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Datasheet for the decision of 22 September 2015

Case Number: T 0699/13 - 3.3.09

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Language of the proceedings: EN

Title of invention:

PROCESS FOR MANUFACTURING CHEESES AND OTHER DAIRY PRODUCTS AND PRODUCTS THEREOF

Patent Proprietor:

Kraft Foods Group Brands LLC

Opponent:

STRAWMAN LIMITED

Headword:

Relevant legal provisions:

EPC Art. 100(c), 100(b), 54, 56
RPBA Art. 13(1), 13(3)

Keyword:
Grounds for opposition - added subject-matter (no, all requests)
Grounds for opposition - insufficiency of disclosure (no, all requests)
Novelty (no: main request and new auxiliary request 1, yes: new auxiliary request 2)
Inventive step (yes: new auxiliary request 2)
Admissibility of late submission (no)
Admissibility of claim request (yes: new auxiliary request 2)

Decisions cited:

Catchword:

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Case Number: T 0699/13 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 22 September 2015

Appellant: (Patent Proprietor)	Kraft Foods Group Brands LLC Three Lakes Drive Northfield, IL 60093 (US)
Representative:	Alt, Michael Bird & Bird LLP Maximiliansplatz 22 80333 München (DE)
Appellant: (Opponent)	STRAWMAN LIMITED 34 Lovedon Lane Winchester, Hampshire, SO23 7NU (GB)
Representative:	Harding, Charles Thomas D Young & Co LLP 120 Holborn London EC1N 2DY (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 16 January 2013 concerning maintenance of the European Patent No. 1416803 in amended form.**

Composition of the Board:

Chairman	W. Sieber
Members:	M. O. Müller
	E. Kossonakou

Summary of Facts and Submissions

I. This decision concerns the appeals filed by the opponent and the patent proprietor against the decision of the opposition division that European patent No. 1 416 803 as amended met the requirements of the EPC.

II. The opponent had requested revocation of the patent in its entirety on the grounds under Article 100(a) EPC (lack of novelty and inventive step), 100(b) EPC and 100(c) EPC.

The documents submitted during the opposition proceedings included:

D1: A. G. Rand JR. et al., Journal of Dairy Science, volume 58(8), 1974, pages 1144 to 1150;

D2: A. G. Rand JR., Journal of Food Science, volume 37, 1972, pages 698 to 701;

D4: WO 96/40935 A1; and

D12: Y. Miyamoto et al., Biotechnology Letters, volume 22, 2000, pages 427 to 430.

III. The opposition division rejected *inter alia* the main request (claims as granted) and held the claims of auxiliary request 3 allowable (denoted "Amended third auxiliary request" in the decision).

a) Claims 1, 4 and 6 to 8 as granted (the only claims of the main request relevant to the present decision) read as follows:

"1. A process for manufacturing a dairy product containing lactobionic acid, comprising the steps of:

preparing a liquid mix comprising a diary component, lactose, and lactobionic acid or a dietarily acceptable salt or neutralized form thereof; and

treating the liquid mix to obtain the dairy product."

"4. A process according to claim 2, wherein the lactobionic acid is generated by catalytic oxidation of at least a portion of the lactose to lactobionic acid using an oxidase."

"6. A process according to claim 4 or claim 5, wherein the oxidase is lactose oxidase in combination with a cofactor comprising FAD."

"7. A process according to claim 4 or claim 5, wherein the oxidase is a mixture of lactose oxidase and glucose oxidase."

"8. A process according to claim 4 or claim 5, wherein the oxidase is a mixture of lactose oxidase and hexose oxidase."

b) Claims 1 and 27 of auxiliary request 3 (the only claims of this request relevant to the present decision) read as follows:

"1. A process for manufacturing a **cheese** product containing lactobionic acid, comprising the steps of:

preparing a liquid mix comprising a diary component, lactose, and lactobionic acid or a dietarily acceptable salt or neutralized form thereof; and

treating the liquid mix to obtain the **cheese** product." (difference to main request in bold type added by the board)

"27. A cheese product comprising cheese and lactobionic acid or a dietarily acceptable salt or neutralized form thereof, wherein the lactobionic acid or dietarily acceptable salt or neutralized form thereof is present in an amount of 0.1 to 10 percent of the cheese product."

IV. The decision of the opposition division can be summarised as follows:

- The main request did not contain added matter. In particular, claims 6 to 8 were based on the application as filed.

  Furthermore, the invention defined in claim 4 of the main request was sufficiently disclosed. A reasonable amount of trial and error to identify suitable oxidases was permissible when assessing sufficiency of disclosure. It was clear from the patent that the oxidation referred to in claim 4 had to act on lactose to yield lactobionic acid, so that the extent of trial and error needed to reproduce the invention was kept to a minimum.

  The subject-matter of claim 1 of the main request was however not novel over D1 and D2. Both

documents disclosed milk treated with hexose oxidase. As demonstrated in the experimental data filed by the opponent, such a treatment inevitably led to the formation of lactobionic acid as required by claim 1. Furthermore, coagulation was obtained in D1 and D2, and this corresponded to the treatment step as required by claim 1.

- The first and second auxiliary requests lacked novelty.

- Auxiliary request 3 was admitted into the proceedings and the amendments were found to meet the requirements of Article 123(2) EPC.

  This request was furthermore considered to be novel over each of D1 and D2 since there was no evidence that the acidification disclosed in these documents was sufficient to produce a cheese.

  Finally, inventive step was also acknowledged. In view of the closest prior art D1, the objective technical problem was the provision of a process for producing cheese with a reduced lactose content in less time. D1 led away from the claimed invention since it disclosed a preference for the use of glucose oxidase. Moreover, as disclosed in the patent, lactobionic acid acted in the cheese product as a bulking agent and this effect could not be derived from any of the cited prior-art documents.

V. On 15 March 2013, the opponent filed an appeal. The statement setting out the grounds of appeal was filed on 22 May 2013 together with

D13: CODEX GENERAL STANDARD FOR CHEESE, CODEX STAN A-6-1978, Rev.1-1999, 4 pages;

D14: "Processed Cheese Manufacture - A JOHA® Guide", H. Klostermeyer (ed.), 1989, 8 pages;

D15: JP 7-277991 A; and

D15': English translation of D15.

The opponent also referred to the experimental evidence filed with its letter dated 26 September 2012 (referred to hereinafter as D17a).

VI. On 26 March 2013, the proprietor filed an appeal. The statement setting out the grounds of appeal was filed on 23 May 2013 (dated 24 May 2013) together with auxiliary requests 1 to 9, the main request being that the patent be maintained as granted.

VII. As the opponent and the proprietor are each appellant and respondent in the present appeal proceedings, for simplicity the board will continue to refer to them as the opponent and the proprietor.

VIII. A response was filed by the opponent with its letter of 30 September 2013 together with

D16: R. C. Bean et al., J. Biol. Chem., volume 218, 1956, pages 425 to 436; and

D17: Declaration of Mr Jørn Borch Søe, signed 30 September 2013.

IX. By letter of 8 October 2013, the proprietor filed auxiliary requests 9 to 14.

X. By communication of 1 July 2015, the board issued its preliminary opinion, in which it commented on the main request (claims as granted, see point III above) as regards the requirements of Article 100(c) EPC, sufficiency of disclosure, as well as novelty and inventive step.

XI. By its letter dated 21 August 2015, the proprietor filed new auxiliary requests 1 to 7.

XII. By its letter dated 1 September 2015, the opponent filed

D18: CODEX GENERAL STANDARD FOR THE USE OF DAIRY TERMS, CODEX STAN 206-1999, 4 pages.

XIII. On 22 September 2015, oral proceedings were held before the board. Both parties maintained their requests submitted during the written proceedings. The opponent additionally requested that auxiliary requests 2 to 6 not be admitted into the proceedings. As regards the admissibility of auxiliary request 2, the opponent raised two new objections under Rule 80 EPC which, after the board's decision to admit the request into the proceedings, were withdrawn.

XIV. The final requests of the parties were as follows:

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

The opponent additionally requested that new auxiliary requests 2 to 6 not be admitted into the proceedings.

The proprietor requested that the decision under appeal be set aside and that the patent be maintained on the basis of the claims as granted (main request), or the claims of new auxiliary requests 1 to 7 as filed with letter of 21 August 2015.

The proprietor additionally requested that D13 to D15 not be admitted into the proceedings.

XV. The claim requests relevant to the present decision are the main request and new auxiliary requests 1 and 2.

The claims of the main request are the claims as granted (see point III above).

Claim 1 of new auxiliary request 1 is identical to claim 1 as granted.

Claims 1 and 27 of new auxiliary request 2 (the relevant claims for the present decision) are identical to claims 1 and 27 of auxiliary request 3 before the opposition division (see point III above).

XVI. So far as relevant to the present decision, the opponent's arguments can be summarised as follows:

- Claims 6 to 8 of the main request differed from claims 14 to 16 as filed in that they referred to a process for manufacturing a dairy product rather than a cheese product. Claims 6 to 8 of the main request were therefore not based on the application as filed.

- The invention as defined in claim 4 of the main request was insufficiently disclosed since it required an undue burden to identify oxidases

having the capability of oxidising lactose to lactobionic acid as required by claim 4.

- The subject-matter of claim 1 of the main request lacked novelty over D1 and D2. Both D1 and D2 described the exclusive addition of hexose oxidase to skim milk. As could be deduced from D1 and D2, and as proven by the experimental evidence D17 and D17a, this inherently led to the formation of lactobionic acid as required by claim 1. The mixture of hexose oxidase and skim milk was kept at 30°C for 80 hours in D1 and D2, and this corresponded to the treating step as defined in claim 1.

- The proprietor's theoretical considerations, presented for the first time during the oral proceedings, as regards the pH achieved in D17 and D17a and its implications on the disclosure of D1 and D2 should not be admitted into the proceedings. These considerations constituted new facts, and the assumptions underlying these considerations were not even plausible; they were also in contradiction with the actual results. Lastly, to rebut these allegations, the oral proceedings would have to be adjourned to give the opponent sufficient time to react.

  Further novelty objections were raised in view of D4 and D12.

- Since claim 1 of new auxiliary request 1 was identical to claim 1 of the main request, the same novelty objections as for the main request applied.

- New auxiliary request 2 should not be admitted into the proceedings since it had been filed late and gave rise to new deficiencies at a very late stage of the proceedings. In particular the deletion of the wording "to obtain the dairy product" in claim 9 and the deletion of claim 26 as granted led to new deficiencies under Rule 80 EPC (an objection which was eventually withdrawn).

- The subject-matter of claims 1 and 27 of new auxiliary request 2 lacked novelty over D1. The first full paragraph in the right-hand column on page 1149 in conjunction with the experiment described in the first full paragraph in the right-hand column on page 1145 of D1 disclosed the production of lactobionic-acid-containing pizza-type cheese.

- The subject-matter of claims 1 and 27 of new auxiliary request 2 lacked inventive step over D1. The subject-matter of these claims differed from D1, if at all, in that unlike the pizza-type cheese disclosed in D1, the cheese product as defined in claims 1 and 27 contained lactobionic acid. The objective technical problem was the provision of an alternative cheese product. It would have been obvious to the skilled person to use the process described in the experiment on page 1145 of D1, i.e. the oxidation of skim milk with hexose oxidase only to prepare lactobionic-acid-containing milk and to use this milk for the preparation of the pizza-type cheese described on page 1149 of D1.

XVII. So far as relevant to the present decision, the proprietor's arguments can be summarised as follows:

- Claims 6 to 8 of the main request were based on the application as filed. It was true that these claims differed from claims 14 to 16 as filed in that they referred to a dairy rather than a cheese product. It was, however, clearly and unambiguously derivable from the application as filed that the invention pertained to cheeses or other dairy products.

- The invention as defined in claim 4 of the main request was sufficiently disclosed. The opponent's evidence only showed that one specific glucose oxidase was not suitable to oxidise lactose to lactobionic acid. This was however not detrimental to sufficiency of disclosure since the patent provided clear guidance to use lactose oxidase rather than glucose oxidase for this enzymatic oxidation. No undue burden was thus needed to carry out the invention.

- The subject-matter of claim 1 of the main request was novel over D1 and D2. These documents disclosed neither the formation of lactobionic acid, nor a treatment step as required by claim 1.

- New auxiliary request 2 should be admitted into the proceedings. The only difference to previous auxiliary request 3 already filed with the statement of grounds of appeal was a minor amendment in claim 9, which did not confront the opponent with any new issues.

- The subject-matter of claims 1 and 27 of new auxiliary request 2 was novel over D1, which did not disclose that the pizza-type cheese mentioned

on its page 1149 was prepared from the lactobionic-acid-containing milk produced by the addition of hexose oxidase described on its page 1145.

- Lastly, the subject-matter of claims 1 and 27 was inventive over the closest prior art D1. This document taught away from using the lactobionic-acid-containing milk obtained with hexose oxidase for the preparation of the pizza-type cheese described on page 1149. More specifically, according to D1, the pizza-type cheese was prepared by a process similar to that of a document with reference number 2 and this document was directed to the direct acidification with hydrochloric acid rather than enzymatic oxidation with hexose oxidase. Furthermore, the remaining part of D1 clearly focused on the oxidation with glucose oxidase which led to gluconic rather than lactobionic acid. If hexose oxidase was suggested at all in D1, it was taught to use this enzyme in combination with lactase in order to hydrolyse lactose to glucose and lactose, so that again no lactobionic acid was formed.

Reasons for the Decision

Main request (claims as granted)

1. Amendments - Article 100(c) EPC

Granted claims 6 to 8 refer to a process for manufacturing a dairy product (via the indirect reference to claim 1) wherein lactobionic acid is generated by catalytic, i.e. *in situ*, oxidation of

lactose using lactose oxidase in combination with any of FAD, glucose oxidase or hexose oxidase.

These claims are derived from claims 14 to 16 of the application as filed, which refer to a process for manufacturing a cheese product (via the indirect reference to claim 1 as filed) wherein lactobionic acid is generated by catalytic oxidation of lactose using lactose oxidase in combination with any of FAD, glucose oxidase and hexose oxidase.

Hence, claims 6 to 8 differ from claims 14 to 16 as filed only in that they refer to a process for manufacturing a dairy product rather than a cheese product. The opponent therefore argued that claims 6 to 8 were not based on the application as filed.

The board does not find the opponent's argument convincing. It is clearly and unambiguously derivable from the application as filed that the *in situ* oxidation of lactose to lactobionic acid by lactose oxidase can be carried out in cheeses or other dairy products. Firstly, in general terms, the application as filed extends to dairy products other than cheeses:

- page 1, lines 8 to 11: "The present invention generally relates to a process for manufacturing cheese products and other dairy products, and more particularly, to a process for manufacturing cheese products and other dairy products using lactobionic acid and to the resulting products thereof."

- page 8, lines 8 to 10: "The invention also has been successfully demonstrated in the manufacture of other dairy products such as, for example, sour

cream, yogurt, milk, reduced-lactose milk, and the like."

Secondly, the application as filed also mentions dairy products other than cheeses in the specific context of *in situ* generation of lactobionic acid:

- page 5, lines 4 to 7: "The present invention relates to a process for manufacturing cheeses and other diary products, and the resulting products, in which lactobionic acid is added, or generated *in situ*, in combination with the dairy component in the course of the process."

- page 6, lines 17 to 26: "In another advantageous mode of the invention, which is applicable to all the various cheese-making and other dairy product-making embodiments described herein that employ one or more lactose-containing dairy component ingredients in the cheese mix, the lactobionic acid can be introduced to the cheese mixture through its *in situ* generation by catalytic action of an added carbohydrate oxidase enzyme on the lactose present in the dairy component(s) of the cheese mixture. Suitable carbohydrate oxidase enzymes include, for example, lactose oxidase, ... Generally, lactose oxidase is preferred."

- page 15, lines 25 to 29: "The use of such an oxidase to generate lactobionic acid *in situ* using lactose present in the mixture offers the added advantage of significantly reducing lactose levels in the manufactured cheese or other dairy products as compared to those otherwise present in the absence of oxidase addition, all other things

equal" (emphasis in all quoted passages added by the board).

From these passages in the application as filed it is clearly and unambiguously derivable that the lactose oxidase in combination with any of FAD, glucose oxidase and hexose oxidase as disclosed in claims 14 to 16 as filed for cheese products can also be used for dairy products in general.

This is confirmed by page 6, lines 23 to 26 and page 11, lines 19 to 25 as filed, where lactose oxidase, lactose oxidase in combination with FAS, glucose oxidase, hexose oxidase, as well as mixtures thereof, are disclosed without any restriction to cheese products.

Therefore, claims 6 to 8 are based on the application as filed. Consequently, in the absence of any further objections by the opponent, the ground under Article 100(c) EPC does not prejudice the maintenance of the patent as granted.

2. Sufficiency of disclosure - Article 100(b) EPC

2.1 Claim 4 requires that the lactobionic acid is generated by catalytic oxidation of at least a portion of the lactose using an oxidase. The oxidase in this claim is thus defined functionally, namely to the effect that it must be capable of oxidising the lactose present in the liquid mix to lactobionic acid.

2.2 According to the opponent, D17 and the experimental evidence D17a already filed during the opposition proceedings demonstrated that not even the preferred oxidase of the patent, namely glucose oxidase, was

capable of oxidising lactose to lactobionic acid. In the absence of any selection rule in the patent, the skilled person had to use trial-and-error experimentation on arbitrarily selected oxidase enzymes to establish whether they possessed the functionality required by the claim. This represented for the skilled person an invitation to perform a research programme and thus an undue burden. The opponent referred in this respect to decisions T 339/05 and T 1063/06.

2.3 The board acknowledges that in view of the opponent's experimental results, glucose oxidase, or at the very least some glucose oxidases, are not suitable to oxidise lactose to lactobionic acid, although described in paragraph [0014] of the patent as suitable oxidase enzymes. However, isolated failures are not enough to deny sufficiency of disclosure. The crucial question is rather whether the patent enables the skilled person to transform these failures into success (T 480/11, point 3.4), i.e. in the present case whether the patent provides sufficient guidance to the skilled person to select without undue burden those oxidases that have the capability required by claim 4.

It is stated in paragraph [0014] that "Suitable carbohydrate oxidase enzymes include, for example, lactose oxidase, glucose oxidase, hexose oxidase, and the like, as well as mixtures thereof" and that "Generally, lactose oxidase is preferred" (emphasis added by the board). In paragraph [0025], lactose oxidase, cellobiose dehydrogenase, glucose-fructose oxidoreductase and hexose oxidase are mentioned as suitable oxidases. In the subsequent paragraph [0026], a specific lactose oxidase (flavo enzyme from Novozymes A/S) is described as a particularly suitable enzyme. The next paragraph [0027] refers to certain

disadvantages of cellobiose dehydrogenase and glucose-fructose oxidoreductase and states that glucose oxidase belongs to the less efficient enzyme systems (last sentence). In this context, the board notes that glucose oxidase is cited in the claims only in combination with lactose oxidase (claim 7).

Hence, the skilled person reading the patent is taught that glucose oxidase is less efficient to oxidise lactose to lactobionic acid and that the best enzyme for this purpose is really lactose oxidase. The patent thus provides guidance to the skilled person to avoid the failure obtained in the opponent's experiments with glucose oxidase, namely by using glucose oxidase in combination with lactose oxidase. Hence, unlike in the decisions cited by the opponent (T 339/05 and T 1063/06), guidance is given and no undue burden is required to identify oxidases with the required capability of oxidising lactose to lactobionic acid.

2.4 The ground under Article 100(b) EPC therefore does not prejudice the maintenance of the patent as granted.

3. Novelty

3.1 The opponent contested novelty on the basis of D1, D2, D4 and D12.

3.2 Both D1 and D2 relate to the enzymatic conversion of lactose in milk to an acid. It is stated in both documents that hexose oxidase oxidises lactose to its aldobionic acid, i.e. lactobionic acid (first full paragraph in the right-hand column on page 1145 of D1 and first full paragraph in the centre column on page 698 of D2). In an experiment described in both D1 (first full paragraph in the right-hand column on

page 1145) and D2 (first full paragraph in the centre column on page 700), acid formation is observed when hexose oxidase alone is added to skim milk and the resulting mixture is kept at 30°C for more than 80 hours. In this experiment the pH gradually changes ("white triangle" curve in figure 3 of D1 and figure 6 of D2).

In the opponent's experimental evidence D17 (sample 5), exclusively hexose oxidase was added to skim milk in the same amount as in D1 and D2 and the resulting mixture was kept at 30°C for 24 hours. The mixture was then analysed with TLC, which revealed the presence of lactobionic acid. This was confirmed by HPEAC analysis, which gave an amount of 0.76% of lactobionic acid. In a similar experiment in D17a (only difference: amount of hexose oxidase), the presence of lactobionic acid was confirmed by NMR. It has thus been proven by D17 and D17a that the addition of exclusively hexose oxidase to skim milk leads to the formation of lactobionic acid. This confirms the statement in D1 and D2 that the acid formed in the relevant experiment of D1 and D2 is indeed lactobionic acid.

Both D1 and D2 thus disclose the feature of claim 1 of manufacturing a dairy product containing lactobionic acid, comprising the step of preparing a liquid mix comprising a dairy component, lactose (both contained in the skim milk of D1 and D2), and lactobionic acid.

3.3 Figure 3 of D1 and figure 6 of D2 show a change of pH caused by keeping the mixture at 30°C for more than 80 hours, this change of pH occurring over the entire duration of the experiment. Keeping the mixture at 30°C and the resulting change of pH imply a heat treatment,

which corresponds to the treating step as required by claim 1.

The proprietor in this respect argued that claim 10 of the main request defined the treating step to be a coagulation step, which was not disclosed in D1 or D2. However, claim 10 is a dependent claim and thus does not restrict the treating step of claim 1. In fact, this step in claim 1 is entirely undefined and thus covers any conceivable treatment, including that disclosed in D1 and D2.

3.4 Both D1 and D2 thus disclose all the features of claim 1. The process of claim 1 thus lacks novelty over these documents.

3.5 During the oral proceedings, the proprietor provided a new submission based on a "thought experiment". It argued that assuming that the buffering effect of skim milk was comparable to that of a phosphate-citrate buffer, the amount of 0.76% of lactobionic acid found for sample 5 in the opponent's experiments D17 must have induced a pH in the skim milk of 4.1 or even lower. According to the proprietor, this reduction in pH was much higher (about two units) than that observed in figure 3 of D1 and figure 6 of D2 (about 0.5 units). The opponent's experiment thus did not represent a proper reworking of the experiment in D1 and D2, and thus did not prove that lactobionic acid was formed in D1 and D2. In fact, rather than being due to the formation of lactobionic acid, the pH reduction observed in D1 and D2 was due to the oxidation of glucose present at a low amount in the skim milk to gluconic acid.

The opponent requested that the proprietor's new submission not be admitted into the proceedings.

3.5.1 As acknowledged by the proprietor, this submission was made for the first time during the oral proceedings before the board. It rests on two assumptions: firstly, that the buffering effect of skim milk is comparable to that of a phosphate-citrate buffer; and secondly, that in the experiment of D1 and D2 exclusively glucose was oxidised. The first assumption is in contradiction to the fact that the change of pH obtained with hexose oxidase in a phosphate-citrate buffer (white triangles in figure 5 of D2) is different from that obtained with hexose oxidase in skim milk (white triangles in figure 6 of D2). A further contradiction arises due to the fact that the assumed pH of 4.1 would lead to the coagulation of the skim milk, while the declarant of D17 Mr Søe stated during the oral proceedings that no such coagulation had occurred. The proprietor's first assumption is thus not plausible. The second assumption that it was only the glucose that was oxidised in the experiment of D1 and D2 is entirely unsubstantiated. The proprietor's submission thus lacks at the very least any *prima facie* relevance. For this reason alone, the submission is not admissible (Article 13(1) RPBA).

Furthermore, if the submission had been admitted, the opponent would have had to be given the opportunity to react to it, e.g. by filing experimental evidence showing that the change of pH was not as assumed by the proprietor. This would have made the adjournment of the oral proceedings necessary. Therefore the proprietor's submission is not admissible under Article 13(3) RPBA either.

3.5.2 The proprietor argued during the oral proceedings that its submission merely constituted a new argument rather than a new fact and that new arguments should always be admitted into the proceedings. The board does not agree. The proprietor's submission contains numerous assertions of facts, such as that the buffering effect of milk is comparable to that of a phosphate-citrate buffer and that only glucose is oxidised in the experiment of D1 and D2. Therefore, the board considers the proprietor's "thought experiment" submission to be one of fact.

3.5.3 In application of Article 13(1) and (3) RPBA, and in due consideration of Article 114(2) EPC, the board decided not to admit the proprietor's submission into the proceedings.

3.6 The main request is thus not allowable.

3.7 In view of this, the opponent's further novelty objections on the basis of D4 and D12 need not be dealt with.

New auxiliary request 1

4. Claim 1 of new auxiliary request 1 is identical to claim 1 of the main request. Hence for the same reasons as given above with regard to the main request, the process of claim 1 lacks novelty over each of D1 and D2. New auxiliary request 1 is thus not allowable.

New auxiliary request 2

5. Admissibility

5.1 The opponent argued that new auxiliary request 2 should not be admitted into the proceedings since it had been filed late and gave rise to new deficiencies at a very late stage of the proceedings. The opponent in particular argued that the deletion of the wording "to obtain the dairy product" in claim 9 and the deletion of claim 26 as granted led to new deficiencies under Rule 80 EPC.

5.2 New auxiliary request 2 was filed with letter dated 21 August 2015, i.e. about one month prior to the oral proceedings before the board. It is derived from previous auxiliary request 3, which had already been filed with the statement of grounds of appeal and the admissibility of which had not been objected to by the opponent.

Granted claim 26 had already been deleted in previous auxiliary request 3. In fact, the only new amendment in new auxiliary request 2 is the above-identified amendment of claim 9, i.e. the deletion of "to obtain the dairy product". This is a consequential amendment taking account of the restriction of the dairy product in claim 1 to a cheese product. Contrary to the opponent's assertion, this amendment thus does not infringe Rule 80 EPC.

5.3 Hence, the submission of new auxiliary request 2 does not lead to any new deficiencies not already present in previous auxiliary request 3. The board therefore decided to admit new auxiliary request 2 into the proceedings.

6. Amendments - Rule 80 EPC

After the board's decision to admit new auxiliary request 2, the opponent withdrew its objections under Rule 80 EPC. The board therefore does not need to decide on this issue.

7. Amendments - Article 100(c) EPC

As acknowledged by the opponent during the oral proceedings, its objection under Article 100(c) EPC raised against claims 6 to 8 of the main request no longer applies. In any case, the board did not find this objection convincing (see point 1 above).

8. Sufficiency of disclosure - Article 100(b) EPC

For the same reasons as given above with regard to the main request, the invention as defined in new auxiliary request 2 is sufficiently disclosed.

9. Novelty

9.1 The opponent contested novelty of the subject-matter of claims 1 and 27 on the basis of D1 only. Unlike in the main request, the dairy product in both claims 1 and 27 is now restricted to a cheese product. It was a matter of dispute between the parties whether D1 disclosed also this feature.

9.2 The opponent argued that the first full paragraph in the right-hand column on page 1149 in conjunction with the experiment described in the first full paragraph in the right-hand column on page 1145 of D1 (see the discussion of novelty of the main request) disclosed

the production of lactobionic-acid-containing cheese. Therefore, the subject-matter of claim 1 and, by the same token, claim 27 lacked novelty over D1.

9.3 The board does not agree. The paragraph on page 1149 states that it is possible to produce pizza-type cheese with a process similar to the direct acidification method described in a document with reference number 2, a process different from the enzymatic (indirect) oxidation. Although D1 itself describes the enzymatic acidification of milk, it presents numerous options for this, only one of which is the oxidation of lactose present in the milk to lactobionic acid by the exclusive addition of hexose oxidase (experiment on page 1145). There is no indication at all in D1 that the cheese referred to on page 1149 is prepared from this specific lactobionic-acid-containing milk. D1 thus does not clearly and unambiguously disclose a cheese product containing lactobionic acid or the preparation of any such product. Therefore, the subject-matter of both claims 1 and 27 is novel over D1.

10. Inventive step

10.1 The opponent attacked inventive step of the subject-matter of claims 1 and 27 on the basis of D1 only.

10.2 Both parties considered D1 to be the closest prior art and the board sees no reason to disagree.

As set out above, D1 discloses the preparation of pizza-type cheese. As also set out above, this cheese does not necessarily contain lactobionic acid. It is thus different from the cheese product referred to in claims 1 and 27.

10.3 In view of this, the board agrees with the opponent that the objective technical problem is the provision of an alternative cheese product.

10.4 As a solution to this problem, the patent proposes a process wherein lactobionic acid is present, or formed *in situ*, in the liquid mix used to prepare the cheese product.

10.5 The opponent argued that it would have been obvious to the skilled person to use the process described in the experiment on page 1145 of D1, i.e. the oxidation of skim milk with hexose oxidase only to prepare lactobionic-acid-containing milk and to use this milk for the preparation of the pizza-type cheese described on page 1149 of D1.

10.6 The board does not find the opponent's argument convincing.

10.6.1 Firstly, as set out above when discussing novelty over D1, the process of document (2), to which the production of the pizza-type cheese is similar according to D1, is not an enzymatic oxidation with hexose oxidase.

10.6.2 Secondly, D1 discusses four different enzymes, namely glucose oxidase, hexose oxidase, lactose dehydrogenase and invertase, of which it considers glucose oxidase (and not hexose oxidase) to be the most promising enzyme for the acidification of milk (chapter "Glucose oxidase" on page 1145 and first sentence of the chapter "Commercial glucose oxidase" on page 1146). When glucose oxidase is used, glucose or lactase would have to be added to milk to ensure a substrate for acid production (sentence bridging the left- and right-hand

columns on page 1145, the last sentence of the first full paragraph in the left-hand column on page 1148 and summary section on page 1149 of D1). More specifically, the addition of glucose or lactase, which hydrolyses lactose to glucose and galactose, is required since glucose oxidase needs glucose as a substrate to form gluconic acid (see summary section on page 1149 of D1).

10.6.3 Thirdly, as regards hexose oxidase, D1 emphasises that direct oxidation of lactose for acidification of milk (i.e. the formation of lactobionic acid) was inconclusive and insufficient for commercial acid production (first and last sentence of the left-hand column on page 1146 and first full paragraph in the left-hand column on page 1148). Hexose oxidase is reported in D1 to be much more reactive with the monosaccharides glucose and galactose than with lactose (lines 19 to 21 of the right-hand column on page 1145). Accordingly, in the same way as for glucose oxidase, D1 suggests that lactase should be used together with hexose oxidase such that the lactose is hydrolysed to glucose and galactose and the glucose can be oxidised to gluconic acid (sentence bridging the right-hand column on page 1145 and the left-hand column on page 1146 and the first full sentence in the left-hand column on page 1146).

10.6.4 D1 thus teaches the skilled person to use, as the most promising enzyme, glucose oxidase in combination with glucose or lactase for acidification of milk and, if hexose oxidase is used at all, it should also be used in combination with lactase. The crucial point is thus that glucose is always present in the milk, either because it is added to the milk or formed through hydrolysis of lactose, and that the glucose is oxidised to gluconic acid.

In view of this, the skilled person wanting to produce the pizza-type cheese mentioned on page 1149 of D1 would use milk acidified by gluconic acid rather than by lactobionic acid. The skilled person confronted with the problem of providing an alternative cheese product would therefore not arrive at a lactobionic-acid-containing cheese product as required by claims 1 and 27. Consequently, the subject-matter of these claims is inventive over D1.

10.7 Since the remaining claims are more restricted than claims 1 and 27 and no objections have been made by the opponent, the subject-matter of these claims is likewise inventive.

Adaptation of the description

11. As set out above (point 5), apart from a minor amendment new auxiliary request 2 is basically identical to auxiliary request 3 filed with the statement of grounds of appeal, which in turn is identical to auxiliary request 3 found allowable by the opposition division. During the oral proceedings before the opposition division, the proprietor had filed description pages adapted to the claims of this auxiliary request. A copy of the patent specification including these amended description pages was annexed to the opposition division's decision. The amendments in these description pages also take account of the amendments in new auxiliary request 2.

The opponent had no objections to the patent specification as annexed to the decision of the opposition division. Nor did the board see any reason to raise an objection of its own.

Admissibility of D13 to D15

12. The proprietor had requested that D13 to D15 not be admitted into the proceedings. However, as D13 to D15 were not used during the oral proceedings and were not relevant to the decision, there was no need to decide on that issue.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent as amended in the following version:

   - claims 1 to 31 filed as new auxiliary request 2 with letter dated 21 August 2015;

   - description pages 2 to 17 as annexed to the decision under appeal;

   - figures 1/8 to 8/8 of the patent specification.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber

Decision electronically authenticated