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**Datasheet for the decision
of 28 March 2013**

Case Number: T 0975/10 - 3.3.06

Application Number: 03761708.1

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Title of invention:
-

Patent Proprietor:
Reckitt Benckiser N.V.

Opponent:
Henkel AG & Co. KGaA

Headword:
Detergent composition/RECKITT BENCKISER N.V.

Relevant legal provisions (EPC 1973):
EPC Art. 56

Keyword:
"Inventive step (no) - all claim requests - obvious solution"

Decisions cited:
-

Catchword:
-



Case Number: T 0975/10 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 28 March 2013

Appellant: Reckitt Benckiser N.V.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 1 March 2010
revoking European patent No. 1521819 pursuant
to Article 101(3) (b) EPC.

Composition of the Board:

Chairman: P.-P. Bracke
Members: G. Santavicca
U. Tronser

Summary of Facts and Submissions

- I. The appeal by the patent proprietor lies from a decision of the Opposition Division revoking European patent N° 1 521 819, granted on European application N° 03 761 708.1 (published as WO 04/003123).
- II. The patent in suit had been opposed in its entirety on the grounds that its claimed subject-matter was not novel and did not involve an inventive step (Article 100(a) EPC 1973).
- III. The decision under appeal was based on the patent as amended according to the Main and First Auxiliary Requests, both submitted with letter of 30 December 2009, Claim 1 of the Main Request reading as follows: "1. An aqueous boron-free detergent gel composition comprising an enzyme and a stabilising amount of an organic water-miscible solvent, wherein the composition comprises between 5 to 65% by weight of water with at least 70% by weight of the remainder of the composition comprising a water soluble ionic salt, and wherein the non-aqueous portion of the composition has a salt content of at least 80 % by weight."
- IV. In the decision under appeal, it was *inter alia* held that:
- (a) As to novelty, the boron-free dishwasher detergent of D1 (WO 00/29533) was likely to be in form of aqueous gel (a thickener component was present) and comprised an enzyme. However, the salt content of its non-aqueous portion was 72 wt.%, which was less than the minimum non-aqueous portion salt

content of 80 wt.% defined in Claim 1. Therefore, the claimed subject-matter was novel.

- (b) As to inventive step, the closest prior art was disclosed by D1, in particular its Example E3, which pertained to the same technical field of the patent in suit and addressed the problem of enzyme stability. According to the patent in suit the problem to be solved was the need to increase the stability of the enzymes in detergent systems. However, the patent in suit did not contain comparative examples showing whether any technical effect was attained over D1, in particular because compositions differing only by the salt content were not compared with each other. In the absence of a proven technical effect, the skilled person would obviously consider an increase of the salt content from 72 wt.% to at least 80 wt.% as one of the several straightforward possibilities which he might implement without exercising inventive step.
- (c) As regards the First Auxiliary Request, Claim 1 included the additional features of Claim 2 according to the Main Request, namely "and further wherein the enzyme is at least partially encapsulated within water-soluble particles, the particles comprising a water-soluble encapsulating agent, wherein the particles have a migration speed in the gel of less than one centimetre per month". D1, which still described the closest prior art, implicitly disclosed water-soluble encapsulating agents for the enzymes. Also, the migration speed defined in Claim 1 was a result to be achieved rather than a technical feature, which was intrinsically present when all other features of Claim 1 were present. So the only

distinguishing feature was still the salt content, as for the Main Request. Thus, the claimed subject-matter of the First Auxiliary Request too lacked an inventive step, for the reasons as given for the Main Request.

- V. In their statement setting out the grounds of appeal, the patent proprietor (appellant) maintained the Main Request underlying the decision under appeal (Point III, *supra*) and submitted two new Auxiliary Requests.

Compared to Claim 1 of the Main Request, Claim 1 of the First Auxiliary Request contains the following additional features:

"and further wherein the enzyme is encapsulated within water-soluble particles, the particles comprising a water-soluble encapsulating agent, wherein the particles have a migration speed in the gel of less than one centimetre per month, and wherein the composition has a viscosity greater than 4,000 mPas".

Compared to Claim 1 of the First Auxiliary Request, in Claim 1 of the Second Auxiliary Request the feature "and wherein the composition has a viscosity greater than 4,000 mPas" has been replaced by the feature "and the gel and particles have a difference in density of no greater than 0.9 g/cm³".

As to the appellant's requests see item IX.

- VI. Oral proceedings were held on 28 March 2013, in the announced absence of the duly summoned appellant.

VII. The arguments submitted in writing by the appellant can be summarised as follows:

Main Request

Closest prior art

- (a) The closest prior art was described by D1, which mentioned storage stability and enzymes stabilized by substances that prevented their loss of activity. The closest embodiment was illustrated by Example E3 of D1, which concerned a boron-free composition comprising enzyme, propanediol-1,2 and 72 wt% in total of potassium salts (triphosphate, carbonate and silicate) in the non-aqueous portion of the composition. As 1 wt% Carbopol thickener was used in Example E3 of D1, it could be assumed that the composition was in gel form. The difference between the composition of Claim 1 and that of Example E3 of D1 was the at least 80 wt% salt content of the non-aqueous portion (in Example E3 it was 72 wt%).

Problem solved over the closest prior art

- (b) A salt content of the non-aqueous portion of at least 80 wt% provided a technical difference over Example E3 of D1, which was apparent from the examples of the patent in suit. Example 1 illustrated a gel composition comprising protease and amylase enzymes, the non-aqueous portion of which had a salt content of 86 %wt, which was in accordance with Claim 1 of the Main Request. From Table II, which showed the enzyme stability of the

protease and the amylase solution exhibited by the composition of Example 1 after storage for 12 weeks at 20°C, 30°C and 40°C, good results were apparent for the stability of the enzymes at all of the storage temperatures. Compositions A' and B' in Example 3 contained over 90 %wt of salt in the non-aqueous phase but did not contain either enzyme or an organic water-miscible solvent respectively. Without the presence of one of these two ingredients, in combination with the claimed salt content in the non-aqueous phase, the overall cleaning performance of the examples was less than that of Example 1 (which was according to the invention). If protease, amylase and the water miscible solvent were absent from the formulation (as in Ex A'), the cleaning performance fell to well below that of Example 1. The addition of enzymes, as in Composition B', improved the overall cleaning performance, which however did not reach the value for Example 1. Since the experimental results in the patent in suit showed an improvement in enzyme stability and its resultant good cleaning performance, which was attained by the combination of the claimed features, the technical problem solved was to provide good enzyme stability and good cleaning performance in aqueous based detergent gels.

Non obviousness of the solution

- (c) The only teaching given in D1 regarding enzyme stability was a recitation of different materials allegedly aiding enzyme stability. Starting from Example E3 of D1, in order to solve the technical

problem, the person skilled in the art was in no way taught that the salt content in the non-aqueous phase should be increased from 72 %wt to up to at least 80 %wt. D1 gave no hint that doing so would help the stability of the enzyme. Certainly D1 in no way suggested to the skilled person to raise the salt concentration by more than 10 % of the amount present in Example E3 (based on the amount present in Example E3) in order to aid the enzyme stability. An increase of the concentration of an ingredient by more than 10 %wt of its original level would not be considered by a person skilled in the art as being a slight increase, contrary to what was stated in the decision under appeal. So the subject-matter of Claim 1 was not obvious over D1.

First Auxiliary Request

Inventive step

- (a) D1 was still the closest prior art document, for the reasons given for the Main Request.
- (b) The additional technical differences of Claim 1 of the First Auxiliary Request (from Claim 1 of the Main Request) led to an improved stability of the enzymes in the gel compositions. So the particles remained evenly distributed throughout the gel compositions during storage and the user had greater confidence in dispensing a portion of the gel containing the correct level of enzymes. So the problem solved was to provide detergent gel with good stability of the enzyme upon storage whilst

also providing that the enzyme remained evenly dispersed throughout the gel upon storage.

- (c) Example E3 of D1 illustrated liquid enzyme preparations but did not specifically disclose if the enzymes in those liquid preparations were encapsulated. Page 14 paragraph 1 of D1 disclosed that the enzymes might be used in fluid form (as in Example E3) or as a heterogeneous slurry or in micro-encapsulated structure. So it was not certain that the enzymes used in example E3 of D1 were encapsulated. Hence, starting from D1, and seeking to solve the objective technical problem formulated above, there was no teaching given to the person skilled in the art to incorporate the additional features recited above. Indeed D1 gave no teaching to the person skilled in the art that it was in any way advantageous to control the viscosity of the gel to be greater than 4,000 mPas in order to control the distribution of the enzyme throughout the gel and to do that in combination with the encapsulated enzyme. Consequently, Claim 1 of the First Auxiliary Request was not obvious over D1 and involved an inventive step.

Second Auxiliary Request

Inventive step

- (a) D1 was still the closest prior art document. The additional technical differences of Claim 1 of the Second Auxiliary Request over Claim 1 of the Main Request had the same technical effect as set out for the First Auxiliary Request, so that the same

objective technical problem could be formulated. The comments on the form of the enzyme preparations used in Example E3 of D1 given for the First Auxiliary Request applied equally here. Starting from D1 in order to solve the objective technical problem, D1 gave no teaching to the person skilled in the art that it was in any way advantageous to carefully control the density of the gel and the particles so that they have a difference in density of no greater than 0.9 g/cm^3 , in order to control the distribution of the enzyme throughout the gel and to do that in combination with encapsulated enzymes. Therefore, Claim 1 was not obvious over D1 and involved an inventive step.

VIII. The respondent essentially argued as follows:

Main Request

Closest prior art

- (a) The closest prior art was disclosed by D1, e.g. the composition illustrated in Example E3 and detailed in Table I thereof, containing 1 %wt of Carbopol ETD 2691, thus in gel form. The composition of Claim 1 was distinguished therefrom by the salt content of its non-aqueous portion (>80 %wt in Claim 1 versus 72 %wt in Example E3 of D1).

Problem solved over the closest prior art

- (b) With reference to the results of Examples 1 and 3 of the patent in suit, the appellant was trying to show the presence of a technical effect due to the

salt content of more than 80 %wt of the non-aqueous portion of the illustrated composition. However, Table II of Example 1 of the patent in suit merely summarised the stability values for one or two amylases and one protease tested in a formulation, which had always the same salt content. No effect linking ionic strength and enzyme stability had thereby been shown. As concerns Compositions A' and B' of Example 3 of the patent in suit, apart from a salt content of the non-aqueous portion of more than 80 %wt, they were very much different, i.e. not comparable with that of Example 1 of the patent in suit. Hence, the results invoked showed, if any, that washing performance, if comparable, did not depend on the ionic strength but on the content of enzymes such as amylases and proteases, which was a known fact. Since formulations with different enzymes and concentrations were used, the shown differences were expectable. The invoked examples did not prove what effect, if any, was imparted by the ionic strength to the enzyme stability and/or the washing performance. Nor was it thereby proven whether any technical effect arose from increasing the salt concentration of D1 from 72 %wt to at least 80 %wt. Since no improvement had been proven, the problem solved over D1 was to provide further enzymatic compositions having good storage stability and washing performance.

Obviousness of the solution

- (c) The increase in the salt concentration of D1 from 72 to 80 %wt was minimal and affordable, at least when the composition comprised 65 wt% of water. In

that case, a slight variation in the salt content attained the minimum defined in Claim 1. Also, the skilled person would alter the salt content of D1 not only when the problem to be solved required it but, since the salts also played a role in the control of hardness, calcium precipitation, merely to adjust their content. Therefore, a change in the salt content of the non-aqueous portion of the composition of D1 from 72 to 80 wt% was obvious for the skilled person aiming at solving the problem.

First and Second Auxiliary Requests

Inventive step

- (a) The closest prior art was still described by D1. For all the further distinguishing features of Claim 1, no technical effect had been shown that could be used in the formulation of the problem solved. Thus, the problem effectively solved did not change. As regards obviousness, features such as the migration speed, the minimum viscosity and the density difference related to the problem to be solved rather than to the solution of the problem, as it was always desirable to have low migration speed, low density differences and optimum viscosity in liquid and gel compositions, to prevent segregation. As regards encapsulation of the enzymes with water soluble coating material, it was common general knowledge that encapsulation led to improved stability in liquid wash and cleaning compositions, which fact was apparent from D1 (page 14, line 4) and D7 (WO 01/38471) (page 2, last paragraph, to page 3 sixth paragraph), which

disclosed water soluble encapsulating agents. The claimed subject-matter of the auxiliary requests did not involve an inventive step (Article 56 EPC).

- IX. The appellant (patent proprietor) requested in writing that the decision under appeal be set aside and that the patent be maintained on the basis of Claims 1 to 14 of the Main Request or on the basis of Claims 1 to 13 according to the First or Second Auxiliary Request, all claim requests as filed with the statement of grounds of appeal dated 9 July 2010.
- X. The respondent (opponent) requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

Main Request

Novelty

2. It is not in dispute that the feature of Claim 1 "the non-aqueous portion of the composition has a salt content of at least 80 % by weight" represents a distinction from the disclosure of Example E3 of D1. The Board has no reason to take a different position.

Inventive step (Article 56 EPC 1973)

3. The patent in suit concerns detergent compositions, in particular aqueous detergent compositions comprising an enzyme, a stabilising amount of an organic water-immiscible solvent and a water soluble ionic salt (paragraph [0001]).
The patent in suit (Paragraph [0005], first sentence) addresses the very poor stability of enzymes in water-based detergent formulations, in particular the problem of how to increase the poor stability of enzymes in detergent formulations, especially at elevated temperatures and under the presence of UV light. The problem is solved by a composition as defined in Claim 1 (*supra*).

Closest prior art

4. It is not in dispute that D1 represents the closest prior art document.

The disclosure of D1

5. D1 (Claim 1) discloses a liquid aqueous cleaning compositions for machine dishwashing, comprising, as well as further cleaning composition ingredients to be used optionally,
- (a) 20 to 50% by weight of one or more water-soluble builders and
 - (b) 10 to 50% by weight of one or more non-surfactant, water-soluble, liquid binder(s).
- 5.2 The water-soluble builders can be phosphates such as alkali metal phosphates, e.g. pentasodium triphosphate or pentapotassium triphosphate (sodium tripolyphosphate or potassium tripolyphosphate) (Claim 2).
- 5.3 The liquid binder can be polyethylene glycols and polypropylene glycols, glycerol, glyceryl carbonate, ethylene glycol, propylene glycol and propylene carbonate (Claim 5).
- 5.4 The composition of D1 can further comprise:
- (a) 0.05 to 5 %wt of one or more nonionic and/or anionic surfactants (Claim 7);
 - (b) enzymes and/or enzyme formulations, preferably protease(s) and/or amylase (5), in an amount of 1 to 5 %wt based on the composition (Claim 11); and,
 - (c) 0.1 to 5 %wt of a polymeric thickener, preferably from the group of the polyurethanes or that of the modified polyacrylates (Claim 13),
- and can have a viscosity of 500 to 5000 mPas (Claim 14).

- 5.5 Example E3 of D1 illustrates a boron-free composition comprising (wt%) 60.0% of potassium triphosphate (solution 50 %wt), 10.0% of potassium carbonate, 10.0% of potassium silicate, 1.0% of thickener (Carbopol® ETD 2691) (Goodrich), 15.0% of 1,2-propanediol, 3.0% of an enzyme mixture (liquid amylase and liquid protease in a ratio of 1:2), 0.2 % of perfume, the rest (30.8%) being water. In this composition the salt content of the non-aqueous portion amounts to $(30+10+10=50/69.8=)$ 72 %wt. It is not in dispute that the composition is in form of gel, due to the presence of 1 wt% of the thickener.
- 5.6 According to D1 (page 27, last paragraph and page 28), the compositions illustrated by its examples attained better washing performance than an unspecified commercial product, even after storage at 40°C for 4 weeks, i.e. the enzyme activity was maintained.

Problem solved over D1

6. Normally, the problem addressed in the application as filed, and on which the patent in suit was granted, is taken as the starting point (Case Law of the Boards of Appeal of the EPO, 6th edition 2010, I.D.4.3.2), in the present case how to overcome the very poor stability of enzymes in water-based formulations, especially at elevated temperature and under the presence of UV (application as filed, third full paragraph on page 1, and Paragraph [0005] of the patent specification).
- 6.1 However, as apparent from Page 1 of the application as filed, that formulation of the problem was not based on D1, which was not acknowledged in application as filed, which however already solved the problem.

6.2 Since D1 was not taken into account in the application as filed when the problem was formulated, the problem effectively solved **within the whole breadth** of Claim 1 of the Main request over D1 must be determined, based on the results effectively attained over D1.

6.3 In the determination of the problem effectively solved, the available examples play a role, provided that they relate to the closest prior art D1.

6.4 Example 1 of the patent in suit illustrates a composition as follows,

Component	Wt%
Dehardened water	61.339
Monopropylene glycol	1.850
Sulphuric acid (30%)	0.100
Preservative	0.100
Polyacrylic acid (thickener)	1.250
Trisodium citrate	32.800
Sodium hydroxide	0.110
Calcium chloride	0.500
Amylase particles (Purastar Oxam)	0.500
Nonionic surfactant	0.200
Perfume	0.050
Protease liquid (Savinase)	0.650
Amylase liquid (Purastar 1500L)	0.550
Dye	0.001
	100.000

which shows good stability of the enzyme (amylase) which is contained in the particles (Paragraph [0082]), in relation to an unspecified comparison amylase enzyme, as illustrated in Table II, however without making any comparison with a composition according to D1.

6.5 Also, Table II of Example 1 of the patent in suit merely summarises the stability values for one or two amylases and one protease tested in a formulation, after storage in the dark for 12 weeks at 20 or 35°C, which however has always the same salt content. Thus, neither stability under UV nor an effect linking ionic

strength and enzyme stability has thereby been shown. The invoked results could only show that washing performance, if comparable, does not depend on the ionic strength but on the content of enzymes such as amylases and proteases.

6.6 Example 3 illustrates two compositions A' and B', as follows,

Component	Wt%	
	A'	B'
Dehardened water	60.800	37.380
Potassium Tripolyphosphate	5.500	32.000
Sodium Tripolyphosphate	9.500	-
Sodium Silicate	15.000	-
Sodium Bicarbonate	0.100	-
Sodium Hypochlorite (12.5%)	4.900	-
Sulphuric acid (30%)	-	0.100
Polyacrylic acid (thickener)	1.200	0.800
Trisodium citrate	-	30.000
Potassium hydroxide (45%)	3.000	-
Perfume	-	0.300

Protease liquid	-	1.080
Amylase liquid	-	0.340
Dye	0.080	0.025
	100.00	100.000

wherein Composition A' neither contains enzymes nor an organic water miscible solvent and Composition B' contains enzymes but not an organic water-miscible solvent. Thus, neither of them correspond to a composition according Claim 1.

6.7 Since different enzymes and concentration are used in the composition of Example 1 and in Compositions A' and B', these examples of the patent in suit do not prove what effect, if any, is imparted by the ionic strength to the enzyme stability and/or the washing performance. Nor is it thereby proven whether any technical effect arises from increasing the salt concentration of D1 (72 %wt) to up to at least 80 %wt.

6.8 If sufficient supporting evidence in comparison with the closest prior art D1 is not available and cannot be taken into consideration for formulating the problem effectively solved by the claimed subject-matter over its whole breadth over D1 (Case Law, *supra*, I.D.4.2), the problem effectively solved over D1 cannot be formulated in terms of an improvement and has to be redefined based upon the information present in the application as filed (Case Law, *supra*, I.D.4.4).

6.9 Therefore, the problem solved over D1 is the mere provision of further enzymatic detergent compositions having good storage stability and washing performance.

Obviousness

7. It remains to be decided whether for the skilled person starting from the closest prior art D1, using common general knowledge and aiming at solving the problem posed, the claimed subject-matter was obvious.

7.1 The question arises whether D1 encompasses the possibility of using a salt content higher than that illustrated in its Example E3. In this respect, attention is drawn to Claim 1 of D1, which requires that 20 to 50% by weight of the composition be made by the builders, wherein the composition must contain at least 10% of non-surfactant, liquid binder. Hence, the minimum amount of binder is 10 %wt and the maximum salt content of the non-aqueous portion (builder + binder) of the composition of D1 can be $50/60 = 82$ %wt, which reduces itself in proportion to further ingredients used such as enzymes (minimum 1 %wt), thickener (e.g. 1 %wt) and surfactants (minimum 0.05 %wt). This

interpretation of D1 encompasses the salt content calculated for the composition illustrated by its Example E3. Since the composition of Example E3 contains 15.0 %wt of binder (higher than the minimum of 10 %) and 3% of enzyme (higher than the minimum of 1%), the salt content of 72 %wt calculated from Example E3 is not the maximum possible amount of salt disclosed by D1, which thus can be increased to up to about 80 %wt.

7.2 The objective that the skilled person sets out to attain is decisive for deciding obviousness. If as in the present case the objective is to provide further detergent compositions over those of D1, an increase of the salt content to up to about 80% appears to be an option that can be deduced from D1.

7.3 Since the skilled person was seeking further detergent enzymatic compositions over D1, he was motivated at modifying the composition illustrated by Example E3 of D1, e.g. by increasing the salt content of the non-aqueous portion thereof to its limits, which were about 80 % by weight. Therefore, the subject-matter of Claim 1 of the Main Request was obvious.

First and Second Auxiliary Requests

Inventive step

8. It is not in dispute that the amendments made do not change the closest prior art (D1).

8.1 No technical effect from the distinguishing features of Claim 1 of each of First and Second Auxiliary Requests

has been shown that could be used in the formulation of the problem solved, which thus does not change.

8.2 As regards obviousness, the following is noted:

- (a) features such as migration speed, minimum viscosity and density difference relate to results to be attained without specifying how they are attained.
- (b) Low migration speed, low density differences and optimum viscosity are always desirable when dealing with dispersions in liquid and gel compositions, in order to avoid aggregation and/or sedimentation that impair stability. So the skilled person would care after and obviously try to implement them.
- (c) It has not been shown by evidence that the values defined in Claim 1 of the auxiliary requests are unusual. As a case in point, D1 mentions a viscosity as high as 5000 mPas (Claim 14).
- (d) As regards encapsulation (partial or total) of the enzymes with water soluble material, the fact that this led to improved stability of the enzymes in liquid wash and cleaning compositions was already known from D1 (page 13, second paragraph, last sentence; page 14, line 3), which also mentioned microencapsulation on page 14, line 4.
- (e) Microencapsulation was known from D7 (WO 01/38471), which pertained to the same technical field of D1 and described (page 2, last paragraph, to page 3 penultimate paragraph) water soluble materials such as starch for completely coating enzymes (page 4, third paragraph, last sentence) for detergent compositions (page 4, penultimate paragraph). Hence, also the use of an enzyme encapsulated by water soluble material was known, i.e. available for solving the problem (case law, *supra*, I.D.8.19).

The subject-matter of Claim 1 of each of the auxiliary requests was obvious over D1 (Article 56 EPC 1973).

Conclusion

9. None of the claim requests at issue fulfil the requirements of the EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Magliano

P.-P. Bracke