BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen
(D) [ ] No distribution

Datasheet for the decision of 15 May 2007

Case Number: T 0519/04 - 3.3.09

Application Number: 96925730.2

Publication Number: 0839006

IPC: A23L 1/0524

Language of the proceedings: EN

Title of invention:
Process for stabilizing proteins in an acidic environment with a high-ester pectin

Patentee:
DANISCO A/S

Opponent:
CP Kelco

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Prior oral publication (yes) - handout distributed during a seminar: available to the public"
"Main request, auxiliary requests 1-6: novelty (no)"
"Auxilairy request 7: novelty, inventive step (yes)"

Decisions cited:
-

Catchword:
Reasons 2, 3, 4

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0519/04 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 15 May 2007

Appellant: (Opponent)
CP Kelco
1313 North Market Street
Wilmington
DE 19894-0001 (US)

Representative:
Hiebl, Inge Elisabeth
Kraus & Weisert
Patent- und Rechtsanwälte
Thomas-Wimmer-Ring 15
DE-80539 München (DE)

Respondent: (Patent Proprietor)
DANISCO A/S
Langebrogade 1
P.O. Box 17
DK-1001 Copenhagen K. (DK)

Representative:
Harding, Charles Thomas
D Young & Co
120 Holborn
London EC1N 2DY (GB)

Decision under appeal:
Decision of the Opposition Division of the European Patent Office orally announced 10 February 2004 and posted 11 March 2004 rejecting the opposition filed against European patent No. 0839006 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: P. Kitzmantel
Members: W. Ehrenreich
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. Mention of the grant of European patent No. 0 839 006 in respect of European patent application No. 96 925 730.2 in the name of *Danisco A/S* filed on 12 July 1996 as International application PCT/EP 96/03051, was announced on 12 September 2001 in Bulletin 2001/37.

The patent, entitled "Process for stabilizing proteins in an acidic environment with a high-ester pectin" was granted with fifteen claims, Claim 1 reading as follows:

"1. A process comprising adding to an acidic environment, which contains at least one protein, a block-wise enzymatically de-esterified pectin, wherein the pectin is a high ester pectin."

II. Notice of opposition requesting revocation of the patent in its entirety on the grounds of Articles 100(a) and 100(b) EPC was filed by

Cp Kelco on 12 June 2002.

Concerning the opposition grounds under Article 100(a) the Opponent submitted that the claimed subject-matter was not novel and/or lacked an inventive step.

With regard to the issue of novelty, the Opponent contended that the claimed subject-matter was not new, inter alia over the disclosure in

D1 EP-A 0 709 033

a document constituting prior art according to Article 54(3) EPC.

In a letter dated 22 October 2003, after the expiry of the opposition period, the Opponent put forward the argument that the claimed subject-matter lacked novelty also over the disclosure in the documents

D10a and D10b,

both representing handouts (D10a in Japanese / D10b the corresponding English version) distributed to the audience on the occasion of a presentation held by Dr Paul-E. Glahn at the GENU New Products Development Seminar which took place on 25 April 1995 in the Makuhari Prince Hotel in Japan.

In order to support its allegation that the seminar was not confidential and the attendees were not bound to secrecy, *inter alia* the following further documents were presented:

D11a/11b Article in the Journal "Food Chemical" issued in August 1995 reporting on the GENU New Products Development Seminar/English translation;

D12/12a Newspaper Article which appeared in *"Food Chemicals News"* on 4 May 1995/English translation;

D13/13a Newspaper Article which appeared in *"Food Times"* on 10 May 1995/English translation;

D16 Affidavit by Mr Sadao Ishii.

Furthermore, *inter alia*, the documents

D2 Glahn et al. "Casein-Pectin Interaction in Sour Milk Beverages" in *"Food Ingredients Europe, Conference Proceedings"*, Earls Court, London, 4,5,6 October 1994;

D3 Kohn et al. "Die Verteilung der freien und veresterten Carboxylgruppen im Pectinmolekül nach Einwirkung von Pectinesterase aus *Aspergillus Niger* und Orangen" in *"Die Nahrung"*, 1985, vol. 29 No. 1, pages 75 to 85;

D5 Tieman et al.: "An Antisense Pectin Methylesterase Gen Alters Pectin Chemistry and Soluble Solids in Tomato Fruit" in "*The Plant Cell*", vol. 4, 1992, pages 667 to 679;

D14 Collection of product information sheets for GENU pectin type YM-100 and NY-1 dating from 1994 to 1996

were submitted. D2, D3 and D5 were cited in support of the objection of lack of inventive step.

III. The Patent Proprietor, *inter alia*, submitted, with a letter dated 4 February 2004, the following document:

D17 Declaration dated 3 February 2004 of Ms Ellen Trost, an employee of Danisco USA Inc.

IV. With the decision orally announced on 10 February 2004 and issued in writing on 11 March 2004 the Opposition Division rejected the opposition.

As to the objection of insufficiency of disclosure contrary to Article 83 EPC the Opposition Division pointed out that it was not contested by the Opponent that the process according to Claim 1 as granted, the subject-matter of the only independent claim, could be carried out by a skilled person. Therefore, the arguments put forward by the Opponent against several of the dependent Claims, i.e. Claims 5, 10, 13 14 and 15, were objections concerning the issue of clarity under Article 84 EPC, which however was not an opposition ground.

The Opposition Division also considered the claimed subject-matter novel over D1. It was argued that the teaching of the patent was confined to an enzymatic pectin treatment *in vitro,* i.e. by adding the enzyme externally. Therefore, pectins which were naturally de-esterified by enzymes prior to extraction were not encompassed by the claimed invention.

Since D1 disclosed the use of conventionally extracted citrus pectin without further enzyme treatment for stabilising proteins in sour milk products, D1 did not anticipate the claimed subject-matter.

As to the alleged prior oral publication, the Opposition Division expressed doubts whether the GENU New Products Development Seminar at which the handouts D10a/10b were distributed was open to the public. It

was argued that the further documents presented by the Opponent did not provide evidence that the seminar was part of the public FIA Conference which was held at the same time in the same hotel.

Mr Sadao Ishii, the maker of the affidavit D16, was an employee of a company closely related to the firms Sansho and Copenhagen Pectin, who had sponsored the seminar. No evidence was presented that a person not related to one of these companies was able to attend the seminar.

D10a/10b was therefore considered not to be citable prior art.

The Opposition Division also considered the claimed subject-matter inventive over D2 as the closest prior art in combination with D3.

The problem to be solved by the invention vis-à-vis D2, which disclosed the use of conventional pectins extracted from citrus peels for stabilising proteins in low pH milk systems, was defined as the *improvement of known methods of stabilising proteins in an acidic environment without adversely affecting its viscosity*. In the opinion of the Opposition Division there was no indication in D2 that pectins extracted from citrus fruits which had been blockwise de-esterified with external PME (Pectin Methyl Esterase) would provide stability without adversely affecting the viscosity of the acidic environment.

Neither was there any apparent motivation for a skilled person to combine D2 with D3, given that the latter merely disclosed how to appropriately effect blockwise de-esterification of pectins.

V. An appeal against the decision of the Opposition Division was filed by the Opponent (hereinafter: the Appellant) on 20 April 2004. The Statement of the Grounds of Appeal, in which the Appellant maintained its objections as to insufficiency of disclosure (Article 83 EPC), lack of novelty over D1 and D10a/10b (Article 54 EPC) and lack of inventive step vis-à-vis D2 as the closest prior art (Article 56 EPC), was submitted on 9 July 2004.

In support of its allegation that D10a/10b was a document which was available to the public, *inter alia* the following further documents were cited:

D19/19a List of Persons Who Attended FIA Related Seminar(s) and/or Party/English translation;

D20/20a Invitation to GENU New Products Development Seminars and Name list for FIA related seminar;

D21 Editorial details to "Food Chemicals Newspaper Inc."

D22/22a Editorial details to "Food Times"("Shokuruyu Taimusu")/English translation;

D26 Affidavit by Mr Eiichi Yamashita.

VI. In response to the Appellant's Statement of the Grounds of Appeal the Patent Proprietor (hereinafter: the Respondent) defended, as the main request, the patent as granted and filed, with a letter dated 4 November 2004, sets of claims as bases for auxiliary requests 1 to 6.

These auxiliary requests 1 to 6 were replaced by seventeen new sets of claims as bases for auxiliary requests 1 to 17, submitted with the letter dated 4 September 2006.

During the oral proceedings before the Board, which were held on 15 May 2007, the Respondent maintained the following requests:

- main request;
- auxiliary request 1;
- auxiliary request 6, renumbered to read auxiliary request 2;
- auxiliary requests 14 to 17, renumbered to read auxiliary requests 3 to 6.

All other requests were withdrawn.

Furthermore, the following new requests were presented in the oral proceedings:

- auxiliary requests II to V;
- auxiliary requests 7 and 8 which were based on former auxiliary requests 16 and 17 (renumbered 5 and 6) and which were redrafted in order to cope with the situation that the subject-matter claimed

according to the corresponding previous requests lacked novelty.

VII. The Appellants contested the admissibility of auxiliary requests II to V. It was argued that these requests were late filed because the amendments made therein were caused by objections which were already raised in the written submissions dated 23 September 2005 and 7 February 2007.

The Board did not admit these requests into the proceedings, which were thereafter no longer maintained by the Respondent.

Auxiliary requests 7 and 8 were submitted after the Respondent was given an opportunity by the Board to overcome novelty problems for the subject-matter of the previous auxiliary requests 5 and 6, which arose for the first time in the oral proceedings.
These requests were admitted into the proceedings.
There were no objections by the Appellant against their admission.

VIII. Several pairs of requests have identical Claims 1.
These are:

- Main request and auxiliary request 1;
- Auxiliary requests 3 and 4;
- Auxiliary requests 5 and 6;
- Auxiliary requests 7 and 8

Claims 1 of the requests on file read as follows:

Main request/auxiliary request 1:

"1. A process comprising adding to an acidic environment, which contains at least one protein, a block-wise enzymatically de-esterified pectin, wherein the pectin is a high ester pectin."

Auxiliary request 2:

"1. A process comprising adding to an acidic environment, which contains at least one protein, a block-wise enzymatically de-esterified pectin, wherein the pectin is a high ester pectin; and wherein said enzymatically de-esterified high ester pectin is prepared by adding to a pectin, which is not a pectin that has been prior treated with the enzyme polygalacturonase to substantially reduce the length of the pectin backbone, a pectin methyl esterase (PME) enzyme capable of block-wise enzymatically de-esterifying pectin; and stabilising said protein by said block-wise enzymatically de-esterified pectin."

Auxiliary requests 3 and 4:

"1. Use of a block-wise enzymatically de-esterified pectin, which pectin is a high ester pectin in an acidic environment containing at least one protein for stabilising said protein in said acid environment without adversely affecting the viscosity of the environment."

Auxiliary requests 5 and 6:

"1. A process comprising adding to an acidic environment, which contains at least one protein, a block-wise enzymatically de-esterified pectin, wherein the pectin is a high ester pectin, wherein the blockwise enzymatically de-esterified pectin is prepared by treating a pectin with a recombinant enzyme comprising any one of the amino acid sequences shown as SEQ ID No. 1 or SEQ ID No. 2. or comprising an amino acid sequence that has at least 75% homology with any one of the amino acid sequences shown as SEQ ID No. 1 or SEQ ID No. 2."

Auxiliary requests 7 and 8:

"1. A process comprising providing a pectin and adding to said pectin a recombinant enzyme comprising any of the amino acid sequences shown as SEQ ID No. 1 or SEQ ID No. 2 or comprising an amino acid sequence that has at least 75% homology with any of the amino acid sequences shown as SEQ ID No. 1 or SEQ ID No. 2 to provide a blockwise enzymatically de-esterified pectin, wherein the pectin is a high ester pectin, and adding the blockwise enzymatically de-esterified pectin to an acidic environment, which contains at least one protein."

IX. In the oral proceedings, the discussion mainly concentrated on the following topics:

(a) Status of the documents D10a/10b;

(b) Novelty of the subject-matter claimed in Claims 1 of all requests over D1 and D10a/10b;

(c) Inventive step of the subject-matter claimed according to the auxiliary requests 5 to 8 in view of D2 or D10b as the closest prior art in combination with D5.

X. The arguments concerning the above points provided by the Appellant can be summarized as follows:

(a) The GENU New Products Development Seminar, which was held within the framework of a series of FIA-related seminars on 25 April 1995 and the presentation given by Dr Glahn in the course of this seminar did not take place under conditions of confidentiality.

This emerged from the newspaper/journal articles D11a/11b, D12/12a, D13/13a reporting on this seminar, the list D19/19a of persons attending the seminar and the invitation list D20/20a.

In particular, Dr Glahn was one of the authors of the article D11a appearing in August 1995 in the newspaper "Food Chemicals" and which reported in detail (pages 5 to 11 of the English translation D11b) on issues which he presented during his lecture in April 1995. Several passages in this article corresponded to passages disclosed in the handout D10a/10b. For instance the table at page 7 of D11b and Table 3 after figure 7 of D10b were identical.

Reference was also made in the section "Referential Literatures" on page 11 No. 1) of D11b to the title of the handout D10b *"The importance of block structure for the stabilizing capability of pectin in acidified milk drinks"*.

Editorial details of the newspapers "Food Chemicals News" and "Food Times" given in the documents D21 and D22a/22b further showed that the above newspapers, in which the articles D12 and D13 appeared, were independent and had no relation to the companies sponsoring and/or organising the GENU Pectin Development Seminar.

The public nature of the GENU Pectin Development Seminar was also confirmed by D19/19a and D20/20a. In particular, it was evident from these documents that more than 180 persons attended the seminar, many of them being employees of important competing companies of the Japanese food industry. Representatives of the newspaper "Food Chemicals" also attended the FIA related seminars (attendees No. 114, 115, 116 on the list D19a).

The public availability of the handout D10a/10b at the date of the seminar was in particular evident from the declarations by Mr Sadao Ishii D16 and by Mr Eiichi Yamashita D26.

In these declarations both persons confirmed that they attended the lecture of Dr Glahn at the GENU New Products Development Seminar and received on the same day the textbook entitled *"The importance of block structure for the stabilizing capability*

of pectin in acidified milk drinks". The fact that the title of this textbook was identical with the title on the handout D10a/10b proved that the texts were also identical.

In their declarations Mr Ishii and Mr Yamashita also confirmed unanimously that *"there was no obligation to keep the contents of the textbook or of the seminar secret"*.

D10a/10b was therefore citable prior art.

(b) The subject-matter claimed in Claim 1 according to the main request and auxiliary requests 1 to 4 which, contrary to the opinion of the Respondent, did not reflect the teaching of the patent that the pectin was de-esterified *ex vivo*, was not novel over D1 and D10b.

D1 disclosed the stabilization of proteins in acidified milk drinks with blockwise-type HM (High Methoxy) pectin. In the examples, blockwise-type HM pectins manufactured by Copenhagen Pectin were used. The disclosure at page 2, lines 52/53 of D1, that the stabilization of acidified milk drinks with HM pectin extracted from citrus fruits was a general method, furthermore implied that the enzymatic de-esterification of pectins by the enzyme PME was known.

The stabilization of proteins in acidified milk drinks with blockwise enzymatically de-esterified pectins on the basis of the GENU pectin type YM-100, a pectin extracted from citrus peel (see D14)

was expressly disclosed in D10b. The blockwise structure of the de-esterified pectin was evident from figures 6 and 7 in context with the subsequent text explaining the figures.

These disclosures in D1 and D10b anticipated the subject-matter of Claims 1 of the main request and auxiliary request 1.

The disclosure in D10b was furthermore novelty-destroying for the subject-matter of the use Claims 1 according to auxiliary requests 3 and 4. The feature in these Claims "without adversely affecting the viscosity of the environment" was unclear and therefore had no technically limiting character. Moreover, results of viscosity measurements were shown in figures 5S of D10b.

The indication in Claim 1 of auxiliary request 2 that the *"enzymatically de-esterified pectin is prepared by adding to a pectin, which is not a pectin that has been prior treated with the enzyme polygalacturonase to substantially reduce the length of the pectin backbone, a pectin methyl esterase (PME) ..."* was not a limiting feature establishing novelty over D1 and D10b.

Firstly, the feature "to substantially reduce the length of the pectin backbone" was vague and did not define a certain molecular weight range for the pectin.

Secondly, the feature that the pectin is prepared by adding a PME was a product-by-process feature which did not allow a distinction to be made between a pectin de-esterified enzymatically *in vivo* or *in vitro*.

No novelty objections were raised against the subject-matter of auxiliary requests 5 to 8.

(c) D2 was representative of the closest prior art for the consideration of the issue of inventive step of the subject-matter claimed according to the auxiliary requests 5 to 8.

It was disclosed in D2 that casein in sour milk beverages was stabilized by enzymatically de-esterified pectins. In particular, the stabilising effect of pectins which were de-esterified blockwise was emphasized in the right column at page 254 of D2.

The subject-matter claimed according to the auxiliary requests 5 to 8 differed therefrom in that a pectin was used which was blockwise deesterified by a recombinant enzyme. However, no technical effect was shown by this distinguishing measure.

The problem to be solved was therefore merely to be seen in the provision of an alternative pectin de-esterification method. Pectins de-esterified with recombinant enzymes, however, were known from D5.

The subject-matter claimed in Claims 1 of the auxiliary requests 5 to 8 was therefore not inventive over a combination of D2 with D5.

XI. With respect to the issues (a) to (c) the Respondent argued as follows:

(a) The Appellants did no prove "up to the hilt" that the information provided during the GENU Pectin Development seminar was open to the public.

In particular the box "Sem. PEG" representing the GENU Pectin New Products Development Seminar was not marked on the attendance list D19a for the journalists listed under Nos. 114 to 116. Therefore, no journalists attended the lecture of Dr Glahn. The Appellant's allegation that the newspaper articles D12a/12b and D13a/13b proved the public nature of the seminar was therefore unfounded. The journal article D11a/11b written by Dr Glahn et al. was published in August 1995 and therefore after the priority date of the patent.

The declaration D17 Ms Ellen Trost, an employee of Danisco USA Inc., confirmed that she attended the FIA conference held on 25 April 1995 in the same hotel but that she was not allowed to attend the GENU New Products Development Seminar. This was further proof that the GENU New Products Development Seminar was not open to the public.

The declarations of Mr Sadao Ishii and Mr Eiichi Yamashita in D16/D26 could not prove the public availability of the handouts D10a/10b on 25 April

1995. Because of the identical wording of the texts in both declarations it seemed that the declarations were not drawn up by the persons themselves or at least not drafted independently from each other.

In any event, the fact that the title of the textbook which they received during the lecture of Dr Glahn was identical with the title on the document D10a/10b was no proof that the texts in both documents were identical.

For these reasons the Appellant had failed to demonstrate that D10a/10b was available to the public on 25 April 1995.

(b) The wording in Claims 1 of the main request, auxiliary request 1 and auxiliary requests 3 and 4 *"a blockwise enzymatically de-esterified pectin"* implied, when appropriately read in the context of the description, that the invention envisaged the stabilising of proteins with a pectin which had been enzymatically de-esterified *in vitro*. For instance, according to example 1 (page 61, lines 1 to 12 of the publication WO-A 97/03547) Grinsted™ URS mother pectin, an extract from citrus peel, was *in vitro* de-esterified with orange PME. The resulting pectin 1944-96-2 showed considerably better stabilization properties over the mother pectin, as was evident from the tables at pages 62, 63, and 64 of the WO publication.

Pectins simply extracted from citrus fruits did not therefore fall under the scope of the claims.

The enzymatic de-esterification of pectin *in vitro* was expressly indicated in Claims 1 of the auxiliary requests 2 and 5 to 8.

D1 did not disclose the use of *in vitro* enzymatically de-esterified pectins. In contrast thereto, the patent in suit clearly disclosed that HM pectins extracted from citrus fruit were conventional ones not belonging to the inventive teaching of this document. D1 was therefore not novelty-destroying for the subject-matter of any of the requests.

According to D2 and D10b the GENU pectin type YM-100 was used as mother pectin. As could be derived from D14, GENU pectin type YM-100 was a high ester pectin extracted from citrus peel and was therefore not a pectin which had been de-esterified *ex vivo*. D2 and D10b did therefore not anticipate the subject-matter of the main request and auxiliary requests 1, 3 and 4.

As could be derived from D10b, figures 6 and 7, in conjunction with the subsequent passages explaining the figures, the mother pectin was treated with the enzyme polygalacturonase in order to reduce the length of the pectin backbone. This treatment was excluded by the wording of Claim 1 of auxiliary request 2. D10b did therefore not destroy the novelty of the subject-matter according to auxiliary request 2.

Furthermore, neither D2 nor D10b described the de-esterification of pectins with a recombinant enzyme comprising the amino acid sequences as indicated in Claims 1 of auxiliary requests 5 to 8. The subject-matter of these requests was therefore novel over D2 and D10b.

(c) In D2, which represented the closest prior art for the consideration of inventive step of the subject-matter of auxiliary requests 5 to 8, it was disclosed that blockwise de-esterified pectins had the best stabilising effect for proteins and that during maturation of the fruits PME de-esterifies the pectin blockwise.

However, there was nothing in D2 which would motivate a skilled person to take a pectin extract, *in vivo* de-esterified by PME, and to treat it *ex vivo* with a recombinant enzyme.

Similar considerations applied when considering D10b as the closest prior art.

The skilled person would also not combine D2 or D10b with D5 in order to arrive at the claimed invention. D5 dealt with the influence of Antisense PME in fruits from transgenic plants on the pectin chemistry. The pectin was therefore de-esterified *in vivo*. There was no incentive for a skilled person to de-esterify a pectin extract from "normal" fruits *ex vivo* with a recombinant enzyme.

Because the presence of a technical improvement was not necessarily a prerequisite for non-obviousness, the fact that no technical effect had been presented for the use of a pectin treated with a recombinant enzyme was not enough to support a conclusion of obviousness.

XII. The Appellant requested that the decision under appeal be set aside and the patent be revoked.

XIII. The Respondent requested that the appeal be dismissed, or alternatively that the patent be maintained on the basis of any of the auxiliary requests 1, 6, 14, 15, 16 or 17 (respectively renumbered 1, 2, 3, 4, 5, 6) as filed with the letter of 4 September 2005 or auxiliary requests 7 or 8 as filed during the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. *Admission of the auxiliary requests II to V into the proceedings*

In accordance with Rule 10a of the Rules of Procedure of the Boards of Appeal auxiliary requests II to V submitted during the oral proceedings were not admitted at this very late stage because they attempted to overcome objections which were already raised by the Appellant in the written proceedings with the letters dated 23 September 2005 and 7 February 2007 and to which the Respondent had had time to respond, which, however, it had chosen not to do. By the end of the

oral proceedings the Respondent no longer maintained its conditional requests to maintain the patent on the basis of any one of these requests.

3. *Admission of the late filed auxiliary requests 7 and 8 into the proceedings*

In the written and oral proceedings no objections as to lack of novelty of the subject-matter according to the auxiliary requests 16 and 17 (which were renumbered to 5 and 6 in the oral proceedings, see point VI) were raised.

During the discussion of the issue of novelty in the oral proceedings the Board, however, expressed doubts concerning the novelty of this subject-matter. The Respondent was therefore for the first time confronted with an objection to which up to that time it had had no opportunity to react.

The Board therefore considered it appropriate to allow the Respondent to amend the requests in order to overcome the Board's objection.

The new auxiliary requests 7 and 8, submitted in the oral proceedings in order to cope with this situation, are therefore admitted into the proceedings.
The admission of these requests was not questioned by the Appellant.

4. *The status of D10a/10b*

It is not disputed that this document reflects the content of the lecture given by Dr Glahn at the

occasion of the GENU New Products Development Seminar held on 25 April 1995 in Japan. The dispute essentially centres on the issue whether or not the disclosure of document D10a/D10b belongs to the prior art, meeting the requirements of Article 54(2) EPC. In this respect two questions have to be answered:

(a) was a handout with the title and content as shown in D10a/10b distributed at the occasion of the lecture of Dr Glahn?

if question (a) is answered in the affirmative:

(b) were the persons receiving the handout bound to secrecy?

4.1 As to question (a)

In the documents D16 and D26 Mr Sadao Ishii and Mr Eiichi Yamashita, both persons being attendees of the PEG seminar (persons No. 222 and 186 on attendance list D19a), declared in identical words that they had attended the lecture of Dr Glahn on 25 April 1995 and that they had "received on the same day the textbook entitled *'The importance of block structure for the stabilizing capability of pectin in acidified milk drinks - Enzymatic and physical modification of pectin'"* and that "[t]here was no obligation to keep the contents of the textbook or of the seminar secret."

This title of the "textbook" referred to fully corresponds to the title on the English handout version D10b (the use of the word "textbook" in lieu of

"handout" or some other more appropriate term is assumed to result from an unskilled translation).

In the circumstances, the identity of the titles justifies the Appellant's conclusion that also the content of both documents is identical.

In the written appeal proceedings the identity of the texts of D10a/b, reflecting the content of Dr Glahn's lecture, and of the "textbook" handed out to the participants of Dr Glahn's lecture, as referred to in the declarations D16 and D26, had never been contested by the Respondent.

Challenging the correctness of this conclusion in the oral proceedings, at this very late stage, by simply stating that doubts existed as to the identity of the content without any reasonable explanation let alone evidence as to the possible circumstances which might have led to the creation of a "textbook" covering the topic of Dr Glahn's lecture but nevertheless being different from D10a/D10b, amounts to an unsubstantiated allegation that is not convincing by itself. In the Board's judgment it verges on improbability to assume that within the available time frame (D10b dated 4 April 1995; Dr Glahn's lecture on 25 April 1995) a second version of it had been prepared for distribution.

The Board can also not accept the Respondent's argument that the veracity of the two declarations D16 and D26 could not be trusted because the identity of their wordings showed that the texts had not been drafted by the two signatories themselves. Rather, given the absence of any factual evidence to the contrary, the

Board sees no reason to doubt that both signatories, Mr Sadao Ishii and Mr Eiichi Yamashita, both duly registered as attendees of Dr Glahn's lecture, gave their declarations independently and have signed at their own free will a pre-formulated text with identical content which corresponds to actual situation they experienced. Legal assistance in formulating such declarations (leading to the use of specifically adapted wording), in the Board's opinion, is the rule rather than the exception and cannot be considered detrimental to the veracity of the facts attested.

The Board therefore concludes that question (a) has to be answered in the affirmative.

4.2 Ad question (b)

As referred to above, Mr Ishii's and Mr Yamashita's declarations D16 and D26 furthermore contain the statement that there was no obligation to keep the contents of the textbook or of the seminar secret.

The Board has no reason to question these statements.

It is beyond any doubt that on 25 April 1995, within the framework of the FIA conference, the GENU New Products Development Seminar took place in the Makuhari Prince Hotel in Japan, and that on that occasion a lecture by Dr Paul-E. Glahn concerning the block structure of pectin for use in acidified milk drinks was held. This was not questioned by the Respondent/Patent Proprietor.

In the Board's judgment, it would be contrary to human experience that - without particular measures for strict confidentiality being taken (which have not been contended for, even less established) - the information conveyed at such an event, comprising quite a number of lectures covering several topics and attended by a great number of persons including representatives of rival companies and journalists, should be considered as given under the proviso of confidentiality. Indeed, no conceivable purpose would be served by such an obligation, when the very idea behind the event was to disseminate newly acquired knowledge within the community concerned.

The Respondent's argument (see point XI(a)) that the lecture of Dr Glahn was not public because the newspaper representatives (persons 114 to 116 on the list D19) did not attend, is not convincing. The reason for their not attending is much more likely to have been their greater interest in other topics (person 115 attending the other seminars TJ and PE) and/or the party (persons 114 to 116), the latter one being of course an important source of information for journalists. It has to be remembered here that the term "public" in the context of Article 54(2) EPC encompasses any member of the public and that "making available" as it is used therein is not restricted to purposeful publication but is satisfied by the unrestrained possibility of (lawfully) gaining the relevant knowledge. Therefore, any attendee, not just a journalist, qualifies as prospective information disseminator.

Neither does the fact that Ms Ellen Trost declared in D17 (see point XI(a)) that she was not allowed to attend the PEG seminar constitute a proof that this seminar was confidential. She could have been turned away for various practical reasons, for instance lack of space or for organizational reasons, in particular because she was not registered for this seminar.

From the above the Board concludes that question (b) has to be answered in the negative.

4.3 Because a handout with the content corresponding to the text given in D10a/b was distributed to the persons attending the lecture of Mr Glahn (point 4.1), who were not bound to secrecy (point 4.2), D10a/b is citable prior art.

Main Request, Auxiliary Requests 1, 3, 4

5. *Novelty*

Claims 1 of the above requests indicate that the pectin added to the acidic environment containing at least one protein (main request, auxiliary request 1) / used for stabilising the protein in a acidic environment (auxiliary requests 3, 4) ***is a block-wise enzymatically de-esterified pectin which is a high ester pectin***. This feature characterizing the pectin is a product-by process feature which is not apt to make a pectin which has been de-esterified *in vivo* (e.g. by enzymes during fruit maturation) distinguishable from a pectin which has been deesterified *in vitro* (e.g. by external addition of an enzyme extracted from a fruit to a pectin). These claims do not therefore reflect the

"inventive" teaching of the patent, as pointed out by the Respondent (see point XI(b)), that a pectin is blockwise de-esterified *in vitro* and is thereafter added to the acidic environment containing the protein.

Document D10b is concerned with the stabilisation of proteins, such as casein, in sour milk drinks, such as yoghurt drinks, by adding the pectin to the acidic environment.

GENU pectin type YM-100 (a pectin extracted from citrus peel, see D14, which is, at least partially, enzymatically blockwise de-esterified, see D2, page 254, first and second paragraph in the right column) is used as mother pectin (page 1 under "Preparation of yoghurt drinks"). Furthermore, in the text following figures 5S, D10b points to the importance of the block structure of the pectin molecule for the stabilisation of protein.

As depicted in the figures 6 and 7 and explained in the subsequent text, investigations of the protein sedimentation as a function of pectin concentration were made. The diagrams "% Sediment" versus "% Pectin" in these figures compare the mother pectin, the mother pectin treated with polygalacturonase, PG-P, and PG-P treated with plant pectin esterase demethylating blockwise.

At least the latter pectin is a pectin which is blockwise enzymatically de-esterified *in vitro*. According to D10b this modified pectin has the high stabilising power of the mother pectin.

The disclosure in D10b therefore anticipates the subject-matter of Claims 1 of the main request and auxiliary request 1.

The same applies to the subject-matter of Claims 1 of auxiliary requests 3 and 4, which are formulated as use claims but otherwise essentially correspond to Claim 1 of the main request. The additional feature therein *"without adversely affecting the viscosity of the environment"* is nothing more than a desired purpose expressed in non-quantifiable relative terms and thus does not contribute any additional technical information to the claimed invention which could serve to establish novelty.

The main request and auxiliary requests 1 and 3, 4 are therefore not allowable.

Auxiliary Request 2

6. *Novelty*

The wording of Claim 1 of this request *"wherein said enzymatically de-esterified high ester pectin is prepared by adding to a pectin, which is not a pectin that has been prior treated with the enzyme polygalacturonase to substantially reduce the length of the pectin backbone, a pectin methyl esterase (PME) ..."* again defines the pectin structure via a product-by-process feature.

D10b, disclosing the stabilisation of proteins in sour milk drinks by adding a pectin which has been treated with polygalacturonase and thereafter with PME (D10b,

Figures 6, 7, Table 2 and subsequent page, first paragraph) is again the most pertinent prior art for the assessment of novelty.

Accordingly, the essential question arises whether the feature according to Claim 1 that the pectin has not been treated with the enzyme polygalacturonase distinguishes the pectin of the invention from the pectin used in D10b.

The Respondent argued that the prior treatment of the pectin with the enzyme polygalacturonase according to D10b reduced its molecular weight. Because this kind of enzyme treatment was not carried out according to Claim 1 of auxiliary request 2, the molecular weight of the starting pectin was considerably higher. This made the blockwise de-esterified pectin according to the invention distinguishable from a pectin according to D10b resulting from the two-step enzymatic treatment including the chain length reduction as an intermediate step.

In this conjunction, the Respondent referred to the WO-publication of the patent in suit defining on page 11, line 31 to page 12, line 1 a typical molecular weight range of the pectins according to the invention as being from 50 KD to 150 KD (50,000 to 150,000).

The Board does not accept this argument for the following reasons:

– In contrast to the description, Claim 1 does not define any molecular weight. The molecular weight of

the pectin embraced by the claim is therefore not limited to a specific range;

– according to Table 2 of D10b the molecular weight of a pectin treated with polygalacturonase is 97,000 before treatment with PME and 83,000 after treatment with PME. Both values lie within the typical range as defined in the description of the WO publication.

Therefore, the feature in Claim 1 that the pectin has not been prior-treated with the enzyme polygalacturonase cannot establish novelty over D10b.

Auxiliary request 2 is therefore not allowable.

Auxiliary Requests 5 and 6

7. *Novelty*

Novelty objections against the subject-matter of these requests were not raised by the Appellant.

In the Board's judgment, however, their subject-matter also lacks novelty over D10b.
According to Claims 1 of both requests, the blockwise enzymatically de-esterified pectin is defined by a product-by-process feature, in that the pectin is prepared by *treating it with a recombinant enzyme comprising an amino acid sequence as defined in a certain sequence protocol or an amino acid sequence having at least 75% homology with the protocol.*

Because no further structural details of the pectin, such as molecular weight, length or stereochemical

arrangement of the de-esterified blocks, are defined in Claims 1, the Board cannot see how a pectin resulting from a treatment by a recombinant enzyme according to auxiliary requests 5 and 6 can be distinguished from a pectin according to D10b treated first with polygalacturonase and thereafter with natural PME.

Because the Respondent also failed to provide evidence that such a distinction can be made, the subject-matter of Claims 1 according to auxiliary requests 5 and 6 is not considered novel over D10b.

Auxiliary requests 5 and 6 are therefore not allowable.

Auxiliary Request 7

8. *Amendments - Article 123(2) and (3) EPC*

The sequence of the process steps indicated in Claim 1 of auxiliary request 7 is unambiguously derivable from the application as filed in its whole context, see for instance WO-A 97/03574 page 5, lines 1 to 10 and page 8, lines 5 to 9.

The feature in Claim 1 of auxiliary request 7 that the recombinant enzyme comprises any one of the amino acid sequences shown as SEQ ID No. 1 or SEQ ID No. 2 or comprising an amino acid sequence that has at least 75% homology with any one of the amino acid sequences shown as SEQ ID No. 1 or SEQ ID No. 2 is disclosed at page 14, lines 4 to 15 of the WO publication.

The amendments therefore comply with Article 123(2) EPC.

Since the scope of Claim 1 of auxiliary request 7 is considerably restricted as compared with its granted version, the requirements of Article 123(3) EPC are also complied with.

9. *Clarity - Article 84 EPC*

The feature in Claim 1 of auxiliary request 7 that the recombinant enzyme has at least 75% homology with any of the amino acid sequences shown as SEQ ID No. 1 or SEQ ID No. 2 is part of granted Claim 14 and to this extent is not objectionable under Article 84 EPC.

Likewise, the fact that the pectin resulting from the treatment with the recombinant enzyme is a high ester pectin comes from a combination of granted Claim 1 with granted Claim 14. The Appellant's objections in this respect under Article 84 EPC are therefore unjustified.

10. *Novelty*

The process according to Claim 1 comprises the following steps:

- a pectin is provided and a recombinant enzyme with a defined amino acid sequence is added to the pectin in order to de-esterify it blockwise;

- the treated pectin, which is a high ester pectin, is added to an acidic environment which contains a protein.

The combination of these two process steps is nowhere disclosed in the cited prior art.

The subject-matter of Claim 1 and dependent Claims 2 to 10 is therefore novel.

11. *Inventive step*

11.1 The subject-matter of the patent in suit

The patent is concerned with the stabilization of proteins in an acidic environment, in particular in sour milk products, with a blockwise de-esterified high methoxy (HM) pectin. The de-esterification is carried out enzymatically *in vitro* by way of a recombinant enzyme.

It is one of the aims of the invention to keep the viscosity of the acidic environment stable: see patent specification paragraphs [0019] to [0022].

According to the process of Claim 1 of auxiliary request 7 the pectin, in a first step, is treated with a recombinant enzyme comprising any one of the amino acid sequences shown as SEQ ID No. 1 or SEQ ID No. 2 or comprising an amino acid sequence that has at least 75% homology with any one of the above sequences. In a second step, the resulting blockwise de-esterified HM pectin is added to the acidic environment containing the protein.

11.2 The closest prior art

Although D2 was favoured by the parties as the closest prior art for the assessment of an inventive step, D10b is, in the Board's judgment, the better starting point

because of the disclosure therein of an enzymatic de-esterification of pectin *in vitro* (points 5 and 6 above)

The claimed process differs therefrom in that the *in vitro* de-esterification step is carried out with a recombinant enzyme defined by its amino acid sequence protocol or the degree of homology with this protocol.

11.3 The problem to be solved

The Respondent has not shown by way of experimental evidence that the viscosity profile or other properties such as sedimentation or particle size of sour milk drinks stabilized with a pectin which has been blockwise de-esterified with a recombinant enzyme are improved vis-à-vis the stabilisation with a pectin de-esterified with a plant pectin esterase.

Example 1 of the patent specification merely compares in the Tables in paragraphs [0263], [0268] and [0271] the sedimentation, particle size and viscosities in yoghurt drinks stabilized with the following pectins:

- Grinsted™ Pectin URS as mother pectin, a plant extract;
- Pectin 1944-96-2: the mother pectin *in vitro* treated with Orange PME;
- Grinsted™ Pectin AM453, a commercial pectin used in yoghurt production.

Neither Pectin 1944-96-2 nor Grinsted™ Pectin AM453 are pectins resulting from a treatment with recombinant enzymes.

Therefore, the problem to be solved by the claimed invention is seen in the provision of a process including a first enzymatic pectin de-esterification step and a second step wherein the pectin is added to an acidic environment containing a protein, wherein the de-esterification step is catalysed by an alternative enzyme.

11.4 Obviousness

In the Appellant's view it was obvious for a skilled person being aware of D5 to replace the pectin esterase enzyme extracted from fruit according to D2/D10b by a recombinant enzyme in order to solve the problem posed.

The Board does not share this view.
D5 is concerned with the introduction of Antisense Pectin Methylesterase (PME) genes into tomato plants in order to investigate the influence of the reduced PME activity in the *in vivo* ripening process of the tomato fruits. It is clearly stated in the left column at page 672 of D5 that the introduction of antisense PME gene leads to a 20 to 40% higher degree of methylesterification of cell wall pectins throughout fruit ripening.

A skilled person would therefore conclude that such an antisense PME gene results in a recombinant PME enzyme which has lost its capacity to de-esterify pectins to a considerable extent. Hence, he would not be motivated to extract such an inactive genetically modified enzyme from the plant and use it for an *in vitro* process for blockwise pectin de-esterification requiring appropriate de-esterification activity.

Thus, D5 teaches away from the claimed invention and cannot contribute to the solution of the problem posed.

The claimed process is therefore not rendered obvious by a combination of D2/D10b with D5.

12. *Sufficiency of disclosure - Article 83 EPC*

It is common practice in biochemistry, justified by the necessity to gain reasonable protection, to define a protein not only by its exact amino acid sequence but also by a minimum degree of homology with this sequence. Of course, this manner of defining the protein implicitly requires in agreement with the teaching of the patent that the activities of the exactly defined enzymes and their homologues are comparable and are sufficient for performing the claimed invention.

In this context, it has also to be pointed out that the determination of amino acid sequences and enzyme activities make use of standard methods in biochemistry. The Board can therefore not see any insufficiency of disclosure for the definition of the recombinant enzyme via the amino acid sequence protocol and the degree of homology with this protocol.

13. *Conclusion*

It follows from points 8 to 12 that none of the Appellant's objections raised under the Article 100(a) and 100(b) EPC opposition grounds and under Articles 84 and 123(2) EPC prejudice the maintenance of the patent on the basis of auxiliary request 7.

It is therefore not necessary to discuss auxiliary request 8.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. Auxiliary requests II to V are rejected as inadmissible.

3. The case is remitted to the first instance with the order to maintain the patent on the basis of auxiliary request 7 as filed during the oral proceedings after any necessary consequential amendment of the description.

The Registrar The Chairman

G. Röhn P. Kitzmantel