Internal distribution code:

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

Datasheet for the decision of 7 April 2017

Case Number: T 0226/14 - 3.3.09

Application Number: 05746631.0

Publication Number: 1883308

IPC: A23C9/142, A01J11/04

Language of the proceedings: EN

Title of invention:
A METHOD IN THE PROTEIN FRACTIONATION OF SKIM MILK BY MEANS OF MICROFILTRATION

Patent Proprietor:
Tetra Laval Holdings & Finance S.A.

Opponent:
ALPMA Alpenland Maschinenbau GmbH

Headword:

Relevant legal provisions:
EPC Art. 54, 56, 123(2)

Keyword:
Main request : novelty (no)
Auxiliary request VIA : amendments - added subject-matter (no)
Auxiliary request VIA : inventive step (yes)

Decisions cited:
G 0003/14

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0226/14 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 7 April 2017

Appellant: (Patent Proprietor)	Tetra Laval Holdings & Finance S.A. Avenue Général-Guisan 70 1009 Pully (CH)
Representative:	Müller Schupfner & Partner Patent- und Rechtsanwaltspartnerschaft mbB Bavariaring 11 80336 München (DE)
Appellant: (Opponent)	ALPMA Alpenland Maschinenbau GmbH Alpenstrasse 39 - 41 83543 Rott am Inn (DE)
Representative:	Manitz Finsterwald Patentanwälte PartmbB Postfach 31 02 20 80102 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 18 December 2013 concerning maintaining European patent No. 1883308 in amended form.**

Composition of the Board:

Chairman	W. Sieber
Members:	N. Perakis
	E. Kossonakou

Summary of Facts and Submissions

I. This decision concerns the appeals filed by the patent proprietor and the opponent against the interlocutory decision of the opposition division that European patent No. 1 883 308 in amended form met the requirements of the EPC.

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

II. Independent claim 1 as granted reads as follows:

"1. Method for the protein fractionation of skim milk by means of microfiltration, in which the skim milk is microfiltered in one or more stages, characterised in that the skim milk, prior to the microfiltration, is heated to between 55 and 65°C and kept at this temperature during 2 to 15 minutes, and that the skim milk, during the microfiltration, displays a falling or alternatively maintained temperature curve."

III. With the notice of opposition the opponent requested that the patent be revoked in its entirety on the grounds of Article 100(a) EPC (lack of novelty and of inventive step).

The documents cited during the opposition proceedings included the following:

D1 : WO 02/069724 A1;

D7 : Excerpt from "Dairy Processing Handbook", TetraPak, 2003, pages 131-140; and

D13: WO 96/08155 A1.

IV. The decision of the opposition division was based on a main request (claims as granted) and an auxiliary request 1 filed during the oral proceedings of 23 October 2013.

Regarding the main request, the opposition division held that the subject-matter of claim 1 did not involve an inventive step in view of D13, the closest prior art, in combination with D1 and the skilled person's general technical knowledge as evidenced by D7.

Regarding auxiliary request 1, the opposition division held that it met the requirements of the EPC. Claim 1 of this request differed from claim 1 as granted only in that the milk was heated to between 60 and 65°C (instead of between 55 and 65°C).

The opposition division did not decide on an alleged prior use, because it did not become relevant during the opposition proceedings.

V. The patent proprietor appealed this decision and filed the statement setting out the grounds of appeal on 25 April 2014. It requested that the decision of the opposition division be set aside and that the patent be maintained as granted, and that the Chief Executive Officer of Landfrisch Molkerei Wels, Mr Johann Wöllinger, be heard as a witness about the alleged prior use.

VI. The opponent also appealed the decision and filed its statement setting out the grounds of appeal on 28 April 2014. It requested that the decision of the opposition division be set aside and that the patent be revoked in its entirety.

VII. With letter of 1 September 2014 the patent proprietor filed observations on the opponent's appeal and auxiliary requests I to IV.

VIII. With letter of 17 September 2014 the opponent filed observations on the patent proprietor's appeal and submitted a new document:

D14: a scientific statement by Prof Ulrich Kulozik.

With a further letter of 18 September 2015 it filed observations on the auxiliary requests.

IX. On 17 March 2016, the board issued a communication setting out its preliminary non-binding opinion on the outstanding issues and seeking clarification regarding the hearing of the witness.

X. With letter of 17 May 2016, the patent proprietor said it withdrew its request that the witness be heard.

The opponent "maintained" its request that the witness be heard (letter of 18 May 2016), although, as pointed out by the patent proprietor, it had never actually filed such a request in the appeal proceedings.

XI. With letter of 23 December 2016 the board summoned the parties to oral proceedings to be held on 7 April 2017.

XII. On 5 January 2017, the board issued an order to take evidence by hearing the witness Mr Johann Wöllinger and summoned him to give evidence before the board during the oral proceedings.

XIII. With letter of 29 March 2017 the patent proprietor stated that the version in which the patent was maintained by the opposition division was its auxiliary request IV, with the consequence that former auxiliary request IV became auxiliary request V.

XIV. Oral proceedings before the board took place on 7 April 2017 as scheduled. During the oral proceedings the patent proprietor filed additional auxiliary requests, including auxiliary request VIA. Eventually it withdrew all auxiliary requests except auxiliary request VIA.

The opponent stated that the alleged prior use was not relevant to this auxiliary request VIA, so that there was no need to hear the witness, and it therefore withdrew that request.

XV. Claim 1 of auxiliary request VIA reads as follows:

"1. Method for the protein fractionation of skim milk by means of microfiltration, in which the skim milk is microfiltered in more than one stages, characterised in that the skim milk, prior to the microfiltration, is heated to between 55 and 65°C and kept at this temperature during 2 to 15 minutes, and that the skim milk, during the microfiltration, displays a falling temperature curve, and in that at each microfilter (5) included in the plant, the temperature is reduced by a few degrees."

XVI. The arguments put forward by the patent proprietor in its written submissions and during the oral proceedings and relevant to the present decision may be summarised as follows:

Main request

- D14 should not be admitted into the proceedings since it was late-filed and not relevant. D14 was not concerned with the protein fractionation of skim milk into casein and whey proteins.

- The subject-matter of claim 1 was novel over D1. D1, which dealt with a method for the production of sterile milk, did not concern a method for the protein fractionation of skim milk. This was corroborated by the fact that the retentate was not used.

  Regarding protein fractionation, D14 showed that microfiltration was a complex process which did not depend exclusively on the filter pore size. The nature of the milk, the temperature, the flow rate and the number of stages involved were further parameters which influenced microfiltration.

  D7 disclosed an overview of the separation of milk ingredients based on their size and showed that overlapping results were obtained when filters with different pore sizes were used.

  The microfilter used in D1 was different from that of the patent since D1 disclosed that its "effective" pore size was of 0.5 µm or less (claim 5). This was different from the pore size 0.05 to 0.5 µm according to the patent in suit

(paragraph [0017]). Thus, in D1 ingredients with a size larger than 0.5 µm could be part of the permeate, which meant that no protein fractionation in the sense of the patent in suit took place.

- A further difference was that D1 did not disclose that the skim milk was kept at 50-55°C for 2 to 15 minutes in the open vessel before being microfiltered. As D1 did not disclose any heating device for keeping the milk at the required temperature whilst it was in the open vessel, the temperature would normally have fallen.

- A further difference was that D1 did not disclose that during microfiltration the skim milk displayed a falling or alternatively maintained temperature curve. In fact, the skim milk of D1 was unavoidably heated up because of friction and the pumping energy during processing through the filter. D1 did not disclose any cooling device, let alone a cooling device controlling the temperature profile.

  Furthermore, a cooling device to avoid heating up the skim milk was not part of the skilled person's general technical knowledge. The teaching of D7 was to conduct microfiltration at 50°C and not between 55 and 65°C.

  Nor was the disclosure of D1 referring to the solubility of the calcium phosphate on page 4, lines 26-27, an indication of temperature control during microfiltration. That disclosure concerned the preheating step and not the microfiltration.

  The comparison of the temperature profile during microfiltration illustrated in figure 2 of D1 with

that illustrated in figure 3 of the patent in suit was based on an *ex post facto* analysis.

Auxiliary request VIA

- Claim 1 of this request fulfilled the requirements of Article 123(2) EPC.

  Microfiltration "in more than one stages" was disclosed in the application as published, in particular by the wording "in one or more stages", which would be understood by the skilled reader to mean "in one or more than one stages". The limitation of the original wording to "in more than one stages" found support in figures 1 and 3 and the corresponding part of the description which disclosed an embodiment comprising four filters (i.e. four stages). Furthermore, the combination of this feature with one of the alternatives of the temperature profile during microfiltration was directly and unambiguously derivable from the application as published, since it was one of two initially disclosed equivalent temperature profiles.

- The subject-matter of claim 1 was novel over D1 since during microfiltration the skim milk displayed a falling temperature curve in that at each microfilter included in the plant the temperature was reduced by a few degrees. Although "falling temperature curve" was not a conventional term, it had a clear meaning to the skilled person working in dairy plants.

D1, in the light of D7, at most disclosed that the microfiltration temperature should be kept constant at all stages.

- The subject-matter of claim 1 involved an inventive step starting from the closest prior art D1. The temperature control during microfiltration provided an optimal solution for reducing the operational costs and led to a good commercial effect. Indeed, a temperature increase was not desired, since it would lead to precipitation of calcium phosphate, and a temperature reduction was also not desired, since it would lead to a viscosity increase. If the latter happened, the skilled person would expect increased energy requirements for pumping the retentate through each microfilter.

  Furthermore, the skilled person would not have found in the art any motivation to apply the claimed falling temperature profile during microfiltration.

XVII. The arguments put forward by the opponent in its written submissions and and during the oral proceedings and relevant to the present decision may be summarised as follows:

Main request

- D14 should be admitted into the proceedings. It had been filed by the opponent with its observations on the proprietor's appeal and was a reaction to the proprietor's allegation that D1 did not concern protein fractionation of skim milk.

- The subject-matter of claim 1 of the main request lacked novelty in view of D1, which implicitly disclosed a method for skim milk protein fractionation by microfiltration. The degree of fractionation was not of importance, since claim 1 of the main request defined protein fractionation broadly, thus including a very small removal of casein from the permeate. Furthermore, both D1 and the patent used microfilters and skim milk which could not be differentiated. Therefore, the microfiltration results had to be the same. The contested "effective" pore size of the filter of D1 differed only marginally from the pore size of the filter of the patent in suit. Contrary to the patent proprietor's assertions, the patent in suit did not disclose that protein fractionation of skim milk depended on any additional parameters not disclosed in D1. The fact that the retentate of D1 was not used was irrelevant for the issue of protein fractionation.

- Contrary to the patent proprietor's assertion, D1 also disclosed that the skim milk prior to microfiltration was heated at 50-55°C and kept at this temperature for at least 2 minutes (page 6, lines 9-13). The skim milk would not cool down whilst in the open vessel because it was led to microfiltration at a temperature of 50-55°C (page 4, lines 1-2).

- Lastly, the skilled person would have understood that D1 implicitly disclosed that during microfiltration the skim milk displayed a maintained temperature curve in order to avoid precipitation of calcium phosphate.

On the one hand, D1 disclosed that the solubility of calcium phosphate was reduced with increased temperature (page 4, lines 26-26).

On the other hand, such a skim milk temperature profile during microfiltration belonged to the skilled person's general technical knowledge, as evidenced by D7 (page 140, last paragraph).

Furthermore, this temperature profile derived from the similarity of the shape of the curves in figure 2 of D1 and figure 3 of the patent in suit, these curves illustrating the transmembrane pressure as a function of operational time. The control of the temperature during microfiltration was responsible for this shape (patent in suit paragraph [0024]). Since the shape of the curve in figure 3 of the patent in suit was obtained by maintaining the temperature, the similar shape of the curve in figure 2 of D1 meant that in D1 the temperature was also kept constant.

- Thus claim 1 of the main request lacked novelty in view of D1.

Auxiliary request VIA

- Claim 1 of auxiliary request VIA did not fulfil the requirements of Article 123(2) EPC. There was no basis in the application as published for the feature "in more than one stages". Furthermore, the combination of this feature with a falling temperature curve during microfiltration was not disclosed in the application as published.

- Furthermore, the term "falling temperature curve" was vague and not standard in the art.

- The subject-matter of claim 1 did not involve an inventive step in view of D1. The specific temperature profile during microfiltration did not provide any technical effect and was merely an arbitrary alternative of the temperature profile during microfiltration as disclosed in D1.

XVIII. The patent proprietor requested that the decision of the opposition division be set aside and that the patent be maintained on the basis of the main request (claims and description as granted) or, alternatively, on the basis of auxiliary request VIA filed during the oral proceedings and the description adapted thereto.

XIX. The opponent requested that the decision of the opposition division be set aside and that the patent be revoked in its entirety.

Reasons for the Decision

Main request (claims as granted)

1. Admission of D14

The scientific statement D14 was filed by the opponent as a reaction to the patent proprietor's argument that the microfiltration as carried out in D1 would not be regarded by the skilled person as a protein fractionation of skim milk. D14 was filed at the earliest possible stage of the proceedings, namely with the opponent's observations on the patent proprietor's

appeal. Furthermore, it corroborated the opponent's point of view that the microfiltration of D1 did indeed lead to protein fractionation of skim milk, a stance it had already adopted in the opposition proceedings. Therefore, the board admitted D14 into the proceedings.

2. Novelty

2.1 The opponent considered that the subject-matter of claim 1 as granted lacked novelty in view of the disclosure of D1 and the general technical knowledge of the skilled person as evidenced by D7.

D1 relates to a method of pretreating milk in microfiltration, comprising the method steps that raw milk (1) is heated and separated into a cream fraction (5) and a skimmed milk fraction (4), that a milk fraction (11), constituting at least the skimmed milk fraction (4), is led at a temperature of approx. 50-55°C to microfiltration, and that the heated milk fraction (11) is kept for at least two minutes in an open vessel (12) before the microfiltration (claim 1). The aim of microfiltration is to produce sterile consumer milk (page 3, lines 6-7). Sterile milk may be defined as being free of micro-organisms which can grow under the prevailing conditions (page 1, lines 17-18).

2.2 Claim 1 may be presented in the form of the following feature analysis:

(1.1) Method for the protein fractionation of skim milk by means of microfiltration,

(1.2) in which the skim milk is microfiltered in one or more stages,

(1.3) the skim milk, prior to microfiltration, is heated to between 55 and 65°C,

(1.4) kept at this temperature for 2 to 15 minutes, and

(1.5) the skim milk, during the microfiltration, displays
- a falling temperature or alternatively,
- a maintained temperature curve.

2.3 Feature (1.1)

2.3.1 The patent proprietor argued that D1 did not disclose protein fractionation of skim milk, but merely the production of sterile milk. Protein fractionation of skim milk was a process intended to divide up skim milk into casein and whey.

However, the board notes that claim 1 merely refers to "protein fractionation of skim milk by means of microfiltration". The degree of protein fractionation and/or the nature of proteins in the retentate and/or the permeate is not specified. The board is also not aware of any generally accepted definition that "protein fractionation of skim milk" necessarily refers to the separation of skim milk into casein and whey. Nor has the patent proprietor provided evidence for such a definition. Therefore, the board interprets "protein fractionation of skim milk" broadly, especially in view of the broad range of pore sizes that can be used for the microfilters (see also points 2.3.2 and 2.3.3 below). In other words, the wording of claim 1 covers situations where only minor amounts of milk proteins may be separated from the rest of the skim milk.

If the patent proprietor wanted to rely on its narrow definition of "protein fractionation of skim milk", it could and should have incorporated this definition into claim 1 (see for example paragraphs [0002] and [0019] of the patent and the corresponding passages in the application as filed).

2.3.2 It is acknowledged that D1 does not explicitly mention protein fractionation of skim milk. However, protein fractionation of skim milk (within its broad definition) occurs implicitly during the microfiltration disclosed in D1, basically in view of the similarity of the type of microfilter(s) used in the patent in suit and D1.

Regarding the type of microfilter, D1 discloses that:

"*The filter 13 is preferably manufactured from ceramics, but it may also be made of glass, polymers or the like*" (page 4, lines 33-34);

"*The microfilter 13 has an effective pore size of 0.5 µm, ... Alternatively, the filter 13 has an effective pore size of 0.3 µm ...*" (page 5, lines 3-5);

and

"*All microfiltrations in the trials have been carried out with a filter 13 having an effective pore size of 0.5 µm*" (page 6, lines 24-25).

Claims 5 and 6 of D1 disclose a membrane filter having an effective pore size of equal to or less than 0.5 µm or 0.3 µm, respectively.

According to the patent, protein fractionation is achieved by the use of the following types of microfilter:

"The microfilter 5 is preferably manufactured from ceramics, but it may also be manufactured from glass, polymers or the like. The microfilter 5 has a mesh or pore size of 0.05-0.5 µm, preferably 0.1-0.2 µm. If the protein fractionation takes place in several stages, all microfilters 5 have approximately the same mesh or pore size" (column 3, lines 31-37).

Thus both D1 and the patent in suit use a filter made of the same material, and the pore sizes for the filter mentioned in D1 fall within the range indicated in the patent to be suitable for microfiltration. Thus, according to the patent, protein fractionation can be achieved even with a filter having a pore size of 0.5 µm, a value which is mentioned in D1. D1 even refers to the smaller pore size of 0.3 µm. The opponent acknowledged that the "pore size" cited in the patent in suit and the "effective pore size" referred to in D1 are not exactly the same. However, it explained, without being contradicted, that this was a marginal difference with no impact on the protein fractionation.

Since there is not necessarily a difference in the type of microfilter to be used and since skim milk is used in both cases, the microfiltration of D1 must result in a protein fractionation as envisaged by claim 1 in its broadest sense. Consequently, D1 discloses feature (1.1).

2.3.3 This conclusion is confirmed by the scientific statement D14 indicating that:

"*Evidently, within a skim milk microfiltration plant equipped with membranes of a pore size of 0.3 - 0.5 µm a milk protein fractionation takes place*" (page 6, penultimate paragraph).

This is also confirmed by D7, a handbook on dairy processing, which shows that for the pore sizes mentioned in D1 some protein fractionation of skim milk inevitably takes place, although not a complete separation into casein and whey.

2.4 Feature (1.2)

D1 discloses that the milk phase (11) which contains the skim milk fraction (4) is led to a microfilter (13) (page 4, lines 32-33) and that the retentate may be led to an additional microfilter (page 5, line 9).

Thus D1 teaches that the skim milk is microfiltered in one or more stages. Consequently, D1 discloses feature (1.2).

2.5 Feature (1.3)

As apparent from claim 1 of D1 (see point 2.1 above), the milk fraction (11), constituting at least the skimmed milk fraction (4), is led to microfiltration at a temperature of approximately 50-55°C. 55°C is the lower limit of the heating temperature required in claim 1. It is self-evident that, in order to be led to microfiltration at this temperature, the milk fraction has to be heated to this temperature beforehand. Thus D1 discloses feature (1.3).

2.6 Feature (1.4)

In D1, the heated milk fraction (11) is kept for at least two minutes in an open vessel (12) before microfiltration. The patent proprietor argued that the heated milk fraction would cool down in the open vessel, so that the milk fraction would not be kept at the heated temperature. In contrast, claim 1 as granted required that the skim milk, prior to microfiltration, be kept at this temperature, i.e. the heated temperature.

The board cannot follow the patent proprietor's argument. Firstly, it has not provided any evidence for its assertion that the milk fraction would cool down in the open vessel. Secondly, this argument is even contrary to the disclosure of D1. D1 requires that the milk fraction (11) is led to microfiltration at a temperature of 50-55°C. The flow diagram in figure 1 shows a process according to D1 where the milk from the open vessel (12) is directly driven to microfilter (13) without any further heating apparatus. Thus, this set-up indicates that the temperature of the skim milk in the open vessel must necessarily be maintained at a temperature of 50-55°C in order to feed the milk fraction at this temperature to the filter.

It is thus concluded that the milk during its stay in the open vessel for at least two minutes must necessarily be held at the temperature of 50-55°C. Consequently, by explicitly referring to 55°C D1 discloses feature (1.4) of claim 1.

2.7 Feature (1.5)

According to the opponent, D1 implicitly disclosed a maintained temperature curve during microfiltration.

2.7.1 In this context, the opponent referred to page 4, lines 26-27 of D1:

"*The solubility of calcium phosphate is reduced with increased temperature.*"

According to the opponent, the skilled person was aware that during microfiltration the temperature inevitably increased in view of friction and the pumping energy. Therefore, the skilled person would obviously have maintained the microfiltration temperature curve constant in order to avoid precipitation of calcium phosphate.

Although this statement is made in the context of the preheating step of the method of D1, the board accepts that the statement is valid for the whole microfiltration process, since precipitation of calcium phosphate, triggered by a temperature increase, is generally disadvantageous and has to be avoided.

2.7.2 This is corroborated by D7, a handbook, which shows the general technical knowledge of the skilled person in dairy processing:

"*Filtration plants are <u>normally</u> supplemented with a simple cooling system integrated into the internal circulation loop to compensate for the slight rise in temperature that occurs during operation and to maintain a constant processing temperature*" (page 140, last paragraph) [underlined by the board].

Thus, the skilled person would know that he has to maintain a constant temperature profile during microfiltration of skim milk.

The board does not agree with the patent proprietor that D7 cannot be considered as evidence of the general technical knowledge of the person skilled in this art. D7 is an extract from a handbook in the field of dairy processing. Nor can the board accept the argument that in view of the term "normally" there are alternative measures to be taken by the skilled person. Rather, the term "normally" gives the skilled person the instructions to follow in everyday situations and not in extraordinary cases. Lastly, the board does not agree with the patent proprietor's assertion that the disclosure of D7 is only valid for the specific temperature of 50°C. The relevant passage in D7 is not restrictive regarding the operating temperature. It simply cites that:

"*In most cases, the processing temperature is about 50°C for dairy applications*" [underlined by the board].

2.7.3 As final piece of evidence for the implicit disclosure of feature 1.5 in D1, the opponent relied on a comparison of figure 2 of D1 with figure 3 of the patent in suit.

Figure 2 of D1 represents the variation of the transmembrane pressure TMP in the microfilter, expressed in bar as a function of the operational time expressed in hours. In this figure, curves 24 and 25 represent two trials carried out with the pretreatment method of D1 comprising a stay time of the milk phase (11) in an open vessel (12) of at least two minutes and preferably at least five minutes, followed

by microfiltration with a filter (13) having an effective pore size of 0.5 where the milk phase (11) fed into the filter (13) was heated to 50-55°C. In trials 24 and 25 there was no significant increase in the TMP for an operating time exceeding ten hours (page 6, line 23 to page 7, line 13).

Figure 3 of the patent in suit also represents the variation of the transmembrane pressure TMP in the microfilter expressed in bar as a function of time expressed in hours.

The opponent concluded from this comparison that there is a similar temperature profile during the microfiltration in figure 2 of D1 and figure 3 of the patent, namely a maintained temperature curve. The patent proprietor argued that this comparison was based on an *ex post facto* analysis. The board does not agree, because the comparison was only made in order to explain the technical background of the curves of figure 2 of D1.

2.7.4 Thus, on the basis of the above considerations, the board accepts that D1 implicitly discloses to the skilled person the use of a constant temperature curve during microfiltration, i.e. feature (1.5) of claim 1.

2.8 Since D1 discloses all the features of claim 1, the subject-matter of claim 1 lacks novelty and the main request is not allowable.

Auxiliary request VIA

3. Claim 1 - interpretation

3.1 The subject-matter of claim 1 of this request differs from that of claim 1 of the main request in that:

- the skim milk is microfiltered in more than one stages,

- the skim milk displays a falling temperature curve during microfiltration, and

- at each microfilter (5) included in the plant, the temperature is reduced by a few degrees.

3.2 The opponent accepted that the terms "a falling temperature curve" and "reduced by a few degrees" could not be objected to under Article 84 EPC, because the former was already present in granted claim 1 and the latter was introduced via the incorporation of dependent claim 3 as granted (see G 3/14).

Nevertheless, a discussion arose at the oral proceedings as to what "a falling temperature" meant. First of all, it appeared that a temperature profile is in particular relevant in microfiltration processes using more than one filter, a feature now present in claim 1. Both parties explained that in practice, in a dairy plant, the microfilters as such are not cooled. Thus, during each microfiltration step the temperature of the permeate will rise slightly, and only after each microfiltration step will the permeate be cooled down, either to the entry temperature (maintained temperature curve) or to below that temperature (falling temperature curve).

Although the board accepts that, as argued by the opponent, such a falling temperature profile is not a falling temperature curve in a strict mathematical sense, claim language addresses the skilled person. Thus, in the board's view the claim language at least encompasses the above-outlined falling temperature curve in a dairy plant.

4. Amendments (Article 123(2) EPC

The opponent argued that claim 1 did not fulfil the requirements of Article 123(2) EPC. However, the board considers that not only the individual features of claim 1 but also their combination is disclosed in the application as published (WO 2006/123972 A1).

4.1.1 Claim 1 of auxiliary request VIA corresponds to the combination of claims 1 and 3 of the application as published with the following limitations:

- the skim milk is microfiltered in more than one stages (limited feature 1), and

- the skim milk during microfiltration displays a falling temperature curve (limited feature 2).

4.1.2 Claim 1 now requires that the skim milk is microfiltered "in more than one stages". According to claim 1 as granted (and as published) the skim milk could be microfiltered "in one or more stages". The natural understanding of this wording is that the skim milk could be microfiltered in one stage or in more than one stages. Thus, the wording now chosen reflects exactly one of the two alternatives disclosed in the application as published for the number of stages. Furthermore, the alternative with more than one stages

corresponds to a preferred embodiment of the application as published. In the flow diagram of figure 1, the protein fractionation takes place in four stages (page 4, lines 5-6), and figure 3 shows the transmembrane pressure over a period of time for four filters (page 5, lines 19-20). Thus, the limitation to more than one stages fulfils the requirements of Article 123(2) EPC.

4.1.3 Furthermore, a falling temperature curve has been chosen from the originally disclosed alternatives of a falling or maintained temperature cure.

4.1.4 The feature that the temperature is reduced by a few degrees at each filter included in the plant is based on claim 3 as published (claim 3 as granted being identical thereto). The fact that claim 3 as published refers to each filter and a cooling of a few degrees provides a hint to the combination with more than one stages and a falling temperature curve (in this context see also point 3.2).

5. Novelty

The opponent acknowledged the novelty of the subject-matter of claim 1 of this request in view of D1. In fact, it has been found with regard to the main request that D1 discloses to the skilled person a maintained temperature curve.

Since the opponent has not cited any further documents regarding novelty, the board concludes that the subject-matter of claim 1 of auxiliary request VIA fulfils the requirements of Article 54 EPC.

6. Inventive step

6.1 In agreement with the parties, the board considers D1 to be the closest prior-art document. The subject-matter of claim 1 of auxiliary request VIA differs from D1 in that the skim milk displays a falling temperature curve and in that at each microfilter (5) the temperature is reduced by a few degrees.

During the oral proceedings the patent proprietor stated that the objective technical problem underlying the claimed invention in view of D1 was the provision of a method for the protein fractionation of skim milk which provided a balance between viscosity increase (filterability should not be jeopardised), reduction of filter fouling (less calcium phosphate precipitation; less protein coagulation) and economic viability (decrease in energy requirements).

The board accepts that this is the technical problem which has been solved by the combination of features as set out in claim 1. As plausibly explained by the patent proprietor, the technically significant cooling steps provide this balance.

6.2 There is no document on file indicative of a falling temperature curve.

Contrary to the assertion of the opponent, the cooling disclosed in D7 does not point to a falling temperature curve. It is explicitly disclosed in D7 that the cooling system is there to compensate for a slight rise in temperature and that the processing temperature is kept constant during operation. There is no room in D7 for the opponent's interpretation.

6.3 The board does not agree with the opponent that no effect is shown over the method of D1 and that the technical problem has to be seen in the provision of an alternative method for the protein fractionation of skim milk.

But even if it were so, the skilled person would not find any motivation in the state of the art to modify the method of D1 and carry it out so that the skim milk displays a falling temperature curve during microfiltration and so that at each microfilter included in the plant the temperature is reduced by a few degrees. On the contrary, the skilled person applying his general technical knowledge (D7: page 140, last paragraph) would only be motivated to keep the temperature constant during microfiltration. It is only with hindsight that he would envisage a falling temperature curve.

6.4 In view of the above, the subject-matter of claim 1 of auxiliary request VIA involves an inventive step.

7. The dependent claims

Dependent claims 2 and 3 of auxiliary request VIA correspond to preferred embodiments of the method of claim 1 and are therefore patentable *mutatis mutandis*.

8. Amended description

During the oral proceedings the patent proprietor submitted a description which had been adapted to the claims of auxiliary request VIA. The opponent did not raise any objections, nor did the board see any reason to raise an objection of its own.

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 3 filed as auxiliary request VIA on 7 April 2017 at the oral proceedings before the board;

   - description pages 2 to 4 as filed on 7 April 2017 at the oral proceedings before the board;

   - figures 1 to 3 of the published patent specification.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber

Decision electronically authenticated