixing tools at a range of 25 to 250 rpm. The reasons are as follows:

Documents (9) and (15) can be disregarded because they are concerned with plaster plates, a field which is too far away from the field of detergents. Therefore, a person skilled in the art of detergents would not have referred to them. But independently of this fact, none of these two documents nor of documents (1), (6) and (14) gives a hint that there is a link between the bulk density and the rotating speeds of cutting and mixing tools. Again, the ex post facto analysis of the appellant drew on the knowledge of the invention, which is not admissible.

The other arguments of the appellant related to a lack of unexpected effects of the detergent compositions, a lack of process performance or to additional effects (the flow properties) which should be disregarded. All these arguments must fail because they are not concerned with the problem underlying the patent in suit and, therefore, are not part of the objective underlying the process according to the patent in suit.

- 2.8 For all these reasons, the subject-matter of Claim 1 of the patent in suit involved an inventive step (Article 56 EPC).

The dependent claims 2 to 10 relate to particular embodiments of the process according to Claim 1 and, hence, derive their patentability from Claim 1.

In the light of the above findings, it is not necessary to consider the respondent's auxiliary request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

A. Wallrodt

P. Krasa