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D E C I S I O N
of 17 February 2000

Case Number: T 0366/96 - 3.3.6

Application Number: 89905395.3

Publication Number: 0424398

IPC: C11D 3/395

Language of the proceedings: EN

Title of invention:

A detergent additive for bleaching fabric

Patentee:

NOVO NORDISK A/S

Opponent:

Henkel Kommanditgesellschaft auf Aktien
GENENCOR INTERNATIONAL INC.
Unilever N.V

Headword:

Fabric bleaching/NOVO NORDISK

Relevant legal provisions:

EPC Art. 123(2)(3), 84, 54, 56

Keyword:

"Main request: novelty - no"

"Auxiliary requests: inventive step - no (obvious to try)"

Decisions cited:

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Catchword:

If in the case of selecting two components of a composition from two known lists of possible ingredients a skilled person has, as soon as one component is taken from the first list, no choice in selecting the second component from the second list in view of compelling technical necessities which made the particular second component mandatory, then this cannot be considered to be a "twofold" selection which could render the resulting combination novel (cf. reasons point 2.1).



Case Number: T 0366/96 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 17 February 2000

Appellant: Henkel
(Opponent) Kommanditgesellschaft auf Aktien
TFP/Patentabteilung
D-40191 Düsseldorf (DE)

Appellant: GENENCOR INTERNATIONAL INC.
(Opponent) 4 Cambridge Place
1870 South Winton Road
Rochester
NY 14618 (US)

Representative: Armitage, Ian Michael
Mewburn Ellis
York House
23 Kingsway
London WC2B 6HP (GB)

Appellant: Unilever N.V.
(Opponent) Weena 455
NL-3013 AL Rotterdam (NL)

Representative: Kan, Jacob Hendrik, Dr.
Unilever N.V.
Patent Division
P.O. Box 137
NL-3130 AC Vlaardingen (NL)

Respondent: NOVO NORDISK A/S
(Proprietor of the patent) Novo Allé
DK-2880 Bagsvaerd (DK)

Representative: Goldbach, Klara, Dr.
Grünecker, Kinkeldey,
Stockmair & Schwanhäusser
Anwaltssozietät
Maximilianstrasse 58
D-80538 München (DE)

Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 5 March 1996
concerning maintenance of European patent

Composition of the Board:

Chairman: P. Krasa
Members: G. Dischinger-Höppler
C. Rennie-Smith

Summary of Facts and Submissions

- I. The appeal is from an interlocutory decision of the Opposition Division to maintain European patent No. 0 424 398 in amended form according to a first auxiliary request with independent Claim 1 reading:
- "1. A detergent composition which comprises
- (a) an enzyme exhibiting peroxidase activity with the proviso that haloperoxidase is not present,
 - (b) hydrogen peroxide, a precursor of hydrogen peroxide, or an enzymatic system capable of generating hydrogen peroxide, and
 - (c) a surfactant."
- II. In its decision, the Opposition Division found that this subject-matter fulfilled the requirements of the EPC for patentability. This decision was rendered on three oppositions based on the grounds of lack of novelty, lack of inventive step and insufficient disclosure and a number of documents.
- III. All three Opponents (Appellants) appealed against this decision, referring in their statements of grounds of appeal inter alia to the following documents:
- (1) DE-A-2 430 699
 - (2) EP-A-0 072 098
 - (4) W. Schreiber, Biochem. Biophys. Res. Comm. 63(2)(1975) 509-514
 - (8) M.G. Paice et al., Biotech. Bioeng. 26(1984) 477-

480 and

(12) DE-A-2 009 721.

IV. In a communication dispatched to the parties by telefax on 8 February 2000, the Board pointed to documents

(19) B.C. Saunders et al., "Peroxidase", Butterworths, London, 1964, pages 1 to 3 and 172 to 177 and

(20) Enzyme Nomenclature 1978 IUB, Academic Press, New York, San Francisco, London, 1979, pages 104 to 107.

V. Oral proceedings were held on 17 February 2000, in the course of which the Respondent submitted amended sets of claims according to a new main request and new auxiliary requests I and II, the new requests replacing all requests previously on file.

Claim 1 of the main request reads as follows:

"1. A detergent composition which comprises
(a) a peroxidase,
(b) hydrogen peroxide, a precursor of hydrogen peroxide, or an enzymatic system capable of generating hydrogen peroxide, and
(c) a surfactant."

Claim 1 of auxiliary request I reads:

"1. A process for bleaching usually dry stains present on fabrics comprising treating a fabric with a peroxidase in the presence of hydrogen peroxide, a

precursor of hydrogen peroxide or an enzymatic system capable of generating hydrogen peroxide."

Claim 1 of auxiliary request II differs from that of auxiliary request I only in that the term "bleaching usually dry stains" is replaced by "bleaching naturally coloured stains".

VI. The Appellants' arguments submitted in writing and orally can be summarized as follows:

- The term "a peroxidase" in Claim 1 of the main request had a broader meaning than the original definition in the patent in suit. Further, both that term and the terms "usually dry" and "naturally coloured" in the respective claims of the auxiliary requests I and II were unclear. The amendments were, therefore, not allowable.
- The detergent composition according to Claim 1 of the main request was not novel over documents (1) or (12), nor were the processes of the respective Claims 1 of auxiliary requests I and II novel.
- Concerning inventive step, the Appellants argued that it was known from document (2) to use bleach activators or catalysts for improving the bleaching action of hydrogen peroxide during a washing process.
- Since no advantages had been shown in comparison with such known agents, the problem to be solved in view of such prior art was to provide an alternative for the conventionally used catalysts.

- The detergent composition and its use in a process for bleaching stains present on fabrics as claimed was not, however, based on an inventive step since hydrogen peroxide was known to be efficient for bleaching stains present in fabrics, and since it was known, inter alia, from documents (4) and (8) that peroxidases enhance hydrogen peroxide bleaching, and from document (12) that a hydrogen peroxide bleaching agent in combination with peroxidase can be used in a detergent composition.
- Moreover, there was no prejudice against using a peroxidase and a hydrogen peroxide source for bleaching fabric stains.

VII. The Respondent presented, in essence, the following arguments:

- The amendments made to the claims did not go beyond the scope of the application as originally filed; nor was the claimed subject-matter rendered unclear by these amendments.
- Documents (1) and (12) did not disclose the claimed composition comprising peroxidase combined with hydrogen peroxide and a surfactant.
- It was the object of the patent in suit to provide a detergent composition having a bleaching effect on usually dry fabric stains.
- Any one of documents (1), (2) or (12) which disclosed detergent compositions could be used as a starting point for assessing inventive step. The

teaching of these documents could not, however, be combined with the disclosure of documents (4) and (8) which did not relate to the decolorization of coloured substances by detergent compositions.

- Since, furthermore, none of the cited prior art documents mentioned the bleaching of fabric stains which were normally dry, the claimed combination of features could not be derived from the cited prior art in an obvious manner.

VIII. The Appellants requested that the decision under appeal be set aside and that the European patent No. 0 424 398 be revoked.

The Respondent requested that the appeal be dismissed and the patent be maintained in amended form on the basis of either the main request or alternatively the first or second auxiliary requests submitted during the oral proceedings.

Reasons for the Decision

1. *Amendments (Article 123(2)(3) EPC and Article 84 EPC)*

1.1 Main request

The amendments made to the claims of the patent in suit in accordance with the main request find support in the claims in combination with the description of the application as originally filed (see Claims 15 to 21 in combination with page 2, line 33 to page 3, line 13, page 5, lines 33 to 37, page 9, lines 28 to 32,

page 10, line 35 to page 11, line 1, and page 11, lines 8 to 15). The amendments further bring about a restriction of the extent of the scope of the claims and comply, therefore, with the requirements of Article 123(2) and (3) EPC. In particular and contrary to the Appellants' opinion, the amendment of the term "enzyme exhibiting peroxidase effect" into "a peroxidase" is held to be limiting for the following reasons:

As is set out in the patent in suit, the term "enzyme exhibiting a peroxidase effect" defines a group of enzymes utilizing hydrogen peroxide as a substrate for the oxidation with a mode of action similar to that of "peroxidase" (page 2, lines 41 to 48). Hence, the two terms in question do not express identical matter. This tallies with the common general knowledge of a person skilled in the technical field of enzyme terminology as exemplified by documents (19) and (20). Thus, document (19), dated 1964, distinguished then between typical or true peroxidases, such as horseradish peroxidase, and three other groups of peroxidases which may be similar to the true peroxidases in structure and/or mode of action (page 1, third paragraph to page 2, third paragraph). Likewise, but more systematically, document (20), dated 1978, distinguishes between a class of enzymes having the number 1.11.1 which is said to **contain** the "peroxidases" and a subclass comprised therein having the number 1.11.1.7 and the recommended name "peroxidase". Hence, the Board accepts the Respondent's argument that the term "a peroxidase" is a limitation to those enzymes of class 1.11.1 which fall under subclass 1.11.1.7, whereas the originally used term "enzymes exhibiting a peroxidase effect" covers

the whole class 1.11.1.

Considering this definition, the subject-matter as claimed according to the main request also complies with the clarity requirement of Article 84 EPC.

1.2 Auxiliary requests I and II

According to the auxiliary requests, the claimed subject-matter is a process as defined in Claim 6 of the main request restricted, however, to its application on "usually dry stains" (auxiliary request I) or on "naturally coloured stains" (auxiliary request II).

These amendments are supported by the description of the application as originally filed (see page 5, lines 8 to 16, page 4, lines 1 to 2 and page 12, lines 9 to 13) and fulfill, therefore, the requirements of Article 123(2) EPC.

As concerns clarity of these amendments, the Board considers that in the absence of any specific definition the term "usually dry" used in Claim 1 of auxiliary request I has to be understood as "dry or not dry". This was confirmed by the Respondent who conceded during the oral proceedings that the term had no limiting effect.

In respect of auxiliary request II, the patent in suit again fails to give any well-defined meaning to the term "natural". It is merely stated that "the process is particularly well suited for bleaching stains caused by natural coloured substances, e.g. polyphenols, found

in, for instance, fruit juice, wine, tea and the like" (page 5, line 24 of the patent in suit). This statement does not, however, allow any distinction between colours which occur in nature and colours which are obtained by artificial modifications of naturally occurring substances. Nor does this statement provide any support for a generalization of its meaning into food colours or colours used for nutrition as suggested by the Respondent. Therefore, the term "naturally coloured" present in Claim 1 of auxiliary request II on its proper construction merely means "coloured" and, in the Board's judgement cannot be given any more specific meaning.

It follows that the amendments made to Claim 1 according to the auxiliary requests are clear and do not extend the scope of the claims. They also comply, therefore, with the requirements of Articles 84 EPC and 123(3) EPC.

2. *Novelty (Article 54 EPC)*

2.1 Main request

Document (12) discloses a softening detergent composition for treating fabrics comprising inter alia anionic or non-ionic surfactants, enzymes and a bleaching agent (see Claim 8 in combination with Claims 4 and 1). Suitable bleaching agents are either inorganic peroxide containing compounds such as a perborate or percarbonate (page 20, first paragraph) or chlorine containing compounds (page 21). Suitable enzymes are explicitly listed in the first paragraph of page 25, in particular in the first three sentences,

which read:

"**The enzymes to be used** usually represent a mixture of different enzymatic agents. Depending on **their** mode of action, **they** are named proteases, carbohydrases, esterases, lipases, oxidoreductases, catalases, peroxidases, ureases, isomerases, lyases, transferases, desmolases or nucleases. Of particular interest are enzymatic agents which are isolated from bacterial strains or fungi such as *Bacillus subtilis* and *Streptomyces griseus*, in particular proteases and amylases." (Emphasis added; translation by the Board).

The Respondent argued that the second sentence had to be read in isolation and merely as a background information concerning enzyme nomenclature because the list of enzymes contained the oxidoreductases as well as the catalases and peroxidases which were sub-classes within the oxidoreductases. Further, the list contained also the desmolases which were not suitable for use in detergent compositions, and the rest of the teaching of document (12) exclusively dealt with the use of proteases, amylases and lipases. Hence, only these three enzymes were taught to be used in the composition of document (12).

Whilst accepting that proteases, amylases and lipases are the preferred enzymes used in document (12), because most stains, in particular on garments, are caused by protein, starch or fatty material, the Board cannot concur with the argument that the teaching of document (12) was restricted to these enzymes. In particular, it must not, in the Board's opinion, be overlooked that the first two sentences on page 25 of

document (12) are directly interrelated by using in immediate succession the terms "**the enzymes to be used**", "depending on **their mode of action**" and "**they are named**". Therefore, a reader cannot but understand that any of the enzymes listed are to be used in the detergent composition of Claim 8 of document (12), regardless of whether or not these enzymes were known to be useful for this particular purpose. (Concerning the mentioning of the catalases and peroxidases in addition to oxidoreductases, the Board tends to view this as an emphasis laid on these particular enzymes within the oxidoreductases.)

Therefore, the Board concludes that document (12) teaches a detergent composition comprising a peroxidase and a bleaching agent (Claim 8 in combination with page 25, lines 1 to 9).

As can be readily understood from the name "peroxidases", and as is generally known in the art (see patent in suit, page 2, lines 41 to 43 and page 2, line 53 to page 3, line 3; document (19), page 1, paragraphs 2 and 3; see also document (20), which classifies under point 1.11 those enzymes which act on hydrogen peroxide as acceptor), peroxidases act on hydrogen peroxide as a substrate. In this context, the term "depending on their mode of action" mentioned in document (12) (see quotation above) implies, in the Board's judgment, that if the presence of peroxidases is specified, there will also be the simultaneous presence of hydrogen peroxide in the form of a source generating hydrogen peroxide such as perborates or percarbonates mentioned as possible bleaching agents in the detergent composition of document (12).

In other words, even if one would accept for the sake of argument that in document (12) the peroxidase on the one hand is enumerated in one list (i.e. that of the enzymes) and the hydrogen peroxide precursors perborates and percarbonates are named in another list (i.e. that of the bleaching agents), it would not require a "twofold" selection from two lists (which could render the resulting combination of features novel) to arrive at the compositions of Claim 1 of the patent in suit. Rather on the contrary, as soon as a person skilled in the art contemplates a peroxidase containing detergent composition as disclosed in citation (12), he or she must also contemplate the hydrogen peroxide precursors also disclosed there in order to ensure the necessary supply of the peroxidase substrate hydrogen peroxide. The skilled person is given no choice in this respect. It follows that document (12) discloses directly and unambiguously detergent compositions comprising both peroxidase and a hydrogen peroxide precursor.

For these reasons, the Board concludes that the subject-matter of Claim 1 of the main request is not novel in view of the teaching of document (12).

2.2 Auxiliary requests I and II

The Appellants argued that the process for bleaching "usually dry" or, respectively, "naturally coloured" stains present on fabrics as claimed in accordance with the auxiliary requests was not novel over the teaching of documents (1) or (12). However, neither of these documents actually relates to or even mentions the bleaching of stains. In these documents, the term

"bleaching" is only used in the context of the bleaching agents which may be contained in the detergent composition (see document (1), page 27, paragraph 5 to page 29, second paragraph; document (12), page 9, first paragraph and pages 20 and 21). However, the term "bleaching" as such is not, in the Board's opinion, restricted to stain bleaching. It also implies bleaching an entire fabric or textile, e.g. during its manufacture in order to lighten its natural or artificial colour. One such process is, for example, used to achieve the so-called stone washed appeal of denim. Consequently, the presence of a bleaching agent in the compositions of documents (1) and (12) does not amount to a clear and unambiguous teaching of its use in a process for bleaching stains present on fabrics.

No other prior art document has been cited in respect of novelty of the subject-matter as claimed in accordance with the auxiliary requests.

Therefore, the Board decides that the process of Claim 1 according to either of auxiliary requests I or II is novel.

3. *Inventive step (Article 56 EPC)*

It remains, therefore, to be assessed whether or not the claimed processes according to auxiliary requests I and II are based on an inventive step.

3.1 Technical background

The patent in suit relates to the use of bleaching agents in washing procedures (page 2, lines 12). An

important object in this technical field is said to consist in the provision of detergent compositions which contain bleaching agents and are efficient even at low temperatures. It is further stated in the patent in suit that this object has successfully been attained in the art by incorporating into the detergent composition a hydrogen peroxide precursor together with TAED (tetraacetyl ethylene diamine) as a bleach activator (see page 2, lines 22 to 37).

3.2 Closest prior art

Document (2) is representative of such prior art and, hence, suitable as a starting point for assessing inventive step. The Respondent also confirmed that document (2) can be taken as the closest prior art.

Document (2) pertains to liquid detergent compositions containing a hydrogen peroxide precursor which is activated by the addition of a bleach activator to yield hydrogen peroxide at low temperatures (Claims 1 and 19 to 25, Example 1, page 2, lines 3 to 6 and 12 to 14). The bleach activator is selected from conventional organic compounds, such as TAED, which react with hydrogen peroxide via the formation of the more efficient organic peracids, or from heavy metal ions of the transition series, such as cobalt, which are said to catalyse peroxide decomposition (page 6, line 54 to page 7, line 8).

3.3 Technical problem and its solution

According to the Respondent, the patent in suit was concerned with the technical problem arising from stains which were usually dry and adsorbed into the fibres of the fabric and, therefore, less accessible to the action of the bleaching agent (page 3, lines 25 to 29). However, the bleaching of such dry or adsorbed stains has not been exemplified or even sufficiently defined in the patent in suit (see point 1.2 above). Hence, it has not been shown that such a problem has been solved by the claimed subject-matter.

The examples of the patent in suit show a treatment of soiled swatches as does document (2), where stained fabrics are treated (see Examples). In each case tea is used as the soiling material. No comparative data as regards document (2) are on file. Therefore, the problem to be solved in view of this document boils down to what has actually been achieved by the use of peroxidase instead of TAED or transition metal as the only distinguishing feature.

The examples of the patent in suit show that the addition of peroxidase as a catalyst to the hydrogen peroxide containing bleaching system improves the detergency or delta detergency values in comparison with a system without peroxidase. Since, however, no particular effects have been shown in comparison with the process known from document (2), the existing problem must be seen in the provision of simply another means suitable to activate or catalyse a hydrogen peroxide based bleaching agent. In view of the examples of the patent in suit, it is evident that this

technical problem is solved by the claimed subject-matter.

- 3.4 It remains to be decided whether, in view of the available prior art documents, it was obvious for someone skilled in the art to solve the above technical problem by the means claimed.

According to the patent in suit it was known that "peroxidases act on various amino and phenolic compounds resulting in the production of a colour" and it was, therefore, surprising that peroxidases may also exert a bleaching effect on coloured substances (page 2, lines 49 to 52).

However, the ability of peroxidase to catalyse or activate the oxidation of organic compounds by hydrogen peroxide has long been known in the art (e.g. document (19), page 1 second paragraph). Moreover, hydrogen peroxide is well-established in the art as a stain bleaching agent (patent in suit, page 2, lines 12 to 24). It was further known, e.g. from document (12), to use peroxidase together with a hydrogen peroxide based bleaching agent for treatment of fabrics and it was known that the addition of peroxidase increases the ability of hydrogen peroxide to decolorize coloured matter even at alkaline pH (document (4), page 509, last paragraph to page 510, second paragraph and Figure 1; document (8), page 477, abstract and right-hand column, first paragraph, page 478, left-hand column, second and fourth paragraph and page 479, Figure 3).

Therefore, despite any suggestion that undesired

colouring might occur in certain specific instances, the knowledge referred to in the previous paragraph would, in the Board's opinion, have clearly guided someone skilled in the art looking for other possible catalysts suitable in a hydrogen peroxide bleaching process as taught in document (2), simply to try a peroxidase for that purpose and thereby arrive at a process as claimed in Claim 1 of **both** auxiliary requests.

The Respondent's submission that, due to the different compositions used and purposes aimed at, the teaching of document (2) would not have been combined by a skilled person with that of documents (4) and (8), is not well-founded since all these documents deal with the ability of certain activators and catalysts to improve the effect of hydrogen peroxide in decolouring coloured material. Therefore, a skilled person interested in solving the technical problem defined above would have considered the disclosure of all these citations. It is, in particular, unconvincing to suggest that the absence of a detergent in the compositions disclosed in documents (4) and (8) could be construed as an essential difference to the subject-matter of the Claims 1 of the auxiliary requests, since the presence of a detergent is equally not mandatory in the claimed processes.

- 3.5 For these reasons the subject-matter of the respective Claims 1 of auxiliary requests I and II do not involve an inventive step; consequently these requests must fail.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

G. Rauh

P. Krasa