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File No.: T 0323/92 - 3.3.1
Application No.: 84 201 145.4
Publication No.: 0 135 226
Classification: C11D 3/39
Title of invention: Enzymatic machine-dishwashing compositions

D E C I S I O N
of 29 June 1993

Applicant:
Proprietor of the patent: UNILEVER N.V., et al
Opponent: 01) Henkel Kommanditgesellschaft auf Aktien
02) Joh. A. Benckiser GmbH

Headword: Silver tarnishing/UNILEVER

EPC: Art. 56

Keyword: "Inventive step; main and auxiliary request (no)" - "Obvious alternative"

Headnote
Catchwords



Case Number: T 0323/92 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 29 June 1993

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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office of 30 January 1992, posted
on 18 February 1992 revoking European patent
No. 0 135 226 pursuant to Article 102(1) EPC.

Composition of the Board:

Chairman: A. Jahn
Members: P. Krasa
J.-C. Saisset

Summary of Facts and Submissions

I. The mention of the grant of patent No. 0 135 226, in respect of European patent application No. 84 201 145.4 filed on 6 August 1984, was published on 7 February 1990 (cf. Bulletin 90/06) on the basis of seven claims. Independent Claim 1 and dependent Claim 6 read:

"1. Enzymatic detergent cleaning composition adapted for use in automatic dishwashing machines having a pH, as determined from a solution of 3 g/l of the composition in distilled water, of from 9.3 to 10.8 and comprising a detergency builder and an amylolytic enzyme, characterized in that it comprises:

- (i) from 0.2 to 5% by weight of an amylolytic enzyme such that the final composition has amylolytic enzyme activity of from 10^3 to 10^6 Maltose Units/kg;
- (ii) from 5 to 25% by weight of a peroxy compound bleach selected from the group of solid peroxy acids and their salts; and mixtures of a solid hydrogen peroxide adduct with an activator wherein the ratio by weight of said hydrogen peroxide adduct to activator is within the range of from 10:1 to 1:1; and
- (iii) not more than 0.2% by weight of chloride, [Cl⁻].

6. Enzymatic detergent cleaning composition according to any of the above claims, characterized in that it contains enzyme granules having a chloride content of less than 30% by weight."

II. Two notices of opposition were duly filed within the prescribed period (Article 99 EPC).

The grounds of opposition were that the subject-matter of the disputed patent lacked novelty and inventive step. However, the novelty objection was not pursued in the course of the opposition proceedings.

The oppositions were based, *inter alia*, on:

- (1) DE-A-1 302 394
- (5) Nature, 179 (1957), 557 to 559
- (6) Angewandte Elektrochemie, 26 (1972), 41
- (8) FR-A-1 544 393.

III. By a decision of 30 January 1992, posted on 18 February 1992, the Opposition Division revoked the patent.

The Opposition Division held that the subject-matter of the patent in suit was novel but did not involve an inventive step. It defined the problem to be solved as to improve the cleansing efficiency as compared to the compositions known from citation (8), which was deemed to represent the most relevant state of the art, and at the same time to reduce silver tarnishing. According to the Opposition Division, the skilled person knew from document (5) that silver tarnishing was linked to the presence of solid or not completely dissolved sodium chloride. Thus, it would have been obvious to reduce, as far as possible, the amount of sodium chloride present in the composition. Therefore, it would have been obvious also to replace the amylolytic enzymes disclosed in document (8) by chloride-free enzymes which were already known and were readily available to the skilled person at the priority date of the disputed patent, but not at the publication date of citation (8).

IV. An appeal was lodged against this decision on 11 April 1992 with payment of the prescribed fee. In their Statement of Grounds of Appeal, filed on 15 June 1992, the Appellants (Patent Proprietors) argued that document (5) was not relevant for the current case as it related to the formation of local stains on silverware in washing machines and, thus, with a phenomenon different from the tarnishing effect of silverware to which the patent in suit referred. They submitted that document (8) was not concerned with the technical problem of silver tarnishing and that this problem only occurred when the composition contained a strong peroxy compound bleach and filed experimental data in support of this statement. Furthermore, it was doubtful, so the Appellants argued, that chloride was indeed responsible for the tarnishing of silverware as document (6) disclosed that the dark deposit resulting from prolonged treatment of silver cutlery consisted mainly of elementary silver and comprised chloride only as a second component. Hence, they concluded that the subject-matter of the patent in suit was inventive over document (8), either alone or in combination with the other citations. The Appellants submitted during oral proceedings, which took place on 29 June 1993, an amended set of six claims which differed from the claims as granted only by combining Claims 1 and 6 as granted to form the new independent Claim 1.

V. The Respondents (Opponents) submitted that the only difference between the present patent and document (8) was that the latter did not disclose the absence of sodium chloride in the detergent cleaning compositions. The tarnishing effect of sodium chloride, however, was known from documents (5), and (6). Hence, it would have been obvious for the skilled person to avoid the presence of this salt in the composition, and, as the enzyme was the only potential source of chloride, simply

to use as a component of the detergent cleaning composition a chloride-free enzyme preparation which was available on the market.

- VI. The Appellants requested that the impugned decision be set aside and the patent in suit be maintained as granted (main request) or on the basis of Claims 1 to 6 filed during oral proceedings (auxiliary request). At the end of the oral proceedings, the Chairman announced the decision of the Board to dismiss the appeal.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty*

None of the citations discloses the subject-matter of Claim 1 of the patent in suit which, therefore, is novel. Since this is no longer in dispute, it is not necessary to give detailed reasons for this finding.

3. *Technical Problem and Solution*

- 3.1 The patent in suit relates to enzymatic detergent cleaning compositions as defined in Claim 1 comprising a peroxy compound bleach for automatic dishwashing machines. The peroxy compound bleach is selected from:

- solid peracids and their salts; and
- mixtures of a solid hydrogen peroxide adduct with an activator.

Sodium perborate is disclosed as a preferred example for the solid hydrogen peroxide adducts (= percompounds; page 3, lines 31 to 33).

The claimed compositions have, as a 0.3% aqueous solution, a pH of from 9.3 to 10.8.

In the patent in suit, compositions which have a solution pH of not more than 11.0, as determined from a solution of 3 g composition per 1 l of distilled water are defined as mildly alkaline compositions (page 2, lines 16 to 19). According to the patent in suit, low to mildly alkaline enzyme and bleach containing machine dishwashing compositions tend to cause rather severe tarnishing of silverware (page 2, lines 26 to 27).

- 3.2 Similar compositions as presently claimed are known, in particular from document (8) (see the disputed patent, page 2, lines 20 to 23), which in view of the Opposition Division and of the parties represents the most relevant prior art. As there is no compelling alternative, the Board also takes document (8) as the starting point for the evaluation of inventive step.

Document (8) discloses, in particular, detergent compositions for use in automatic dishwashing machines (page 1, left-hand column, lines 1 and 2, in combination with page 4, left-hand column, lines 5 to 6) which have - in the form of an aqueous solution (3 g composition/litre) - a pH-value of up to 11, preferably of from 7.0 to 9.0 (page 1, right-hand column, lines 35 to 39), and comprise:

- up to 80% detergent builders such as sodium triphosphate or tetrasodium pyrophosphate (page 1, right-hand column, lines 18 to 21;

- amylolytic enzymes in an amount so that the final composition has an enzyme activity of from 10^4 to 10^6 Maltose Units/kg (page 2, left-hand column, last paragraph); and
- a peroxy compound bleach such as sodium perborate (page 1, right-hand column, lines 31 to 32) - the amount disclosed in the Examples 8, 9, and 10 is 6% (page 4, right-hand column).

Hence, the compositions of the current Claim 1 differ from those disclosed in document (8) only by the presence of the percompound activator and the further requirement that they may not contain more than 0.2% by weight of chloride.

3.3 The Appellants strongly contested that the drawback of silver tarnishing was linked to the compositions of citation (8) since the document, in fact, makes no mention of silver tarnishing with respect to the mildly alkaline compositions disclosed herein, but only refers to it in connection with a composition with a pH of 11.6 ([comparative] Example 11; page 5, left-hand column, lines 4 to 20). They insisted, relying on experimental data, that the problem of silver tarnishing only arose with compositions comprising combinations of percompounds and activators (Statement of Grounds of Appeal, page 3, last but one paragraph).

3.4 From this it follows that the problem of the tarnishing of silver due to the action of mildly alkaline enzymatic dishwashing compositions comprising a peroxy compound bleaches did not arise with the compositions of document (8). Therefore, a solution to the technical problem, which was considered by the patent in suit to be still unsolved (cf. page 2, lines 42 to 44), was already known. Since the Appellants did not claim that the

present compositions displayed any other effect as compared to those of citation (8) and the Board cannot recognise any such other effect, the technical problem to be solved according to the patent in suit has to be defined as to provide alternative mildly alkaline enzymatic dishwashing compositions comprising peroxy compound bleaches which will not cause silver tarnishing.

3.5 It is credible, in view of the composition of the claimed enzymatic detergent cleaning compositions, that the compositions of Claim 1 of the patent in suit solve the above defined technical problem.

4. *Inventive Step*

It remains to be decided whether or not the subject-matter of Claim 1 according to the main or the auxiliary request involves an inventive step.

4.1 Main Request

4.1.1 The compositions of Claim 1 differ, as already indicated, from those of citation (8) by the presence of a percompound activator and the restriction of the chloride content to not more than 0.2% by weight of the composition.

4.1.2 Mildly alkaline enzymatic dishwashing compositions comprising an activator in combination with a percompound, however, were known from document (1) as preferred embodiments (see column 2, lines 50 to 53). This document results from the same priority application as document (8) and relates to the same subject-matter as the latter citation. Therefore, in the Board's judgment, it was obvious for the skilled person to incorporate an activator into the compositions of

document (8), including those generically disclosed therein, having a solution pH of up to 11 (document (8), page 1, right-hand column, lines 35 to 36).

4.1.3 Document (5) is concerned with the formation of local stains on silver tableware. Five solid detergents, all containing halides, were tested and all but one produced stains. The composition which did not cause stains had the lowest halide content (page 557, right-hand column, lines 22 to 25 after the heading). According to this document, the staining of the silver is caused by solid detergents containing, *inter alia*, chloride, which may give rise to local chloride concentrations on the silver surface which in turn causes the staining which is more pronounced in alkaline solutions or in solutions containing certain oxidants (see the paragraph bridging pages 557 and 558 and the second complete paragraph of the left-hand column of page 558). It is suggested, as a precautionary measure for preventing the formation of stains on silverware, to preclude the possibility of local halide concentration at the metal surface (page 559, left-hand column, lines 4 to 6). This clearly teaches the skilled person that the chloride content in solid dishwashing compositions should be minimised and that this should be done irrespective of the composition's solution pH or of the presence of enzymes.

4.1.4 The Appellants' counterargument that document (5) is not relevant as the silver staining to which it relates is a different effect as compared to the silver tarnishing with which the patent in suit is concerned is not convincing. In the Board's judgment, silver staining and silver tarnishing are synonymous terms. This is not only confirmed e. g. by Chamber's Concise 20th Century Dictionary which lists under "stain", *inter alia*, "to tarnish", but also by document (5) itself. The introductory part of this citation commences:

"The loss in brilliance of silverware is generally caused by the formation of a silver sulphide layer, which is easily removed by normal cleaning methods. In recent years, however, a different type of stain has appeared, usually taking the form of small and often circular dark spots, ..."

As the Appellants confirmed during the oral proceedings, the thus described silver sulphide formation would be called tarnishing. It follows that in document (5) staining is used as a synonym for tarnishing. In this connection the Appellants' argument that the staining of document (5), which is only a local effect, has to be distinguished from the tarnishing as defined according to the patent in suit as being a whole surface effect is not convincing. The passage in the disputed patent to which the Appellants referred in support of their argument reads (after amendment of a clerical error):

"The results on silver plated spoons are given as a score between 1 (= completely untarnished spoon) and 8 (= a completely black tarnished spoon) whereby score 2 indicates a tarnished spoon (whole surface slightly tarnished) which is already unacceptable." (Page 5, lines 51 to 53.)

Thus, this passage defines several degrees of tarnishing for the evaluation of respective experiments rather than the term "tarnishing" as such. In the Board's judgment, such an incidental remark referring to the "whole surface" can hardly qualify as a feature decisive for the patentability of the claimed subject-matter.

However, even if the Board were to accept, on the basis of the quoted passage, that the patent in suit dealt with a type or degree of tarnishing different from that

of document (5), then, nevertheless, the skilled person would take into consideration the teaching of document (5), since the avoidance of a discolouration covering the whole surface differs only in degree, but not in essence, from the avoidance of a discolouration covering only parts of the surface.

- 4.1.5 The Appellants further argued that the discolouration of silverware experienced with the compositions otherwise identical to those of the patent in suit but having a higher chloride content were not due to silver chloride but mainly to elemental silver and referred to document (6) in support.

This document discloses that the surface coating resulting from prolonged washing of silverware consists mainly of silver. However silver chloride is also a component of this discoloration (page 41, left-hand column, lines 11 to 16 after the second sub-heading). Therefore, this citation also discloses that silver chloride participates in this staining of silverware and cannot support the Appellants' submission that the skilled person would have disregarded document (5).

- 4.1.6 It follows that neither of the two features which differentiate the compositions of Claim 1 from those of document (8) can render these compositions inventive. The incorporation of an peroxide activator into the compositions known from document (8) was, as demonstrated in the above paragraph 4.1.2, obvious for the skilled person in the light of the disclosure of document (1), and to specify that their chloride content - on which citation (8) is wholly silent - should be as low as possible, was obvious to the skilled person from document (5) if he wanted to solve the problem of silverware discolouration. Hence, in the Board's judgment, the subject-matter of Claim 1 does not involve

an inventive step. In the absence of an allowable independent claim the dependent claims share the fate of the independent claim.

4.2 Auxiliary Request

Claim 1 differs from that of the main request by limiting the chloride content of a particular component of the claimed compositions, namely of the enzymes, which are to be incorporated into the composition in the form of granules, to less than 30% by weight of this component observing the over all limit for the chloride content of 0.2% by weight of the composition.

It is, however, obvious for the skilled person to use components with a chloride content as low as possible, if he knows that it is essential to minimise the chloride content of the final composition. Thus, no inventive merits can be seen in the selection of a low chloride content enzyme which, as the parties agreed during the oral proceedings, was available on the market at the priority date of the present patent.

Therefore, the Board concludes that the subject-matter of Claim 1 of the auxiliary request and of the claims depending on it do not involve an inventive step.

Order

For these reasons, it is decided that:


The appeal is dismissed.

The Registrar:



E. Görgmaier

The Chairman:



A. Jahn