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**Datasheet for the decision
of 19 November 2019**

Case Number: T 1854/18 - 3.3.03

Application Number: 11007747.6

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Language of the proceedings: EN

Title of invention:

Method for generating energy

Applicant:

Xyleco, Inc.

Relevant legal provisions:

EPC Art. 76(1), 123(2), 111(1)

Keyword:

Divisional application - subject-matter extends beyond content
of earlier application (no, after amendment) - added subject-
matter (no) - after amendment

Remittal to the department of first instance (yes)

Decisions cited:

G 0002/10



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Case Number: T 1854/18 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 19 November 2019

Appellant: Xyleco, Inc.
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 9 January 2018
refusing European patent application No.
11007747.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman D. Marquis
Members: F. Rousseau
C. Brandt

Summary of Facts and Submissions

- I. The appeal lies from the decision of the examining division posted on 9 January 2018 to refuse European application No. 11 007 747.6, filed as a divisional application of the earlier European patent application 07 870 818.7, the later being filed as International application PCT/US 2007/022719 and published as WO 2008/073186 A2.
- II. The decision was based on a main request submitted with letter of 8 June 2017 and an auxiliary request submitted during the oral proceedings on 8 December 2017. According to the reasons for the decision the step of burning lignin disclosed on page 10, lines 12-13 of the description of the application as filed could not be read separately from the step of removing lignin from the second lignocellulosic material and from a step of combining the de-lignified material with a micro-organism as was disclosed on lines 9-11 of the same page. Accordingly, the subject-matter of claim 1 of the main request and of its dependent claims extended beyond the content of the divisional application as filed, in contravention of Article 123(2) EPC. For the same reasons, the subject-matter of claim 1 of the main request and of its dependent claims was also held to extend beyond the content of the earlier application as filed contrary to the requirements of Article 76(1) EPC. The amendment introduced into the auxiliary request *prima facie* could not overcome the objection that claim 1 did not meet the requirements of Article 123(2) EPC. Therefore, the examining division using its discretion under Rule 137(3) EPC did not admit the auxiliary request into the proceedings.

III. The decision was appealed with letter of 6 March 2018 and the statement setting out the grounds of appeal was submitted with letter of 4 May 2018 to which a second auxiliary request labelled "Auxiliary Request 2" was attached. The main request submitted with letter of 8 June 2017 and the auxiliary request submitted during the oral proceedings on 8 December 2017 (herein after referred to as the first auxiliary request) were maintained.

IV. In a Board's communication sent in preparation of the oral proceedings the Board gave the preliminary opinion that the main request and the second auxiliary request extended beyond the content of the earlier application as filed. It was also indicated that the Board was of the preliminary opinion that the first auxiliary request was not to be admitted into the proceedings under Article 12(4) RPBA, since there was no reason to consider that the examining division had not correctly exercise its discretion in not admitting this claim request into the proceedings.

V. Oral proceedings were held on 19 November 2019 in the course of which all pending claim requests were replaced by a single new request, whose claims read as follows:

"1. A method comprising:
providing a first lignocellulosic material that includes cellulose having a first number average molecular weight;
irradiating the first lignocellulosic material to provide a second lignocellulosic material that includes cellulose having a second number average molecular weight lower than the first number average molecular weight;

combining the second lignocellulosic material with a microorganism and burning an obtained lignin residue to generate energy, or removing lignin from the second lignocellulosic material to provide a delignified material, then combining the delignified material with a microorganism, and burning the lignin to generate energy.

2. The method of claim 1 wherein the lignin residue is burned to heat water flowing through a heat exchanger.

3. The method of claim 2 further comprising evaporating the water flowing through the heat exchanger and superheating it to steam.

4. The method of claim 3 further comprising using the steam in heat exchange in a distillation process.

5. The method of claim 3 or 4 further comprising allowing the steam to expand to power a multi-stage steam turbine connected to an electric generator.

6. The method of claim 5 further comprising condensing steam exiting the steam turbine with cooling water, and returning the condensate to the heat exchanger for reheating the steam.

7. The method of any one of claims 2 to 6 further comprising controlling the flow rate of water through the heat exchanger to obtain a target electricity output from the steam turbine when the turbine is connected to an electric generator.

8. The method of claim 7 further comprising adding water to the heat exchanger to ensure that the steam

turbine is spinning fast enough to turn the electric generator.

9. The method of claim 1 wherein irradiating comprises treating with electron beam radiation to a total dose of between 10 Mrad and 150 Mrad.

10. The method of any one of the above claims wherein the lignocellulosic material is selected from the group consisting of grasses, rice hulls, bagasse, jute, hemp, flax, bamboo, sisal, abaca, straw, corn cobs, corn stover, alfalfa, hay, coconut hair, seaweed, algae, and mixtures thereof.

11. The method of any one of the above claims wherein irradiating is performed at a dose rate of 1 Mrad/s to 10 Mrad/s.

12. The method of claim 9 wherein the electron beam delivers electrons having an energy of 0.3 MeV to 2.0 MeV.

13. The method of any one of the above claims, the method further comprising reducing the size of lignocellulosic material by subjecting the material to one or more of the following: stone grinding, mechanical ripping or tearing, pin grinding, or air attrition milling.

14. The method of any one of the above claims wherein the lignin residue further comprises cellulose and hemicellulose."

VI. The appellant essentially submitted that the amendments contained in claims 1 to 14 did not extend beyond the content of both the application and the earlier

application as filed. The passages of the earlier application as filed and of the application as filed indicated by the appellant as forming the basis for the subject-matter of the pending claim request are indicated below in the Reasons for the Decision.

- VII. The appellant requested that a patent be granted on the basis of claims 1 to 14 according to the request as submitted during the oral proceedings on 19 November 2019.

Reasons for the Decision

Amendments

1. In accordance with the established case law of the boards of appeal of the EPO (Case Law of the Boards of Appeal of the EPO, 9th edition, 2019, II.F.2.2), a divisional application can only be amended if the amended divisional application meets both the requirements of Article 76(1) EPC and the requirements of Article 123(2) EPC.

Article 76(1) EPC

2. Claim 1 defines a method in which in a first step a first lignocellulosic material that includes cellulose having a first number average molecular weight is irradiated to provide a second lignocellulosic material that includes cellulose having a second number average molecular weight lower than the first number average molecular weight. This first step is disclosed on page 10, lines 4-8 of the earlier application as filed (the

passage of the application cited hereafter refer all to the description of the earlier application as filled).

In the second step of the method of operative claim 1 the second lignocellulosic material is according to the first embodiment of said method combined with a microorganism and the obtained lignin residue is burned to generate energy or according to the second embodiment of said method the second lignocellulosic material is de-lignified, the lignin is burned to generate energy and the de-lignified material is combined with a microorganism.

- 2.1 The burning to produce energy of the lignin obtained by a delignification step and the combination the de-lignified material with a microorganism are steps disclosed on page 10, lines 9-13 which are defined to constitute further measures of the methods defined on page 10, lines 4 to 8 whose definition corresponds to that of the first step of operative claim 1.

Accordingly, the second embodiment of operative claim 1 does not result in the skilled person to be presented with new technical information in comparison to the earlier application as filed, which in accordance with the established Case Law of the Boards of Appeal of the EPO is the relevant question to be decided in assessing whether the subject-matter of an amended claim extends beyond the content of the earlier application as filed (see G 2/10, OJ 2012, 376, point 4.5.1 of the Reasons and Case Law, supra, II.E.1).

- 2.2 Moreover, the information on page 10, lines 12-13 that the "*lignin from the processing*" can be burned to produce energy does not solely refer to the lignin removed from the second lignocellulosic material, but

also to the lignin residue obtained by combining the second lignocellulosic material with a microorganism.

This information is also given on page 98, lines 26-28, wherein it is described that the lignin containing residues from primary and pretreatment processes, i.e. fermentation in the presence of microorganisms (passage starting at page 87, line 24) and treatment of the feedstock which includes irradiation (page 38, lines 13-16, page 42, lines 8-11), can be used as a high/medium energy fuel and to generate power.

This also is apparent from the passages on page 95, lines 9-11 and lines 19-20 concerning the burning of the post-distillate solids, reference being made to unconverted lignin, from Example 20 (page 121, 22-24; page 122, lines 18-20; page 122, lines 26-27) and from Figure 39 which disclose that the post-distillate solids comprising unconverted lignin, i.e. the lignin residue obtained after fermentation using a microorganism, are burned to generate energy.

Consequently, the first embodiment of operative claim 1 also does not result in the skilled person to be presented with new technical information in comparison to the earlier application as filed.

- 2.3 It is therefore concluded that claim 1 meets the requirements of Article 76(1) EPC.
- 2.4 As to the dependent claims, the features of claims 2 to 8 are all disclosed in the last full paragraph of page 95 of the description, whereas the features of claim 9 are described on page 4, lines 18-21. Moreover, the list of lignocellulosic materials defined in claim 10 is described on page 4, lines 6-8. As to claims 11 and

12 their features are disclosed on page 4, lines 19-21 and on page 46, lines 21-23, respectively. The further steps for reducing the size of lignocellulosic material defined in claim 13 are based on page 31, lines 14-15. Finally, the definition that the lignin residue further comprises cellulose and hemicellulose is described on page 122, lines 19-20.

3. Consequently, the claim request submitted during the oral proceedings before the Board on 19 November 2019 is in keeping with the requirements of Articles 76(1).

Article 123(2) CBE

4. Considering that the subject-matter of the present claims is disclosed in the description of the earlier application as filed, and that the same description was used both for the earlier application as filed and the divisional application as filed, the Board also concludes that the claim request submitted during the oral proceedings before the Board meets the requirements of Article 123(2) EPC.

Remittal

5. Since the examining division in the decision under appeal only addressed the allowability of the claims having regard to the requirements of Articles 76(2) and 123(2) EPC, the Board considers it appropriate, pursuant to Article 111(1) EPC, to remit the case 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 request (claims 1 to 14) submitted during the oral proceedings on 19 November 2019.

The Registrar:

The Chairman:



B. ter Heijden

D. Marquis

Decision electronically authenticated