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D E C I S I O N
of 13 February 2003

Case Number: T 0762/98 - 3.3.6

Application Number: 88905333.6

Publication Number: 0322429

IPC: C11D 3/386

Language of the proceedings: EN

Title of invention:
Cutinase Cleaning Composition

Patentee:
GENENCOR INTERNATIONAL, INC.

Opponent:
NOVOZYMES A/S
Unilever N.V.

Headword:
Cutinase composition/GENENCOR

Relevant legal provisions:
EPC Art. 123(2), 83, 56

Keyword:
"Main request: inadmissible amendment (Article 123(2) EPC)"
"First and second auxiliary requests: inventive step - no"
"Third auxiliary request: inadmissible amendments
(Article 123(2) EPC)"
"Fourth auxiliary request: sufficiency of disclosure
(Article 83 EPC) - no"

Decisions cited:
T 0689/90, T 0737/90, T 0323/97

Catchword:
-



Case Number: T 0762/98 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 13 February 2003

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 8 July 1998
revoking European patent No. 0 322 429 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: P. Krasa
Members: P. Ammendola
C. Rennie-Smith

Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition Division revoking European patent No. 0 322 429 concerning cutinase cleaning compositions. This patent was based on the International application PCT/US 88/01844 filed on 31 May 1988, claiming priority of 29 May 1987 from US 056500 and published on 1 December 1988 with number WO 88/09367.

II. Novo Nordisk A/S (Opponent I and Respondent I) filed a notice of opposition, based on lack of novelty and lack of inventive step (Article 100(a) EPC), citing *inter alia* the following documents:

Document (1) = "Cutinases from fungi and pollen" by P.E. Kolattukudy in "Lipases", Borgström and Brockman Eds., Elsevier, 1984, pages 471 to 504

Document (2) = EP-A-0 130 064

Document (4) = GB-A-1 372 034

III. Respondent II (Opponent II) also filed a notice of opposition for lack of novelty and lack of inventive step of the patent as granted (Article 100(a) EPC). In addition it requested revocation of the patent on the grounds of Article 100(c) EPC (see also Article 123(2) EPC).

It cited *inter alia* the following documents:

Document (8) = EP-A-0 268 456

Document (8A) = US-A-5 030 240

Document (9) = EP-A-0 268 452

Document (10) = EP-A-0 206 390

Document (11) = EP-A-0 218 272

IV. The Opposition Division held that the amendment of the "gly" residue at position 254 of the amino acid sequence of a preferred cutinase on page 5 of the patent application into a "glu" residue (see position 254 of the amino acid sequence on page 4 of the granted patent) was the correction of an obvious error in view of Document (9) and clearly complied with the requirements of Article 123(2) EPC (see point 2 of the reasons of the decision under appeal). It found that Document (1) and/or (8) anticipated the subject-matter of claims 1 to 12 of the patent as granted and that claims 1 to 6 and 8 to 12 of the patent in suit were not entitled to priority from US 056500 since Document (8A), in which one of the inventors is also one of the inventors of the patent in suit, disclosed for the first time the subject-matter thereof.

V. The Appellant (patent Proprietor) filed an appeal against this decision and requested that the patent be maintained as originally granted.

It filed under cover of the statement setting out the grounds of appeal

Document (14) = WO 94/03578.

VI. The Board was informed on 14 December 2000 that Respondent I demerged into Novo Nordisk A/S and Novozymes A/S and transferred all its enzyme activities to Novozymes A/S. A copy of the relevant parts of the Demerger Document was filed. The other parties received copies of the filed letter and documents.

VII. The Appellant further filed under cover of a letter dated 13 January 2003

Document (17) = US-A-5 512 203,

two sets of amended description pages labelled as auxiliary requests 1 and 2 and nine sets of amended claims labelled as auxiliary requests 3 to 11. In this letter it also requested the possibility of combining these auxiliary requests at the oral proceedings before the Board.

VIII. Respondent I filed under cover of a letter dated 29 January 2003

Document (20) = EP-A-0 399 681.

IX. Oral proceedings were held before the Board on 13 February 2003.

At the oral proceedings the Appellant withdrew the eleven auxiliary requests of 13 January 2003 and filed four auxiliary requests.

Each auxiliary request included an amended page 4 of the patent description in which the residue 254 of the amino acid reads "gly" as in the original application WO 88/09367.

The first auxiliary request additionally included a set of 8 claims in which independent claim 1 reads as follows:

"1. *An enzymatic cleaning composition comprising a mixture of anionic and non-ionic surfactants, a substantially pure microbial cutinase and one or more enzymes selected from lipases, amylases and proteases, wherein the cutinase is present in an amount of from about 0.01% to about 5% by weight of the surfactant, said cleaning composition not comprising an enzymatic perhydrolysis bleaching system.*"

The second auxiliary request included in addition to the amended page 4 of the specification a set of 5 claims in which the only independent claim 1 reads as follows

"1. *Use of an enzymatic cleaning composition for enzymatically cleaning material, which composition comprises a mixture of anionic and non-ionic surfactants, a substantially pure microbial cutinase and one or more enzymes selected from lipases, amylases and proteases, wherein the cutinase is present in an amount of from about 0.01% to about 5% by weight of the surfactant, said cleaning composition not comprising an enzymatic perhydrolysis bleaching system.*"

In the set of claims of the second auxiliary request claims 2 to 5 define preferred embodiments of the composition defined in claim 1.

The third auxiliary request included, in addition to the amended page 4 of the specification, a set of 5 claims which differ from that of the second auxiliary request only in that in claim 1 the passage "*for enzymatically cleaning material, which composition comprises*" is replaced by "*for enzymatically cleaning material said material being a cloth having a lipid stain thereon, wherein said cutinase hydrolyses said lipid, which composition comprises*".

During the oral proceedings the Appellant proposed to modify the third auxiliary request so that the words "*lipid stain*" were amended to "*stain comprising lipids*".

The fourth auxiliary request included, in addition to the amended page 4 of the specification, a single claim which reads as follows:

"1. *A method of manufacture of an enzymatic cleaning composition comprising adding a substantially pure microbial cutinase and one or more enzymes selected from lipases, amylases or proteases to two or more surfactants, wherein the surfactants synergistically increase the hydrolytic activity of the cutinase.*"

- X. With respect to its request to maintain the patent as granted (main request) the Appellant argued in writing and orally *inter alia* that the amendment of the amino acid at position 254 of the sequence at page 5 of the patent in suit did not infringe the requirements of Article 123(2) EPC, since the original international application of the patent in suit (see WO 88/09367

page 4, last sentence) disclosed that such amino acid sequence was that of the cutinase isolated from a microorganism "*described in copending U.S. patent application, Serial No. 932, 959, filed November 19, 1986*".

It observed initially that, even if no US patent corresponding to the cited US patent application was ever published, the correct amino acid sequence of the cutinase was rendered available to the public before the filing date of the patent in suit with the publication on 25 May 1988 of Document (9), i.e. the European patent application claiming priority from such US patent application. The Appellant referred in particular to the decision T 689/90 of 21 January 1992 (OJ 1993, page 616, point 1.3 of the reasons for the decision) which established that a cross-reference to a US patent application also unambiguously identified the published European patent application corresponding to it and concluded that the Opposition Division was correct in assessing the basis for the amendment in the amino acid sequence only in view of the sequence disclosed in Document (9).

The Appellant then stressed at the oral proceedings before the Board that the cited US patent application was also available to the public, via inspection of the file of Document (9) at the EPO.

With respect to the admissibility of the four auxiliary requests submitted at the hearing before the Board, it justified the late filing by the fact that it had hoped for a written communication giving the preliminary opinion of the Board which would identify those of the Respondents' objections which were likely to affect the

patent as granted. Moreover, it maintained that the amended sets of claims were evidently aimed at overcoming the grounds of opposition under Articles 100(a) and 100(c), clearly supported by the application as originally filed and complied with the requirements of Articles 84 and 83 EPC.

The Appellant eventually conceded that the only problem credibly solved by the claimed invention was to provide an alternative to the enzymatic detergent compositions for lipid stains of the prior art and that this problem had been solved by using cutinase therein.

In respect of the non-obviousness of the subject-matter of claim 1 of the first and second auxiliary requests the Appellant submitted *inter alia* the following arguments:

- the person skilled in the art would consider the cutinases as a class of enzymes on their own, quite distinct from conventional lipases, and even Document (1) explicitly disclosed their limited lipolytic activity on normal fats (see page 483 the first 9 lines of section 6.1, and page 484, lines 7 to 10);
- moreover only the inventors of the patent in suit recognised that lipids bound to a cloth are similar to cutin and realized that cutinase could perform a special function in a cleaning composition which conventional lipases were less apt to produce: i.e removing the lipids bound to the cloth therefrom;

- only on the basis of this insight could one realistically conceive the idea of using cutinases in detergent compositions.

Finally, the Appellant maintained that the person skilled in the art of detergents would not consult Document (1) and considered the experimental comparison of example 8 of Document (14) - also depicted in Figure 12 of this document - sufficient to demonstrate that cutinases were surprisingly superior to conventional lipases in removing lipid soil.

- XI. The Respondents refuted the Appellant's arguments, stressed that the original application of the patent in suit made reference only to the US patent application with the Serial No. 932959 and not to Document (9) and contested the admissibility of the amended auxiliary requests in view of their late filing, as well as of the requirements of Articles 123(2), 84 and 83. In particular Respondent I submitted that the Appellant's auxiliary requests including disclaimers were to be considered in the light of the decision T 323/97.

They further objected that the invention of the patent in suit was not entitled to claim a priority date of 29 May 1987 from US 056500, since not this US patent application but rather the US patent application on which Document 8A was based and from which Document (8) claimed priority represented the first application in which the present invention was disclosed. Therefore, the Respondents concluded that Documents (8) and (9) formed part of the state of the art under Article 54(2) EPC and should be taken into consideration in assessing the presence of an inventive step.

The Respondents further submitted that the experimental comparison of Figure 12 of Document (14) was insufficient to demonstrate credibly a surprisingly improved cleaning of lipid stains in general over the whole range of claimed compositions.

In the Respondents' opinion, Document (1) was a document of general use for any skilled person interested in the use of lipases and even the index of this citation shows that cutinases were normally classified among lipases.

XII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained as granted or according to one of the auxiliary requests 1 to 4 filed during the oral proceedings.

Respondents I and II requested that the appeal be dismissed.

XIII. At the end of the oral proceedings the chairman announced the decision of the Board.

Reasons for the Decision

1. *Identity of Respondent I*

In view of the documents submitted (cf. point III above), the Board is satisfied that the opposition of Novo Nordisk A/S was validly transferred to Novozymes A/S (cf: decisions G 4/88, OJ EPO 1989, 480). No objection was raised by the other parties in this respect.

2. *Article 123(2) for the amended amino acid sequence in the description of the patent as granted (Appellant's main request)*

2.1 The Board notes that nothing in the original application of the patent in suit *per se* suggests that the amino acid sequence explicitly given therein contains an error and, therefore, the amendment of the amino acid residue at position 254 from "gly" to "glu" cannot be justified pursuant to Rule 88 EPC as the obvious correction of a self-evident error.

According to the Appellant's argument, this amendment would instead be justified by the (alleged) contradiction between the amino acid sequence explicitly disclosed in the original description of the patent in suit and that (allegedly) disclosed in another document - i.e. in the US patent application with the Serial No. 932959 - referred to in the original description of the patent in suit.

2.2 The Appellant initially maintained, much as in point 2 of the reasons in the decision under appeal, that the amino acid sequence disclosed in Document (9), which is a European patent application, demonstrated the existence of that contradiction and, therefore, provided the basis for the amendment.

In particular the Appellant argued that according to the decision T 689/90 a reference to an unpublished patent application also unambiguously identified the published documents claiming priority therefrom.

2.3 The Board finds that the original application does not make direct reference to Document (9) and observes that the difference between the allegedly correct and the allegedly erroneous amino acid sequences lies exclusively in a single mistyped letter ("y" instead of "u"). In the present circumstances it is thus necessary to assess the **literal** content of the cited US patent application document.

To refer to Document (9) alone amounts therefore to assuming implicitly that the cutinase amino acid sequence in the cited US patent application with the Serial No. 932959 and that published in Document (9) were unavoidably literally identical.

However, no reason has been given by the Appellant which would render it more plausible that the amino acid sequence in the US patent application with the Serial No. 932959 should be identical to that in Document (9), rather than, for instance, identical to that given in the original application of the patent in suit or rather than different from both.

Therefore, whereas the decision T 689/90 considered it sufficient to rely on a published EP application claiming priority from an unpublished US patent application in order to establish some disclosure contained in the latter (see point V of the facts and submissions and point 1.3 of the reasons for the decision), the Board comes to the conclusion that in the circumstances of the present case the text of Document (9) taken alone is not sufficient to demonstrate credibly the (alleged) disclosure of the amino acid sequence with a "glu" residue at position 254 in the US patent application cited in the patent in suit.

2.4 The Appellant then maintained at the oral proceedings that the cited US patent application was also available to the public at the filing date of the patent in suit, since it could be retrieved by inspection of the EPO's file of Document (9), which was already published at that date.

2.5 It is established jurisprudence of the Boards of Appeal (see e.g. headnotes and point 1.4 of the reasons of T 689/90, specifically relied upon by the Appellant) that those features of the invention which are described in the specification of the patent application only by reference to the disclosure in another document are *prima facie* not within "the content of the application as filed" for the purpose of Article 123(2) EPC, i.e. that the disclosure in a document may become part of the content of a European patent application making a reference to such document only under certain specific conditions. In particular, in the decision T 737/90 of 9 September 1993, unpublished in the OJ, the Board considered that when

the cited document is unpublished at the filing date of the patent application it is not only necessary that the document containing such disclosure must be unambiguously identified, but also that the relevant addressees of the European patent application (e.g. initially the EPO and, after the publication of the patent application, also the public) have ready access to such document (see headnotes and point 3 of the reasons for the decision).

The Board follows the said principle and also notes that the Guidelines for the Substantive Examination in the EPO are in line with it. Chapter C-II, 4.18 indicates that cited documents not available to the public at the filing date of the patent application would be rendered ready accessible to the EPO and, therefore, also to the reader of the published patent application via "file inspection" of the patent application, if copies thereof were filed together with the European patent application referring to such cited documents.

2.6 Since in the present case a copy of the original text of the US patent application with the Serial No. 932959 was not filed together with the original application of the patent in suit, this document would have only become available to the EPO or to the reader of the patent application on its publication date at the end of the following onerous sequence of four steps:

- (i) an enquiry at the US Patent and Trademark Office as to the publication of a US patent on the basis of the US patent application with the Serial No. 932959 and a negative answer thereto;

- (ii) enquiries in patent databank(s) as to the existence of published patents of the same family;
- (iii) the retrieval of Document (9), and
- (iv) an inspection of the file of Document (9) at the EPO to retrieve the original text of its priority document.

Thus, the Board concludes that the original text of the US patent application with the Serial No. 932959 cannot be considered as ready accessible to the addressees of the European patent application as originally filed and, therefore, **no** portion of its disclosure may be considered incorporated in the content of the original application of the patent in suit pursuant to Article 123(2).

2.7 It follows that the amendment of the residue 254 of the amino acid sequence into "glu" has no basis in the application as originally filed pursuant to Article 123(2) EPC and, therefore, that the Appellant's main request is not allowable.

3. *Admissibility of the four auxiliary requests of the Appellant in view of their late filing.*

3.1 The Board observes that Appellant's expectations as to a possible, but not mandatory, communication of the Board expressing its provisional opinion does not represent a valid justification for not submitting with the grounds of appeal as auxiliary request(s) a version or versions of the patent that the Appellant considered

more likely to be found valid in view of the grounds of opposition, the Opponents' submissions and the reasoning in the decision under appeal.

3.2 On the other hand in the present case:

- the amended description pages present in all four late filed auxiliary requests simply brought the amino acid sequence in the patent specification in line again with that in the patent application as filed,
- the independent claim 1 of the first two auxiliary requests is substantially identical to claims already present in the auxiliary requests considered by the Opposition Division, and
- the third and fourth auxiliary requests result from the incorporation into the claims of the second auxiliary request or in granted claim 12 of expressions whose technical meaning and relevance to the case had been extensively discussed throughout the whole opposition procedure and again by the Appellant in the letter of 13 January 2003.

3.3 Therefore, the Board concludes that the four late-filed auxiliary requests of the Appellant were not such as to take the Respondents by surprise and that during the oral proceedings sufficient time was available to the Respondents - which could be expected to be familiar with the auxiliary requests filed during the opposition proceedings and aware of the arguments discussed in the

written submissions of the Appellant - to study these late-filed requests so as to be able to comment on them at the hearing.

Accordingly, the Board decides to admit the Appellant's four late-filed auxiliary requests in the proceedings under its discretionary power pursuant to Article 114(2) EPC.

4. *Amended page 4 of the patent specification in the four auxiliary requests of the Appellant.*

It is undisputed that the amended description on page 4 in all of the four auxiliary requests complies with the requirements of Rule 57a and Articles 83, 84, 123(2) and (3) EPC. Therefore, no reasons need be given in this respect.

5. *Disclaimer in the independent claims of the first, second and third auxiliary requests of the Appellant.*

The independent claims of the first auxiliary request, as well as claim 1 of the second and third auxiliary requests, contain the following negative technical feature (disclaimer): "*said cleaning composition not comprising an enzymatic perhydrolysis bleaching system.*" which was not present in the claims of the patent as granted.

Respondent I implicitly contested the admissibility of such amendments, by observing in its reply of 29 January 2003 that these "disclaimers" were to be discussed in the light of the decision T 323/97.

Since all these requests fail for other reasons there was no need for the Board to decide whether or not the incorporation of these disclaimers into the respective claims was an admissible amendment complying with the requirements of Article 123(2) EPC.

6. *Appellant's first auxiliary request.*

- 6.1 The Board is satisfied that besides the undecided issue just mentioned of the admissibility of the disclaimer, the other amendments to the granted patent resulting in the 8 claims of this auxiliary request comply with the requirements of Rule 57a and Articles 83, 84, 123(2), 123(3) EPC.

The Board is also satisfied that the subject-matter of these claims is novel pursuant to Articles 52(1) and 54 EPC.

As this request fails for lack of inventive step, no reasons need to be given in these respects.

- 6.2 Inventive step for the subject-matter of claim 1 (Article 56 EPC)

- 6.2.1 The Respondents' objection that the patent in suit was not entitled to claim priority of 29 May 1987 from US 056500 was aimed only at establishing that Documents (8) and (9) were also part of the state of the art under Article 54(2) EPC, to be taken in consideration when examining inventive step of the claimed subject-matter of all Appellant's requests.

However, since the other documents available to the public before the filing date of US 056500 render obvious the subject-matter of claim 1 of this request, it has not been necessary to discuss at the oral proceedings and to decide either on the entitlement to priority of the patent in suit or on the relevance of the disclosure of Documents (8) and (9) for a decision on inventive step of this request.

6.2.2 It is undisputed that lipases, i.e. enzymes with lipolytic activity, are conventional components of detergent compositions possibly comprising other enzymes.

The decision under appeal indicated at point 5.3 of the reasons that - as also conceded by the Appellant at the oral proceedings and maintained by the Respondents - the problem credibly solved by the claimed compositions was **to provide an alternative to the detergent compositions of the prior art comprising mixtures of anionic and nonionic surfactants, lipolytic enzyme and an additional enzyme**, such as those disclosed in **any of Documents (2), (4), (10) or (11)**.

It is also undisputed that the claimed compositions differ from those of these prior art documents comprising a mixture of anionic and nonionic surfactants, lipase and an additional enzyme only in that cutinase is used **in complete or partial substitution for one of the enzymes**.

The Board finds no reason to deviate from these findings of the decision under appeal in respect of the most relevant prior art, the technical problem credibly solved vis-à-vis this state of the art and the

difference between the claimed compositions and those of the relevant prior art.

6.2.3 However, the Appellant maintained that the person skilled in the art would consider the cutinases as a class of enzymes different from conventional lipases. They had very specific lipidic substrates and too limited activity on conventional lipids to be comparable with the lipases conventionally added to cleaning compositions. In support of this contention the Appellant cited the teaching at page 484, lines 7 to 9, of Document (1), that fungal cutinase hydrolysed triglycerides only at very slow rate. Accordingly, it would have been unreasonable to consider cutinases as an alternative to conventional lipases.

Instead the inventors had recognised for the first time the similarity between cloth-bound lipid and cutin and realized that cutinase could perform a special function in a cleaning composition for cloths with lipid stains, a function which conventional lipases were not known (or not expected) to be able to produce: i.e. hydrolysing the chemical bond between the cloth and the lipids bound to the cloth.

Only on the basis of this "insight" could one have realistically conceived the idea of using cutinases in detergent compositions instead of or in addition to other lipases. Since this "insight" had never been disclosed or suggested prior to the filing of the patent in suit, the person skilled in the art would have no reason to contemplate such an idea.

Additionally, the Appellant also submitted that the experimental comparison in example 8 and Figure 12 of Document (14) would demonstrate a superior cleaning efficiency of the cutinase-containing detergent compositions vis-à-vis the lipase-containing ones.

- 6.2.4 This last argument contradicts the Appellant's own statement at the hearing before the Board that the problem solved by the compositions of the invention was to provide an alternative to prior art enzymatic detergent compositions for lipid stains (i.e. the existing technical problem as already correctly identified in the decision under appeal, see above point 6.2.2). Further, and even more important, Figure 12 of Document (4) provides the results of a single comparative test only, in which a specific cutinase (different from those explicitly considered in the patent in suit) was found to provide in the presence of non-ionic surfactant (but in the absence of further enzymes and of anionic surfactant) better cleaning of a specific soil than another specific lipase.

Thus, this evidence is clearly not sufficient to credibly demonstrate that the same improved cleaning efficiency was reasonably to be expected also in the presence of anionic surfactants and of additional enzymes in all the detergent compositions according to claim 1 of this auxiliary request for any kind of lipid soil and for any possible cutinase/other enzyme pair.

Therefore, this last argument of the Appellant is unconvincing.

6.2.5 The Board observes that the remaining part of the Appellant's reasoning (see above point 6.2.3) amounts to a description of the (subjective) line of reasoning according to which the inventors allegedly arrived at the invention, starting from certain considerations.

6.2.6 However, the assessment of inventive step requires the Board to establish whether or not it would have been obvious to the notional person skilled in the art, in view of the available state of the art, to solve the technical problem defined above (see 6.2.2) by using a cutinase instead of (all or part of) the lipase, in the detergent compositions of the prior art comprising anionic and nonionic surfactants, lipase and protease.

The person skilled in the art, searching for a solution to the posed problem, would obviously have considered the possibility of substituting the conventional lipases used in the detergent compositions of the prior art with immediately evident substitutes and, thus, would have consulted Document (1), which is a basic textbook in the field of lipases.

Document (1) teaches that cutinases are lipolytic enzymes stable in the presence of mixtures of anionic and nonionic surfactants and proteases. In particular, it discloses that anionic SDS surfactants cause inhibition of the enzyme while the addition of nonionic Triton X-100 may fully reverse the inhibition (see Figure 9 and the comments referring to such figure in paragraph 6.2.1, as well as paragraph 7.1, the first 23 lines and the last 9 lines).

Moreover, the statement in Document (1) relied upon by the Appellant as to slow triglyceride hydrolysis (see above at point 6.2.3), is referring exclusively to fungal cutinase, while the immediately following sentence discloses that at least triglycerides of primary alcohols are very rapidly hydrolysed by microbial cutinases.

Therefore, it was obvious for a skilled person to replace (a part or all of) the lipases by the known microbial cutinase enzymes mentioned in Document (1) at least in the detergent compositions of the prior art disclosed in any of Documents (2), (4) (10) or (11) which contain mixtures of anionic and nonionic detergents and proteases, in the reasonable expectation that in such detergent compositions these cutinases would achieve cleaning results comparable to those of the other lipases with similar lipolytic activity, thereby arriving at the claimed subject-matter without exercising any inventive skills.

6.2.7 Consequently, the subject-matter of this claim 1 does not involve an inventive step and, therefore, the Appellant's first auxiliary request does not comply with the requirements of Article 56 EPC.

7. *Appellant's second auxiliary request.*

7.1 Taking into account what has already been said at point 5 above as to the undecided admissibility of the negative feature introduced in the independent claim of this request, the Board is satisfied that the other amendments of the granted patent resulting in the 5

claims of this auxiliary request comply with the requirements of Rule 57a and Articles 83, 84, 123(2) and (3) EPC.

The Board is also satisfied that the subject-matter of these claims is also novel in view of the requirements of Articles 52(1) and 54 EPC.

As this request fails for lack of inventive step, no reasons need to be given in these respects.

- 7.2 Whereas claim 1 of the first auxiliary request relates to an **enzymatic detergent composition**, claim 1 of the present request relates to **its use as an enzymatic detergent composition**.

It is stressed that at the hearing the Appellant did not contest the Respondents' objection that no additional, technically relevant feature is expressed by the wording "for enzymatically cleaning" characterizing the use of claim 1 of the second auxiliary request.

Therefore, the same arguments given above for the reasoning as to the absence of inventive step for the subject-matter of claim 1 of the first auxiliary request evidently apply to the subject-matter of claim 1 of the present request as well.

- 7.3 Consequently, and as with the first auxiliary request (see above item 6.2), it has not been necessary to discuss the validity of the priority of 29 May 1987 from US 056500, in order to decide that this request of the Appellant does not comply with the requirements of Article 56 EPC either.

8. *Appellant's third auxiliary request*

8.1 The use defined in claim 1 of the third auxiliary request differs from that of claim 1 of the second auxiliary request only in that it specifies that the material to be enzymatically cleaned by the cutinase containing cleaning composition is "*a cloth having a lipid stain thereon*" and that in the claimed use "*said cutinase hydrolyses such lipid*".

8.2 The Appellant maintained that this wording satisfies the requirements of Article 123(2) in that it is supported by the paragraph bridging pages 6 and 7 of the original application. In particular, the last full sentence at page 6: "*Stains comprising lipids which could be hydrolysed or bound by cutinase on a substrate such as a cloth would be similar to the natural substrate cutin*" disclosed the hydrolytic activity of the cutinase on the lipids comprised in stains on a cloth.

8.3 The Board observes that this sentence describes only the (hypothetical) similarity between cutin - i.e. the cutinase natural substrate - and the stains which contain the lipids that cutinase may either hydrolyse from a cloth or (chemically) bind thereon. Therefore, the meaning of this portion of the original patent specification amounts to the technical teaching that cutinase may be expected to have the specific ability to attack certain cloth-bound lipids, i.e. those which are similar to cutin, and, therefore, to contribute to the removal of stains by hydrolysing such **cloth-bound** lipids from the cloth.

The use of claim 1 of the third auxiliary request is instead much broader in that it requires that during the claimed use the cutinase hydrolyses lipid(s) of the stain (see above point 8.1), **independently** of whether or not the cutinase attacks the lipid when it is (still) bound to the cloth and hydrolyses it therefrom.

Since neither the last paragraph at page 6 of the original patent application nor other portions thereof disclose explicitly or implicitly the hydrolysis of lipids by the cutinase when the latter are **not bound** to the cloth, the original application as filed provides no support for the feature of claim 1 requiring that the cutinase hydrolyses **in general** at least one lipid of the stain and, thus, encompassing lipid hydrolysis by cutinase whereby the lipids are only attacked by the enzyme when they are not (or not any longer) chemically bound to the cloth.

- 8.4 It is self-evident that the above objection also applies to the modified third auxiliary request proposed by the Appellant during the hearing before the Board (see above at point IX of the facts and submissions).
- 8.5 From the above reasoning the Board concludes that either claim 1 of the third auxiliary request as filed or its amended version suggested by the Appellant during the hearing encompasses subject-matter which extends beyond the content of the original patent application and that these requests are therefore not admissible under Article 123(2) EPC.

9. *Appellant's fourth auxiliary request*

9.1 The Board is satisfied that the claim of this request complies with the requirements of Rule 57a and Articles 84, 123(2) and (3) EPC. Since the request fails for other reasons no reasons need be given in this respect.

9.2 The method claimed in this auxiliary request involves only conventional mixing steps but implies the knowledge of the surfactant mixture to be used and in which amount so as to ensure that the cutinase activity in the manufactured cleaning composition is "synergistically increased".

9.3 The Respondents have objected that this latter expression is intrinsically unclear and that the patent in suit does not disclose how to determine the cutinase activity in the cleaning composition, which may comprise other lipases.

9.4 The Board finds however that the person skilled in the art would immediately understand that the cleaning compositions containing mixtures of surfactants to be manufactured in the claimed method are those in which the cutinase activity is higher than any of those observable either in the corresponding cleaning compositions containing none or only one of the surfactants in such mixtures.

Moreover, the patent in suit discloses in the section headed "EFFECT OF DETERGENTS ON HYDROLASE ACTIVITY" at pages 6 to 7 an experimental test for evaluating the hydrolytic activity of cutinase.

Even though in this test the cutinase activity is determined in the absence of some of the mandatory components of the cleaning compositions of the invention, the Respondents have provided no convincing reasons to expect that the cutinase activities measured in such test would not be representative of those actually occurring in the complete cleaning compositions.

Accordingly, the patent specification provides sufficient disclosure as to how to identify whether a certain surfactant mixture may be used in the method of manufacture claimed in this auxiliary request.

- 9.5 However, even if the person skilled in the art after reading the patent in suit is in a position to identify whether or not a certain surfactant mixture is able to "synergistically increase" cutinase activity in a cleaning composition, this is not sufficient to establish that the patent in suit discloses the invention defined in the fourth auxiliary request so that it may be carried out by a person skilled in the art pursuant to Article 83 EPC, since the patent in suit does not provide sufficient information as to how to arrive at surfactant mixtures which provide the desired results in the test.

According to the patent specification any conventional anionic, nonionic, cationic or zwitterionic surfactant is in principle a possible candidate component of the desired surfactant mixture (see page 5, lines 34 to 37).

In the above-mentioned activity test the patent discloses that mixtures of a specific anionic and a specific nonionic surfactants in certain amounts actually achieve an increase of enzyme activity.

The experimental results reported in the Table demonstrate that varying the amounts of the anionic or nonionic surfactants has a different influence on the cutinase activity. For instance, the cutinase activity in the presence of surfactant mixtures containing the same amount of Triton® nonionic surfactant increases substantially when increasing the amount of SDS anionic surfactant from 0.05 wt% to 0.1 wt%, then decreases significantly if the SDS amount is further increased to 0.2 wt%. On the contrary, in the examples containing the same amounts of SDS an increase of the Triton® amount always results in a decrease of cutinase activity.

This difference suggests at least that surfactants belonging to different classes can be expected to influence the enzyme activity differently.

9.6 This fact, and the absence of any other general instructions as to the factors which favour or affect the occurrence of the synergistically increased cutinase activity, oblige the notional person skilled in the art to rely exclusively on "trial and error" experiments to establish which surfactant mixtures may be used in the claimed method.

9.7 It is the constant jurisprudence of the Boards of Appeal (see the "Case Law of the Boards of Appeal of EPO", 4th ed.2001, chapter II.A.4, p.148) that when empirical investigation is needed to reproduce the

invention disclosed in a patent, this empirical investigation should not amount to an undue burden in order for the patent disclosure to comply with the requirements of Article 83 EPC. In particular, when trial and error experiments are required, the disclosure in the patent should provide adequate information leading necessarily and directly towards success through the evaluation of the initial failures and, therefore, only a few attempts should be required to transform failure into success.

- 9.8 In the present case, the person skilled in the art attempting to arrive at suitable surfactant mixtures, can only start by arbitrarily selecting random amounts of surfactants from among all conventional anionic, cationic, nonionic or zwitterionic surfactants, i.e. an arbitrary choice among a very large number of alternatives, and then verify if the chosen mixture provides the intended effect according to the given test.

However, in the case of initial failure the skilled person is left without any guidance how to modify the mixture already tested to obtain one with the desired property.

Therefore, in the present case the evaluation of the initial failures does not allow the surfactant mixture for use in the claimed method of manufacture to be reliably and rapidly identified through a reasonable number of further explorative experiments, but may possibly require **very extensive** experimentation.

Accordingly, the extent of trial and error experiments necessary for the reproduction of the method claimed in the fourth auxiliary request may amount to an undue burden.

- 9.9 The Board therefore comes to the conclusion that the fourth auxiliary request of the Appellant is not admissible as not complying with the requirements of Article 83 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P. Krasa