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D E C I S I O N
of 23 April 1998

Case Number: T 0140/94 - 3.3.2
Application Number: 86100531.2
Publication Number: 0191311
IPC: A23B 7/00

Language of the proceedings: EN

Title of invention:
Treatment of fruit and vegetable material

Patentee:
Société des produits Nestle S.A.

Opponent:
CPC Maizena GmbH

Headword:
Heat processing treatment/NESTLE

Relevant legal provisions:
EPC Art. 52, 54, 56, 83, 84
EPC R. 27(1)(b)

Keyword:
"Sufficiency yes: functional terms in the claims acceptable"
"Novelty yes: new technical effect"
"Inventive step yes: technical effect not obvious"

Decisions cited:
G 0002/88, G 0004/93, G 0005/83, T 0014/83, T 0012/81,
T 0198/94

Catchword:
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Boards of Appeal

Chambres de recours

Case Number: T 0140/94 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 23 April 1998

Appellant:
(Opponent)

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Decision under appeal:

Interlocutory decision of the Opposition Division
of the European Patent Office posted 21 December
1993 concerning maintenance of European patent
No. 0 191 311 in amended form.

Composition of the Board:

Chairman: P. A. M. Lançon
Members: G. F. E. Rampold
R. E. Teschemacher

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Summary of Facts and Submissions

I. The Appellant (Opponent) filed notice of opposition to the grant of European patent No. 0 191 311 (application No. 86 100 531.2) requesting that the patent be revoked in its entirety on the grounds laid down in Article 100(a) and (b) EPC, owing to lack of novelty (Articles 52(1), 54 EPC), lack of inventive step (Articles 52(1), 56 EPC), and insufficiency (Article 83 EPC). Claim 1 as granted read as follows:

"A process for treating fruit and vegetable materials to inhibit the formation of a reddish colouration during heat processing characterised in that an effective amount of a protein is added to the fruit or vegetable material."

Out of the eight documents relied on by the Appellant in the course of the first instance opposition proceedings only the following remained relevant in the appeal proceedings:

- (4) Handbuch der Lebensmittelchemie, Springer Verlag, Berlin, Heidelberg, New York, 1968, Band V, 2. Teil, page 414
- (5) Karl Duch, Handlexikon der Kochkunst, Verlag Alfred Pröbster KG, Kempten, 8. Auflage 1972, page 587
- (6) Davidis-Schulze, Praktisches Kochbuch für die einfache und feinere Küche, Kleins Druck- und Verlagsanstalt GmbH, Lengerich, 1960, page 154

- (8) Rotraud Degner, Das Kochbuch fürs Leben, Verlag Solitude, Stuttgart 1957, page 208
- II. The interlocutory decision of the Opposition Division posted on 21 December 1993 established that the patent could be maintained under Article 102(3) EPC on the basis of claim 1 as amended on 22 February 1993, dependent claims 2 to 19 as granted, and the description adapted accordingly.
- Said amended claim 1 read as follows:
- "A process for treating fruit and vegetable materials to inhibit the formation of a reddish colouration during heat processing, characterised in that a protein is added to the fruit or vegetable material for contacting leucoanthocyanidin red pigment precursors in an amount effective to inhibit the formation of a reddish colouration of the fruit and vegetable material during heat processing."
- III. The Appellant lodged on 16 February 1994 an appeal against the above decision and requested that the patent be revoked in its entirety, since the subject-matter of the amended claims was not patentable on the grounds of lack of novelty, lack of inventive step and insufficiency having regard to the documents cited during the proceedings before the Opposition Division.
- IV. In a communication dated 30 March 1998, the parties were informed that the Board preferred to rely on the full text of the publication of "P. Nehring: Gemüse in Dosen und Gläsern" in Handbuch der Lebensmittelchemie, Springer Verlag 1968, Band V, 2. Teil, pages 394-482,

of which only page 414 was cited and submitted by the Appellant during opposition proceedings as document (4). A copy of the full text of the Nehring publication has been made available and is hereinafter referred to as document (4).

- V. Oral proceedings were held before the Board on 23 April 1998. The Appellant's submissions both in the written procedure and at the oral proceedings can essentially be summarised as follows:

Concerning the sufficiency of disclosure, the Appellant submitted that the reference in claim 1 to the formation of a "reddish colouration" of the fruit or vegetable material was vague and indefinite giving rise to the reproducibility of the invention being called into question. It submitted further that the disclosure was insufficient and not enabling to determine appropriate conditions for the heat processing treatment and, in particular, to determine the "effective amount" of protein, when what was meant was the amount of any particular protein necessary in any particular case to inhibit the formation of a reddish colour of the fruit or vegetable material treated.

Further to sufficiency, the Appellant dispensed during oral proceedings with its prior assertion submitted in writing that the preferred weight ranges given for various kinds of proteins in the first full paragraph on page 3 of the patent in suit would include in several cases amounts of protein which, at the same time, were shown in the comparative examples of the patent specification as ineffective.

As far as novelty was concerned, the Appellant concluded by way of comparison of the technical features of claim 1 presently on file with the disclosure of what it considered to be the closest

state of the art, viz. document (8), that the subject-matter of claim 1 was no longer novel because all its technical features were directly inferable from document (8) and from document (5) as well, which differed from (8) only in the kind of the vegetable treated. Although the cited documents admittedly belonged to the field of domestic cookery, it argued that the claims did not contain any technical feature which would reflect or support the distinction, emphasised in the Respondent's submissions, between the invention's subject-matter, on the one hand, relating to the industrial heat processing treatment of fruit and vegetable material and domestic cookery, on the other.

Even if the alleged invention were to be regarded as novel, the claimed process did not, in the Appellant's opinion, involve an inventive step. Not only would the skilled person have known from (8) that the addition of an effective amount of milk prevented cauliflower, which was reported in the present patent specification itself to contain leucoanthocyanidin red pigment precursors, from discolouration during cooking, but he would also have learned from a combination of the teaching of document (4) with that of (5) or (6) of the possibility of adding some milk to prevent black salsify from the forming a reddish colour which was explicitly disclosed in (4) as originating from the presence of leucoanthocyanidin red pigment precursors in this kind of vegetable. It was thus in the Appellant's opinion merely a matter of routine for the skilled practitioner to solve the problem of inhibiting the formation of a reddish colour during industrial heat processing treatment by means which were identical or at least equivalent to those already shown in the cited prior art to be effective for the same purpose in domestic cookery.

VI. During the oral proceedings, the Respondent submitted a newly amended statement of claim as the main request.

Claim 1 of the said main request reads as follows:

"Use of a protein to inhibit formation of a reddish colour during the heat processing treatment of a fruit or vegetable material containing leucoanthocyanidin red pigment precursors under conditions which are such as to induce the formation of a reddish colour in the fruit or vegetable material, the protein being added to the fruit or vegetable material to contact the leucoanthocyanidin red pigment precursors in an amount effective to inhibit formation of the reddish colour during the heat processing treatment."

Dependent claims 2 to 18 refer to specific embodiments of the invention as set out in claim 1.

The Respondent's submissions in support of its request can be summarised as follows:

The request to maintain the patent in suit on the basis of "use claims" rather than on the basis of the original "process claims" was essentially based on certain submissions and comments on the part of the Appellant and was thus intended to overcome at least some of the objections to the patentability of the claimed subject-matter.

With regard to the sufficiency of disclosure and reproducibility of the invention, the Respondent admitted that the effective amount of protein had to be determined by trial and error in any particular case, since the amount required to inhibit formation of the reddish colour, i.e. the "effective amount", depended on a number of factors, such as the kind and quality of the protein, the amount of leucoanthocyanidin red

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pigment precursors present in the fruit or vegetable material and the type and degree of ripeness of the said material. It was, however, self-evident that in practice such determination did not require some complicated test or assay to be performed but merely a simple test in which the conditions of the heat processing treatment were applied in the presence of a measured amount of the protein. Determination of the amount which is in fact "effective" was then merely a matter of simple observation.

The allegation that the preferred weight ranges given for various kinds of protein, by way of example, in the first full paragraph on page 3 of the specification would include in several cases amounts which were shown in the specification itself to be ineffective and would, therefore, in reality be misleading, resulted from a clear misinterpretation of the disclosure of the patent specification on the part of the Appellant. On the contrary, the recommended ranges illustrated by several examples gave, in the Respondent's opinion, the skilled person appropriate guidance on which to base the determination of the required amount of protein in each particular case. The description and claims of the patent taken as a whole thus gave sufficient instructions to enable the invention to be carried out in any particular case without undue difficulties.

If the claims on file, on the one hand, and the prior art considered by the Appellant as relevant to the assessment of novelty, in particular documents (5) and (8), on the other, were correctly interpreted the skilled reader would necessarily reach the conclusion that none of the cited documents disclosed or even came

anywhere close to the claimed use of a protein that included the combination of the following essential technical features which were all part of present claim 1:

- (i) a heat processing treatment of a fruit or vegetable material which contains leucoanthocyanidin red pigment precursors under conditions which would otherwise [in the absence of the measure taken in the invention] be such as to induce a reddish colour;
- (ii) addition of protein for contacting leucoanthocyanidin red pigment precursors in an amount effective to inhibit formation of the reddish colour during the heat processing treatment.

Novelty should therefore be beyond doubt.

As far as inventive step was concerned, the Respondent maintained that the technical problem addressed by the invention was to avoid the formation of an unwanted reddish colour when heat processing fruit and vegetable materials containing leucoanthocyanidin red pigment precursors. Apart from the fact that none of the cited prior art addressed this problem, it occurred in practice only in the industrial processing of food and was not likely to be encountered in domestic cookery. However, the documents identified by the Appellant as the closest state of the art related in fact to the field of domestic cookery and were thus quite irrelevant to the problem at issue and its proposed solution as well.

From the foregoing the Respondent concluded that the present invention also involved an inventive step in the light of the cited prior art.

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VII. The Appellant maintains its request that the decision under appeal be set aside and that the patent be revoked in its entirety.

In case the Board decided to maintain the patent according to the Respondent's main request, the Appellant requests that the state of the art according to documents (4), (5) and (8) be acknowledged in the description.

VIII. The Respondent requests that the appeal be dismissed and that the patent be maintained in the version of the main request as submitted during oral proceedings before the Board, alternatively in the version of one of the auxiliary requests 1 to 3 also as submitted during oral proceedings.

Reasons for the Decision

1. The appeal is admissible.
2. In the following reference is made to the **main request**.
3. *Amendments*

3.1 Claim 1 and dependent claims 2 to 19 as originally filed and identically granted were directed to a *process* for treating fruit or vegetable materials to inhibit the formation of a reddish colouration during heat processing essentially comprising the step of adding a protein in an effective amount to the said materials.

Amendment of the main request during oral proceedings so that all claims are now directed to the **use** of a protein in an amount which is effective to inhibit formation of a reddish colour during the heat

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processing treatment of a fruit or vegetable material, is considered acceptable under the terms of Article 123(2) and (3) EPC.

Both the original *process* claims and the amended *use* claims belong to the same category and involve the same procedural steps or, expressed differently, the same technical realisation giving rise to the same final technical effect. As far as their essential content is concerned, therefore, no difference of substance can be seen between these two types of claim (see in this respect Decision G 5/83, OJ EPO 1985, 64, Reasons, especially point 11, first paragraph).

3.2 Compared to claim 1 in the form maintained by the Opposition Division the wording of the introductory portion of claim 1 has moreover been amended during appeal proceedings so as to explicitly require that

- (i) the fruit and vegetable material being subjected to the heat processing treatment must "contain leucoanthocyanidin red pigment precursors" - to be susceptible to the formation of a reddish colouration during heat processing due to their content of the said pigment precursors; and that
- (ii) the heat processing treatment must be carried out "under conditions which are such as to induce [normally, i.e. in the absence of the measures provided according to the invention] the formation of a reddish colour in the fruit or vegetable material".

Feature (i), now introduced into the independent claim, was present explicitly in dependent claim 2 as originally filed and identically granted and is moreover supported by the disclosure at lines 28 to 31 on page 2 of the original documents.

Apart from the fact that feature (ii) was already implicit in the original wording of claim 1, more specifically in the statement of purpose "to inhibit the formation of a reddish colouration during heat processing", it is moreover derived from the disclosure at lines 6 to 16 on page 3 of the original documents and in fact also from the whole disclosure as such.

Dependent claims 2 to 18 are based on claims 3 to 19 as originally filed and identically granted with minor consequential amendments to comply with amended claim 1.

Compared to claim 1 as granted, claim 1 presently on file as the broadest claim now additionally contains the two technical features (i) and (ii) in explicit form and as such confers, in principle, about the same but definitely not more protection.

- 3.3 In view of the foregoing, the claims as amended during appeal proceedings are acceptable as complying in these formal respects with the provisions of Article 123(2) and (3) EPC. Furthermore, such claims are clear and supported by the description as required by Article 84 EPC.

The consequential amendments of the specification and the acknowledgment of the prior art according to documents (4) and (8) in the introductory part of the description are also acceptable.

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- 3.4 The Board concurs with the Respondent's submission that the proposed amendments, including replacement of the original "process type" claims by "use type" claims, find their background primarily in the objections raised by the Appellant and were essentially introduced to deal with the said objections. Consequently, the amendments arise out of the appeal and, moreover, do not place the Appellant in a worse position than it was in as a result of the interlocutory decision under appeal. In other words, the Respondent's main request does not, in the present case, constitute a possible *reformatio in peius*.

The Board has thus decided in the exercise of its discretion (see Decision G 4/93, OJ EPO 1993, 478, Reasons, especially points 15, 16) to admit the amendment of the main request to the appeal proceedings.

4. *Sufficiency of Disclosure*

- 4.1 The Appellant's objections on these grounds essentially relate to the reproducibility of certain technical features which are defined in present claim 1 in functional terms.

The features in question are

- (i) the nature of the heat processing treatment requiring "conditions which are such as to induce formation of a reddish colour in the fruit or vegetable material"; and
- (ii) the amount in which the protein is added which must be such as to be "effective to inhibit formation of the reddish colour during heat processing treatment".

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4.2 An attack on the ground of insufficiency under Article 100(b) EPC is of course based on Article 83 EPC which requires that the disclosure of the invention must be "sufficiently clear and complete for it to be carried out by a person skilled in the art. As clearly pointed out in Decision T 14/83 (OJ EPO 3/1984, 105) the question of adequate disclosure must be assessed on the basis of the patent specification as a whole - including the description and the claims - and not of the claims alone.

4.3 The Appellant submitted during oral proceedings that the disclosure was insufficient to reduce both the functional features (i) and (ii) and consequently the teaching of claim 1 to practice for the simple reason that the person skilled in the art was unable to determine the meaning and scope of the term "reddish colour". Whilst this objection appears basically a matter for the support and clarity of the claim under Article 84 EPC which is not available as a ground for opposition under Article 100 EPC, it could, if justified, possibly have consequences for the question of reproducibility.

In the present case, however, it is clearly derivable for the skilled reader from the patent specification as a whole and more specifically from page 3, lines 2 to 4, that the invention is directed to the inhibition of a reddish colouration which is undesired and would be regarded by the consumer as unnatural in the fruit or vegetable material in question. The skilled person being guided by these principles would certainly not encounter substantial difficulties in determining in each particular case the kind or shade of reddish colour which would indeed be considered to be undesirable or unnatural, for example, by comparing the treated product with the material prior to its subjecting to the heat treatment, even though such

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colour may vary within certain limits depending e.g. on the particular fruit or vegetable material treated, or the desired appearance of the product. But this does not, in the Board's judgment, jeopardise the reproducibility of the invention.

4.4 As indicated in the patent specification, heat processing treatments causing the undesirable red colouration are generally known treatments, such as sterilisation, pasteurisation, concentration or drying, using standard conditions which are exemplified at page 2, lines 40 to 45. Moreover, the skilled person will be prompted to use the invention only after having realised that the conditions necessary for the particular heat processing treatment are in fact such as to induce the undesirable reddish colouration. This means that the person skilled in the art seeking to apply the invention would, in principle, already know the conditions responsible for inducing formation of a reddish colour and would therefore have no difficulties in implementing feature (i) on the basis of the disclosure.

4.5 As to feature (ii), in interpreting the instruction in claim 1 to add the protein "in an amount effective to inhibit the formation of a reddish colouration of the fruit or vegetable material during heat processing", the skilled reader will already, on the basis of the disclosure of the lower limit, i.e. "from at least 2% by weight" (see page 3 of the patent specification, lines 1 to 2), and the upper limit, i.e. "above 12% of any protein will provoke the brown colour" (see page 3, lines 5 to 6), rule out the use of impracticably small or large proportions of the protein. In seeking suitable amounts of protein, which may vary according

to the vegetable or fruit material to be protected from reddish discolouration and the kind of protein used, the skilled person will also be guided by the preferred weight ranges provided for various kinds of proteins, by way of example, in the first full paragraph on page 3 of the patent specification.

Moreover, the skilled person is given on the basis of the examples in context with the comparative examples included in the specification precise instructions - should he need them - as to how he can, by means of simple tests, determine the amount of protein required in each particular case. The effort called for to carry out such tests on the part of a skilled person must be regarded as reasonable since determination of the amount which in fact is "effective" is in practice merely a matter of simple observation.

4.6 In conclusion, the Board sees in the Appellant's submissions no basis for an objection under Article 83 and accordingly no ground for opposition under Article 100(b) EPC.

5. *The Problem and the solution*

5.1 Document (4) discloses methods of canning of various kinds of vegetables on an industrial scale and refers in this connection also in great detail to the necessity of preserving the vegetables by subjecting the filled and sealed cans or glass jars to proper thermal sterilisation (cf. pages 395-404: "Grundlagen der Haltbarmachung durch Hitzesterilisation"; the paragraph bridging pages 412/413: "Sterilisationstechnik"). What is of particular relevance in relation to the present invention is the fact that in the penultimate paragraph on page 414 of (4) explicit mention is made that a particular species

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of vegetable, namely black salsify (Schwarzwurzeln), is prone to undergo enzyme-dependent reddish discolouration during canning, presumably by virtue of its containing leucoanthocyanidin red pigment precursors. The document goes on to state that formation of the undesirable reddish discolouration can be prevented altogether or at least be considerably reduced by the exclusion of air and adding 0.05% citric acid solution to the vegetable during its preparation and canning.

The Board has reached the conclusion that the above cited reference in document (4) comes closest to the subject-matter of the contested patent. It is indeed the only citation that addresses explicitly the problem of preventing the reddish discolouration of a certain vegetable material containing leucoanthocyanidin red pigment precursors during a heat processing treatment, and offers a solution to this problem as well. It should also be noted that the heat processing treatment of (4) is applied in the field of industrial processing of vegetables including the step of thermal sterilisation.

The above reference is thus considered to be closer to the subject-matter of the invention than other pieces of the prior art alternatively proposed by the Appellant during oral proceedings, that is to say the reference in the 2nd paragraph on page 416 of (4) essentially stating that, on heating, cauliflower may be subject to a Maillard-type reaction or a pink discolouration caused by the presence of heavy metal impurities, in particular iron, or the extract (8) from a cookery book which merely notes in one short sentence that cauliflower stays nice and white if some milk is added to the cooking water. There is no mention in (8) of the problem of the formation of a reddish colour and thus also no disclosure of a solution to this problem.

5.2 It is derivable from the disclosure of the patent in suit on page 2, lines 17 to 18, that the use of an acid as a food additive, for example citric acid [the use of which is proposed in (4) to suppress the reddish discolouration], is not free from certain disadvantages. In particular, the addition of acid may negatively affect the taste of the product and sugar has usually has to be added to try to mask the acidity. It appears immediately apparent to a person skilled in the art that the disadvantage associated with the use of an acid is particularly relevant in cases, where, for example, vegetable or fruit materials having an inherent sweet or neutral taste such as banana pulp or apple or pear puree and, in particular, baby food are concerned.

Thus, starting from the above identified reference in (4) as representing the closest state of the art, the objective technical problem the present invention sets out to solve may be seen as that of providing means which, on the one hand, prevent formation of a reddish colouration during the heat processing treatment of a fruit or vegetable material containing leucoanthocyanidin red pigment precursors at least as effectively as citric acid does but, on the other, overcome the disadvantages associated with the use of citric acid.

5.3 The solution to the problem offered in the contested patent is based on the finding that proteins such as skimmed milk powder, whey protein powder, egg white powder, etc. are advantageously capable of effectively inhibiting formation of a reddish colour during the heat processing treatment of a fruit or vegetable material without negatively affecting the taste of the products treated. In particular, the solution to the problem as described in the patent in suit essentially involves the step of adding an effective amount of the

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protein to the fruit or vegetable material to contact the leucoanthocyanidin red pigment precursors. That these measures according to the invention indeed solve the technical problem defined above is plausibly derivable from the examples and comparative examples included in the specification and has moreover never been contested in the course of the first instance opposition or appeal proceedings.

6. *Novelty*

6.1 Document (4) recommends in the above-cited references (see point 5.1) at page 414 the use of citric acid and at page 416, apart from citric acid, alternatively also the use of ascorbic acid to inhibit or reduce the formation of a reddish or pink colouration during heat treatment of either black salsify or cauliflower, but is entirely silent about the use of a protein for this particular purpose. The claimed subject-matter in the patent in suit is accordingly novel over the disclosure in the closest state of the art. This was also not contested by the Appellant.

6.2 It was however contended by the Appellant that the disclosure of document (8) and also that of document (5) would fully anticipate the particular intended use of a protein as claimed and described in the patent in suit.

In respect of this objection to lack of novelty, the Board considers it useful to refer in the first place to Decision G 2/88 (OJ EPO 1990, 93, Reasons, especially points 9, 10). In the said decision, the Enlarged Board concluded that a claim to the use of a known compound for a particular purpose, which is based on a technical effect, should correctly be interpreted as including such a technical effect as a functional

technical feature. If that technical feature has not previously been made available to the public by any means as set out in Article 54(2) EPC, then the claimed invention is deemed to be novel, even though such technical effect may have inherently taken place in the course of carrying out what has previously been made available to the public.

6.3 Present claim 1 is indeed directed to the use of a known class of substances for a particular purpose and as such has to be interpreted in the sense outlined above. It appears therefore in the present case appropriate and necessary to focus the assessment of novelty primarily on the question of whether or not either of the documents (8) and (5) or any other cited document already made available to the public the technical feature that any kind of protein, when used as claimed and described in the patent in suit, achieved the technical effect of inhibiting the formation of a reddish colouration during the heat processing treatment of a fruit or vegetable material containing leucoanthocyanidin red pigment precursors (hereinafter referred to as "the specific technical effect of the invention")

6.4 Reference (8), which is an extract from a cookery book, consists of three sentences and, in reality, it is only the middle sentence which is relevant to the present case and could possibly best be translated as providing the reader with the following instruction: "If you add some ("etwas") milk to the cooking water for the cauliflower, it stays nice and white".

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The knowledge of the notional skilled person in the art that cauliflower contains leucoanthocyanidin red pigment precursors was not contested on the part of the Respondent. This is also mentioned in the patent specification (cf. page 2, line 6).

However, neither was sufficient evidence provided by the Appellant that the skilled person could or even would have known from his own practical experience or his familiarity with the state of the art that under the conditions and circumstances of domestic cooking as used in (8) cauliflower would indeed be susceptible to the formation of a reddish discolouration, nor has this been made available to the public in the sense of Article 54(2) EPC either in document (8) or in any other document cited in the proceedings. It follows that the ability of milk to inhibit formation of a reddish colouration of the cauliflower during cooking is likewise not derivable from document (8).

- 6.5 The Board is similarly unable to share the Appellant's opinion that, in the absence of an explicit disclosure of the specific technical effect of the invention in (8), the claimed subject-matter was at least implicitly derivable from the cited document, because in carrying out the teaching of (8) the skilled person would necessarily arrive at the same technical result as claimed in the patent in suit.

This is however not the case here. The technical teaching of the patent in suit concerning the particular purpose and effect of using the protein - use of a protein to inhibit the formation of a reddish

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colour of a fruit or vegetable by adding the protein in an amount which must be sufficient to suppress the radish colour - is specific

- (i) with respect to the colour (reddish colour), the formation of which should be suppressed, and also
- (ii) with respect to the amount of protein necessary to suppress this particular colour (see also point 6.8 below).

On the other hand, the teaching described in (8) - use of milk to maintain the inherent white colour of cauliflower or, differently expressed, to inhibit the formation of any conceivable colour (stays white) by adding some milk - is general

- (i) with respect to the colour, the formation of which should be suppressed, and also
- (ii) with respect to the amount of protein necessary to inhibit the formation of a certain colour.

It was not contested by the Appellant that under the conditions and circumstances of domestic cooking cauliflower may possibly be susceptible to the formation of various discolourations whereby formation, for example, of a greyish colour was apparently accepted as being commonly known in the art. It was also not contested that the minimum necessary amount of protein (milk) may vary considerably depending on the particular colour the formation of which should be inhibited.

It follows that (8) cannot be considered as containing a "prior implicit disclosure" in the sense that, in carrying out the teaching of (8), the skilled person would **inevitably** arrive at a result falling within the terms of claim 1 or, differently expressed, would **inevitably** achieve the specific technical effect of the invention (see in this respect, for example, Decisions T 12/81, OJ EPO 1982, 296, Reasons, points 7 to 10, T 124/87, OJ EPO 1989, 491).

6.6 The Appellant also argued during oral proceedings that in view of the broadness of present claim 1, as far as the conditions of the heat treatment, as well as the amount and kind of the protein used were concerned, it could not entirely be excluded that the use of milk previously described in (8) would have among other possible effects at least inherently the same technical effect as the claimed use, and on this basis there was lack of novelty. In this connection, it also referred to the problems involved in relation to infringement if there was no finding of lack of novelty in the present case. In particular, already the mere activity of adding a protein during any heat treatment to a fruit or vegetable material containing leucoanthocyanidin red pigment precursors for whatever purpose would, in the Appellant's opinion, bear the risk of infringement of the patent in suit.

Although no evidence has been provided that the specific technical effect of the invention had possibly inherently taken place in the course of carrying out what has been described in (8), the Board would in respect of the above submission nevertheless emphasise that, for the assessment of novelty within the meaning of Article 54(1) and (2) EPC as one of the prerequisites for the patentability under the EPC, the question to be decided is what has in fact been "made available" to the public, and not what may have been

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"inherent" in what was made available. In the case of a "written description", what is made available is the information content which the skilled reader obtains from the written description (see in this respect Decisions T 12/81, OJ EPA 1982, Reasons, points 5 to 7; T 198/84 OJ EPA 1985, 209, Reasons, point 4). In each such case, however, a line must be drawn between what is in fact made available, and what remains hidden, inherent or otherwise has not been made available. Thus, the question of "inherency" does not arise as such under Article 54 EPC (see in this respect Decision G 2/88, loc. cit.)

The Board sees therefore in the disclosure of document (8) no basis for an objection to lack of novelty.

- 6.7 The above grounds for the acknowledgment of novelty of the claimed subject-matter in the patent in suit vis-à-vis the disclosure of reference (8) apply a *fortiori* to the disclosure of document (5). This citation, which is also an extract from a cookery book, essentially recommends placing prepared salsify in acidified water to maintain its whiteness and cooking the vegetable in water mixed with a small amount ("wenig") of milk and flavoured with salt and lemon juice, while maintaining whiteness ("weißkochen").

First of all, document (5) similarly does not disclose the particular technical effect achieved when using a protein as claimed and described in the contested patent. It is, moreover, expressis verbis stated in reference (5) that the vegetable is placed in acidified water for the purpose of maintaining its whiteness, and it is further stated that the cooking water is also mixed with lemon juice containing citric acid which is known from (4) to prevent salsify from discolouration

during heat treatment. This is why the purpose of adding some milk to the cooking water and the effect achieved therewith remain in reference (5) undisclosed and moreover entirely unclear.

- 6.8 The Board also considers that the functional technical feature in claim 1 stipulating that the protein be added "in an amount effective to inhibit the formation of a reddish colour during the heat treatment" is capable of introducing an additional new element into the independent claim to delimit further the claimed subject-matter in the patent in suit in respect of novelty from the cited prior art.

As far as the actual amount is concerned, the citations are confined to the rather diffuse teaching that some ("etwas") milk (8) or a small amount ("wenig") of milk (5) should be added to the vegetable material. The skilled person is, however, given no directions as to how he could in fact prevent the fruit and vegetable material from forming a reddish colour, if this problem nevertheless occurred during heat treatment. In contrast to the patent in suit, there is certainly no technical teaching available in the citations to the effect that in such case, for example, the amount of milk (protein) has to be increased to a level which is once at for all capable of inhibiting formation of the reddish colour. From the results shown in the comparative examples of the patent in suit it becomes clear that the amount of protein necessary to achieve the desired effect in each particular case is an essential technical feature which is defined in functional terms in present claim 1 but is definitely not part of the cited prior art.

In this connection it appears appropriate to point to the distinction which has to be made between novelty and inventive step. Contrary to what the Appellant

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appears to suggest, in the present case lack of novelty could not be based on the grounds that the skilled person would have understood the instruction in the cited documents concerning the amount of milk to be used, i.e. literally "some ("etwas", "ein wenig") milk", to be virtually synonymous with the instruction to use the protein such as milk in an amount sufficient to inhibit formation of reddish colouration. To do so would mean to adduce a typical criterion for the evaluation of inventive step.

Moreover, some yet undisputed calculations submitted by the Respondent show, that amounts of milk, which the skilled practitioner would normally use on the basis of the information provided in the citations, e.g. some ("etwas") milk or a little amount ("wenig") of milk, are far too low compared to those which would in fact be necessary successfully to inhibit formation of a reddish colouration.

6.9 In summary, none of the documents cited in the proceedings discloses in the Board's judgement all the technical features of the independent claim. The subject-matter of claim 1 and dependent claims 2 to 18 is therefore deemed to be novel within the meaning of Article 54(1) EPC.

7. *Inventive step*

7.1 As has been acknowledged in the introductory part of the patent specification (see especially page 2, lines 19 to 26), sodium bisulphite, cysteine and complexing compounds such as phosphates, or ethylene diamine tetra-acetic acid in admixture with either ascorbic acid or citric acid have been used in the state of the art as alternatives to citric acid to prevent reddish discolouration of foods during heat

treatment. However, only citric acid was considered at all useful for this purpose, because the alternatives mentioned above were either not found successful in inhibiting the reddish colouration, or did not suppress it sufficiently, or developed a repulsive odour in the cans or glass jars due to their sulphur content, making their use as a food additive unacceptable or at least questionable. Similarly, the closest prior art (4) suggests the use of citric acid.

7.2 Thus, at the priority date of the patent in suit it was apparently part of the knowledge of the skilled person that the use of citric acid was the matter of choice to inhibit formation of a reddish colouration during heat treatment of certain kinds of fruits or vegetables originating from their containing leucoanthocyanidin red pigment precursors, in spite of some obvious disadvantages associated with such use. Hence, the relevant question to be decided under Article 56 EPC is whether or not it was obvious to a skilled person faced with the technical problem as defined above to solve this problem on the basis of his common general knowledge, his familiarity with the relevant state of the art and also with related art by the use of a protein.

7.3 It may be true that milk has always been added routinely in domestic cookery to various types of food for rather different purposes. However, not the slightest indication was found in what has been submitted in writing or orally in the present case to suggest that the skilled practitioner would have done this on the basis of his common general knowledge or his practical experience to suppress formation of a reddish discolouration of certain kinds of fruits or vegetables during cooking.

- 7.4 Although the reason for the formation of the red colour in vegetable materials containing the appropriate pigment precursors during heat processing treatment is correctly indicated in document (4), all that the said document suggests in order to prevent reddish discolouration is the addition of citric acid when canning salsify. Despite the fact that (4) is a multi-volume handbook of food chemistry and deals, for example, exhaustively with the problems occurring during heat stabilisation of vegetable materials, it is entirely silent about any alternative to the use of an acid. Consequently, the person skilled in the art could not derive or glean from the closest state of the art any clue as to the ability of any protein to suppress the formation of a reddish colouration.
- 7.5 The Respondent's argument put forward during oral proceedings is acceptable that neither the exact purpose of adding some milk nor the precise effect achieved by this measure is derivable from the disclosure of either document (5) or (8). In any case, even upon careful study of the content of both these documents the skilled reader is given no hint or suggestion leading him to the conclusion that adding some milk would indeed have the effect of inhibiting the formation of a reddish colouration of cauliflower (8) or black salsify (5) during cooking, let alone that the addition of some milk would exhibit this effect during heat treatment under conditions such as necessary, for example, for sterilisation or pasteurisation.
- 7.6 Similarly, the combination of the teaching of document (4) with that of either (5) or (6) would not point the skilled person to the solution of the present technical problem. Thus, even if the skilled person knew from (4) that black salsify is prone to undergo reddish discolouration during canning and sterilisation

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by virtue of its containing leucoanthocyanidin red pigment precursors and knew also that this can be suppressed by the addition of citric acid, there is no recognisable link between document (4), on the one hand, and (5) or (6), on the other, suggesting that the addition of milk during cooking would have the same or at least a similar effect. Therefore, the combined teaching of the above cited documents would likewise in no way be helpful in pointing the skilled person in the direction of solving the problem by replacing citric acid with an effective amount of a suitable protein.

7.7 The subject-matter of claim 1 accordingly involves an inventive step. Since dependent claims 2 to 18 relate to advantageous embodiments of claim 1, they, too, are allowable.

8. *Acknowledgment of the prior art in the description*

The Board concurs with the Appellant's request insofar as the prior art of documents (4) and (8) has been acknowledged in the description in accordance with Rule 27(1)(b) EPC. However the prior art of document (5) is for the reasons given in paragraph 6.7 above not considered to constitute relevant background art which should be indicated in the description.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

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

Claims 1 to 18 and description pages 2 to 6, both submitted as the main request during oral proceedings.

The Registrar:

P. Martorana

The Chairman:

P. Lançon

