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Datasheet for the decision of 26 July 2012

Case Number: T 0827/09 - 3.3.08

Application Number: 01986901.5

Publication Number: 1373531

IPC: C12N 15/82

Language of the proceedings: EN

Title of invention:
Method of encoding information in nucleic acids of a genetically engineered organism

Applicant:
Bayer CropScience NV

Headword:
Labelled plant/BAYER CROPSCIENCE

Relevant legal provisions:
EPC Art. 54, 56, 83, 84, 123(2)

Keyword:
"Main request - requirements of the EPC met - (yes)"

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0827/09 - 3.3.08

D E C I S I O N
of the Technical Board of Appeal 3.3.08
of 26 July 2012

Appellant: (Applicant)
Bayer CropScience NV
J.E. Mommaertslaan 14
B-1831 Diegem (BE)

Representative:
Blodig, Wolfgang
Wächershäuser & Hartz
Patentanwaltspartnerschaft
Ottostrasse 4
D-80333 München (DE)

Decision under appeal:
Decision of the Examining Division of the European Patent Office posted 13 November 2008 refusing European patent application No. 01986901.5 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: M. Wieser
Members: B. Stolz
J. Geschwind

Summary of Facts and Submissions

I. The appeal lies against the decision of the examining division to refuse European patent application No. 01986901.

II. The examining division decided that

- the main request, claims 1 to 36 filed during oral proceedings on 28 October 2008, lacked an inventive step, and

- the auxiliary request, claims 1 to 36 also filed during oral proceedings on 28 October 2008, did not meet the requirements of Article 123(2) EPC.

III. The applicant (appellant) requested that the decision of the examining division be set aside and a patent be granted on the basis of its main request or, in the alternative, on the basis of auxiliary requests I to III, all filed with its grounds of appeal. Oral proceedings were requested as an auxiliary measure.

IV. The appellant was summoned to oral proceedings. A communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA) annexed to the summons, informed the parties of the preliminary non-binding opinion of the board on some of the issues of the appeal proceedings.

V. With letter dated 26 June 2012, the appellant withdrew auxiliary requests I to III filed with its grounds of appeal and submitted new auxiliary requests I to VI.

VI. Oral proceedings were held on 26 July 2012. In the course of these proceedings, the appellant filed a new main request and withdrew all its other requests.

VII. Claim 1 of the main request reads:

"1. A method of producing a genetically engineered plant organism by simultaneously incorporating into said organism

(a) a functional DNA sequence containing a gene or gene fragment; and

(b) a non-functional DNA sequence not required for the function of the organism or the function of the functional DNA sequence;

wherein

(i) the non-functional DNA sequence is provided by mapping an information message consisting of a sequence of alphanumeric characters into a DNA sequence according to a predefined coding scheme;

(ii) said information message is related to said functional DNA sequence in that it contains information regarding the functional DNA sequence, which information indicates the presence of the functional DNA sequence;

(iii) said predefined coding scheme provides a mapping from a plurality of possible information messages into a plurality of DNA sequences;

(iv) the mapping from a DNA sequence to an information message is unique while the mapping from an information message to a DNA sequence is non-unique;

(v) wherein the non-functional DNA sequence and the functional DNA sequence are incorporated in the same chromosome, and

wherein the distance between the functional and the non-functional DNA sequence is shorter than 10 000 nucleotides for reducing the frequency of recombination between the non-functional and the functional DNA sequence."

Dependent claims 2 to 15 refer to preferred embodiments of the method of claim 1.

VIII. The following documents are referred to in this decision:

D1: EP 1045037

D2: WO 96/17954

D3: WO 00/68431

D5: US 5139812

D6: De Neve et al., (1997) Plant J., 11:15-29

D7: Kumar S., Fladung M.(2000), Mol Gen Genet., 264:20-28.

D8: Wakita Y., et al. (1998), Genes Genet Syst., 73:219-226.

D9: Leggett J.M., et al. (2000), Heredity, 84:46-53.

IX. Appellant's arguments, as far as relevant for the present decision, can be summarized as follows:

Article 83 EPC

It was part of the general knowledge that the functional and the non-functional sequences could be incorporated in close proximity on the same chromosome by incorporating both sequences from the same transformation vector. Further, as shown by documents D6 to D9, the functional and the non-functional DNA sequences could be incorporated on separated DNA molecules but simultaneously by co-transformation using either Agrobacterium or particle bombardment. In both cases the vectors had a high likelihood of being incorporated on the same chromosome in close proximity.

Article 56 EPC

The closest prior art was represented by document D1, disclosing a method of genetically marking a plant for identification by introducing into its genome a DNA sequence having a specific information content. The problem to be solved by the present invention was seen in the provision of a method for producing a transgenic plant by which a functional sequence (a transgene) could be safely and reliably traced. This was different from the goal underlying documents D1 and D2 which

merely intended to mark a plant. None of these documents contained any suggestion that the information encoded by a non-functional (marker) sequence should be closely linked to a functional sequence to be tracked.

X. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of its main request.

Reasons for the decision

Admissibility of the main request

1. The claims of the main request were filed at the oral proceedings before the board after discussion of the requests previously on file. During this discussion, the board had directed appellant's attention to issues arising under Articles 83, 84 and 56 EPC. Not all of these issues were clearly derivable from the decision under appeal and not all of them had been explicitly mentioned in the communication attached to the summons to oral proceedings. In order to address this situation, the appellant requested an opportunity to submit a new main request consisting of claims 1 to 15. Claim 1 of the new main request is a combination of claims 1 and 2 of auxiliary request 1 filed on 26 June 2012, dependent claims 2 to 15 corresponded to claims 3 to 6, 8 to 16, and 18 of this request.

2. According to Article 13(1) RPBA, any amendment to a party's case after it has filed its grounds of appeal or reply to a communication from the board, may be admitted and considered at the board's discretion.

Although the main request must be regarded as being filed at a late stage of the procedure, the board, acknowledging that it was a reaction to objections which in their entirety could not have been foreseen earlier by the appellant and that the amendments consisted merely in the combination and deletion of claims of an already existing request, decided to admit it into the procedure.

Article 123(2) EPC

3. Basis for the claimed subject matter can be found in the claims as originally filed (claim 34 via direct reference to claims 33, 29, 5, 4, and 1) in combination with page 4, explaining the general features of the non-functional DNA sequence, and page 12, requiring the distance between the functional and non-functional sequences to be kept shorter than 10000 nucleotides to reduce the frequency of recombination events. Thus, the requirements of Article 123(2) EPC are met.

Article 84 EPC

4. The examining division considered the claims of the main request before it to meet the requirements of Article 84 EPC. The present set of claims is derived from said earlier set by the combination of claims 1 and 2, and its limitation to plant organisms, as well as by deletions of and within dependent claims. These amendments do not introduce any ambiguities or unclarities, and the board sees no reason to deviate from the conclusion reached by the examining division.

Article 83 EPC

5. The method of claim 1 comprises the simultaneous introduction into a plant organism of a functional and a non-functional DNA sequence wherein the two sequences are incorporated in the same chromosome, and the distance between the two DNA sequences is shorter than 10000 nucleotides.

The board agrees with the appellant that it belonged to the general knowledge of the skilled person that it was possible to simultaneously introduce two DNA sequences into a plant by placing them on a single vector. A schematic example of such a vector is given in Figure 4 of the patent application, and various vectors, such as plasmid pBI101 (document D1, [0021]), comprising a selectable marker gene and a multiple cloning site for the insertion of a further DNA sequence, were publically available.

Methods for simultaneously integrating two DNA molecules, carried on two different vectors, into plant genomes in close proximity by cotransformation were also known (documents D6 to D9).

Pages 4 to 6, 10 to 12, and Examples 1 to 4 of the description provide sufficient instructions how to create and encode an information message according to features (i) to (iv) of claim 1.

The board is therefore satisfied that the requirements of Article 83 EPC are met.

Article 54 EPC

6. None of the documents on file discloses a method with all the features of claim 1. The vector construct of document D1 may comprise a functional gene, i.e. a resistance marker, but the encoded message of the non-functional DNA sequence does not contain information regarding this resistance marker. The subject-matter of the claims is therefore novel within the meaning of Article 54 EPC.

Article 56 EPC

7. Claim 1 refers to a method of producing a genetically engineered plant organism by simultaneously incorporating into said organism a functional DNA sequence and a non-functional DNA sequence, wherein both DNA sequences are incorporated in the same chromosome within a distance of less than 10 000 nucleotides. The non-functional DNA sequence is further characterised by carrying an information message according to features (i) to (iv) of claim 1.

8. The board agrees with the appellant that document D1 represents the closest prior art. It concerns a method for marking and tracking a plant. The document discloses a plant cell identification system, and a method for genetically marking a plant for identification by introducing into the plant genome a DNA sequence having specific information content. Contemplated is the use of short information sequences of 100 base pairs or less which contain information such as e.g. the plant owner, a geographic origin or other plant characteristics that unambiguously specify

the marked plant (paragraphs [0016], [0020]). To facilitate the isolation of plant cell clones containing the registration sequence, the 100 base pair registration sequence can be cloned into a plasmid vector comprising a selection marker.

9. Starting from the disclosure in document D1, the technical problem underlying the present invention is seen in the provision of a method of producing a genetically engineered plant organism comprising a functional DNA sequence wherein the functional sequence can be reliably traced when the organism is reproduced.

10. As a solution to this problem the application proposes the method with the features of claim 1.

11. Example 2 of the patent application describes an exemplary vector comprising an information message with features (i) to (iv) of claim 1, the transformation of N. tabacum and A. thaliana with this plasmid, as well as PCR amplification of the encoded message from primary transformants carrying the plasmid. The simultaneous incorporation of the functional and the non-functional DNA sequence will lead to a physically close linkage as required by feature (v) of claim 1. The board considers it credible that this allows the reliable tracing of the functional sequence when the organism is reproduced. The board is therefore satisfied that the underlying technical problem is solved by the method of claim 1.

12. It remains to be established if the proposed solution involves an inventive step.

13. Document D1 discloses a method for registering a plant by introducing into its genome a unique predetermined piece of DNA ([0004-0007]). The DNA sequence is introduced into the plant genome by standard procedures, and the sequence does preferably neither alter transcription nor encode a protein. The specifics of a registered plant can then readily be determined by standard procedures such as PCR. While document D1 is generally concerned with the marking and tracing of proprietary plants, it does not address the problem of tracing a transgene when a plant is reproduced. It contains no pointer to the technical problem underlying the present invention or to the claimed solution.

Similarly, document D2 is concerned with the labelling of living and non-living objects by DNA molecules; among others the labelling of plants by incorporating DNA sequences into their genome (pages 21/22). By integrating the label in the genome or in a plasmid of a living organism, the label can be passed on to offspring (page 22, lines 2-10). Document D2 also discloses a coding scheme with the characteristics of features (i) to (iv) of claim 1 (page 13). It does however neither mention the possibility of linking the DNA label to any other functional gene, nor does it address the problem of tracing a transgene when a plant is reproduced.

Documents D3 and D5 concern the marking of non-living objects with DNA to provide means for proving ownership.

Documents D6 to D9 are all concerned with the cointegration of multiple genes into plant genomes, and

do not mention tracing of a transgene other than by tracing it via a resistance marker.

14. Thus, neither document D1 itself nor any other prior art document on file contains any information that would motivate a skilled person trying to solve the underlying technical problem to amend the teaching in the closest prior art and to arrive at the claimed solution in an obvious way.

15. The board decides that the method of claim 1 involves an inventive step. The same is true for dependent claims 2 to 15.

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 with the order to grant a patent on the basis of claims 1 to 15 of the Main Request filed during the oral proceedings and a description to be adapted thereto.

The Registrar: The Chairman:

A. Wolinski M. Wieser