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**Datasheet for the decision
of 6 November 2018**

Case Number: T 0921/16 - 3.3.03

Application Number: 09075137.1

Publication Number: 2098558

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C10L5/44, C08L1/02, C08L97/02,
C08J3/28

Language of the proceedings: EN

Title of invention:
Processing biomass

Applicant:
Xyleco, Inc.

Relevant legal provisions:
EPC Art. 76(1)

Keyword:
Divisional application - subject-matter extends beyond content
of earlier application (all requests: yes)

Decisions cited:
G 0001/06, G 0002/10



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Case Number: T 0921/16 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 6 November 2018

Appellant: Xyleco, Inc.
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 18 November
2015 refusing European patent application No.
09075137.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman D. Marquis
Members: O. Dury
W. Ungler

Summary of Facts and Submissions

I. The appeal lies from the decision of the examining division posted on 18 November 2015 refusing European patent application No. 09 075 137.1, which was filed as a divisional application of the parent application No. 07 870 818.7. The latter was filed as an international application, which was published as WO 2008/073186.

II. The parent application as filed comprised 124 claims, of which claims 61, 66, 68 and 69 read as follows:

"61. A method of making a product, such as a combustible fuel, the method comprising:

providing a material comprising a carbohydrate produced by pretreating a biomass feedstock with any one or more of radiation, sonication, oxidation, pyrolysis, and steam explosion, wherein less than about 25 percent by weight of the biomass is hydrolyzed subsequent to pretreatment; and

contacting the material with a microorganism having the ability to convert at least a portion of the material, e.g., at least about 1 percent by weight, to the product, such as the combustible fuel."

"66. The method of any one of claims 60 to 65, wherein the process does not include hydrolyzing the biomass with an acid or a base."

"68. The method of any one of claims 60 to 67, wherein the irradiating is performed utilizing an ionizing radiation, such as gamma rays or a beam of electrons."

"69. The method of claim 68, wherein the ionizing

radiation comprises electron beam radiation."

III. The divisional application as filed comprised a set of 21 claims, of which only claim 21 was directed to a method of making a combustible fuel and read as follows (as compared to claim 61 of the parent application as filed, additions are indicated in **bold**, deletions in ~~strikethrough~~):

"21. A method of making a product, such as a combustible fuel, the method comprising:

providing a material comprising a carbohydrate produced by **a process comprising** pretreating a biomass feedstock with any one or more of radiation, sonication, ~~oxidation~~, pyrolysis, and **oxidation steam explosion**, ~~wherein less than about 25 percent by weight of the biomass is hydrolyzed subsequent to pretreatment~~; and

contacting the material with a microorganism having the ability to convert at least a portion of the material, e.g., at least about 1 percent by weight, **of the material** to the product, such as the combustible fuel."

The description of the divisional application as filed was identical to the one of the parent application as filed but comprised in addition, on pages 130-139 thereof, those aspects of the invention which constituted the 124 claims of the parent application as filed.

IV. In the Partial European Search Report (Sheet C) of the divisional application, the search division indicated that an incomplete search had been carried out pursuant to Rule 63 EPC, whereby in particular the search of claim 21 was restricted to the treatment of cellulosic

and/or lignocellulosic material by the claimed method.

- V. The contested decision was based on a main request and on an auxiliary request, both filed with letter of 29 July 2015. Claim 1 of said main request, which is the sole claim relevant to the present decision, read as follows (as compared to claim 61 of the original parent application as filed, additions are indicated in **bold**, deletions in ~~strikethrough~~):

"1. A method of making a ~~product, such as a~~ combustible fuel, the method comprising: providing a material comprising a carbohydrate produced by pretreating a **cellulosic or lignocellulosic** biomass feedstock with ~~any one or more of radiation, sonication, oxidation, pyrolysis, and steam explosion,~~ wherein less than about 25 percent by weight of the biomass is hydrolyzed subsequent to pretreatment; and contacting the material with a microorganism having the ability to convert at least a portion of the material, ~~e.g., at least about 1 percent by weight,~~ to the ~~product, such as the~~ combustible fuel, **wherein the irradiating is performed utilizing an ionizing radiation, wherein the ionizing radiation comprises electron beam radiation at a dose rate of 1 Mrad/s to 10 Mrad/s and the biomass receives a dose of at least 10.0 Mrad.**"

- VI. The application was refused *inter alia* because claim 1 of the above main request was held not to satisfy the requirements of Article 76(1) EPC (section 2 of the reasons of the decision).

- VII. Together with its statement of grounds of appeal, the applicant (appellant) requested that said decision be set aside and that a patent be granted on the basis of either the main request or any of auxiliary requests I

to III filed therewith, whereby the main request corresponded to the main request dealt with in the contested decision.

Claim 1 of auxiliary request I differed from claim 1 of the main request in that the feature "and the biomass receives a dose of at least 10.0 Mrad" was amended to "and the biomass receives a total dose ranging between 10 and 150 Mrad".

Claim 1 of auxiliary request II differed from claim 1 of auxiliary request I in that in the expression "cellulosic or lignocellulosic", the terms "cellulosic or" were deleted.

Claim 1 of auxiliary request III read as follows (as compared to claim 61 of the original parent application as filed additions are indicated in **bold**, deletions in ~~strikethrough~~):

"1. A method of making a ~~product, such as a~~ combustible fuel, the method comprising: providing a material comprising a carbohydrate produced by pretreating a **cellulosic or lignocellulosic** biomass feedstock with ~~any one or more of radiation, sonication, oxidation, pyrolysis, and steam explosion,~~ wherein less than about 25 percent by weight of the biomass is hydrolyzed **the process does not include hydrolizing the biomass with an acid or a base** subsequent to pretreatment; and contacting the material with a microorganism having the ability to convert at least a portion of the material, e.g., ~~at least about 1 percent by weight,~~ to the ~~product, such as the~~ combustible fuel, **wherein the irradiating is performed utilizing an ionizing radiation, wherein the ionizing radiation comprises electron beam radiation at a dose rate of 1 Mrad/s to**

10 Mrad/s and the biomass receives a total dose ranging between 10 and 150 Mrad."

- VIII. In a communication sent in preparation to oral proceedings, the Board provided its preliminary view of the case.
- IX. With letter of 26 September 2018 the appellant withdrew the then pending main request.
- X. Oral proceedings were held on 6 November 2018.
- XI. The arguments put forward by the appellant, as far as relevant to the present decision, can be summarised as follows:

Auxiliary request I - Article 76(1) EPC

- (a) Claim 1 represented a combination of original claims 61, 68 and 69 of the parent application as filed, whereby the features specifying the dose rate and the total dose of the electron beam radiation as well as the features "cellulosic or lignocellulosic" were added.
- (b) The features specifying the dose rate and the total dose of the electron beam radiation were based on page 4, lines 18-21 of the parent application as filed, whereby the skilled person would understand that said passage constituted the preferred embodiment of the radiation step, including electron beam, disclosed in the parent application as filed;
- (c) The skilled person would also understand from the passage at page 1, lines 23-25 of the parent

application as filed that the feature "cellulosic or lignocellulosic" constituted the most preferred embodiment for the biomass feedstock disclosed in the parent application as filed. Besides, as indicated by the search division, those biomass feedstocks were the sole ones which were precisely disclosed in the parent application as filed. Therefore, that amendment did not offend Article 76(1) EPC.

- (d) The combination of the above amendments was further supported by examples 9 and 19 of the parent application as filed.
- (e) In view of the above, operative claim 1 satisfied the requirements of Article 76(1) EPC.

Auxiliary requests II and III - Article 76(1) EPC

- (f) In respect of Article 76(1) EPC, the same arguments as for claim 1 of auxiliary request I were valid for claim 1 of auxiliary request II.
- (g) Claim 1 of auxiliary request III represented a combination of original claims 61, 66, 68 and 69 of the parent application as filed, further modified in the same manner as claim 1 of auxiliary request I (see above section (a)). Since said claim 69 was *inter alia* dependent on any of claims 61, 66 and 68, the combination of those four claims was supported by the parent application as filed. Therefore, in respect of Article 76(1) EPC, the same arguments as for claim 1 of auxiliary request I were valid for claim 1 of auxiliary request III.

XII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of auxiliary request I, auxiliarily on the basis of one of auxiliary requests II and III, all filed with the grounds of appeal.

Reasons for the Decision

Auxiliary request I

1. Article 76(1) EPC

1.1 Pursuant to Article 76(1) EPC, the subject-matter of a European divisional application may be filed only in respect of subject-matter which does not extend beyond the content of the earlier application as filed.

1.2 In accordance with the established case law of the boards of appeal of the EPO, exactly the same principles are to be applied when assessing Article 76 EPC and Article 123(2) EPC. In particular the subject-matter being claimed in a divisional application must be directly and unambiguously derivable from both the earlier (parent) application as filed and the (divisional) application as filed (G 1/06; Case Law of the Boards of Appeal of the EPO, 8th edition, 2016, II.F.2.1).

In the present case, the question to be answered is whether or not the subject-matter of claim 1 of auxiliary request I extends beyond the content of the parent application as filed, i.e. whether after the amendment the skilled person is presented with new technical information (see G 2/10, OJ EPO 2012, 376,

point 4.5.1 of the Reasons and Case Law, *supra*, II.E.1 and 1.2.1). In the case of multiple amendments being made, as is the case here, it has to be assessed whether the specific combination of features now being defined in operative claim 1 emerges from the application as filed, whereby the description is not to be viewed as a reservoir from which features pertaining to separate embodiments can be freely combined in order to artificially create a certain embodiment (Case Law, *supra*, II.E.1.4.1).

1.3 The subject-matter of operative claim 1 corresponds to that of claim 69 of the parent application as filed, read as being dependent on claim 61 (whereby some optional features were deleted), with the following additional amendments:

(a) the definition of the ionizing radiation in terms of a specific dose rate ("1 Mrad/s to 10 Mrad/s") and a specific total dose ("between 10 and 150 Mrad");

(b) the limitation of the definition of the biomass feedstock with the expression "cellulosic or lignocellulosic".

1.4 Regarding amendment (a), it is indicated in a general manner on page 4, lines 15-18 of the parent application as filed that irradiation can be for instance performed using a beam of electron (as one of three alternative irradiation means) and that the radiation can be applied at a total dose of between 10 Mrad and 150 Mrad such as at a dose rate of "0.5 to 10 Mrad/day" (sic) or 1 Mrad/s to 10 Mrad/s. Considering that the passage at page 4, lines 15-18 of the parent application as filed starts with "For example, ...", it is, in the Board's

view, merely illustrative and there is no reason to consider that it constitutes a preferred embodiment, contrary to the appellant's view.

Furthermore, the latter passage is not specifically related to the dose rate of the electron beam (as indicated in operative claim 1) but only to the "radiation", as a generic term. In that respect, it is further derivable from the parent application as filed as a whole that said radiation was not limited to a single irradiation source but that it could encompass a combination of different irradiation means, including electron beam (page 4, lines 23-24; page 42, section "Radiation Treatment, first paragraph; page 49, lines 2-3 and 10-14).

Besides, it is indicated in the section of the parent application as filed dealing with the suitable doses of irradiation to be employed (starting at page 49), that low (total) doses of irradiation, in particular doses lower than 10 Mrad, could be used (page 49, lines 2-6; page 49, paragraphs 4 and 5; page 50, first full paragraph). Also, there is no mention in those passages of the application as filed that an electron beam radiation defined according to above amendment (a) represents a preferred embodiment. In that respect, it is further indicated in the parent application as filed that the doses to be applied depend on the desired effect and the particular feedstock, whereby high doses could be used for breaking chemical bondings whereas low doses could increase chemical bonding within the feedstock components (page 42, section "Radiation Treatment, first paragraph, last two sentences). However, it was neither argued nor shown that it was derivable from the application as filed that the "method of making a combustible fuel" being claimed had

to be carried out using any specific type of irradiation, in particular not one as now being defined in operative claim 1.

Furthermore, the parent application as filed contained 124 claims, comprising twelve different independent claims (1, 14, 60 to 62, 71, 75, 77, 108, 112, 120, 123) directed to eleven embodiments comprising at least a feature dealing with an irradiation step (all claims cited previously apart from claim 112) and which were not all directed to a "method of making a combustible fuel" as in operative claim 1. Under those circumstances, it cannot be concluded that the passage at page 4, lines 20-21 of the parent application as filed would have been read as mandatorily applying to all of the embodiments encompassed by the parent application as filed, in particular to each of the independent claims contained therein, and more particularly to claim 61.

In view of the above, it cannot be concluded that it was shown that there was a direct and unambiguous connection between claim 69 and said passage at page 4, lines 20-21 of the parent application as filed. Under such circumstances, the argument of the appellant that the skilled person would understand from the application as filed as a whole that the passage at page 4, lines 19-21 represented the most preferred embodiment for the electron beam radiation indicated in claim 69 of the parent application as filed is not persuasive.

- 1.5 Regarding amendment (b), although that limitation is directed to one of the embodiments disclosed in the parent application as filed (see e.g. the passage at page 1, lines 23-25 relied upon by the appellant), it

remains that said amendment constitutes a selection within the ambit of the parent application as filed, in which it is explicitly indicated that the biomass feedstock referred to in the parent application as filed is directed to any non-fossilized, i.e. renewable, organic matter including plant biomass, animal biomass and municipal waste biomass (paragraph bridging pages 21 and 22; see also the list on page 4, lines 5-8, which is not limited to those materials; page 26, lines 22-24; page 27, lines 10-13; page 42, section "Radiation Treatment", first sentence).

The appellant argued that amendment (b) resulted from a limitation of the operative claims to those embodiments which were effectively searched, namely cellulosic or lignocellulosic biomass feedstocks, following an objection raised by the search division in the Partial European Search Report (see section IV above). However, independently of the reason why the amendment was made, it remains that, as explained in the preceding paragraph, amendment (b) constitutes a selection within all the biomass feedstocks originally disclosed as suitable alternatives in the parent application as filed.

- 1.6 Regarding the specific combination of features according to operative claim 1, in particular the combination of claim 69 of the parent application as filed with the above amendments (a) and (b), no passages of the parent application as filed could be identified in order to show that said combination of features, in particular the use of electron beam radiation on a cellulosic or lignocellulosic biomass feedstock in a method of making a combustible fuel, all of these features being defined according to operative claim 1, was directly and unambiguously derivable from

the parent application as filed. In particular, as explained above (section 1.4: first and third paragraphs), neither the passages at page 4, lines 16-17 nor those on pages 49-50 of the parent application as filed indicate that an electron beam radiation defined according to amendment (a) constitutes a preferred embodiment. In addition, neither example 9 (entitled "Methods of determining molecular weight of cellulosic and lignocellulosic materials by gel permeation chromatography"), nor example 19 (directed to "Microbial testing of pretreated biomass"), which were the sole passages of the parent application as filed relied upon by the appellant in reply to a question of the Board in that respect during the oral proceedings, are directed to a method of making a combustible fuel comprising a pretreatment with irradiation and a subsequent contact with a microorganism as defined in operative claim 1, and no connection between example 19 and example 9 was shown by the appellant to be derivable from the parent application as filed. Therefore, the combination of examples 19 and 9, which was relied upon by the appellant in support of the combination of features now defined in claim 1, is not directly and unambiguously derivable from the parent application as filed.

- 1.7 It was further not shown that the parent application as filed provides any basis for a method according to operative claim 1 in which the pretreatment of the cellulosic or lignocellulosic biomass feedstock is carried out using only radiation, which is a method according to operative claim 1, whereby such an embodiment results in the skilled person being presented with new technical information as compared to the parent application as filed.

1.8 Under such circumstances, the combination of features now being defined in claim 1 of auxiliary request I can only be arrived at by artificially creating an embodiment by combining various passages of the application as filed, which was not shown to amount to a disclosure which is directly and unambiguously derivable from the application as filed (see Case Law, *supra*, II.E.1.4.1).

1.9 In view of the above, claim 1 of auxiliary request I is not allowable pursuant to Article 76(1) EPC.

Auxiliary request II

2. Claim 1 of auxiliary request II only differs from claim 1 of auxiliary request I in that the term "cellulosic" was deleted. Since no further argument was put forward by the appellant in that respect, the same conclusion in respect of Article 76(1) EPC is bound to be reached as for claim 1 of auxiliary request I.

Auxiliary request III

3. Claim 1 of auxiliary request III differs from claim 1 of auxiliary request I in that it comprises an additional feature according to the wording of claim 66 of the parent application as filed. However, claim 1 of auxiliary request III comprises the same combination of features than claim 1 of auxiliary request I, which was found to extend beyond the content of the parent application as filed (see section 1 above). Therefore, the same conclusion in respect of Article 76(1) EPC must be drawn for the subject-matter of claim 1 of auxiliary request III as for claim 1 of auxiliary request I.

4. Since none of the appellant's requests fulfills the requirements of Article 76(1) EPC, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



B. ter Heijden

D. Marquis

Decision electronically authenticated