

From the INTERNATIONAL SEARCHING AUTHORITY

To:

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

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| Date of mailing <i>(day/month/year)</i> 23 February 2018 | |
| Applicant's or agent's file reference 206918 WO | FOR FURTHER ACTION See paragraph 2 below |
| International application No. PCT/EP2017/081236 | International filing date <i>(day/month/year)</i> 01 December 2017 |
| Priority date <i>(day/month/year)</i> 02 December 2016 | |
| International Patent Classification (IPC) or both national classification and IPC C07D 307/46(2006.01)i | |
| Applicant SÜDZUCKER AG | |

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

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|--------------------------------------|------------------------------------|--------------------|
| Name and mailing address of the ISA/ | Date of completion of this opinion | Authorized officer |
| | | |

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2017/081236

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed.
 - a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

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International application No.

PCT/EP2017/081236

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability;
citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|------|-----|
| Novelty (N) | Claims | 1-20 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | 1-20 | YES |
| | Claims | | NO |
| Industrial applicability (IA) | Claims | 1-20 | YES |
| | Claims | | NO |

2. Citations and explanations :

See Supplemental Box

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Box V**Reasoned statement with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

Reference is made to the following documents:

| | |
|----|--|
| D1 | EP 0 230 250 A2 (SUEDEDEUTSCHE ZUCKER AG [DE]) 29 July 1987 (1987-07-29), cited in the application |
| D2 | WO 2015/113060 A2 (RENNOVIA INC [US]) 30 July 2015 (2015-07-30), cited in the application |

1. Novelty

The subject matter of claim 1 differs from the disclosures of documents D1 and D2 in the step e).

2. Inventive step

According to the description, the problem to be solved by the application should be considered that of providing an improved method for producing HMF (page 4).

The experimental data suggest that the present method makes a contribution to the solution of the problem addressed.

Document D1 is considered the relevant prior art, since D1 likewise discloses a method for producing HMF (page 1).

The present method differs from the method known from D1 in a further step.

The application does not contain any comparative data that suggest better or different properties with regard to this difference. Therefore, the problem to be solved by the application should be considered that of providing a further method for producing HMF.

The claimed solution to the objective problem should be considered the further step e), which further step makes it possible to produce not only HMF but also levulinic acid and formic acid.

The solution is inventive because the prior art does not contain anything that would prompt a person skilled in the art to add a further method step to the method known from D1, in order to produce not only HMF but also levulinic acid and formic acid. Therefore, the claimed subject matter does not appear to be obvious, and an inventive step can be acknowledged for the subject matter of the present claims 1-20.