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**Datasheet for the decision
of 26 January 2017**

Case Number: T 1341/14 - 3.3.06

Application Number: 06116782.1

Publication Number: 1867707

IPC: C11D3/06, C11D3/12, C11D3/386

Language of the proceedings: EN

Title of invention:
Detergent compositions

Patent Proprietor:
The Procter & Gamble Company

Opponents:
UNILEVER N.V. / UNILEVER PLC
Henkel AG & Co. KGaA

Headword:
Alkaline bacterial enzyme / PROCTER & GAMBLE

Relevant legal provisions:
EPC Art. 52(1), 54, 56
RPBA Art. 12(4), 13(1)

Keyword:

Inventive step : (no) unexpected cleaning performance not convincingly shown across the whole scope of claim 1 (main request and auxiliary request 2)
Admittance of auxiliary claim requests: auxiliary request 2 (yes) - auxiliary request 5 (no)

Decisions cited:

T 0023/10

Catchword:



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Case Number: T 1341/14 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 26 January 2017

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 2 April 2014
revoking European patent No. 1867707 pursuant to
Article 101(3)(b) EPC.**

Composition of the Board:

Chairman B. Czech
Members: L. Li Voti
 S. Fernández de Córdoba

Summary of Facts and Submissions

- I. The appeal is from the decision of the Opposition Division revoking the European patent no. 1 867 707.

Claim 1 as granted reads as follows:

"1. A detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity (E.C. 3.2.1.4), up to 10 wt% aluminosilicate (anhydrous basis) and/or phosphate builder, the composition having a reserve alkalinity of greater than 4."

- II. The two opponents had opposed the patent invoking *inter alia* lack of novelty and lack of inventive step (Article 100(a) EPC).

The parties had relied *inter alia* on the following evidence:

- D1:** WO 2004/053039 A2;
- D22:** E. Hoshino et al.: "Improvement of Cotton Cloth Soil Removal by Inclusion of Alkaline Cellulase from *Bacillus* sp. KSM-635 in Detergents"; Journal of Surfactants and Detergents, Vol. 3, No.3 (July 2000), pages 317 to 326;
- D26:** "Standard Deviation Analysis relating to test data submitted EPO 2 July 2010", which are labeled "2nd set of Technical data sheet for EP patent application No. 06116782.1" (hereinafter referred to by the Board as **D26'**);
- D27:** "Standard Deviation Analysis relating to test data submitted EPO 26 May 2009", which are labeled "Technical data sheet for EP patent

application No. 06116782.1" (hereinafter referred to by the Board as **D27'**);

D33: H. Bauer et al.: "The evolution of detergent builders from phosphates to zeolites to silicates"; *Tenside Surf. Det.*, 36 (1999), 4, pages 225 to 229;

D42: "Unilever EXPERIMENTAL REPORT - FURTHER EXPERIMENTAL EVIDENCE IN SUPPORT OF THE OPPOSITION AGAINST EP1867707 (Our ref:COPN7146)" by S. Batchelor; dated 5 February 2014, pages 1 to 9;

D42B: Corrected page 7 of D42;

D44: "Annex A - EP1867707B(EPA No.06116782.1) Additional Data Sheet - CM3098", pages 1 to 3 and "Annex B", pages 1 to 4 (filed by the Patent Proprietor with letter of 5 February 2014).

III. In the decision under appeal, the Opposition Division found *inter alia* that the subject-matter of claim 1 as granted lacked novelty over some of the cited prior art documents. The subject-matters of the respective claims 1 according to the then pending auxiliary requests 1 to 4 either also lacked novelty or did not involve an inventive step taking D1 as the closest prior art.

As regards the relevance of the experimental data submitted by the parties, the Opposition Division took the view (decision under appeal, page 13, penultimate paragraph, to page 15, first full paragraph) that

- ... on the balance of probabilities the data as filed by [the Patent Proprietor] during the examination phase and the statistical analysis provided as D26 and D27 are considered valid and seem to show an enhanced whitening effect for those compositions having the

lower amount of phosphate respectively zeolite for the clay type of soil.

- Regarding the data provided in D44, the [Opposition Division] is of the opinion that taking into account the standard deviation of Berger Whiteness, the results obtained for the lower amount of zeolite can not be distinguished from those obtained for the higher amount of zeolite. With respect to treating carbon black type of soils, no improvement has been shown.

...

- [The Patent Proprietor] disputed the validity of the experimental data of D42, because different test conditions have been used ... [The Patent Proprietor] further pointed out that the compositions tested by [Opponent 1] in D42 are not an exact replica of those compositions tested by [the Patent Proprietor] - they do not comprise a co-surfactant, CMC nor a silicate.

- Firstly, [the Patent Proprietor] has only alleged that the test conditions as selected by [Opponent 1] are inappropriate without showing any evidence to back-up this statement. Secondly, regarding the detergent ingredients, claim 1 actually only requires the specific enzyme to be present. Claim 1 is silent about the type of surfactant, co-surfactant, CMC and silicate.

- The [Opposition Division] therefore is of the opinion that the data provided by D42 shows that under certain conditions no effect can be seen on the whiteness of the fabric for the amount of zeolite builder.

...

- *The overall conclusion regarding the experimental data is therefore that the effect as shown by the [Patent Proprietor] can not be validly claimed over the whole scope of claim 1.*

IV. In its statement of grounds of appeal of 12 August 2014, the Appellant (Patent Proprietor) maintained that claim 1 as granted was novel and involved an inventive step. In this connection, it also referred to the newly filed further item of evidence

D42C: "Annex A: 12 August 2014", pages 1 to 4.

Nevertheless, with its statement the Appellant also filed seven sets of amended claims as auxiliary requests 1 to 7.

Amended claim 1 according to auxiliary request 5 reads as follows (additions to claim 1 as granted made apparent by the Board):

*"1. A detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity (E.C. 3.2.1.4), **one or more anti-redeposition agents, and** up to 10 wt% aluminosilicate (anhydrous basis) and/or phosphate builder, the composition having a reserve alkalinity of greater than 4, **wherein the enzyme is a polypeptide containing (i) at least one family 17 carbohydrate binding module and (ii) at least one family 28 carbohydrate binding module.**"*

V. In its reply, Respondent I (Opponent 1) maintained that the subject-matter of claim 1 as granted lacked novelty. Moreover, it argued that the subject-matter of claim 1 according to (*inter alia*) auxiliary request 5, starting from D1 as closest prior art, lacked an

inventive step. In this respect, it contested the correctness of the statistical analysis presented in D42C, invoking also the newly filed document

D46: "A Basic Course in Statistics", by G.M. Clarke et al.; second edition, 1983, page 135.

VI. In its reply to the statement of grounds, Respondent II (Opponent 2) maintained *inter alia* that the subject-matter of claim 1 according to all requests lacked novelty over D1, or at least lacked an inventive step, *inter alia* in the light of document D1, taken alone or in combination with document D33.

Embedded in its reply (pages 11 and 12), it also filed experimental data (measurements of the reserve alkalinity performed on a composition reproducing the one of D1, example IV, right column), as well as the further item of evidence

D47: Experimental report labelled "Versuchsbericht-Anti-Grey", two pages.

In a further letter dated 2 September 2015, Respondent II submitted that none of the pending auxiliary requests 1 to 7 should be admitted into the proceedings pursuant to Article 12(4) RPBA in view of their belated filing.

VII. The parties were summoned to oral proceedings. In a communication dated 1 December 2016 issued in preparation therefor, the Board expressed its provisional opinion on some of the issues raised by the parties, *inter alia* with regard to the interpretation of claim 1 and possible consequences thereof.

VIII. The Appellant reacted by filing, with letter of 20 December 2016, thirteen amended sets of claims as new auxiliary request 2 and additional auxiliary requests 8 to 19.

Claim 1 according to said new auxiliary request 2 reads as follows (amendments to claim 1 as granted made apparent by the Board):

*"1. A detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity (E.C. 3.2.1.4), ~~up to 10~~ **less than 5** wt% aluminosilicate (anhydrous basis) and/or phosphate builder, the composition having a reserve alkalinity of greater than 4, **wherein the enzyme is a polypeptide containing (i) at least one family 17 carbohydrate binding module and (ii) at least one family 28 carbohydrate binding module.**"*

IX. In a further letter dated 21 December 2016, Respondent II maintained all its previously raised objections, *inter alia* its inventive step objection based on a combination of D1 with D33, and responded also to the views expressed by the Board.

X. In a fax communication sent on 22 December 2016 the Board addressed the possible interpretation of terms contained in claim 1 as granted.

XI. The Appellant replied by letter of 16 January 2017, filing also two further sets of amended claims as auxiliary requests 20 and 21.

XII. Oral proceedings were held on 26 January 2017, in the course of which the Appellant filed documents

D46B: "A Basic Course in Statistics", by G.M. Clarke et al.; second edition, 1983, pages 135, 142 to 145, 257 to 259 and 271 and

D48: Sheet of data presentation.

Following the discussion of the claims according to the main request (patent as granted), the Appellant maintained only its pending auxiliary requests 2 and 5 and withdrew all other auxiliary requests.

XIII. Final requests

The Appellant (Patent Proprietor) requested that the decision under appeal is set aside and that the patent is maintained as granted (main request) or, in the alternative, in amended form on the basis of the claims according to either auxiliary request 2, filed by letter of 20 December 2016, or auxiliary request 5, filed by letter of 12 August 2014.

The Respondents I and II (Opponents 1 and 2) requested that the appeal be dismissed.

XIV. The arguments of the parties of relevance here can be summarised as follows:

Main request - construction of claim 1 and novelty

- According to **Respondent II** the wording of claim 1 as granted "*up to 10 wt% aluminosilicate (anhydrous basis) and/or phosphate builder*" did not correspond exactly to any wording contained in the description of the patent in suit and should be interpreted literally, as it stood.

- Taking into account the term "*or*", the wording of

claim 1 only imposed an upper limit of 10 wt% on one of the two builder types. Accordingly, the other type could be present in any amount, not subject to an upper limitation.

- Accordingly, the detergent composition described in Detergent Example IV (data in the right-hand column on pages 30 to 31) of D1 [hereinafter referred to as the **composition of D1/Ex.IVr**], having a reserve alkalinity of 14, and comprising an enzyme of the type defined in claim 1 at issue, 0 wt% phosphate builder and 15 wt% zeolite builder, displayed all the features of claim 1 as granted and was thus novelty-destroying.

- The **Appellant** submitted that the wording of claim 1 had to be interpreted in a narrower manner. It clearly emanated from the description that the total amount of strong builders like aluminosilicate and phosphate was intended to be limited to an amount not exceeding 10 wt%.

- Therefore, claim 1 as granted was novel over the composition of D1/Ex.IVr, comprising 15% zeolite.

Main request - inventive step - technical problem solved by the composition according to claim 1

- For the **Appellant** the technical problem underlying the claimed invention in the light of the closest prior art D1/Ex.IVr consisted in the provision of a further detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity and exhibiting improved or at least unexpected cleaning performance.

Such an improved/unexpected cleaning performance had

been convincingly shown by means of the experimental data D26/D26'. The alleged statistical evaluation of the experimental data of D26 contained in D42 (Analysis 2) was not reliable and it was not clear on which basis the standard deviations in D42 (Analysis 2) had been determined. Moreover, it could be derived from D46B that the statistical evaluation had not been correctly applied in D42, the difference between the Patent Proprietor's evaluation and Opponent 1's being shown graphically in D48.

Moreover, the statistical significance of the cleaning results reported for the comparative tests contained in D42/D42B was dubious since there were fundamental concerns about the methodology employed to this end in such tests. For example, no indication was given of the number of replicates on which the standard deviation for these tests was calculated. Furthermore, these tests were not meaningful since they had been carried out on compositions which were different from those tested in D26/D26' and not representative of a detergent composition as claimed in claim 1 at issue. In fact, the tested compositions did not comprise an anti-redeposition agent like CMC as those of D26/D26'.

The Appellant's repetition of some of these tests, filed as D42C, showed instead very different results, confirming that the compositions according to claim 1 provided a significantly improved performance and that the results reported in D42/D42B were unreliable.

The experimental data D44/Annex A did not comprise a statistical evaluation of the results as done according to D26/26'. However, even though they might not show any significant improved performance for the compositions of the invention, it could not either be

concluded that these tests would show the contrary, i.e. that no improvement was achieved by using a composition according to claim 1 as granted as shown in D26/D26'.

The experimental data D47 were of little relevance since they were based on a single measurement without any replicate.

Furthermore, as shown in document D22, it was to be expected that the reduction of the zeolite content in an enzymatic composition of the type of claim 1 would bring about a reduction of the cleaning performance. Therefore, the results of all experimental data confirmed that compositions as claimed exhibited an unexpected cleaning performance.

- **Respondent I** submitted instead that the statistical analysis 2 presented in D42 was more correct than that of the Appellant in D26. Moreover, the compositions tested in D42 were at least so meaningful as those of D26', since neither the data D42 nor those of D26' contained a comparison with the composition of D1/Ex.IVr. Furthermore, the comparisons contained in D42 of a composition having 5% zeolite with one having 11% zeolite, closer to the upper limit of 10% for the zeolite amount of claim 1 as granted, had more probative value than those contained in D26, which concerned a comparison of a composition comprising 2% zeolite with one having 20% zeolite. The compositions tested in D42 were also encompassed by the ambit of claim 1 as granted, which required explicitly only the presence in the detergent composition of the specific alkaline enzyme.

The experimental data of D42 were moreover meaningful,

since the same method, in particular the same number of replicates had been used as according to D27'.

Moreover, D44/Annex A clearly showed no significant effect for compositions according to claim 1 at least as regards the Berger Whiteness value.

In D42C the Appellant had retested some of the compositions of D42 having 5% zeolite. However, no comparison was provided with compositions outside the scope of the claims. Moreover, the Appellant did not use apparently the same statistical analysis of the error reported in D42 (analysis 1) which corresponded to that of D46. Therefore, no conclusion could be drawn on these results.

The alleged improved or unexpected cleaning performance had thus not been made credible across the whole ambit of claim 1 as granted. In the light of D1/Ex.IVr taken as the closest prior art, the technical problem actually solved was thus merely the provision of an alternative detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity.

- **Respondent II** submitted that the Appellant had shown, if at all, an effect with respect to the very specific composition of D26' whilst D42 clearly showed that no effect was present across the whole ambit of the claim.

Similarly, the experimental data of D47, which had been carried out under real conditions in a washing machine and not in a tergotometer like those of D26/D26' and were thus more meaningful than the tests D26/D26', showed that no improvement was achieved when comparing a composition comprising 25% zeolite with one

comprising 0% zeolite.

Document D22 concerned a very specific enzyme, different from that used according to D1. Therefore, its teaching did not represent common general knowledge and could not be extrapolated to other enzymes like that of D1.

The alleged improved or unexpected cleaning performance had thus not been made credible across the whole ambit of claim 1 as granted. In the light of D1/Ex.IVr taken as the closest prior art, the technical problem actually solved thus consisted simply in the provision of an alternative detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity.

Main request - inventive step - claim 1 - obviousness

- The **Respondents** submitted that the part of the description of D1 concerning the builder system clearly indicated that phosphate builders were less preferred because of environmental reasons and that preferred builder systems included mixtures of zeolite A or layered silicate (SKS-6) with citrate. Moreover, the description of D1 (page 17, line 22) also indicated that detergency builder salts could be comprised in amounts as low as 5% by weight.

Therefore, starting from the composition of D1/Ex.IVr, containing 15% zeolite A, 11% SKS-6 and 3% citrate, it would have been obvious for the skilled person, looking for an alternative detergent composition, to follow the explicit teaching given in the description of D1 and replace at least part of zeolite A with SKS-6 instead of zeolite A. This possibility was also expressly

suggested by document D33, illustrating the advantages generally obtainable by replacing phosphate and zeolite builders with layered silicates, which could even be used as stand-alone builder in the absence of zeolite and phosphate.

Claim 1 as granted thus lacked an inventive step.

- The **Appellant** submitted that a modification of the composition of D1/Ex.IVr would not have been an obvious choice for the skilled person, since he would have been aware that the modification of the builder system of this example, which included both zeolite A and SKS-6, could disturb the balance and the efficiency of the composition. Moreover, all the compositions exemplified in D1 contained amounts of zeolite of 15% or more. Therefore, the skilled person would not have been led by the teaching of D1 to try as an alternative a composition comprising less than 15% zeolite A.

Document D33 only showed the various advantages and disadvantages of layered silicate builders but it did not teach them explicitly as a suitable replacement for zeolite builders. Therefore, the skilled person would only have modified the composition of D1/Ex.IVr in a manner leading to a composition as claimed based on hindsight.

Claim 1 as granted thus involved an inventive step.

Auxiliary Request 2 - inventive step - claim 1

- The **Appellant** submitted that, since claim 1 at issue required that the claimed composition comprised less than 5% aluminosilicate, the only relevant experimental

data were those of D26/D26', i.e. the comparisons comprising 2% and 20% zeolite, respectively.

These data convincingly showed that a composition as claimed provided an unexpected cleaning performance.

The experimental data D44 and D47 were not relevant for the same reasons as pointed out with regard to the main request.

The technical problem underlying the invention had thus to be seen in the provision of a further detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity and having improved or unexpected cleaning performance.

The claimed subject-matter was inventive for the reasons put forward with respect to claim 1 as granted. In particular, since the prior art did not contain any suggestion that reducing the zeolite content even further, i.e. to a level of less than 5% by weight, could bring about a technical advantage, the claimed subject-matter was inventive in the light of D1.

- **Respondent I** remarked that the experimental data of D26/D26' concerned a single specific composition comprising 2% zeolite, tested under particular conditions, and could not cogently prove the existence of the alleged unexpected cleaning performance across the whole claimed range. In particular, the experimental data D42/D42B showed that across the range of compositions having from 5 to 11% zeolite no improvement was present. Therefore, it was not credible that an improvement would be obtained with a composition comprising an amount of zeolite only slightly below 5% by weight, as encompassed by the

wording of claim 1 at issue.

- **Respondent II** maintained similar arguments on the basis of the experimental data D47.

- Both **Respondents** thus submitted that since no technical improvement had been convincingly shown across the entire ambit of claim 1 at issue, the technical problem still consisted only in the provision of an alternative detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity.

For the reasons analogous to those put forward in respect of claim 1 as granted, the subject-matter of claim 1 according to auxiliary request 2 lacked an inventive step in the light document D1, taken alone or in combination with document D33.

Auxiliary request 5 - Admittance into the proceedings

- The **Appellant** submitted that the filing of this request had to be considered as a legitimate reaction to the decision under appeal, wherein the experimental data D42B, filed by Opponent 1 during the oral proceedings before the Opposition Division, had been taken into account. This request could thus not have been filed before the Opposition Division.

Moreover, unlike the compositions tested in D26/D26', the compositions tested according to D42 did not contain an anti-redeposition agent. Therefore, they were not representative of realistic detergent compositions and the results of these tests were not meaningful. The incorporation of the additional requirement concerning the presence of one or more

anti-redeposition agent as an essential feature of claim 1 was thus a reaction to the reasoning given in the decision under appeal.

Furthermore, the so-amended claim 1 was clearly allowable and its subject-matter involved an inventive step. In fact, the experimental data D42, not referring to compositions containing an anti-redeposition agent, were irrelevant and, moreover, flawed because in the absence of such a component redeposition of the cleaned soil could not be avoided. For this reason, only the experimental data of D26/D26' were relevant. The claimed invention thus showed an unexpected improvement in cleaning. Inventive step had thus to be acknowledged.

- **Respondent I** submitted that D42B had been filed during the oral proceedings before the Opposition Division because D42 comprised an error on page 7 of D42. The latter contained, however, also other relevant experimental data on pages 8 and 9, which likewise showed no improvement in a comparison of a composition comprising 5% zeolite with one comprising 11% zeolite. Therefore, a request such as present Auxiliary request 5 could have been filed already during the opposition proceedings. Moreover, during the oral proceedings before the Opposition Division, the Patent Proprietor had been given the opportunity, after a discussion of all experimental data, including D42B, and of the four auxiliary requests already pending, to file further requests. The Patent Proprietor had, however, decided not to file further requests.

Auxiliary request 5 should thus not be admitted under Article 12(4) RPBA in view of its belated filing.

- **Respondent II** submitted that such an auxiliary request could have been submitted already before the Opposition Division as a reaction to the facts and evidence already on file even before the oral proceedings. Moreover, the amended feature, i.e. the compulsory presence of one or more anti-redeposition agents, was not part of any granted dependent claim but was taken from the description, wherein anti-redeposition agents were, however, merely mentioned as optional components amongst many others, and not as a necessary component of a detergent composition according to the invention, as argued by the Appellant.

Therefore, such an amendment brought about a shift in the focus of the discussion and raised new questions which had not been discussed in the proceedings so far. This request thus could and should have been filed before the Opposition Division. Hence, it should not be admitted in the proceedings pursuant to Article 12(4) RPBA.

Both **Respondents** submitted also that claim 1 at issue was not at first sight allowable as the only composition tested in D26/D26' concerned a composition comprising CMC (carboxymethyl cellulose) as anti-redeposition agent and no evidence had been brought as regards compositions comprising other types of anti-redeposition agents. Therefore, the alleged unexpected cleaning performance could not be considered to have been shown across the whole scope of claim 1.

Therefore, this late filed request was also not allowable at first sight. Auxiliary request 5 should thus not to be admitted under Article 12(4) RPBA also for this reason.

Reasons for the Decision

Main request

1. Interpretation of claim 1

- 1.1 As acknowledged in the Board's communication the wording "*up to 10wt% of aluminosilicate (anhydrous basis) and/or phosphate builder*" in claim 1 is ambiguous and thus open to different interpretations.

For example, Respondent II maintained that the wording "*and/or*" could be interpreted as not requiring an upper limit of 10 wt% for both the aluminosilicate and phosphate builder, as submitted by the Appellant, but only imposing a maximum content of 10 wt% on **one** of the two builder types, so that claim 1 also encompassed, for instance, compositions containing no or at most 10% phosphate builder, and any (i.e. an unlimited) amount of aluminosilicate builder.

- 1.2 Due to this ambiguity in wording, claim 1 has to be interpreted to permit a meaningful comparison of the claimed subject-matter with the prior art invoked (D1) as regards novelty and inventive step.

- 1.2.1 According to established case law, the Board interprets this feature in the light of the whole content of the patent in suit, including the description. In this respect, the parties referred in particular to paragraphs [0005], [0006], [0020] and [0021] of the description of the patent in suit.

- 1.2.2 Paragraph [0005] reads as follows: "*In accordance with the present invention there is provided a detergent composition comprising ... less than 10 wt%*

*aluminosilicate (anhydrous basis) builder **and** less than 10 wt% phosphate builder ...*" (emphasis added by the Board).

This wording differs from that of claim 1 as granted and it imposes an upper limit of 10 wt% for the relative amounts of each of the aluminosilicate and phosphate builder types considered individually.

1.2.3 The following paragraph [0006] reads "*In a **preferred** aspect of the invention, the detergent compositions of the invention comprise **less than 10 wt% builders selected from** aluminosilicate (zeolite) builder **and/or** phosphate builder*" (emphasis added by the Board).

1.2.4 Paragraph [0020] reads "*In accordance with the present invention, the amount of strong **builder selected from phosphate and/or zeolite builder is no greater than 10 wt%***".

Incidentally, the Board holds that although the quoted sentence refers specifically to zeolite (and not, like claim 1, more generically to aluminosilicate builder), the person skilled in the art would understand that in the context of the patent in suit this quantitative criterion applies generically to the class of aluminosilicate builders, of which the zeolite is expressly indicated in the patent as being the typical representative (see paragraph [0020], page 6, line 33).

1.2.5 Paragraph [0021] reads "*... the compositions of the invention **may** comprise from 0 wt% **to 10wt% zeolite builder**, and 0 wt% **to 10 wt% phosphate builder**, the **total amount** of phosphate **and/or** zeolite **not exceeding 10 wt%** ...*Preferably the compositions of the invention comprise from 0 wt% to 8 wt% ... zeolite builder*".*

The following paragraph [0022] reads "*The compositions of the invention may comprise from 0 wt% to 10 wt% phosphate builder.*"

For the Board, these passages confirm once more that the compositions of the invention may comprise only up to 10% of phosphate builder, and only up to 10% of aluminosilicate builder.

1.3 In view of the repeated, express indications of an upper limit of 10% by weight for each of the two builder types (paragraph [0005] setting such limits to even less than 10% by weight), the Board concludes that in the light of the description claim 1 has to be interpreted as relating to compositions which may neither comprise more than 10% by weight of aluminosilicate builder nor more than 10% by weight of phosphate builder, contrary to the view of Respondent II.

2. Novelty

2.1 It is undisputed that the composition of **D1/ex.IVr** discloses a detergent composition comprising 0.05 wt% of an enzyme component including an endo-glucanase which is an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity (E.C. 3.2.1.4) as required according to claim 1 at issue (see D1, page 31, line 6, in combination with page 3, lines 6 to 29; and the patent in suit, page 3, lines 19 to 25, where reference is made to D1 and the enzyme disclosed therein).

2.2 The composition of D1/ex.IVr has a reserve alkalinity of 14, as measured by Respondent II (letter of 25 February 2015; page 11, last full paragraph, table bridging pages 11 and 12, and page 12, first full

paragraph). Said measurement result is not contested by the Appellant.

2.3 The composition of D1/ex.IVr contains no (0 wt%) phosphate builders but comprises 15% by weight of zeolite A (D1: page 30, line 37), i.e. of a "*hydrated sodium aluminosilicate*" (D1: page 28, line 1). It is undisputed that this corresponds to a relative amount which is higher than the upper limit of **10 wt%** aluminosilicate (anhydrous basis) prescribed by claim 1 at issue as construed by the Board.

2.4 Therefore, the Board concludes that the subject-matter of claim 1 is novel over D1 (Articles 52(1) and 54 EPC).

3. Lack of inventive step

3.1 The invention

3.1.1 The present invention relates to detergent compositions comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity (E.C. 3.2.1.4) (paragraph [0001] and claim 1 of the patent in suit) and to a washing process making use of such a composition (claim 24).

3.1.2 With respect to the prior art, it is stated in the description of the patent in suit (paragraph [0002]) that "*[r]ecently ... [e]specially alkaline endo-glucanases have been developed to suit better the use in alkaline detergent conditions.*"

3.1.3 Furthermore, it is stated in the patent in suit (paragraph [0004]) that "*[t]he problem facing the present inventors was how to maximise performance from*

this new generation of cellulases."

3.2 Closest prior art

3.2.1 It was common ground between all parties that the composition of D1/Ex.IVr represents the closest prior art for the assessment of inventive step.

3.2.2 Considering the similarities, in terms of technical issues addressed and compositions provided, the Board has no reason to take a different stance.

D1 indeed concerns the provision of a detergent composition comprising an endo-glucanase that provides "improved detergency performance" (D1: page 1, lines 2 and 3) and also explicitly addresses the need for "improved enzyme performance" (page 1, line 33). As noted above, the composition of D1/Ex.IVr only differs from the ones claimed according to the patent in that one of the aluminosilicate component is present in a higher relative amount.

3.3 Technical problem according to the Appellant

The Appellant submitted that the technical problem to be solved by the invention in the light of the closest prior art consisted in the provision of a further detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity, the composition showing improved, at least unexpected cleaning performance.

3.4 The solution

As the solution to this technical problem the patent in suit proposes the composition of claim 1 (full wording

under I, *supra*) which is characterised in particular in that it

"contains up to 10 wt% aluminosilicate (anhydrous basis) and/or phosphate builder".

3.5 Alleged success of the claimed solution

3.5.1 It is not in dispute that the patent in suit does not contain any test results qualifying the performance of a composition as claimed or of the enzyme contained therein. Neither is it in dispute that none of the experimental data filed by the parties in the course of the examination, opposition and appeal proceedings permit a direct comparison of compositions according to the invention with the composition of D1/Ex.IVr (closest prior art).

It has thus to be evaluated whether or not the experimental data on file permit to safely conclude that an improved, at least unexpected cleaning performance is obtained across the whole ambit of claim 1 at issue.

As regards the issue of inventive step, the parties also relied on evidence filed for the first time in the appeal proceedings. Considering that the filing of the new items of evidence (experimental reports D42C and D47, proof of common general knowledge D46 and D46B, arguments in graphical form, e.g. D48) was merely intended to further corroborate the respective positions of the parties and did not, as such, generate objections, the Board saw no reason for not considering them.

3.5.2 In assessing the relevance of the experimental results

on file, the Board adopts the methodology applied by the parties in writing and during oral proceedings, which essentially comprises

- identifying the improvement in cleaning performance (if any) of a composition containing the enzyme (Celluclean) compared to a corresponding composition not containing the enzyme (Control), and
- comparing the improvement (if any) determined for compositions having an aluminosilicate content according to claim 1 at issue to the improvement determined for a corresponding compositions having an aluminosilicate content outside the range prescribed by claim 1, taking also into account the statistic significance of the results.

In doing so, the Board focuses, as the parties did, on the measured L^* , b^* , R_{460} and/or Berger Whiteness values, considered to best represent a possible improvement as concerns at least whiteness of the washed samples.

Moreover, the Board accepts in the following the Appellant's stand, expressed in D26 (third full paragraph) and not contested as such, that a statistically significant improvement of one of these properties (P) is observed if the difference determined when comparing the results obtained according to two examples **(ΔP) is greater than two times the value of the corresponding standard deviation (σ)** (i.e. when $\Delta P > 2\sigma(\Delta P)$).

Even though the parties contested the respective statistical evaluations, the Board takes from their submissions that they actually applied a similar approach, in line with what is indicated in D46/D46B

(section 9.4.1), in determining the relevant $\sigma(\Delta)$, i.e. using the formula $\sigma(\Delta)=[\sigma(\text{example})^2+\sigma(\text{Control})^2]^{0.5}$ (see D42, page 2, formula). In D42C the Appellant apparently used the same formula (with typos as regards the positions of the brackets), but adapted to also take into account the number of external replicates, i.e. $\sigma(\Delta)=[(\sigma(\text{example}))^2/(\text{number of ext. replicates})+(\sigma(\text{Control}))^2/(\text{number of external replicates})]^{0.5}$.

3.5.3 The experimental data D26/D26'

i) Experimental report D26' concerns four test compositions (see table on page 1) having a reserve alkalinity greater than 4 (page 1, first line below the table):

- The "**Composition of the invention**" comprises 2% zeolite and 0.05 ppm of the alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity (E.C. 3.2.1.4) commercialised as Celluclean[®] (it is not in dispute in this respect that Celluclean[®] is representative of the endo-glucanase used in D1 and in its example IV).
- **Comparative example A** comprises also 2% zeolite but no Celluclean[®].
- **Comparative example B** comprises 20% zeolite and 0.05ppm Celluclean[®].
- **Comparative example C** comprises 20% zeolite and no Celluclean[®].

ii) The tests of D26' were carried out by washing cotton test fabrics soiled with "Newcastle Technical Centre (NTC Clay)" (page 2, lines 1 and 9). The tests were performed on 16 test fabrics (page 2, line 11). The reflectance ($L^*a^*b^*$) and Berger Whiteness values were determined before washing and after 4 cycles. The values reported in the table at the bottom of page 2

are apparently mean values of the 16 measured values.

iii) D26', however, does not contain information regarding the statistical significance of the reported values. Therefore, no sound conclusion can be drawn regarding the occurrence of the alleged improved/unexpected cleaning performance on the basis of D26' taken alone.

iv) Document D26 (see table) is a standard deviation analysis for the $L^*a^*b^*$ values reported in D26'. In this document the "Composition of the invention" of D26' is identified as **product B**, comparative example A as **product A**, comparative example B as **product D** and comparative example C as **product C**.

The relevant data of the table of D26 for the L^* and b^* values of the washed samples and their standard deviations are the following:

	<i>Data L^*</i>	<i>St.dev. L^*</i>	<i>Data b^*</i>	<i>St.dev. b^*</i>
A	94.62	0.18	-7.38	0.20
B	95.70	0.14	-9.26	0.16
C	94.02	0.18	-6.53	0.36
D	94.55	0.38	-7.94	0.33

- the ΔL^* value for **product B over product A** (composition of the invention comprising 2% zeolite vs. similar composition not comprising the enzyme) is **1.08** (95.70 - 94.62),
- whilst the ΔL^* value for **product D over product C** (composition comprising 20% zeolite and enzyme vs. a similar composition not containing enzyme) is only **0.53**

- (94.55 - 94.02);
- the Δb^* value for **product B over product A** is **1.88** (-9.26 vs. -7.38),
 - whilst the Δb^* value for **product D over product C** is of **1.41** (-7.94 vs. -6.53).

The Board accepts that, as indicated in D26 and as found in the decision under appeal (point III, *supra*), the values of ΔL^* and Δb^* determined for the comparison of products B (2% zeolite + enzyme) and A (2% zeolite, no enzyme) show a statistically significant increase in cleaning performance under the specific test conditions, whereas the same cannot be said when comparing compositions D (20% zeolite + enzyme) and C (20% zeolite, no enzyme).

v) This finding is also confirmed by Respondent I in D42 (page 2), which comprises a statistical "Analysis 2" of the data reported in D26'. This analysis confirms for the Board that, applying the criterion mentioned above to the L^* , b^* and standard deviation values indicated in the table of D26, cleaning performance of composition B is improved compared to that of composition A ($\Delta L^* = 1.08 > 2\sigma(\Delta L^*) = 0.46$; $\Delta b^* = 1.88 > 2\sigma(\Delta b^*) = 0.51$). However, the same cannot be said when comparing composition D (20% zeolite + enzyme) and C (20% zeolite, no enzyme). Although a significant improvement is shown for the b^* value ($\Delta b^* = 1.41 > 2\sigma(\Delta b^*) = 0.98$) for the latter comparison, no significant improvement is achieved in fact as regards the L^* value, representing the most relevant whiteness indicator ($\Delta L^* = 0.53 < 2\sigma(\Delta L^*) = 0.84$).

vi) Referring without much further explanations to some "error bar" graphical plots (D42, page 3, figure 2;

letter of 18 February 2015, page 7; D48) Respondent I argued repeatedly, that no significant improvement had been shown in D26 (and in other experimental tests like D42B), but it did not disprove the findings concerning compliance of certain statistical evaluations with the " $\Delta P > 2\sigma(\Delta P)$ " criterion.

vii) The Board thus comes to the same conclusion as the Opposition Division, namely that the experimental data D26/D26' show, at least under the tested conditions, a significant improvement in cleaning performance in case the composition according to claim 1 contains a relatively small amount of 2% zeolite and the enzyme in question, whereas at a higher zeolite level, the additional incorporation of the enzyme does not lead to a similar, statistically significant increase.

3.5.4 The experimental data of D42/D42B versus the experimental data of D42C

i) **D42B**, the corrected page 7 of D42, describes as "Example 2" a series of experiments carried out in the same way as "Example 1" of D42 (page 7, line 2). In these experiments, the method outlined in D27' was reproduced, comprising washing eight cotton test fabric pieces soiled with carbon black (see D42, page 4, first, fourth and fifth full paragraphs). It is thus clear that in these experiments eight replicates for each sample were measured as in the method outlined in D27' (see D42, page 4, fourth full paragraph and D27', page 2, third full paragraph and D27, first full paragraph).

The Board thus cannot agree with the Appellant's argument that D42 would not indicate the number of replicates used in the described experiments.

Therefore, in the absence of conclusive evidence/arguments to the contrary the Board has no reason to consider the statistical evaluation contained in this document to be flawed.

ii) The Appellant objected also that the tested compositions did not represent detergent compositions for the purpose of the claimed invention since they did not comprise essential components, such as an anti-redeposition agent and a chelating agent, as contained in the compositions tested according to D26'.

However, claim 1 as granted (wording under I, *supra*) only requires that the detergent composition comprises the specific enzyme and components necessary for achieving a reserve alkalinity above 4. The Board thus agrees in this respect with the finding in the decision under appeal (III, *supra*) that claim 1 at issue also unequivocally encompasses compositions of the type tested in D42/D42B.

iii) Moreover, since also the experimental data D26/D26' do not contain a direct comparison with the closest prior art composition (see 3.5.1, *supra*), the results obtained when testing the compositions according to D42/D42B (Example 2) are not considered to be less relevant than those reported in D26/D26'. For the Board, the experimental data of D42/D42B are thus technically meaningful and have to be taken into account in determining whether the alleged improvement is indeed achieved across the full ambit of claim 1 at issue.

iv) The tested compositions of D42B/Example 2 relevant for the present decision are those having a reserve alkalinity of > 4 as required by claim 1 at issue, i.e.

of 13.3 (Z3 and Z3C) and 13.2 (Z4 and Z4C), respectively (see D42B, page 7, first table). These compositions comprise either 5% zeolite A (Z3 and Z3C) or 11% zeolite A (Z4 and Z4C), and either 0.2ppm Celluclean® (Z3C and Z4C) or no Celluclean® (Z3 and Z4). **Z3C** thus represents a composition according to claim 1 at issue.

The experimental data contained in the first table include the reflectance R_{460} values of the washed samples and the standard deviation σ for these values. The statistical analysis of the results is reported in the second table of page 7 in terms

- of ΔR_{460} , i.e. the difference of the reflectance values of the composition comprising the enzyme and of a comparative composition not comprising the enzyme and

- of $2\sigma(\Delta R_{460})$, i.e. two times the corresponding standard deviation (see D42, page 2, first full paragraph).

The values determined are as follows:

	R_{460}	σ	ΔR_{460}	$2\sigma(\Delta R_{460})$
Z3	73.2	1.8		
Z3C	77.5	1.4		
Z4	77.6	1.5		
Z4C	80.5	0.8		
Z3C-Z3			4.3	4.5
Z4C-Z4			2.9	3.4

It is immediately apparent that the Appellant's criterion for statistical significance is not met,

since ΔR_{460} is not $> 2\sigma(\Delta R_{460})$ when comparing compositions Z3C and Z3 ($\Delta R_{460} = 4.3 < 2\sigma(\Delta R_{460}) = 4.5$) or Z4C and Z4 ($\Delta R_{460} = 2.9 < 2\sigma(\Delta R_{460}) = 3.4$).

Therefore, a comparison of the results observed for these two comparisons does **not** permit to conclude that the composition comprising enzyme and 5% zeolite performs **better** than the one comprising enzyme and 11% zeolite (outside claim 1 at issue).

v) According to Example 3 of D42, the same detergent compositions (Z3, Z3C, Z4, Z4C) were tested in the same way, but using as soil, instead of carbon black, 1.2g and 0.1g of Stanley Clay (see D42, page 8, first full paragraph).

The reported respective L^* values of the washed fabrics, the standard deviations σ thereof, and values of ΔL^* and $2\sigma(\Delta L^*)$ are reproduced below for the two test series carried out with, respectively, 1.2g and 0.1g soil.

1.2g	L^*	σ	ΔL^*	$2\sigma(\Delta L^*)$
Z3	90.08	0.47		
Z3C	90.54	0.44		
Z4	91.04	0.33		
Z4C	91.38	0.48		
Z3C-Z3			0.46	1.29
Z4C-Z4			0.35	1.17

0.1g	L^*	σ	ΔL^*	$2\sigma(\Delta L^*)$
Z3	96.74	0.05		
Z3C	96.85	0.08		

Z4	96.93	0.09		
Z4C	96.79	0.13		
Z3C-Z3			0.11	0.19
Z4C-Z4			-0.14	0.31

Again, applying the Appellant's criterion for statistical significance, these data show that composition Z3C (according to claim 1 at issue) cannot be considered to perform significantly better than the composition not in accordance with claim 1 at issue, Z4C (11% zeolite).

Similar conclusions can be drawn from the measured b* values.

vi) For the Board, the data of Example 4 of D42 (page 9) are less relevant since they do not permit a comparison of compositions comprising enzyme and zeolite differing only in terms of their zeolite content. Instead, the compositions compared also differ in terms of their respective sodium carbonate content (see page 9, first full paragraph and first table), which cannot be excluded to have an effect on the final performance of the compositions.

vii) "Example 1" and "Example 2" of **D42C**, filed by the Appellant, are supposed to correspond to the experiments of D42/D42B, example 2 and example 3 (with 1.2g Stanley Clay as soil), concerning compositions Z3 and Z3C (composition according to claim 1), but with a different number of replicates (2 "external" and 10 "internal").

These tests appear to show a (statistically significant) higher cleaning performance in terms of

ΔR_{460} (Example 1, page 2, bottom table and last two paragraphs) or Δb^* (Example 2, page 3, bottom table and last two paragraphs) of composition Z3C according to claim 1 at issue (comprising 5% Zeolite and enzyme), as compared to composition Z3 (comprising no enzyme). In particular, the σ values indicated were apparently obtained by application of the formula (corrected for typos) indicated on page 1 of D42C:

$$\sigma(\Delta) = [(\sigma(\text{example}))^2 / (\text{number of ext. replicates}) + (\sigma(\text{Control}))^2 / (\text{number of external replicates})]^{0.5}.$$

However, the tests of D42C do not provide a comparison with compositions comprising 11% zeolite (outside claim 1) as carried out in D42/D42B.

Therefore, it cannot be determined whether the observed increased cleaning performance of composition Z3C would differ significantly from an increase in cleaning performance possibly obtained with a composition comprising 11% zeolite (outside claim 1) and enzyme (e.g. Z4C vs. Z4), i.e. whether an improvement in cleaning performance is attributable to a reduction of the zeolite content from 11% down to 5%.

For the Board, absent a cogent demonstration that the approach adopted in D42B is wrong either in terms of the experimental methodology used or the statistical evaluation of the results, the experimental data of D42C do not justify overruling the conclusion drawn by the Opposition Division that the results of D42B do not show that an improvement is attributable to a reduction of the zeolite content.

viii) The Board thus concludes that the experimental data in D42/D42B indeed show (points (ii) and (iii)) that the alleged improved/unexpected cleaning

performance shown in D26/D26' is **not** achieved throughout the ambit of claim 1.

3.5.5 The experimental data of D44/Annex A

D44/Annex A contains another set of experiments carried out with essentially the **same compositions as tested according to D26/D26'** (see D44/Annex A, table of page 1; D26', table of page 1; and point 3.5.3, *supra*). The tests of D44/Annex A (page 1, last full paragraph and page 2, second full paragraph) were carried out on eight replicates by washing cotton test fabrics and using carbon black as a soil. L*, a*, b* and Berger Whiteness were measured (see table of page 2).

As conceded by the Appellant during oral proceedings, the experimental data D44/Annex A do not comprise a statistical evaluation of the measured L*, a*, b* values as done according to D26/26'. In fact, standard deviations are only indicated for the Berger Whiteness (**BW**) values, as follows:

Test composition	BW	Std dev BW
Invention: enzyme + 2% zeolite	141.60	1.088
Comp. ex. A: 2% zeolite, no enzyme	130.20	0.164
Comp. ex. B: 20% zeolite + enzyme	139.80	3.777
Comp. ex. C: 20% zeolite, no enzyme	131.70	2.928

The increment in Berger Whiteness for the composition of the invention comprising 2% zeolite vs. comparative composition A not comprising the enzyme is found to be **11.40** (141.60 - 130.20) whilst that increment is found

to be **7.50** (139.20 - 131.70) for comparative composition B (comprising 20% zeolite and enzyme) vs. comparative composition C (comprising 20% zeolite but no enzyme).

As found in the decision under appeal (III, *supra*), these data do not appear to show a significant difference in terms of an improvement of BW between compositions comprising lower and higher amounts of zeolite. This would appear to be confirmed applying the formula(s) put forward by the parties to a comparison of the BW data for the composition according to the invention and composition B.

The Appellant conceded during oral proceedings that even though these data might not show a significant improved performance for the compositions of the invention with respect to a composition outside claim 1, they would certainly not deprive the results shown in D26/D26' of their probative force.

In any case, for the Board, the data of D44/Annex A, concerning a composition substantially identical to that tested in D26/D26', do not provide any additional information concerning the improved/ unexpected level of cleaning performance of the composition of the invention tested in D26/D26'.

3.5.6 The experimental data of D47

These data are based on a single measurement, apparently without any replicate (see page 1, "repetition: 1"). Since the statistical significance of the measured values cannot properly be evaluated, these data are not further considered in this decision.

3.5.7 Other experimental data (phosphate containing compositions)

Since the closest prior art composition does not contain phosphate builders (2.3, *supra*), experimental data which concern compositions containing phosphate builders but no zeolite builder, such as those contained for example in D27/D27', D42 (page 2) and D44/Annex B), are not relevant in the evaluation of the relative cleaning performance of compositions (encompassed by claim 1 at issue) comprising zeolite (aluminium silicate) and enzyme but no phosphate, and need not to be considered in this decision (i.e. in the assessment of the obviousness of compositions containing no phosphate builder, *infra*).

3.5.8 Document D22

i) The Appellant also argued that D22 and, in particular, figure 8/A thereof, showed that in a detergent composition comprising alkaline cellulase and zeolite A, a reduction of the amount of zeolite builder brought about a **reduction** in cleaning performance. Hence, even if the experimental data on file were not considered to prove consistently an improved cleaning performance, the cleaning performance shown throughout the tests was at least unexpected.

ii) The Board remarks that the teaching of D22 concerns the behaviour of detergent compositions comprising

- an amount of, specifically, zeolite A varying between about 21 to about 42 wt% and
- an amount of a specific alkaline cellulase from *Bacillus* sp. KSM-635 (page 317, abstract).

This alkaline cellulase falls under the definition given in claim 1 at issue (see patent in suit, paragraph [0011], sixth row of the table; and page 5, lines 21 to 53), but it is different from that contained in the composition of D1/Ex.IVr.

For the Board, the specific teaching of D22/Figure 8A is neither part of common general knowledge and may not simply be generalised so as to be considered to be applicable to all kinds of detergent compositions comprising amounts of zeolite and endoglucanases as specified in claim 1 at issue. Therefore, the Board holds that the person skilled in the art aware of D22 would thus not necessarily expect that a detergent composition comprising a different alkaline cellulase (e.g. Celluclean®) at substantially lower levels of zeolite builder, but without any limitations (except for phosphate builder) being imposed as regards the presence and amounts of other, e.g. builder components, will always display an unexpected cleaning performance. Moreover, no evidence was brought that these two cellulases would behave similarly as regards the cleaning performance of a composition including them.

- 3.5.9 Based on the above considerations, the Board holds that the experimental data on file do not permit to conclude that a cleaning performance which is improved compared to the one of the composition of D1/EX.IVr, or at least unexpectedly high, is consistently attained (i.e. across the full ambit of claim 1 at issue) when using cleaning compositions falling within the ambit of claim 1, i.e. containing an enzyme as specified and not more than 10 wt% zeolite.

3.6 Reformulation of the technical problem

Therefore, the technical problem has to be reformulated in less ambitious terms. It can thus be seen in the mere provision of a further detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity.

3.7 Success of the claimed solution

Considering the information provided in the description of the patent in suit, it is plausible that this less ambitious technical problem is indeed successfully solved by the compositions according to claim 1 at issue. This was not in dispute.

3.8 Obviousness of the solution

3.8.1 It remains to be evaluated whether it would have been obvious to the skilled person seeking to solve the technical problem posed, to modify the composition of D1/Ex.IVr such as to arrive at a composition falling within the ambit of claim 1, i.e. by reducing the amount of zeolite contained therein without adding substantial amounts of phosphate builder.

3.8.2 As regards the builder system to be used in the enzymatic detergent compositions taught, D1 (page 16, line 4) explicitly qualifies phosphate builders as being less preferred for obvious environmental reasons. In fact, none of the compositions exemplified in D1 contains a phosphate builder.

Therefore, D1 does certainly not induce the skilled person to replace, not even in part, the zeolite A

contained in the composition of D1/Ex.IVr with a phosphate builder.

- 3.8.3 Instead, as regards preferred builder systems, D1 suggests explicitly (page 17, lines 1 to 3; emphasis added) the use of "a mixture of a water-insoluble aluminosilicate builder such as zeolite A **or** of a layered silicate (SKS-6), and a water-soluble carboxylate chelating agent such as citric acid".

The composition of D1/Ex.IVr contains the following builder components: 15% by weight zeolite A, 11% by weight SKS-6 and 3% citrate, a water-soluble carboxylate chelating agent.

- 3.8.4 Therefore, the Board holds that in the light of the full disclosure of D1 regarding preferred builder systems, it would have been one among many equally obvious solutions readily available to the person skilled in the art seeking to solve the technical problem posed, to provide an alternative composition by replacing, in the composition of D1/Ex.IVr, a substantial amount of the zeolite A component by an additional amount of SKS-6, the latter being explicitly suggested as alternative builder system component in the description of D1.

- 3.8.5 The Appellant argued that the person skilled in the art, noting that all the compositions exemplified in D1 contained at least 15% zeolite A, would have been reluctant to modify the builder system of the composition of D1/Ex.IVr. In particular the person skilled in the art would have expected that a reduction of the zeolite content of this composition comprising 15% zeolite A and 11% SKS-6 would disturb the balanced properties and efficiency of the composition.

Therefore, the skilled person would not have modified such a composition in this manner and could only have arrived at the claimed invention based on hindsight considerations.

3.8.6 These arguments do not convince the Board considering the explicit general teaching in D1 to use SKS-6 **or** zeolite in a builder system in combination with a polycarboxylic chelating agent. Therefore, the person skilled in the art would not expect drawbacks resulting from replacing a substantial part of the zeolite A component with SKS-6 in the composition of D1/Ex.IVr.

3.8.7 Moreover, the suitability of SKS-6 as a replacement for zeolite A builders was common general knowledge at the filing date of the patent in suit. This is apparent from review-type document D33 setting out the advantages and disadvantages of phosphate, zeolite and SKS-6 builders, and of their behaviour in detergent compositions (see D33, page 226, right column, section "Primary builder function", to page 228, left column, first three lines, and page 229, figure 11). Moreover, figure 8 of D33 illustrates a "formulation B" comprising only SKS-6 and no zeolite or phosphate as main builder component (and 5% co-builder). Moreover, in the part of this document entitled "Outlook" (page 228, right column to page 229, left column) the following is stated: *"With its ability to supply alkalinity, SKS-6 has advantages compared with phosphate or zeolite. The same holds true for its beneficial effect on the bleach system and heavy-metal-binding capability ... In terms of surfactant loading and detergent compactness, SKS-6 has additional advantages. With regard to ecological concerns, zeolite and SKS-6 have obvious advantages because they are designed to be phosphate substitutes. ... For more*

*ecologically sensitive areas and/or applications, layered disilicate SKS-6 is a good alternative to sodium triphosphate. It is also a **universal stand-alone builder.**"*

From the above the Board concludes that the skilled person was well aware that SKS-6 was a very suitable replacement for both phosphate and zeolite builder components.

D33 thus further confirms that at the effective filing date of the patent in suit it was highly obvious for the person skilled in the art seeking to provide an alternative to the detergent composition of D1/Ex.IVr to follow the explicit teaching of D1.

3.8.8 By accordingly replacing a substantial part of the zeolite A contained in said composition with a corresponding, effective amount of SKS-6, he/she would arrive, without ingenuity, at a composition containing no phosphate builder and an amount of less than 10% by weight of an aluminosilicate (anhydrous basis) builder falling within the ambit of claim 1 at issue.

3.8.9 Therefore, the subject-matter of claim 1 as granted does not involve an inventive step (Articles 52(1) and 56 EPC).

4. Consequently, the Appellant's main request is not allowable.

Auxiliary request 2

5. Admittance of auxiliary request 2

5.1 This request filed in the course of the appeal

proceedings does not correspond to any of the requests filed before the Opposition Division. However, at the oral proceedings the Respondents did not object to its admittance.

5.2 Claim 1 according to this request is based on a combination of claims 3 (alternative "and") and 15 as granted.

5.3 Therefore, the Board saw no reason for not admitting this request into the proceedings (Article 13(1) RPBA).

6. Lack of inventive step - claim 1

6.1 The invention as defined in claim 1

Claim 1 according to auxiliary request 2 (VIII, *supra*) differs from claim 1 as granted in that it additionally requires that the composition may only comprise

"less than 5 wt% the amount of aluminosilicate (anhydrous basis) and/or phosphate builder" (emphasis added)

and restricts the endo-glucanase enzyme used to be

"a polypeptide containing (i) at least one family 17 carbohydrate binding module and (ii) at least one family 28 carbohydrate binding module".

6.2 Closest prior art

6.2.1 It was common ground between the parties that the composition described in D1/Ex.IVr, also represents the closest prior art with respect to the subject-matter of the so-amended claim 1, and the Board has no reason to

take another stance.

In this respect it was common ground between the parties that the endo-glucanase used according to D1/Ex.IVr, commercialised as Celluclean[®], is a polypeptide containing (i) at least one family 17 carbohydrate binding module and (ii) at least one family 28 carbohydrate binding module.

6.2.2 The subject-matter of claim 1 thus only differs from the closest prior art, i.e. the composition of D1/Ex.IVr, in terms of the lower amount of aluminosilicate (anhydrous basis) builder component that may be present.

6.3 Technical problem solved according to the Appellant

The Appellant submitted that with regard to the more limited subject-matter of claim 1 at issue the technical problem solved had to be seen in the provision of a further detergent composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity showing improved, at least unexpected cleaning performance.

6.4 Solution

As the solution to this technical problem, the patent in suit proposes the composition according to claim 1 at issue, which is characterised in particular in that it may only comprise "**less than 5 wt%** aluminosilicate (anhydrous basis) builder" component.

6.5 Alleged success of the solution

6.5.1 According to the Appellant, the only relevant

experimental data relating to such more limited subject-matter were those presented in D26/D26', i.e. the comparison of a composition comprising 2% zeolite with one comprising 20% zeolite showing the significantly better performance of a composition according to claim 1.

The experimental data submitted by the adverse parties were, instead, not relevant since they did not concern compositions falling within the ambit of claim 1 at issue (D42/D42B) or were of little probative force (D47).

6.5.2 As already indicated under point 3.5.1, *supra*, none of the parties submitted experimental data permitting a direct comparison of a composition as claimed with a composition representing the closest prior art (D1/Ex.IVr). All the experimental data submitted concern, however, detergent compositions comprising Celluclean[®], i.e. comprising a specific enzyme as defined in claim 1 issue. Therefore, these data may be considered in determining the technical problem actually solved.

6.5.3 The Board accepts (see 3.5.3, *supra*) that the experimental data of D26/D26' show (at least under the test conditions indicated), a significantly improved cleaning performance of a composition according to claim 1 containing 2% zeolite, which is not achieved using a similar composition containing 20% zeolite.

However, the experimental data D26/D26' only concern a single, specific composition, tested using only one specific type of clay soil. More particularly, no experimental data were submitted showing that a similarly high cleaning performance is achieved with further comparative compositions containing up to "less

than 5 wt%" zeolite, as also covered by claim 1 at issue.

Furthermore, as already exposed with respect to the main request (3.5.4 (iv), (v), (viii), *supra*), the experimental data D42/D42B show, instead, that compositions comprising the enzyme and **5% by weight** zeolite, i.e. an amount of zeolite at (but just above) the upper limit of the range defined in claim 1 at issue, do **not** necessarily display a significant improvement in cleaning performance compared to compositions comprising 11% zeolite, i.e. a relative amount substantially lower than the one (20%) used in the comparative compositions tested according to D26/D26'.

The Board thus holds that the experimental data of D42/D42B have a stronger probative value than those of D26/D26' as regards the non-occurrence of the alleged advantageous effect for the range of conceivable compositions comprising a relative amount of zeolite close to the upper limit of 5% by weight defined in claim 1.

6.5.4 Therefore, the Board is not convinced that an improved or at least unexpected cleaning performance, as shown for the specific composition of D26/D26' under specific conditions, is actually obtained across the full range of compositions falling within the ambit of claim 1 at issue.

6.6 Reformulated technical problem actually solved

6.6.1 In view of the above finding, the technical problem has to be reformulated in less ambitious terms. It thus can be seen in the provision of a further detergent

composition comprising an alkaline bacterial enzyme exhibiting endo-beta-1,4-glucanase activity.

6.6.2 Considering the information given in description of the patent in suit, the Board is satisfied that this less ambitious technical problem is indeed successfully solved by compositions according to claim 1 at issue. This is not in dispute.

6.7 Obviousness of the solution

6.7.1 As exposed above (3.8.3, 3.8.4, 3.8.6 and 3.8.7, *supra*), D1 taken alone already suggests the possibility of replacing the zeolite builder with layered silicate SKS-6, and the advantages of SKS-6 potentially to be obtained in this context were known to the person skilled in the art as apparent from document D33.

6.7.2 Therefore, the skilled person looking for an alternative to the detergent composition of D1/Ex.IVr would have envisaged following the explicit teaching of D1, i.e. replacing to a large extent the zeolite A component thereof with a corresponding, effective amount of SKS-6, thereby arriving without ingenuity at a composition not containing phosphate builder and comprising less than 5% by weight aluminosilicate (anhydrous basis) builder.

6.8 In the Board's judgement, the subject-matter of claim 1 at issue does not, therefore, involve an inventive step (Articles 52(1) and 56 EPC).

7. Auxiliary request 2 is thus not allowable either.

Auxiliary request 5 - Non-admittance into the proceedings

8. The set of amended claims according to auxiliary request 5, filed for the first time with the statement of grounds of appeal, differs from all the sets of claims filed before the Opposition Division. The Respondents objected to its admittance into the proceedings.
- 8.1 Claim 1 according to this request (full wording under IV, *supra*) differs from claim 1 according to the main request in that it additionally requires that the claimed composition must comprise "*one or more anti-redeposition agents*" (feature taken from the description, paragraph [0086] of the patent in suit) and that the alkaline enzyme to be used is limited to the one specified in claim 1 according to auxiliary request 2 (6.1, *supra*).
- 8.2 The Appellant argued that this request had to be admitted since its filing was a legitimate reaction to the late filing of the experimental data D42B during the oral proceedings before the Opposition Division. The necessity of filing such a request had only become clear once it became apparent that in taking its decision the Opposition Division had also considered relevant the experimental data D42B. Accordingly, claim 1 of Auxiliary request 5 had been formulated to additionally require the presence of one or more anti-redeposition agents in the claimed composition, i.e. of a component comprised in the compositions tested according to D26/D26' but not in those tested according to D42B.
- 8.2.1 The Board observes that D42B is nothing more than a corrected version of page 7 ("Example 2") of document

D42. In "Example 2" according to D42B, only the determined R_{460} and σ values (in the first table) were corrected, the relevant ΔR_{460} and $2\sigma(\Delta R_{460})$ values reported, as well as the conclusions drawn from the latter, were however left unchanged.

D42 had, moreover, already been filed one month before the day of the oral proceedings before the Opposition Division. Furthermore, the relevant arguments given in the decision under appeal (page 14, first four full paragraphs) are not only based on page 7 ("Example 2") of D42B, but also on other parts of D42 concerning (see "Example 3") tests performed using the same detergent composition as according to D42B ("Example 2") (see 3.5.4 (iii), *supra*).

- 8.2.2 Last not least, the experimental data of D42, concerning also compositions different from those tested by the Appellant in D26/D26', were controversially debated during the oral proceedings before the Opposition Division (see point 20 of the minutes of oral proceedings).
- 8.2.3 The Boards thus holds that the Appellant, aware of the experimental data D42 and conclusions drawn therein, had every reason to file, as a precautionary measure, an amended claim request addressing the issues in question at the latest during the oral proceedings before the Opposition Division.
- 8.3 The Board remarks also that at the oral proceedings before the Opposition Division (point 36 of the minutes), after the discussion of all pending claim requests, the Patent Proprietor had been expressly given the opportunity to file further requests, but deliberately chose not to do so (point 37 of the minutes).

8.4 The Board thus holds that for these reasons alone a set of claims like the one according to Auxiliary request 5 could and should already have been filed before the Opposition Division.

8.5 For the sake of completeness, the Board also observes the following.

8.5.1 The patent in suit is silent about the possible importance of the presence of an anti-redeposition agent in the detergent compositions of the invention. These agents are mentioned as preferred but optional adjuncts (patent in suit, page 14, line 53, paragraph [0086]), but only as one amongst many other preferred optional adjuncts.

For the Board, the filing of the claim request amended by the incorporation of said features taken from the description thus amounts to shifting the focus of the debate on inventive step, in the appeal proceedings, to aspects not discussed previously, a course of action to be avoided according to the case law of the boards (see, for example, decision T 23/10 of 18 January 2011, point 2.8 of the reasons).

8.5.2 Finally, as also argued by the Respondents, it is not immediately apparent that the amended claims according to the request at issue could overcome the pending inventive step objections. More particularly, a possible unexpected impact attributable to the presence of any kind of anti-redeposition agent did not appear prima facie to be derivable from the experimental data on file. In this respect it is, for instance, noted that claim 1 of Auxiliary request 5 still does not require the presence of some of the other components also comprised in the compositions tested according to

D26/D26', such as co-surfactant and silicate.

8.6 Taking into account all the above aspects, the Board, in the exercise of its discretion under Article 12(4) RPBA, decided not to admit Auxiliary request 5 into the proceedings.

Conclusion

9. None of the Appellant's requests is both admissible and allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Magliano

B. Czech

Decision electronically authenticated