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Datasheet for the decision of 17 August 2007

T 1045/06 - 3.3.06 Case Number:

Application Number: 87309570.7

Publication Number: 0270240

IPC: C11D 11/02

Language of the proceedings: EN

Title of invention:

Detergent powders and process for preparing them

Patentees:

UNILEVER PLC, et al

Opponent:

PROCTER & GAMBLE EUROPEAN TECHNICAL CENTER N.V. Henkel KGaA

Headword:

Spray-drying process/UNILEVER

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (no): obvious modification"

Decisions cited:

Catchword:



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Boards of Appeal

Chambres de recours

Case Number: T 1045/06 - 3.3.06

DECISION

of the Technical Board of Appeal 3.3.06 of 17 August 2007

Of 17 August 2007

Appellant: Henkel

(Opponent II) Kommanditgesellschaft auf Aktien

TFP / Patentabteilung
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(Opponent I)

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Decision under appeal: Decision of the Opposition Division of the

European Patent Office posted 10 May 2006

rejecting the opposition filed against European patent No. 0270240 pursuant to Article 102(2)

EPC.

Composition of the Board:

Chairman: G. Raths
Members: P. Ammendola

U. Tronser

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Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition division dated 10 May 2006 rejecting the oppositions against the European patent No. 0 270 240 having the filing date 29 October 1987 and claiming a priority date of 31 October 1986.

II. Claim 1 of the granted patent read:

- "1. A process for the preparation of zero-phosphate detergent powder which comprises spray-drying an aqueous slurry to form a powder, the slurry comprising:
 - (a) from 5 to 60% by weight, based on the powder, of one or more anionic detergent-active compounds;
 - (b) from 0 to 30% by weight, based on the powder, of one or more nonionic detergent-active compounds;
 - (c) from 15 to 86% by weight, based on the powder, of crystalline or amorphous sodium aluminosilicate builder;
 - (d) from 2 to 40% by weight, based on the powder, of a polymeric polycarboxylate;
 - (e) optionally other salts;
- (f) optionally conventional minor ingredients; characterised in that the slurry comprises from 2 to 20% by weight, based on the powder, of sodium carbonate, the powder has a total electrolyte level not exceeding 20% by weight and a particle porosity not exceeding 0.40, and if the amount of anionic detergent-active compound (a) exceeds 14.5% by weight the weight ratio of sodium carbonate to anionic detergent-active compound (a) does not exceed 1.1:1."

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- III. Two opponents had opposed this patent on the grounds of insufficiency of disclosure (Article 100(b) and 83 EPC) and lack of novelty and inventive step (Articles 100(a), 52(1), 54 and 56 EPC).
- IV. In the preceding decision T 378/97 this Board had established that the disclosure of the patent in suit enabled a person skilled in the art to carry out the claimed process (Articles 100(b) and 83 EPC) and had remitted the case to the Opposition division for further prosecution in respect of the remaining opposition grounds.
- V. During the opposition proceedings following this remittal the Opponents relied, *inter alia*, on document

R12 = EP-A-0 240 356,

published on 7 October 1987.

The Patent Proprietors in their letter of 22 August 2003 acknowledged that, if the patent was found not to be entitled to the claimed priority date, then the disclosure provided by document R12 would represent the closest prior art.

VI. In its decision of 10 May 2006 the Opposition division found that the subject-matter of the granted claims was not entitled to the claimed priority date, but nevertheless novel and based on an inventive step. In particular, the patent examples were considered sufficient for rendering it credible that the claimed process provided spray dried detergent powders exhibiting the aimed combination of excellent powder

properties with high bulk density, this latter being due to the powders' low particle porosity. Document R12 was found of lower relevance because it would address a technical problem different from that solved in the patent in suit.

VII. Only Opponent II (hereinafter the Appellant) appealed against this decision.

In the grounds of appeal it did not contest the finding of the Opposition division in respect of the novelty of the patented subject-matter, but disputed the presence of an inventive step in view of several combinations of documents. One of these inventive step attacks included, although not as starting point, document R12. It argued additionally that the previous decision T 378/97 had only established that the patent in suit provided sufficient disclosure as to the method for measuring the required particle porosity of at most 0.40, but maintained that the patent in suit would not disclose sufficiently how to produce a particulate with such a porosity.

VIII. The Patent Proprietors (hereinafter "Respondents")
replied to the grounds of appeal by refuting the
Appellant's arguments and filing three auxiliary
requests. They maintained in particular that the issue
of reproducibility of the invention was res judicata,
having been decided upon in T 378/97 and requested
remittal to the first instance should the Board find
the Appellant's objection based on Article 100(b) EPC
admissible.

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- IX. In a communication to the parties enclosed with the summons to oral proceedings to be held on 17 August 2007, the Board expressed its preliminary opinion that the issue of sufficiency of disclosure was no longer to be considered after T 378/97.
- X. In a letter dated 20 April 2007 Opponent I (hereinafter "the Party as of right") announced its absence at the forthcoming oral proceedings and requested that the present appeal be allowed and the patent revoked.
- XI. In a letter dated 26 June 2007 the Respondents announced their absence at the forthcoming oral proceedings and withdrew the previously filed auxiliary requests, but maintained the request for remittal to the first instance should sufficiency of disclosure still be open to consideration.
- XII. Oral proceedings took place as scheduled before the Board, in the announced absence of the Respondents and of the Party as of right. During the discussion on inventive step the Appellant considered for the first time that document R12 could also represent a suitable starting point.
- XIII. The Appellant argued in respect of Article 56 EPC in essence as follows:

On the one hand, the patent examples, as well as the absence of any explicit requirement in claim 1 that the obtained detergent powder should display a high bulk density, would demonstrate that the claimed spraydrying process could also result in compositions of conventional bulk density. On the other hand, the

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particle porosity defined in claim 1 would neither in itself represent an appreciable advantage for a detergent powder nor necessarily imply an unconventionally high bulky density. Actually, the invention examples would demonstrate the rather poor properties of the detergent powders of the invention despite of their low porosity. Hence, the achievement of this latter would not represent in itself nor imply any realistic technical advantage.

Therefore, the Opposition division had erred in identifying the technical problem addressed by the invention in that of providing spray-dried detergent powders exhibiting low particle porosity and improved powder properties.

The patented subject-matter would only represent an obvious alternative to the spray drying processes of the prior art for producing detergent powders of conventional bulk density.

At the hearing before the Board, the Appellant considered, inter alia, that the same problem had also been solved by the spray drying of slurries possibly containing sodium carbonate builder according to the process disclosed in the examples of document R12, and concluded that no inventive activity would be required from a skilled person who is searching for an alternative to this prior art in order to fully or partially replace the sodium sulphate used therein with a slightly lower amount of the sodium carbonate builder, mentioned in document R12 as a possible alternative to the sodium sulphate.

XIV. The Respondents in their written submissions in these appeal proceedings replied to the Appellant's objections under Article 56 EPC by maintaining, in essence, that only the patent in suit would have solved the technical problem of providing detergent powders containing anionic surfactants with very high bulk density, as demonstrated by the patent examples.

In particular document R12 would instead be concerned with the use of polycarboxylates as structurant for spray-dried powders to improve particle strength and contained no hint to use these chemicals to reduce the porosity of these powders and, thus, to increase their bulk density.

The remaining arguments contained in the written submissions of the Respondents in these proceedings are not relevant for the present decision, because they refer to documents different from R12 that have been used by the Appellant for disputing the presence of inventive step.

- XV. The Appellant requested that the decision of the first instance be set aside and the patent be revoked.
- XVI. The Respondents requested in writing that the appeal be dismissed and the patent maintained as granted.

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Reasons for the Decision

Preliminary considerations

1. The Board finds that the issue of reproducibility of the patented process was already res judicata in the previous decision T 378/97. Hence, the Appellant's objection under the provisions of Article 100(b) EPC is found inadmissible in the present proceedings.

No further details need to be given in this respect because of the conclusions of the Board as to the absence of inventive step for the reasons given hereinafter.

- 2. The Board concurs with the findings of the Opposition division that the patented subject-matter is not entitled to the claimed priority date. Since the Respondents have not contested these findings in these appeal proceedings and, thus, not disputed the possibility of considering document R12 in the inventive step assessment, no further reason needs to be given in this respect.
- 3. During the discussion at the oral proceedings, which took place in the announced absence of the Respondents, the Appellant considered for the first time that the prior art of document R12 could represent the suitable starting point for assessing inventive step according to the problem-solution approach.
- 3.1 Nevertheless, it is apparent from the case history that the Respondents were manifestly aware well before the date of the oral proceedings that this citation could

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turn out highly relevant in the discussion on inventive step at the hearing. This is evident not only in view of point 3.5 of the reasons of the decision under appeal that deals expressly with document R12, but also in view of the explicit consideration given to such document:

- in the Appellant's grounds of appeal (page 15, paragraphs 2 and 3),
- in the Respondents' own reply thereto (point 4.3) and
- in the communication of the Board enclosed to the summons to the hearing.

Moreover, the problem-solution approach starting from this document represents just a new line of reasoning for supporting the same inventive step objection already formulated in writing in the Appellant's grounds of appeal starting from other documents, i.e. the Respondents were already aware that in the Appellant's opinion the patented subject-matter would only represent an obvious alternative to the spray drying processes of the prior art for producing detergent powders of conventional bulk density and that such prior art encompassed the processes of document R12.

The Board wishes to stress in this respect that, although the Respondents in their written submissions in these appeal proceedings have maintained that none of the cited documents would solve the same technical problem posed in the patent in suit, they appear to have instead previously acknowledged explicitly in

their letter of 22 August 2003 (see page 6) that, in case the claimed priority date would have been considered not valid, document R12 addressed the same technical problem as the patent in suit and, thus, represented the closest prior art.

Hence, the Respondents were aware of the possibility that at the forthcoming oral proceedings the prior art disclosed in document R12 could turn out to be the most appropriate starting point for assessing inventive step. Nevertheless, they decided not to be represented at the hearing and, thus, also not to avail themselves of the opportunity to comment on novel lines of reasoning based on this prior art.

Accordingly, the Board could decide at the hearing (for the reasons indicated hereinafter) that the prior art disclosed in document R12 represented the most suitable starting point for the issue of inventiveness without violating the right to be heard of the party voluntarily absent at the hearing.

Inventive step (Article 100(a) EPC in combination with Articles 52(1) and 56 EPC): claim 1

4. This claim (see above section II of the Facts and Submissions) defines a process for producing a zero-phosphate detergent powder comprising spray-drying an aqueous slurry whose mandatory ingredients are (beside water) anionic surfactant, aluminosilicate builder, polymeric polycarboxylate and sodium carbonate. The process is characterized, inter alia, by the limited electrolyte content and particle porosity of the resulting powder, as well as, by the amounts in the

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powder of the above listed mandatory ingredients. It is undisputed that the electrolyte content therein embraces the concentration of sodium carbonate, as this latter is also an electrolyte.

As explicitly confirmed in the patent specification (see e.g. page 3, lines 3 to 5, page 5, lines 12 to 14, and examples 17 and 18), the powder directly obtained by spray drying may either be used as detergent or as base powder and, thus, further compounded (e.g. by post-dosing further powder ingredients) to form the final detergent powder.

matter is concerned with "the general technical problem of providing detergent powders containing anionic surfactants, with very high bulk density, by means of spray drying" (see page 5, lines 1 to 3 of their reply to the grounds of appeal). It is apparent that this definition reflects the reference in the patent in suit to the allegedly well-known difficulties in achieving low porosity in detergent powders based on anionic surfactants (see page 3, lines 8 to 12), as well as the more general definition of the problem underlying the invention as given in two sentences of the passage (hereinafter indicated as "the cited passage") at page 2, lines 24 to 27, of the patent description:

"We have now discovered that spray-dried zeolitebuilt powders of very high bulk density may be prepared by spray-drying slurries of defined moisture content, and low or zero levels of electrolyte." - 11 - T 1045/06

and

"The powders are characterised by exceptionally low particle porosity and excellent powder properties.".

Also the decision under appeal relies on said passage while implicitly equating "high bulk density" with "low particle porosity" (see decision under appeal, point 3.1, first and last sentence)

5.1 The Board notes preliminarily that the "excellent powder properties" mentioned in the cited passage are manifestly those further specified at page 4, lines 24 to 32, and also measured in the patent examples, i.e. flow rate, resistance to cracking, compressibility and agglomerate strength. These properties may, similarly to "high bulk density", represent evident technical advantages for the patented detergent powders.

However, the qualitative expression "low particle porosity" (or even the corresponding quantitative expression in claim 1 "particle porosity not exceeding 0.40") does not correspond to a property that the skilled person would immediately recognise as advantageous **per se**.

Indeed, even the patent in suit confirms that, as credibly argued by the Appellant, the technical advantage may rather lay in a high bulk density, which, however, does not depend only on the particle porosity and, thus, cannot be equated to this latter (compare the cited passage with the formula at the top of page 5 of the granted patent which shows the bulk density as a

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function of solids' density, particle porosity and bed porosity).

Hence, it is apparent to the skilled reader of the cited passage that only the two (qualitative) expressions "excellent powder properties" and "high bulk density" identify technical advantages of the detergent powders of the invention, whereas the "low particle porosity" also mentioned therein appears instead to represent only one of the measures required for achieving the aimed "high bulk density", i.e. a low particle porosity is part of the found solution and not of the problem addressed by the invention.

However, the fact that an evident technical relevance may be attributed to the invention advantages expressed by "excellent powder properties" and "high bulk density" does not imply that such expressions provide a clear definition of these advantages. Indeed, these expressions are qualitative, i.e. vague, and, hence, must be interpreted in view of the remaining disclosure of the patent in suit; in particular, their meaning and/or credibility must be assessed in view of the features of claim 1.

5.2 In respect of the "high bulk density" the skilled reader of the patent in suit notes, on the one hand, that the patent claims do not even mention "bulk density".

On the other hand, the patent description illustrates that the overall bulk density depends on at least another factor different from particle porosity, namely the "bed porosity", which on its turn depends on the

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particle size distribution curve (see page 4, line 54 to page 5, line 9, in combination with page 5, lines 47 to 49).

Moreover, it is an undisputed fact that the patent in suit does not even allege that the concentration of electrolyte or that of sodium carbonate defined in claim 1 ensure the achievement of a certain minimal bulk density.

Hence, it is apparent to the skilled person that neither the claim explicitly requires the detergent powders to display a bulk density higher than a certain specific minimum value, nor can any specific value for such lower limit be derived from the 40% particle porosity minimum or from the other powder features defined in claim 1.

5.2.1 The skilled reader of the patent in suit notes further that, despite the fact that at page 2, lines 21 to 23, of the patent in suit it is indicated that

"...detergent manufacturers have been attempting to prepare detergent powders of increased bulk density, for example, 600 g/litre and above as opposed to the 400-500 g/litre of current conventional powders..."

(emphasis added by the Board), the patent itself not only mentions a bulk density as low as 400 g/litre (see page 5, lines 10 to 11) for a theoretically possible embodiment of the invention, but specifically discloses two examples of the invention, wherein the bulk densities obtained for the spray-dried powders are

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respectively 455 and 497 g/litre (see examples 7 and 9 in Table IIB), i.e. well within what the patent itself has previously acknowledged as the "conventional" bulk density range.

5.2.2 Hence, the skilled reader of the patent in suit concludes that the detergent powders of the invention may also display bulk densities as low as 400 g/litre and preferably as low as 450 g/litre.

Accordingly, the vague expression "high bulk density" must be interpreted as encompassing these conventional density values.

5.3 In respect of the other vague expression "excellent powder properties", the passage of the patent description which identifies the relevant properties, i.e. page 4, lines 24 to 32, renders also evident that such properties cannot reasonably be expected over the whole claimed range.

Indeed, the patent states that the relevant powder properties deteriorate rapidly when increasing the moisture content and that this latter may "preferably" be that corresponding to a relative humidity of up to 70% (see page 4, lines 24 to 32). Hence, a severe degradation of the relevant powder properties is to be expected at least in the embodiments of the claimed process that result in detergent powders whose relative humidity is above 70%.

Nevertheless, claim 1 of the patent in suit does **not** define any upper limit for the powder moisture content.

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The Board finds therefore that, in the absence of any limitation as to the powder moisture content in claim 1, the allegation in the cited passage attributing "excellent powder properties" to the detergent powders of the invention is deprived of any credibility by the statement at page 4, lines 24 to 32, as to the moisture promoted degradation of these properties.

No further details need to be given in this respect as the Respondents themselves have not relied on the achievement of "excellent powder properties" in formulating the technical problem addressed in the patent in suit (see above point 5) in their written submissions in the present appeal.

5.4 Therefore, the Board finds that the above considerations determine the understanding of the addressed technical problem by the skilled reader of the patent in suit.

Accordingly, the technical problem underlying the invention is found to be that of providing by means of spray drying zero-phosphate detergent powders containing anionic surfactants and displaying a bulk density of at least 400 g/litre, i.e. substantially the same general problem identified by the Respondents (see above point 5) with the proviso that the vague expression "high bulk density" has been interpreted as indicated above at point 5.2.2.

6. The decision under appeal stresses at point 3.5 of the reasons that document R12 focuses explicitly on a different technical problem, namely that of overcoming

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the difficulties arising from undesirable interactions among some slurry ingredients.

This caused the Respondents to argue during the present appeal proceedings that none of the cited documents would address the same technical problem underlying the patent in suit (see page 4, point 4, of their reply to the grounds of appeal). In particular, document R12 would be concerned with the use of polycarboxylates as structurant for spray-dried powders to improve particle strength and contained no hint to use these chemicals to give higher bulk density for the powders by reducing their porosity (see page 11, fifth paragraph of the reply to the grounds of appeal).

6.1 The Board notes that this argument implies the assumption that the powders produced by the process of the invention would actually possess a bulk density superior to that of the conventional powders of the prior art.

However, this assumption appears unjustified because of the above finding that the definition of the problem underlying the invention turns out to be that of rendering available spray drying processes for producing zero-phosphate detergent powders based on anionic surfactants with **conventional** bulk densities of at least 400 g/litre.

6.2 Hence, the skilled person would have searched the starting point among the spray drying processes of the prior art already known to address such problem and, thus, would have also considered the spray drying step of the processes of document R12, as these produce low

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or zero-phosphate base powders for detergent compositions with a bulk density of preferably about 450-500 g/litre and containing anionic surfactants (see document R12, claim 1 in combination with examples 1 to 5). In particular, the examples in this citation disclose processes comprising the step of spray draying slurries comprising alkylbenzene sulphonate, zeolite, polymeric polycarboxylates and sodium sulphate (this latter being undisputedly also an electrolyte).

The Board notes, additionally, that sodium carbonate is indicated as a possible optional ingredient of the detergent powders of document R12 together with inorganic salts such as sodium sulphate (page 4, lines 46 to 47)

Therefore, the process disclosed in document R12 has not only already solved the same technical problem addressed in the patent in suit, but has also an evident compositional similarity with the patented subject-matter.

Hence, the Board concludes that the spray-drying processes disclosed in document R12 and, in particular, those exemplified therein, represent a reasonable starting point for the assessment of inventive step. This finding is also consistent with the Respondents' statement that document R12 may be considered the closest prior art in the letter of 22 August 2003 (see page 6, lines 10 to 11).

7. As the examples of this citation already solve the technical problem identified in the patent in suit, it is apparent that the patented subject-matter represents

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just an alternative to the prior art. In other words, the sole technical problem credibly solved by the patented subject matter vis-à-vis the examples of document R12 is that of rendering available **further** spray drying processes resulting in zero-phosphate detergent powders containing anionic surfactants and displaying bulk densities of at least 400 g/litre.

- in the examples of document R12 (see above point 6.2) only in that the powders produced by the process according to the patent in suit, have a more reduced amount of electrolyte not exceeding 20% by weight of the powder and contain from 2 to 20% by weight of sodium carbonate. As a matter of fact, in all the examples of R12 no sodium carbonate is present and the amount of sodium sulphate i.e. the sole electrolyte ingredient is above 20% by weight (it varies between 20.8 and 22.8% by weight of the powder). Also this finding is consistent with the Respondents' evaluation of this citation in their letter of 22 August 2003 (see page 6, lines 18 to 20).
- 8.1 Accordingly, in the present case the assessment of inventive step boils down to establishing whether or not it was obvious to solve the posed problem by modifying the composition of the slurries of the examples of document R12, e.g. in that the amount of the sodium sulphate is replaced in full or in part by a smaller amount of sodium carbonate, so that this latter ingredient accounts for from 2 to 20% by weight of the powder and that the overall electrolyte level remains within at most 20% by weight.

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8.2 For the Board, a skilled person would consider that any embodiment of the spray drying process disclosed in document R12 should reasonably produce powders having properties more or less comparable to those of the examples of document R12 and, thus, also have bulk densities more or less comparable to about 450-500 g/litre.

Hence, if the claimed subject-matter may be considered as a further embodiment of the prior art disclosed in document R12, it represents an obvious solution to the posed problem. Accordingly, the question to be answered is whether document R12 gave sufficient guidance to arrive at the claimed subject-matter.

8.3 In the present case, as already observed above, both sodium carbonate and sodium sulphate are disclosed in document R12 in the same list of optional ingredients (see above point 6.2). This evidently suggests to the skilled person that further embodiments of the process disclosed in this citation are also obtainable by replacing in full or in part the sodium sulfate optional ingredient of e.g. the examples of document R12 with an alternative optional ingredient such as sodium carbonate.

Nevertheless, the amount of sodium sulphate used in the spray drying examples of this citation (i.e. that resulting into 20.8-23.8% by weight of the powders) is higher than the amount of sodium carbonate given in present claim 1 for the carbonate ingredient (i.e. 2 to 20% by weight, based on the powder).

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The Board considers, however, that to vary the amount of the optional ingredient(s) in a prior art process example also represents a conventional measure for realizing further embodiments of such prior art, since the amount of optional ingredients are presumably not critical to any of the essential features or advantages of that process.

Accordingly, the modification of the examples of document R12 - i.e. the partial or complete replacement of the optional sodium sulfate ingredient by a smaller amount of the sodium carbonate alternative thereto - that is necessary to arrive at the patented process is just an obvious way for realizing further embodiments of the prior art process.

Hence, the Board concludes that the claimed subjectmatter provides an obvious solution to the posed problem.

8.4 In their letter of 22 August 2003, the Respondents have argued that document R12, being silent as to the function of the sodium sulphate, i.e. of substantially the sole electrolyte ingredient in the examples of this citation, would not suggest to the skilled person any reason for reducing the total amount of electrolytes to 20 or less% by weight. In particular, the Respondents have stressed (see page 6, lines 9 to 11 from the bottom of their letter of 22 August 2003) that the amount of sodium sulphate used in the examples of document R12 appears to have been chosen simply to bring the total weight up to 100%.

8.4.1 However, the absence in this citation of reasons for simultaneously modifying the kind and/or of the amount of the optional ingredient so as to arrive at the claimed subject-matter has no bearings on the self-evident fact that such modification represents one of the obvious ways for realizing further embodiments of the process of document R12 and, thus, for providing obvious solutions to the posed technical problem (see above points 8.2 and 8.3).

Nor is an inventive step necessary simply because of the possible existence of other evidently obvious ways to realize further embodiments of the prior art (such as, for instance, that of slightly increasing rather than decreasing the amount of the optional electrolytic ingredient). Indeed, even in the absence of any specific reason for preferring one or the other, the arbitrary selection of any among the obvious solutions to the posed problem requires no particular skills and, for this reason, does not involve an inventive step. Accordingly, no inventive ingenuity is required from the skilled reader of document R12 in order to realize further embodiments of the spray drying process exemplified therein by replacing an arbitrarily chosen amount of the optional sodium sulfate ingredient used in the examples by an arbitrarily chosen lower amount of the carbonate alternative thereto also disclosed therein, thereby arriving at the patented process.

Moreover, the Board notes that the molecular weight of sodium carbonate is smaller than that of sodium sulfate and, thus, equimolar amounts of these two ingredients correspond to a lower weight amount for the carbonate.

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8.5 Hence, the Board concludes that no inventive step is required from the skilled person who is searching for an alternative to the process disclosed in the examples of document R12, for arbitrarily choosing among the possible obvious modifications of the examples of document R12 that were likely to result in the production of further detergent powders with bulk densities about 450-500 g/litre, any of those resulting in the patented subject-matter.

9. Therefore, the Board concludes that the process according to claim 1 as granted represents an obvious solution to the posed technical problem and, thus, that the subject-matter of claim 1 of the patent suit does not comply with 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 G. Raths