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Datasheet for the decision of 18 November 2014

Case Number: T 1706/12 - 3.3.09

Application Number: 01946621.8

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Language of the proceedings: EN

Title of invention:
INSOLUBLE PROTEIN PARTICLES

Patent Proprietor:
The Folgers Coffee Company

Opponent:
SPX Flow Technology Crawley Limited

Headword:

Relevant legal provisions:
EPC Art. 84, 123(2), 83, 54, 56
EPC R. 139
RPBA Art. 13(1)

Keyword:
Correction of the appellant's name
Acompanying person
Admissibility of objection under Article 123(2) EPC
Admissibility of objection under Article 84 EPC
Claims - clarity after amendment (yes)
Sufficiency of disclosure - (yes)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:
G 0001/12, G 0004/95, T 0182/89

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

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Case Number: T 1706/12 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 18 November 2014

Appellant: (Opponent)	SPX Flow Technology Crawley Limited Building A, Compass House, Manor Royal Crawley West Sussex RH10 9PY (GB)
Representative:	Nordic Patent Service A/S Højbro Plads 10 1200 Copenhagen K (DK)
Respondent: (Patent Proprietor)	The Folgers Coffee Company 6210 Center Hill Avenue Cincinnati, OH 45224 (US)
Representative:	Cabinet Plasseraud 52, rue de la Victoire 75440 Paris Cedex 09 (FR)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 18 May 2012 concerning maintenance of the European Patent No. 1292196 in amended form.**

Composition of the Board:

Chairman	W. Sieber
Members:	M. O. Müller
	K. Garnett

Summary of Facts and Submissions

I. This decision concerns the appeal by the opponent against the opposition division's interlocutory decision that European patent No. 1 292 196 as amended meets 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) and Article 100(b) EPC.

The documents submitted during the opposition proceedings included:

D1: US 5,350,590 A;

D2: EP 0 323 529 A1;

D6: T. Spiegel, "Thermische Denaturierung und Aggregation von Molkenproteinen in Ultrafiltrationsmolkenkonzentraten - Reaktionskinetik und Partikulieren im Schabewärmetauscher", PhD thesis, TU Munich, 1999; and

D7: T. Spiegel, "Whey protein aggregation under shear conditions - effects of lactose and heating temperature on aggregate size and structure", International Journal of Food Science and Technology 1999, 34, pages 523 to 531.

III. The opposition division's decision, which was announced orally on 28 March 2012 and issued in writing on 18 May 2012, was based on the "MAIN REQUEST" filed during the

first oral proceedings before the opposition division on 16 September 2010. This request contains four independent claims, namely claims 1, 6, 7 and 10 that read as follows:

"1. A composition of matter comprising substantially non-aggregated denatured protein particles having in a hydrated state a mean diameter particle size distribution ranging from 0.1 microns to 5.0 microns, with less than 2 percent of the total number of particles exceeding 5.0 microns in diameter, and wherein the majority of the said particles are substantially spheroidal in shape, said particles in a hydrated state having a substantially smooth, fatty, emulsion-like organoleptic character, said particles having a degree of protein insolubility of at least 80%, said composition comprising no more than 20%, by weight, of soluble protein materials, wherein said denatured protein particles have in a hydrated state a mean diameter particle size distribution ranging from 0.1 microns to 3.0 microns, with less than 5 percent of the total number of particles exceeding 3.0 microns in diameter."

"6. A process for preparing heat-stable, insoluble, denatured protein particles comprising the steps of heating undenatured dairy whey protein at heat denaturing temperatures, in an aqueous medium, at a pH within the upper half of the isoelectric curve of said undenatured protein particles, under the application of mechanical energy in the form of high shear mixing and homogenization, said mechanical energy selected

so as to promote the formation of proteinaceous particles having a mean diameter from 0.1 microns to 3.0 microns, with less than 5 percent of the total number of particles exceeding 3.0 microns in diameter in a hydrated state."

"7. A process for insolubilizing protein comprising the steps of heating partially denatured, partially soluble dairy whey protein particles at heat denaturing temperatures, in an aqueous solution, at a pH within the upper half of the isoelectric curve of said protein, under the application of mechanical energy in the form of high shear mixing and homogenization, said mechanical energy selected so as to promote the formation of proteinaceous particles having in a hydrated state a mean diameter from 0.1 microns to 3.0 microns, with less than 5 percent of the total number of particles exceeding 3.0 microns in diameter."

"10. A heat-treated beverage product comprising: (a) a heat-stable, insoluble, denatured, proteinaceous particle component, having in a hydrated state a mean diameter particle size distribution ranging from 0.1 microns to 3.0 microns, with less than 5 % of the total number of said particles exceeding 3.0 microns in diameter, wherein said proteinaceous particle component has a degree of protein solubility less than 20%; (b) an aqueous carrier; and, (c) optional flavor components."

IV. The opposition division's decision can be summarised as follows:

The main request was allowable under Articles 123(2) and (3) EPC and there was no objection under Article 84 EPC.

The dependence of the protein solubility on the temperature, pH and protein concentration applied during the solubility measurement did not lead to an insufficiency of disclosure. Firstly, without any information about the measurement conditions, the skilled person would use room temperature and a pH of 7. Secondly, it was not possible that insoluble protein became soluble at low protein concentrations because of the centrifugation of the solids. Thirdly, with a limited amount of experimental work, the skilled person would find a suitable working range where oversaturation due to a high protein concentration did not exist and protein concentration did not play a role.

The subject-matter of claim 1 was novel over D2. This document did not unambiguously disclose the claimed protein (in)solubility, since not all protein fractions in D2 were denatured and since furthermore denaturation was not necessarily the same as insolubility.

Finally, inventive step was acknowledged as well. D2 provided fat and oil replacement products, which exhibited a smooth, emulsion-like organoleptic character and were substantially non-aggregated. However the specific problem of the patent, namely the resistance, delaying or slowdown of gravitational sedimentation and the ability to withstand exposure to sterilisation conditions (heat), was not addressed. D7

disclosed that higher temperatures led to more aggregation and was therefore teaching away from using high temperatures. Hence, the combination of D2 and D7 was not possible. Furthermore, D2 already used higher temperatures and therefore a hypothetical combination of D2 with D7 would not result in higher insolubility than already present in D2.

V. On 20 July 2012, the opponent (hereinafter: "the appellant") filed an appeal and, on the same day, paid the prescribed fee. The statement setting out the grounds of appeal was filed on 28 September 2012 together with:

AP1: "Horiba Scientific - A Guidebook To Particle Size Analysis", Horiba Instruments Inc., 2010, 32 pages.

VI. With its letter of 28 January 2013, the proprietor (hereinafter: "the respondent") merely stated that it agreed with the decision of the opposition division and requested that the appeal be dismissed.

VII. On 2 April 2014, the board summoned the parties to oral proceedings. In the preliminary opinion annexed to the summons, the board commented on sufficiency of disclosure, novelty and inventive step. As regards the appellant's insufficiency objections against the particle size distribution, the board observed that the mere fact that particle size distributions on a volume basis were different from those on a number basis did not necessarily mean that the particle size distributions as claimed were ambiguous. It was furthermore clear that the particle size distribution in the claims referred to particles including the soluble fraction thereof. As regards the appellant's

sufficiency objections against the protein (in)solubility, the board essentially followed the reasoning in the decision of the opposition division.

VIII. With letter of 25 July 2014, the appellant submitted:

S1: Comparison of a number and volume based particle size distribution;

S2: "LA-910-16 bit program operation instruction manual and software manual", Horiba Instruments Inc., 7 pages;

S3: "Software Instruction Manual Laser Scattering Particle Size Distribution Analyzer LA-910", Horiba Instruments Inc., second edition, 2004, 5 pages; and

S4: Screen shot of a page of the LA-910 measurement software (32 bit version).

IX. With letter of 16 October 2014, the appellant requested correction of the name of the appellant under Rule 139 EPC in the notice of appeal and in the grounds of appeal and submitted:

B1: Certificate Of Incorporation On Change Of Name, Companies House, 1 December 2010; and

B2: Declaration of the registrar of Companies, signed 30 September 2014.

X. With its letter dated 27 October 2014 the representative of the appellant, Mr Van Walstijn, requested that Mr. Bækmark be allowed to speak during

the oral proceedings under his supervision as part of his training as a European patent attorney.

XI. On 18 November 2014, oral proceedings were held before the board. The respondent confirmed that its request concerned the set of claims headed "MAIN REQUEST" and "DRUCKEXEMPLAR" (request found allowable by the opposition division, hereinafter "main request"). The respondent objected to Mr Bækmark being allowed to speak. The appellant raised a new objection under Article 123(2) EPC and clarified that its only clarity objection was as follows:

"The parameter 'mean diameter particle size distribution' rendered the claims 1, 6, 7, 10 unclear as their type of average (volume or number) is not indicated in the claims."

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

The appellant's name given in the notice and statement of grounds of appeal should be corrected to SPX Flow Technology Crawley Limited.

Mr Bækmark should be allowed to speak since he would do so under the representative's supervision rather than for the purpose of being trained.

The amendments in the claims of the main request did not meet the requirements of Article 123(2) EPC (for details, see point 4 below). This objection should be admitted since it was *prima facie* relevant and it would not take more than 5 minutes to understand it.

The parameter "mean diameter particle size distribution" rendered claims 1, 6, 7 and 10 unclear (for details, see point 5 below). The appellant declared that he did not pursue the further objections under Article 84 EPC raised during the written appeal proceedings.

The appellant raised several objections of insufficiency of disclosure (for details see point 6 below).

According to the appellant, the subject-matter of claims 1 and 10 lacked novelty over D2 (for details, see point 7 below). The appellant declared that it did not pursue its novelty attacks on the basis of D6 and D7, made during the written proceedings.

Finally, the appellant argued that the subject-matter of claims 1 and 2 lacked inventive step over D2 as the closest prior art. The patent did not contain any proof that by way of the low amount of soluble protein an effect would be obtained. Therefore the objective technical problem was the provision of an alternative denatured protein composition. The solution consisted of an arbitrary choice of the amount of soluble protein, which could not establish any inventive step.

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

Mr Bækmark should not be allowed to speak since neither his qualification nor the subject-matter of the proposed oral submissions had been specified.

The objection under Article 123(2) EPC should not be admitted into the proceedings. The claims had been on

file since 2010 and no objection under Article 123(2) EPC had been raised in the grounds of appeal. The first time an objection was raised was in the appellant's letter of 25 July 2014 but this objection was different from the present one.

The appellant's objection under Article 84 EPC that it was not clear whether the claimed particle size distribution was on a number or volume basis should not be admitted into the proceedings since this objection represented a change of case. Furthermore, it was clear that the claims referred to the particle size distribution on a number basis since the claims contained the further requirement that a certain number of particles had to be within a certain size range. It was true that the measurement device to be used according to the patent gave particle size distributions on a volume basis. Therefore the transformation of the measured values into number distributions was necessary. The fact that according to AP1 this transformation was associated with an error was not relevant for clarity.

The invention as defined in the claims was sufficiently disclosed. As regards the transformation of the particle size distributions from a volume to a number basis, all that the skilled person needed to do was to use the measurement device of the patent and to push the appropriate button on the device to obtain the particle size distribution on a number basis. As regards the refractive indices of the protein particles, these were available to the skilled person from tables in text books, as confirmed by AP1. Furthermore, equally according to AP1, not knowing the refractive indices would at most lead to sub-optimal accuracy but not to insufficiency of disclosure. It was

not true in this respect that the patent referred to a new material for which no refractive index values were available. Denatured whey protein particles had been known before the priority date of the opposed patent, e.g., from D2. The invention underlying the patent was not the creation of new whey protein particles but the reduction of the amount of soluble whey protein. As regards the appellant's objections against the examples of the patent, the burden of proof was on the appellant to show that the examples were incorrect and that this led to insufficiency of disclosure. With regard to the appellant's objection against the protein insolubility, the respondent referred to the preliminary opinion of the board.

The subject-matter of claims 1 and 2 was novel over D2. This document did not disclose the claimed protein solubility and, by applying the process of D2, one would still obtain more than 20% soluble protein. In fact D2 represented a conventional process which resulted in a protein solubility as high as 40%. Drying as disclosed in D2 did not yield the claimed low amount of soluble protein either, since it did not remove any of the soluble protein.

Finally, the subject-matter of claims 1 and 10 was also inventive over D2 as the closest prior art. As confirmed by D1, conventional protein compositions had the disadvantage that they were not sufficiently heat stable and thus could not be used in products that were for instance subjected to heat sterilisation. The invention was based on the discovery that this problem was caused by the high amount of soluble protein. The problem existing in the prior art could therefore be solved by the reduction of this amount. The examples of the opposed patent did not report any problem with heat

stability and no proof had been provided by the opponent that this problem was not solved. The objective technical problem was thus the provision of denatured protein particles that did not cause any problems, such as browning, when heated. There was no indication in D2 that in order to solve this problem, the amount of soluble protein had to be reduced. Therefore, the claimed invention was not obvious in view of this document.

XIV. The appellant requested that

(1) The decision under appeal be set aside and the patent be revoked.

(2) The name of the appellant be corrected under Rule 139 EPC in the notice of appeal and in the grounds of appeal from APV UK Limited to SPX Flow Technology Crawley Limited.

XV. The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. The appellant's request for correction of its name

2.1 Opposition proceedings had been initiated on 2 May 2008 in the name of APV UK Limited. On 1 December 2010 the name of the opponent was changed to SPX Flow Technology Crawley Limited as evidenced by the extracts from the British Companies Register B1 and B2. After this change of name, the notice of appeal (on 20 July 2012) and the statement of grounds of appeal (on 28 September 2012)

were filed using the old name APV UK Limited, rather than the new name SPX Flow Technology Crawley Limited.

The appellant stated that the name APV UK Limited had been used erroneously and requested that this name be corrected in the notice and statement of grounds of appeal under Rule 139 EPC to SPX Flow Technology Crawley Limited.

2.2 According to G 1/12, it is possible to correct an error in the appellant's name under Rule 139 EPC provided *inter alia* that the correction introduces what was originally intended (answer to question (3) in the catchword and point 37).

2.3 It was not contested that this condition was met in the present case. On the basis of the notice and the grounds of appeal, it is clear that the appellant's intention was to file an appeal in the name of the opponent who was, at the time of filing the notice and grounds of appeal, SPX Flow Technology Crawley Limited.

2.4 The correction of the appellant's name from APV UK Limited to SPX Flow Technology Crawley Limited is thus allowable.

3. The appellant's request that Mr Bækmark be allowed to speak

3.1 With its letter dated 27 October 2014, the representative of the appellant Mr Van Walstijn stated that Mr. Bækmark from Nordic Patent Service would be attending the oral proceedings and requested that Mr. Bækmark be allowed to speak under his supervision as part of his training as a European patent attorney.

During the oral proceedings, the respondent requested that Mr Bækmark be not allowed to speak.

3.2 According to G 4/95 (headnote), a person accompanying the professional representative of a party may be allowed to make oral submissions on specific legal or technical issues on behalf of that party in addition to the complete presentation of the party's case by the professional representative. However, the Enlarged Board made the allowance of such submissions subject to certain conditions including that a request be made stating the qualification of the accompanying person, and specifying the subject-matter of the proposed oral submissions.

3.3 In the present case, the appellant's request neither stated the qualifications of Mr. Bækmark, nor did it specify the subject-matter of the proposed oral submissions. The two conditions referred to in G 4/95 are thus not met. The board therefore refused the appellant's request.

4. Amendments - Article 123(2) EPC

4.1 During the oral proceedings, the appellant argued for the first time that the combination of the two particle size characteristics in claim 1, namely (i) a mean diameter particle size distribution ranging from 0.1 microns to 5.0 microns, with less than 2% of the total number of particles exceeding 5.0 microns in diameter, and (ii) a mean diameter particle size distribution ranging from 0.1 microns to 3.0 microns, with less than 5% of the total number of particles exceeding 3.0 microns in diameter, represented an intermediate generalisation and thus violated the requirements of Article 123(2) EPC. Furthermore, claim 4 as filed,

which contained the second particle size characteristic, referred to particles while claim 1 referred to a composition of matter.

4.2 The respondent requested that this objection be not admitted into the proceedings.

4.3 The claims of the present main request formed part of the appeal proceedings since their beginning. In the statement of grounds of appeal, however, the appellant did not raise any objection under Article 123(2) EPC. Such an objection was in fact made for the first time in its letter of 25 July 2014. In this letter, the appellant argued that the current claim request contains:

> "amendments pertaining to a completely different European patent than the opposed patent, namely EP 1 946 621 - see upper right corner of the claim sheets. Obviously claims pertaining to another European patent can have no basis in the opposed patent and for that reason alone the claims as amended must be rejected by the present board on failure to comply with article 123(2) EPC."

4.4 Apart from being incorrect - the number in the upper right-hand corner of the claim sheets is the application number of the opposed patent, and not that of a completely different European patent - this objection is entirely unrelated to the objection raised during the oral proceedings before the board. The latter objection thus represents a change of the appellant's case at the latest possible point during the appeal proceedings. Pursuant to Article 13(1) RPBA, this is a reason for not admitting the objection, irrespective of whether, as argued by the appellant,

the objection was *prima facie* relevant and little time was needed to understand the objection. The board therefore decided not to admit the appellant's new objection into the proceedings.

5. Amendments - Article 84 EPC

5.1 At the oral proceedings, the appellant clarified that its only clarity objection was as follows:

> "The parameter 'mean diameter particle size distribution' renders the claims 1, 6, 7, 10 unclear as their type of average (volume or number) is not indicated in the claims."

5.2 The respondent requested that this objection be not admitted into the proceedings since this objection represented a change of case.

The objection has already been raised in the appellant's letter of 25 July 2014. More specifically, it is stated in the paragraph bridging pages 3 and 4 of this letter that two very different particle size distributions resulted depending on whether a number or volume distribution was chosen, one being contained to more than 99% within the claimed size distribution range while the other was outside of this range by more than 50% of the particles. In the first sentence of the first full paragraph of page 4 of the letter, it is furthermore stated that this created an enormous lack of legal certainty and, in the next sentence, reference is made to Article 84 EPC.

While the board concedes that this objection was not made in the statement of grounds of appeal and thus indeed represents a change of case, the situation is

different from that discussed above for the appellant's objection under Article 123(2) EPC. More specifically, the change of case did not occur during but roughly four months before the oral proceedings and, unlike the objection under Article 123(2) EPC, the board and the respondent had had ample time to deal with it. Therefore, the board decided to admit this objection into the proceedings.

5.3 The objection fails however for the following reasons:

Apart from the particle size distribution, claim 1 contains the further requirements that less than 2% of the total number of particles exceed 5.0 microns in diameter, and less than 5% of the total number of particles exceed 3.0 microns in diameter. The number of particles can only be obtained from a number distribution curve. Therefore, the skilled person reading claim 1 would understand that the particle size distributions referred to in this claim must be number distributions. The same applies to the remaining claims 6, 7 and 10.

The appellant in this respect argued that grammatically, the number of particles in claim 1 did not refer to the particle size distribution of this claim. While this is correct from a linguistic point of view, it is still not convincing. A claim must be interpreted as understood by the skilled person trying to make technical sense of it. As set out above, the skilled person knows that in order to determine the number of particles with a certain size, he has to have a number distribution curve at hand. It would thus be technically nonsensical to assume that the particle size distribution in claim 1 is a volume distribution.

The appellant furthermore referred to paragraph [0074] of the patent and argued that this paragraph left the skilled person in doubt whether the particle size distribution was a number or volume distribution. However, since claim 1 is clear in itself, and since furthermore, Article 84 EPC requires the claims to be clear, there is no need to discuss paragraph [0074].

The particle size distributions referred to in claim 1 thus are number distributions.

5.4 Therefore, the appellant's objections under Article 84 EPC against the particle size distribution must fail. In the absence of any further objections, the board considers the requirements of Article 84 EPC to be met.

6. Sufficiency of disclosure

6.1 According to the appellant, the claimed invention was insufficiently disclosed since the claimed particle size distribution was ambiguous.

6.1.1 In a first attack, the appellant argued that the transformation from a volume to a number basis led to errors such that the skilled person was not able to determine the claimed particle size distribution. More specifically, according to AP1, the measurement device to be used in the patent (HORIBA LA-910 laser scattering particle size distribution analyzer, paragraph [0074]) delivered a particle size distribution on a volume basis. So in order to arrive at the number distribution referred to in claim 1, a transformation was needed from a volume to a number basis. As evidenced by AP1, this transformation led to undefined errors and was only valid for symmetric distributions and should not be used (as it had been

done by the proprietor) for any other purpose than comparison to another technique. Therefore, the skilled person would not know whether he could rely on the result obtained after the transformation to a number basis.

The board agrees with the appellant, and this was in fact acknowledged by the respondent, that a transformation from a volume basis (as obtained by the measurement) to a number basis (as claimed) is necessary. As regards this transformation, AP1 states the following:

> "Results can be displayed on volume, surface area, or number basis... A word of caution is given when considering converting a volume distribution into either a surface area or number basis. Although the conversion is supplied in the software, it is only provided for comparison to other techniques, such as microscopy, which inherently measure particles on different bases. The conversion is only valid for symmetric distributions and should not be used for any other purpose than comparison to another technique." (page 6)

> "It is perfectly acceptable to transform image analysis results from a number to volume basis. In fact the pharmaceutical industry has concluded that it prefers results be reported on a volume basis for most applications (ref. 6). On the other hand, converting a volume result from laser diffraction to a number basis can lead to undefined errors and is only suggested when comparing to results generated by microscopy." (page 8)

"Conversion errors can result when deriving number or area values from a laser diffraction volume result" (figure caption of figure 13).

On the basis of these statements, the board also agrees with the appellant that AP1 points to errors occurring when transforming the measured volume-based distribution curve into a number distribution curve. However, the board fails to see how such errors, which apparently lead to a difference between volume and number distribution curves (figure 13 of AP1), render the invention as defined in claim 1 insufficiently disclosed. As evidenced by the above statements in AP1, the measurement device of AP1 offers the possibility to determine particle size distributions on a number basis. Hence, all that the skilled person needs to do is to use the measurement device referred to in paragraph [0074] of the patent and to chose the option provided by this device to obtain the particle size distribution on a number basis. There is thus no lack of sufficiency of disclosure in this respect.

6.1.2 In a second attack, the appellant argued that in order to convert the scattering data of the laser scattering device into particle sizes, it was indispensable to know the complex refractive indexes of the scattering particles and the dispersion medium. Since the patent did not specify these indexes, the skilled person could not convert the measured signal into particle sizes and thus could not determine the claimed particle size characteristics.

In this respect, AP1 (page 28) states the following:

> "The complex refractive index of the sample and diluent must be known for optimum accuracy, but this information is easier to obtain than is often indicated (more often by competitors than informed scientists)."

On the basis of this passage in AP1, the respondent's statement is credible that the complex refractive indexes needed for the determination of the particle size distribution in the opposed patent are generally known to the skilled person. Furthermore, even if they were not known, this would at most lead to sub-optimal accuracy. No proof has been provided by the appellant that this would render it so difficult to carry out the invention such that it is insufficiently disclosed.

It is also not correct that, as argued by the appellant, the patent refers to a new material for which no refractive index values are available. Denatured whey protein particles were known before the priority date of the opposed patent, e.g., from D2 (see novelty discussion below). The invention underlying the opposed patent was not the creation of new whey protein particles but the reduction of the amount of soluble whey protein.

6.1.3 In its last attack against the particle size distribution (only put forward in writing), the appellant argued that there was no indication in claim 1 as to whether the mean diameter particle size distribution referred to the particles with or without the soluble fraction thereof. Before entering an aqueous composition, the particles' mean diameter size distribution would be clearly different from the mean particle size distribution obtained after up to 20% of

the particles were dissolved in the aqueous composition.

It is however clear on the basis of the claim wording that the particle size distribution refers to the particles including the soluble fraction thereof. More specifically, the particle size characteristics in claim 1 are given under the condition that the denatured protein particles are "in a hydrated state". This implies that the protein particles are in contact with water and thus that a fraction of the protein particles, namely up to 20%, has dissolved. Claim 1 thus defines the particle size characteristics after the dissolution and not before. Consequently, no ambiguity, let alone insufficiency of disclosure is present in this respect.

6.2 Apart from attacking sufficiency on the basis of the particle size distribution, the appellant objected to sufficiency on the basis of the working examples of the opposed patent. Various examples in the patent applied completely different starting materials, but still the degree of insolubility and the particle size distribution of all products obtained in these examples were the same. This shed doubt on the credibility of the examples. Furthermore in example 4, the source of the whey protein was not disclosed, in example 5 no information was present about whether the desired reduction of browning was obtained, in examples 6 to 10 the starting materials were not identified and examples 11 and 12 were contradictory since they referred to a tea or juice flavoured beverage while reporting results on a coffee flavoured beverage. Therefore, the examples did not help the skilled person to rework the invention and did not prove that the desired reduction in browning could be obtained.

In order to establish insufficiency, the burden of proof is initially upon the opponent to establish on the balance of probabilities that a skilled reader of the patent using his common general knowledge would be unable to carry out the invention (T 182/89). Even if, in the present case, the appellant's assertion were correct that the examples contained some errors or lacked some information, this in itself does not constitute proof that the skilled person cannot carry out the invention as defined in the claims. Therefore, the appellant has not discharged its burden of proof and its objection must consequently fail.

6.3 Apart from the above two attacks on the basis of the particle size distribution and working examples, the appellant argued that the invention was insufficiently disclosed in view of the claimed degree of protein (in)solubility (80% insoluble and 20% soluble protein material). According to the appellant this degree depended on the temperature, pH and protein concentration applied during the measurement. As regards the protein concentration, the appellant explained that smaller less denatured protein particles could become soluble depending on the concentration, such that if there were a lot of smaller particles, this would have a serious effect on the solubility. Furthermore, soluble protein could become insoluble if the solution was saturated. Since the patent did not disclose the temperature, pH and protein concentration applied during the measurement, the skilled person was unable to determine the degree of (in)solubility.

6.3.1 The method for measuring protein (in)solubility is disclosed in paragraph [0075] of the opposed patent. The dispersion containing the protein particles is

centrifuged until substantially all the solids sediment. A 0.05 ml sample of the supernatant is mixed with 1.5 ml of Coomassie Brilliant Blue G-250. The absorbance of the mixture is detected at 595 nm in a Milton Roy Company Spectronic 601 spectrophotometer and the protein concentration is read from a calibration curve (protein concentration in mg/ml vs. absorbance).

6.3.2 The board accepts that the degree of (in)solubility may depend on the measurement temperature. However, the method for measuring protein (in)solubility as described in the opposed patent (point 6.3.1 above) does not contain any indication that a hot or heated protein dispersion is used for this measurement. The board therefore agrees with the opposition division that the protein solubility is to be determined at room temperature. Therefore, no ambiguity, let alone insufficiency of disclosure arises in this respect.

6.3.3 The board also accepts that the protein (in)solubility depends on the pH. However, the board does still not find the appellant's argument convincing. The protein (in)solubility is measured according to paragraph [0075] by preparing a protein dispersion, centrifuging this dispersion and measuring the concentration of dissolved protein in the supernatant. As acknowledged by the appellant during the oral proceedings, the pH value of the dispersion will be determined by the nature of the protein particles. The pH during the measurement will thus be the pH value that automatically results when forming this dispersion. The fact that no pH is given in the patent when describing the solubility measurement does therefore not lead to any ambiguity or insufficiency of disclosure.

6.3.4 Finally, the appellant's argument that insoluble protein may become soluble and dissolved protein may become insoluble depending on protein concentration is not convincing. More specifically, insoluble protein cannot become soluble because, according to the opposed patent, the protein dispersion has to be centrifuged such that a low concentration of insoluble protein does not arise (the insoluble protein is concentrated in the centrifugation cake). Furthermore, with limited amount of experimental work, the skilled person would find a suitable working range where oversaturation does not exist such that there is no problem of soluble protein becoming insoluble.

6.3.5 The appellant had additionally argued in writing that the alternative method of determining protein solubility, namely by inspection under an optical magnification of 50x to 100x or with the unaided eye (paragraph [0036]) was not feasible since visual inspection of 0.1 µm particles either with this optical magnification or the unaided eye was not possible.

Since on the basis of the observations made above, the method as described in paragraph [0075] to measure protein (in)solubility is clear, there is no need to turn to the alternative method of determining protein (in)solubility as described in paragraph [0036].

6.4 Consequently, the invention as defined by the claims of the main request is sufficiently disclosed.

7. Novelty

7.1 The appellant attacked novelty of the subject-matter of claims 1 and 10 on the basis of D2.

7.1.1 D2 discloses water-dispersible macrocolloid denatured protein particles which in a hydrated state have a substantially smooth, oil-in-water emulsion-like organoleptic character with a mean diameter particle size distribution ranging from 0.1 to 2.0 microns, with preferably less than 2% of the total number of particles exceeding 3.0 microns in diameter (page 3, lines 25 to 32).

7.1.2 It was a matter of dispute between the parties whether D2 discloses the claimed low degree of protein solubility (claim 1: no more than 20%; claim 10: less than 20%). According to the appellant, the claimed degree of solubility inevitably resulted from the process of protein denaturation applied in D2. The appellant in this respect referred to the paragraph bridging pages 3 and 4, the paragraph bridging pages 4 and 5, and page 5, lines 31 to 33 of D2. These passages read as follows:

> "Protein denaturation herein follows from processes which are in general irreversible, and which result in alternations of the native (i.e. undenatured) protein state in a manner which predisposes the protein's molecular accretion in the form of the above-mentioned particles. By way of example of such processes, there are disclosed herein processes whereby thermal denaturation of proteins amenable to such treatment is employed to effect the above-mentioned accretion." (paragraph bridging pages 3 and 4)

> "During denaturation processing according to the invention, undenatured proteins in solution interact to form insoluble coagulates and the

controlled application of heat and high shear forces operate to insure formation of non-aggregated particles within the desired size range." (paragraph bridging pages 4 and 5)

"Controlled denaturation processes of the invention essentially involves *[sic]* "removal" of protein molecules from solution by the association of numerous of these protein molecules with each other to form a protein coagulum which is rendered insoluble through application of heat." (page 5, lines 31 to 33).

The appellant in particular argued that it was impossible to control the denaturation process of proteins. On the contrary, within a split second 100% denaturation was obtained.

The board agrees with the appellant that it can be deduced from the cited passages that the process of D2 leads to the production of denatured protein particles. However, denatured protein particles are not necessarily entirely insoluble such that the degree of solubility is not necessarily as low as required by the claims.

7.1.3 The appellant furthermore argued that any soluble protein particles were removed from the composition in D2 since this composition was subjected to a drying step. While the drying step certainly removes water from the composition, the board fails to see how additionally soluble protein is removed by such a drying step.

7.1.4 In the absence of any proof that the process of D2 leads to the claimed low solubility, the board has to

accept the statement in the patent that conventional processes such as described in D2 (explicitly mentioned in the patent) lead to a protein solubility of approximately 40%, which is above the claimed upper limit (page 3, line 21 in conjunction with page 6, lines 46 to 53).

7.1.5 Consequently, the subject-matter of claims 1 and 10 differs from the disclosure of D2 in terms of the degree of protein solubility of at least 20%. The subject-matter of these claims is therefore novel. Consequently, the appellant's only novelty attack must fail.

8. Inventive step

8.1 The appellant attacked inventive step of the subject-matter of claims 1 and 10 on the basis of D2 as the closest prior art.

8.2 The invention underlying the opposed patent refers to a composition comprising denatured protein particles that have a smoothness and other organoleptic properties similar to fats and oils and that is thus suitable as a replacement for fats and oils (page 2, lines 5 to 16).

8.3 In the same way as the opposed patent, D2 refers to a composition comprising denatured protein particles that possess the smooth organoleptic character of fats and thus are suitable as a replacement thereof (page 2, lines 4 to 8 and page 3, lines 25 to 34). In line with the arguments of both parties, D2 therefore constitutes the closest prior art.

As set out above, the products of claims 1 and 10 at least differ from those in D2 in terms of the protein solubility.

8.4 The problem underlying the patent is the provision of a protein composition that does not develop off-flavours and undesirable texture and appearance (browning) during high-temperature sterilisation procedures (page 3, lines 22 to 30).

8.5 As a solution to this problem, the patent proposes the products of claims 1 and 10, which are characterised in that the amount of soluble protein material is less than 20%.

8.6 It is stated in D1 (column 1, lines 45 to column 2, line 23) that heat denaturation under high shear - which is the process applied in D2 - leads to products that are heat labile and, when present in a food product that is heated, lose their fat-mimicking properties and produce an unappetizing form. It is thus credible that the problem referred to in the patent indeed existed in the prior art. Examples 4, 5, 11 and 12 of the patent describe the incorporation of the claimed protein composition (whey protein from example 2: protein solubility of 20%) in various beverages and the subsequent heating of these beverages at 141°C (examples 4, 11 and 12) and 121.11°C (example 5). In none of these examples are any problems reported as regards the heat-stability of the beverage. In fact, in examples 4, 11 and 12, it is stated that after 45 days, no signs of sedimentation upon visual inspection were observed.

In view of the examples of the opposed patent, and in the absence of any proof to the contrary from the

appellant's side, it is credible that the above problem has been solved. The objective technical problem therefore is the provision of a protein composition that does not develop off-flavours and undesirable texture and appearance (browning) during exposure to high-temperature sterilisation procedures.

8.7 D2 does not provide any teaching that in order to solve this problem, protein solubility has to be reduced. Therefore, the skilled person being confronted with the objective technical problem and reading D2 would not have reduced the amount of soluble protein in D2 to that required by claims 1 and 10. The subject-matter of these claims is hence inventive over D2.

Order

For these reasons it is decided that:

1. The name of the appellant in the notice of appeal and in the grounds of appeal is ordered to be corrected under Rule 139 EPC from APV UK Limited to SPX Flow Technology Crawley Limited.

2. The appeal is dismissed.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber

Decision electronically authenticated