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Datasheet for the decision of 23 March 2017

Case Number: T 2427/13 - 3.3.04

Application Number: 06762831.3

Publication Number: 1910543

IPC: C12N15/82, A01H5/00, A01H5/10

Language of the proceedings: EN

Title of invention:
Overexpression of starch synthase in plants

Applicant:
Bayer Intellectual Property GmbH

Headword:
Process for increasing the phosphate content in starch/BAYER INTELLECTUAL PROPERTY

Relevant legal provisions:
EPC Art. 54, 84, 111(1), 113(1), 123(2)
EPC R. 115(2)
RPBA Art. 15(3)

Keyword:
Auxiliary request 1a: Novelty - (yes), Clarity - (yes), Amendments - allowable (yes)
Appeal decision - remittal to the examining division (yes)

Decisions cited:
G 0001/04, T 0068/85, T 0560/09, T 0809/12

Catchword:

Europäisches Patentamt
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Case Number: T 2427/13 - 3.3.04

D E C I S I O N
of Technical Board of Appeal 3.3.04
of 23 March 2017

Appellant: (Applicant)	Bayer Intellectual Property GmbH Alfred Nobel Strasse 10 40789 Monheim am Rhein (DE)
Representative:	BIP Patents c/o Bayer Intellectual Property GmbH Alfred-Nobel-Straße 10 40789 Monheim am Rhein (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 15 July 2013 refusing European patent application No. 06762831.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairwoman	G. Alt
Members:	M. Montrone
	L. Bühler

Summary of Facts and Submissions

I. The appeal was lodged by the applicant (hereinafter "appellant") against the decision of the examining division to refuse European patent application No. 06 762 831.3. The application was filed as an international application and published as WO 2007/009823 (hereinafter "the application as filed") with the title "*Overexpression of starch synthase in plants*".

II. The decision under appeal refers to a main and fifteen auxiliary requests, the latter all being filed with the appellant's telefax dated 17 September 2012. The examining division held that the subject-matter of claim 1 of the main request lacked clarity. The same applied to claim 1 of auxiliary request 1, which was thus not admitted into the proceedings. The examining division further took the view that the subject-matter of claim 1 of each of auxiliary requests 1 (filed as auxiliary request 2) and 3 to 7 extended beyond the content of the application as filed. Furthermore, it held that the subject-matter of claim 7 of auxiliary request 2 (filed as auxiliary request 8) lacked novelty over the disclosure of each of documents D1, D2 and D4 (see section VI below). Auxiliary requests 9 to 15 were not dealt with in the decision under appeal.

With regard to lack of clarity of the subject-matter of claim 1 of the main request, the examining division took the view that essential technical features which would have allowed a clear delimitation from the prior art were missing. The reasons given were as follows:

"*The function of a patent claim is to define the scope of protection. Thus, Article 84 EPC requires the*

presence of essential technical features in the claim. Essential technical features are features which are necessary to delimit from the prior art and to solve the underlying technical problem.

The process of claim 1 of the main request contains as technical step merely step a. i.e. the transformation of a plant cell by a nucleic acid sequence coding for a soluble starch synthetase. Any other definitions included in the claims are merely by the result to be achieved. The indication that the phospate content is increased by 150 to 500% in comparison to the untransformed wild-type, and the definition that the enzymatic activity of the soluble starch synthase is increased by 600 to 1500% are desideratum definitions only, which leave open the means by which this aim is achieved. The person skilled in the art is not aware which technical means he should take to achieve this result.

In the present case the "result to be achieved features" are those which should delimit the claim from the prior art. D1 as well as D2 both disclose processes for modifying the phosphate content of starch of a plant by transforming the plant with a starch synthase. The documents both do not mention the percentage of increase nor the increase in enzyme activity indicated in claim 1. However, the enzyme of D1 used to transform plants is identical in sequence by 92,269% with the sequence according the the present application".

With regard to lack of novelty of the rice starch according to claim 7 of auxiliary request 2 over the disclosure of documents D1, D2 and D4, the reasons given were essentially that document D1 disclosed rice plants transformed with a soluble starch synthase II

from wheat, which was the same enzyme as that disclosed in the application. Accordingly, the skilled person would have derived from the disclosure in document D1 that the starch obtained from these rice plants inevitably had the same properties as the claimed rice starch. With regard to document D2, it was merely stated that "*the starch obtained in D2 may also have exactly the properties*". Document D4 disclosed rice starches with a DSC T-onset temperature of above 72°C, while it was silent about their phosphate content. However, since document D4 also disclosed that the content of phosphate in rice starches varied between 0.003% and 0.056%, the variations were "*so large that reasonable doubts arise to the novelty*" of the claimed rice starches.

III. With the notice of appeal, the appellant submitted a main request and 15 auxiliary requests. The main and auxiliary requests 1 to 8 differed from those underlying the decision under appeal in that the back-reference in claim 12 of all these requests had been corrected to read claim 11 instead of claim 10. Auxiliary requests 9 to 15 were identical to those referred to in the decision under appeal.

IV. In reply to the board's preliminary opinion the appellant (i) withdrew the main request filed with its notice of appeal; (ii) submitted auxiliary request 1a as the highest ranking request; (iii) withdrew its request for oral proceedings and announced that it would not be attending the oral proceedings.

Claims 1 and 7 of auxiliary request 1a read:

"1. A process for increasing the phosphate content in the C6 position of starches of genetically modified

plant cells to 150 to 500% in comparison with starches from corresponding genetically non-modified wild-type plant cells (100%) whose genetic information, with the exception of the genetic modification which has been introduced and which leads to an increased activity of a soluble starch synthase, corresponds to that of a genetically modified plant cell, wherein

a) a plant cell is genetically modified by the introduction of a foreign nucleic acid molecule coding for a soluble starch synthase II and

b) the enzymatic activity of soluble starch synthase II is increased by 600 - 1500% in comparison to non-genetically-modified plant cells whose genetic information, with the exception of the genetic modification which has been introduced and which leads to an increased activity of a soluble starch synthase, corresponds to that of a genetically modified plant cell.

7. A rice starch which has a DSC T-onset temperature of between 70 °C and 80 °C and a phosphate content in position C6 between 0.9 and 2.3 nmol phosphate per milligram of starch."

V. The following documents are cited in this decision:

D1: WO 97/45545

D2: US 6 423 886

D4: G.E. Vandeputte *et al.*, Journal of Cereal Science, 38, 43-52, 2003

VI. Oral proceedings before the board were held on 23 March 2017 in the previously announced absence of the appellant. At the end of the oral proceedings the chairwoman announced the board's decision.

VII. The appellant's arguments submitted in writing may be summarised as follows:

Auxiliary request 1a

Clarity and Support (Article 84 EPC) - claim 1

The question to be answered was whether or not the two features referred to in claim 1, i.e."*increasing the phosphate content in the C6 position of starches of genetically modified plant cells to 150 to 500%*" ("feature (i)") and "*the enzymatic activity of soluble starch synthase II is increased by 600 - 1500%*" ("feature (ii)") were sufficiently clear to allow the skilled person to determine the protection sought by the process claimed.

Methods for the determination of the phosphate content in starch were disclosed in the application (see page 45, Material and Methods, point 14), as were methods for the determination of the enzyme activity of the soluble starch synthase II (SSII) (see page 35, Material and Methods, point 6). Thus, the skilled person, by applying routine methods, was able to determine an increased phosphate content in starch and an increased activity of the SSII, both relative to a given standard. Accordingly, all of the features referred to in claim 1 were clear and, as a consequence, the protection sought by the subject-matter of claim 1 was also clearly determinable.

Moreover, no essential technical features defining the process according to claim 1 were missing since achieving an increase in the phosphate content in the carbon (C) atom at position 6 ("C6") of starch solely required that plant cells be transformed by a gene encoding a protein having SSII activity and cells then selected which exhibited an increased SSII activity by 600% to 1500% compared to non-transformed cells.

Furthermore, features (i) and (ii) as referred to in claim 1 did not merely define results to be achieved.

As regards feature (i) phosphate was covalently bound to the glucose units of starch and thus formed part of its chemical structure. Accordingly, the phosphate content was a structural characteristic of starch. Starch was a complex compound composed of different polymers and could therefore not be defined by a chemical formula. Moreover it was common practice in the art to define the content of phosphate in starch and its increase in percent by comparison to a reference starch.

As regards feature (ii) it was common in the art to define increases in enzymatic activities in relation to a given standard. The increase in SSII enzyme activity by 600 to 1500% was a feature that would have been understood by the skilled person as a range of values by which the activity of the enzyme had to be increased and not as a result to be achieved.

Hence, the subject-matter of claim 1 met the requirements of Article 84 EPC.

Novelty (Article 54 EPC) - claim 7

Document D1 disclosed nucleic acid sequences encoding SSII from wheat, plant cells transformed with these sequences, and that the phosphate content of the starch produced by these cells could be modified. The document did not disclose that the phosphate content was increased in starch upon over-expression of SSII in transformed plant cells, let alone a rice starch characterised by a phosphate content at position C6 between 0.9 and 2.3 nmol per mg of starch and a DSC T-onset temperature of between 70°C and 80°C.

Document D2 reported various sequences of starch synthases and speculated on the effects which could occur upon their over-expression in plants. Nucleic acid sequences encoding a SSII protein were not disclosed. Furthermore, the document explicitly disclosed maize starch, while it remained silent on rice starch, let alone rice starch characterised by the properties defined in claim 7.

Document D4 disclosed various rice starches characterised by a DSC T-onset temperature of, including one between 70°C and 80°C. However, the document did not disclose that rice starch with these particular characteristics contained, in addition, phosphate at a concentration of 0.9 to 2.3 nmol per mg starch, let alone at position C6.

Accordingly, none of the cited prior-art documents directly and unambiguously disclosed rice starch according to claim 7. The subject-matter of this claim was therefore novel.

VIII. The appellant requested in writing that the decision under appeal be set aside and further, as a main request, that a patent be granted on the basis of auxiliary request 1a filed with its letter dated 20 March 2017, or, alternatively, that a patent be granted on the basis of one of auxiliary requests 1 to 15 filed with the notice of appeal.

Reasons for the Decision

1. The duly summoned appellant announced that it would not be attending the oral proceedings. The board, however, considered oral proceedings to be expedient (Article 116(1) EPC) and that it was in a position to take a decision (Article 113(1) EPC). Accordingly, oral proceedings took place in the appellant's absence in accordance with Rule 115(2) EPC and Article 15(3) RPBA.

Auxiliary request 1a

Amendments (Article 123(2) EPC)

2. The references below are to passages and claims of the application as filed.

3. The subject-matter of claim 1 is derivable from claim 1 in combination with page 8, last paragraph, and page 11, second paragraph, of the application.

4. The subject-matter of claims 2 to 6 and 8 to 15 is disclosed in claims 2 to 6 and 8 to 15, respectively.

5. The subject-matter of claim 7 is derivable from claim 7 in combination with page 16, last paragraph, of the application.

6. Consequently, the board is satisfied that the subject-matter of claims 1 to 15 of auxiliary request 1a meets the requirements of Article 123(2) EPC.

Clarity and Support (Article 84 EPC)

7. The subject-matter of claim 1 of auxiliary request 1a corresponds essentially to that of auxiliary request 1 filed by the appellant with the telefax dated 17 September 2012 and dealt with in the decision under appeal. It differs from the latter claim only in that the feature "*the C6 position of*" has been added to further structurally define the site of phosphorylation in starch as the carbon (C) atom at position 6 ("C6") in its glucose monomer units (see page 9, lines 1 to 3 of the application).

8. The examining division held that the subject-matter of claim 1 of auxiliary request 1 lacked clarity for the same reason as claim 1 of the main request (see the decision under appeal, page 3, second paragraph), which was that "*essential technical features are missing which would allow a clear delimitation from the prior art*" (see page 3, first paragraph). Its reasons for this finding were essentially that the claimed process contained "*as technical step merely step a*", while "Any *other definition included in the claims are merely by* the *result to be achieved".* The two features indicated in this context were "*the phosphate content is increased by 150 to 500%*" and "*the enzymatic activity of the soluble starch synthase is increased by 600 to*

1500%, which leave open the means by which this aim is achieved". Nor was the skilled person aware of the "*technical means he should take to achieve this result*".

Furthermore, the examining division held that the two "*result to be achieved features*" referred to in claim 1 were "*those which should delimit the claim from the cited prior art. D1 as well as D2 both disclose processes for modifying the phosphate content of starch of a plant by transforming the plant with a starch synthase. The documents both do not mention the percentage of increase nor the increase in enzyme activity indicated in claim 1*". The board construes this passage of the decision under appeal as meaning that the examining division disputed that these two "*result to be achieved features*" were suitable to delimit the claimed subject-matter because they were not disclosed in the prior art.

9. Essential technical features in a claim are those which are necessary to define the claimed invention (see decision G 1/04, OJ EPO 2006, 334, point 6.2 of the Reasons), or in other words those which are necessary to solve the technical problem with which the application is concerned (see Case Law of the Boards of Appeal, 8th edition 2016 (hereinafter "CLBA"), II.A. 3.2, first paragraph). Moreover, in relation to features defined by a result to be achieved which essentially corresponds to the problem underlying the application, the case law has held in addition that the requirements of Article 84 EPC are met only if the remaining features of the claim comprise all essential features necessary for achieving that result (see decision T 809/12, points 2.2 to 2.9.2 of the Reasons).

10. Claim 1 is directed to a process for "*increasing the phosphate content in the C6 position of starches of genetically modified plant cells to 150 to 500% in comparison with starches from corresponding genetically non-modified wild-type plant cells (100%)*" (hereinafter "feature (i)"). Accordingly, the claimed process is defined by a functional feature indicating the desired result to be achieved, namely an increase in the phosphate content in starch at a particular position by a defined range of percentages compared to a reference.

11. The application concerns the provision of processes "*by means of which the phosphate content of starches of plants can be increased in vivo*" (see page 8, third paragraph) and the provision of starches with "*modified physico-chemical characteristics*" (see page 8, second paragraph). Accordingly, claim 1 as set out in point 10 above defines the final result of the process, or in other words the desired effect to be achieved by the claimed process, which essentially corresponds to the problem underlying the application.

12. Claim 1 comprises two process steps. Step (a) requires that "*a plant cell is genetically modified by the introduction of a foreign nucleic acid molecule coding for a soluble starch synthase II*" (hereinafter "feature (ii)"), and step (b) requires that "*the enzymatic activity of soluble starch synthase II is increased by 600 - 1500% in comparison to non-genetically-modified plant cells*" (hereinafter "feature (iii)"). Thus, while the process feature in step (a) is structurally defined (nucleic acid encoding a soluble starch synthase II), the process feature in step (b) functionally defines a further "result to be achieved" (an increase in the enzymatic activity by a defined range of percentages compared to a reference).

13. In view of the examining division's reasoning it therefore has to be assessed whether or not claim 1 comprises in features (ii) and (iii) all the technical features necessary to achieve the result defined in feature (i).

14. The application discloses in the working examples that for the production of starch with an increased phosphate content in the position C6 *in vivo*, in a first step rice plants are transformed with the plasmid AH32-191, which contains a nucleic acid sequence encoding a soluble starch synthase II (SSII) from wheat (see examples 1 and 2 on page 47 and 48).

14.1 Rice grains obtained from these transformed plant cells are reported to have increased activities of SSII by a factor of "*6*" and "*10*", corresponding in other words to increases of 600% and 1000%, *vis-à-vis* wild-type rice and an increased phosphate content by "*184%*" and "*358%*" in starch at position C6 when compared to starch from wild-type rice (see example 3, page 48 to 49, Table 1).

14.2 Furthermore, Table 2 on page 49 of the application discloses that an increase in activity of SSII only by a factor of "*2*" compared to wild-type rice results in starch having a phosphate content in position C6 of "*0.74*" nmol/mg, corresponding, according to the board's calculations, to an increase of 148% when compared to the value of "*0.50*" nmol/mg found in wild-type rice (see column headed "*C6P (nmol/mg starch)*").

15. Accordingly, the application discloses that a relative increase in the activity of the enzyme SSII by 600% or 1000% in plant cells, after transforming them with a gene encoding the enzyme, likewise increases the phosphate content in starch at position C6 by 184% and

358%. However, if the activity of SSII is increased by only 200%, the phosphate content in starch is increased by 148%, i.e. a value which is below the lower limit of the range cited in claim 1.

16. Furthermore, by extrapolating the data disclosed in Table 2 of the application, the board considers it reasonable to assume that a further relative increase in the activity of SSII by, for example, 1500% would result in a corresponding increase in the phosphate content in starch by 500%.

17. Consequently, in view of the data disclosed in Tables 1 and 2 of the application, the board is of the opinion that feature (ii) achieves the result defined in feature (iii), i.e. an increase in SSII activity by *"600 - 1500%"*, which is linked to the achievement of the desired result in feature (i) in the process according to claim 1, i.e. an increase in the phosphate content in the position C6 of starch by "*150 to 500%*".

18. The board therefore concludes, contrary to the finding of the examining division, that claim 1 contains all essential technical features.

19. The examining division argued that neither were features (i) and (iii) in the process according to claim 1 defined by the means by which the desired results were achieved nor was the skilled person aware of those means.

20. The board observes that a definition of a feature by a result to be achieved implies that it is defined by its function (functional definition), since functional features are defined in terms of the result (see e.g.

decision T 68/85, point 8.4.1 of the reasons) and not by the specific means needed to achieve the result.

21. Furthermore, it is established case law that such functional features defining a technical result are permissible in a claim and thus meet the requirements of Article 84 EPC, if (i) from an objective point of view, they cannot otherwise be defined more precisely without unduly restricting the scope of the claim, and (ii) they provide instructions which are sufficiently clear for the skilled person to reduce them to practice without undue burden, if necessary with reasonable experiments. In these circumstances, the function of the features must be verifiable by tests or procedures adequately specified in the description or known to the skilled person. This serves the purpose that it can be determined without any ambiguity whether the claimed functional requirement is satisfied or not (see CLBA, II.A.3.4, in particular decision T 560/09, point 2 of the reasons).

22. As regards requirement (i) set out in point 21 above, the board notes that the essence of the present invention lies in the finding that an increase in the SSII activity in a plant cell by 600% to 1500% relative to a reference sample likewise increases the phosphate content in the C6 position of starch produced by these cells by 150% to 500% (see examples 3 and 4, and point 17 above).

22.1 Furthermore, the application discloses that SSII is an enzyme whose nucleic acid sequence is known from various plant species (see page 5, fifth paragraph, and page 11, fourth paragraph) which, moreover, all catalyse the same glycosylation reaction (see page 11, third paragraph).

22.2 The board considers therefore that all plant-derived SSII enzymes, irrespective of their origin and structure, achieve a relative increase in the phosphate content at the C6 position in starch by 150% to 500% in the process according to claim 1, if they exhibit a relative increase in activity by 600% to 1500% after transformation. The board therefore sees no reason to unduly limit the subject-matter of claim 1 by, for example, defining the SSII by the nucleic acid sequence of SEQ ID NO: 1, encoding the SSII of wheat, as an additional structural feature.

23. As regards requirement (ii) referred to in point 21 above, the application discloses that, although a complex polysaccharide polymer, starch consists of chemically uniform glucose units (see page 2, last paragraph, to page 3, first paragraph). The application further discloses that the glucose molecules in starch may be, *inter alia,* phosphorylated *in vivo* at the position C6 and that the amount of phosphate bound at this position may be routinely determined by an enzymatic assay (see page 9, first paragraph; page 45, point 14, to page 46, third paragraph).

23.1 In the board's view, since glucose is the universal unit of starch irrespective of its origin and complexity, the skilled person is in a position to determine the phosphate content at the C6 position in starches obtained from all starch-producing plant species. Moreover, by comparing the amount of phosphate in starches obtained from plants, whether transformed with a gene encoding SSII or not, the skilled person is also able to unambiguously determine whether or not the phosphate content in starch is increased by 150 to 500%, i.e. feature (i) set out in point 10 above.

23.2 With regard to the second functional feature cited in claim 1 (see point 12 above), the application discloses that SSII is an enzyme whose nucleic acid sequence is known from various plant species (see page 5, fifth paragraph and page 11, fourth paragraph) which, moreover, all catalyse the same glycosylation reaction (see page 11, third paragraph). The application further discloses on page 35, second paragraph, to page 36, first paragraph, an assay for determining the activity of SSII, which allows the skilled person to verify whether or not the activity of the enzyme is increased by 600% to 1500% compared to the activity of SSII in non-transformed, i.e. wild-type, plant cells.

24. The board therefore concludes that the application discloses methods allowing the skilled person to verify the functional features referred to in claim 1 and that therefore requirement (ii) set out in point 21 above is met.

25. Thus, for the reasons set out above, the board concludes that the two functional features (see points 10 and 12 above) referred to in claim 1 are clear.

26. The examining division further argued that the features referred to in claim 1 were not suitable to delimit the claimed subject-matter from the prior-art documents D1 or D2 because those two documents "*do not mention the percentage of increase nor the increase in enzyme activity*". In other words, the skilled person cannot determine whether or not features (i) and (iii) (see points 10 and 12 above) are disclosed in the prior art.

26.1 The board is not convinced by this argument, since functional features defined by a result to be achieved

cannot be considered unclear simply because they are not disclosed in the cited prior-art documents.

27. No other objections under lack of clarity or support against further features referred to in claim 1 or against the subject-matter of further claims were raised by the examining division, and the board too has none.

28. Thus, auxiliary request 1a meets the requirements of Article 84 EPC.

Novelty (Article 54 EPC)

29. The subject-matter of claim 7 is directed to rice starch defined by a differential scanning calorimetry (DSC) T-onset temperature of between 70°C and 80°C and a phosphate content at the C6 position between 0.9 and 2.3 nmol per mg of starch, which is identical to that of claim 7 of auxiliary request 2 (corresponding to auxiliary request 8 filed on 17 September 2012) in the decision under appeal.

30. It is established case law that a prior-art document anticipates the novelty of claimed subject-matter if the latter is directly and unambiguously derivable from that document, including any features implicit to a person skilled in the art. In the context of an implicit disclosure, a product which inevitably results from a process properly defined as to its starting substance and reaction conditions is considered to be disclosed even if it is not cited *expressis verbis* in a prior-art document (see CLBA, I.C.4.3, first and eighth paragraphs).

31. The examining division held that the rice starch according to claim 7 lacked novelty over the disclosure in each of documents D1, D2 and D4.

32. With regard to document D1 the examining division reasoned that it disclosed the transformation of plants, including rice plants, with a vector encoding a soluble SSII from wheat, i.e. the same SSII enzyme as disclosed in the present application (see page 14, second paragraph, and SEQ ID NO: 1). The document further disclosed that the plants so obtained would synthesise starch which was modified, *inter alia*, in its phosphate content (see page 19, second paragraph, claim 18). The examining division stated that "*the starch which is produced by said plant must have exactly the properties mentioned in claim 7*", because the plants were transformed with a type of SSII that was identical to the one disclosed in the present application.

33. Thus, in view of the examining division's reasoning, the issue is whether or not the rice starch according to claim 7 is implicitly disclosed in document D1 as the inevitable product of the transformation process disclosed therein.

33.1 In this respect the board notes that the present application discloses in Table 2 that rice grains expressing a six-times-higher SSII activity compared to wild-type rice contain starch with a phosphate content in the C6 position of "*0.92*" nmol/mg starch, i.e. a concentration which lies just above the lower limit of the concentration range cited in claim 7, while grains exhibiting only a twofold increase in SSII activity contain starch with a phosphate content in the C6 position of "*0.74*" nmol/mg starch, i.e. a concentration

that is below the concentration range cited in claim 7 (see Table 2, columns 2 and 5).

33.2 In the board's view, it follows from this disclosure in the application that the process of transforming rice plants by SSII as disclosed in document D1, which does not disclose an increased activity of the enzyme of at least 600% relative to non-transformed wild-type plant cells, may result in rice starch containing phosphate concentrations below the range referred to in claim 7. Therefore, the rice starch according to claim 7 is not the inevitable product of the process disclosed in document D1 and is thus not implicitly disclosed by this document.

34. With regard to the finding that the rice starch according to claim 7 lacked novelty over the disclosure in document D2, the examining division stated in the decision under appeal merely: "*In addition, the starch obtained in D2 may also have exactly the properties.*" Contrary to Rule 111(2) EPC, the decision under appeal neither identifies the relevant passages of document D2 nor contains reasoning suitable to justify the conclusion that the claimed subject-matter lacks novelty over document D2. Nor is any justification for the examining division's finding immediately apparent to the board. The board therefore concludes that the subject-matter of claim 7 is novel over document D2.

35. Document D4 discloses normal rice starches from different rice plants exhibiting, *inter alia,* a DSC T-onset temperature between 73°C and 75.6°C (see page 48, column 2, second paragraph, and Table 3 on page 49, column headed "T_0 *(°C)*"). In particular, Table 3, at the bottom, below the heading "*Normal rice starches of high* T_p", discloses three rice samples which are

characterised by DSC temperatures all falling in the range referred to claim 7. However, neither Table 3 nor other parts of document D4 explicitly disclose the phosphate content of these three rice starch samples, let alone their phosphate content at the C6 position. Document D4 discloses however that "*normal rice starches*" have "*total phosphorous contents: 0.046 to 0.056%*" (see page 47, column 2, second paragraph, emphasis added).

35.1 The board notes, firstly, that "*phosphorous*" is a chemical element with the formula "P", while "*phosphate*" as cited in claim 7 has the formula "$(PO_4)^{2-}$", which means the two terms do not have an identical meaning.

35.2 The board notes, secondly, that the application discloses that "*In principle, the positions C3 and C6 of the glucose units can be phosphorylated in starch in vivo*" (see page 9, first paragraph). Thus, even if the term "*total phosphorous*" content as used in document D4 were construed to mean the sum of phosphorous contained in the phosphate groups bound to the C3 and the C6 positions in starch, this would only allow conclusions to be drawn about the total phosphate content in starch, but not about the phosphate content at the specific position C6 as referred to in claim 7.

35.3 Therefore, document D4 too does not implicitly disclose rice starch characterised by the properties as defined in claim 7.

36. Thus, the board concludes that the subject-matter of claim 7 is novel over the disclosure in each of documents D1, D2 and D4. Accordingly, auxiliary request 1a meets the requirements of Article 54 EPC.

37. For the reasons set out above, the examining division's reasoning in finding that the subject-matter of claim 1 lacks clarity (Article 84 EPC) and that the subject-matter of claim 7 lacks novelty (Article 54 EPC) is not persuasive for the board and, therefore, the decision under appeal is to be set aside.

Remittal – Article 111(1) EPC

38. The board considers that in a case such as the present one, where the decision under appeal has dealt with Articles 54, 84 and 123(2) EPC only, remittal to the department of first instance is the appropriate way of proceeding. The board has therefore decided to exercise its discretion under Article 111(1) EPC and to remit the case to the examining division for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division for further prosecution on the basis of the auxiliary request 1a filed with letter dated 20 March 2017.

The Registrar: The Chairwoman:

P. Cremona G. Alt

Decision electronically authenticated