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[Continued on next page]

(54) Title: ETHANOL PRODUCTION, USE, AND WASTE RECOVERY USING AQUATIC PLANTS

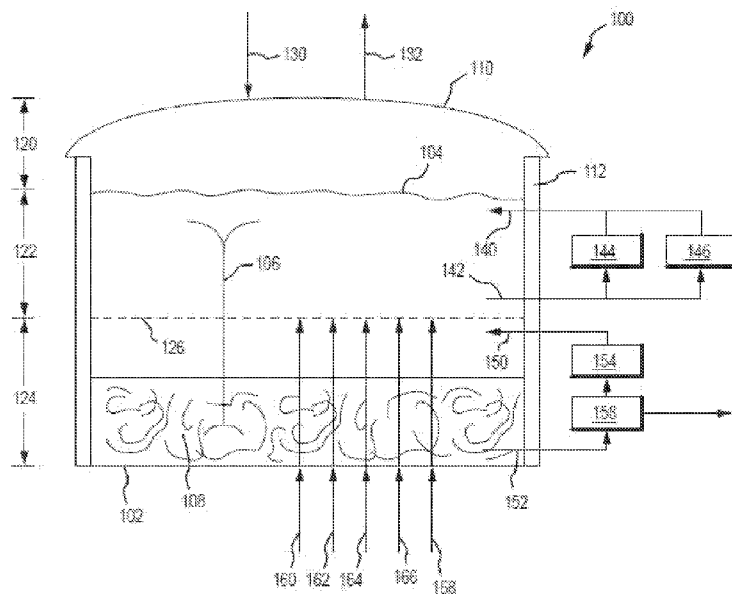


FIG. 1

(57) Abstract: Embodiments of the present disclosure relate to systems and methods for ethanol production, use, and waste recovery using aquatic plants. In certain embodiments, systems and methods are disclosed for reuse and further processing of waste alcohols, sugars, organic acids and/or byproducts produced by conversion of corn, other grains, or other biomass materials of use in biofuel production methods.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
 INV. C12M1/00 A01G33/00
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 C12M A01G
 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/176304 A1 (LEE JAMES WEIFU [US]) 24 July 2008 (2008-07-24) paragraph [0046] - paragraph [0052] paragraph [0111] - paragraph [0114] paragraph [0117] - paragraph [0119] figures 9,10	1-16
X	US 2013/071902 A1 (HAGEN TONY A [US]) 21 March 2013 (2013-03-21) cited in the application paragraph [0035] - paragraph [0037] paragraph [0040] - paragraph [0043] paragraph [0055] - paragraph [0057] figures 4,5 ----- -/--	1,7-11

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Cubas Alcaraz, Jose
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2015/017216

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-16

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2015/017216

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2011/086400 A1 (HAGEN TONY A [US]) 14 April 2011 (2011-04-14) cited in the application paragraph [0031] paragraph [0034] paragraph [0052] - paragraph [0055] paragraph [0059] - paragraph [0060] figures 2,5 -----	1-16
A	US 2013/217082 A1 (HAZLEBECK DAVID A [US]) 22 August 2013 (2013-08-22) paragraphs [0019], [0020], [0033], [0034] -----	5,10, 12-14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2015/017216

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008176304 A1	24-07-2008	US 2008176304 A1 WO 2008039450 A2	24-07-2008 03-04-2008

US 2013071902 A1	21-03-2013	AU 2012312440 A1 CA 2849275 A1 CN 104039748 A EP 2758365 A2 HK 1200160 A1 JP 2014527829 A KR 20140110837 A US 2013071902 A1 WO 2013043824 A2	01-05-2014 28-03-2013 10-09-2014 30-07-2014 31-07-2015 23-10-2014 17-09-2014 21-03-2013 28-03-2013

US 2011086400 A1	14-04-2011	NONE	

US 2013217082 A1	22-08-2013	NONE	

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-16

A system for producing ethanol comprising: a container; a substrate in the container; at least one water inlet; at least one carbon material inlet communicating with an adjacent facility to receive carbon material from the facility; at least one aquatic plant anchored to the substrate; at least one outlet to remove water and ethanol from the container.

2. claims: 17-21

A system for producing ethanol comprising: a container; a substrate in the container comprising at least one elongate plastic material arranged irregularly in the container to define a plurality of spaces; at least one aquatic plant anchored to the substrate; at least one water inlet; at least one water outlet.
