



(51) International Patent Classification:

C10L 3/08 (2006.01) C02F 11/04 (2006.01)
C02F 3/28 (2006.01)

(21) International Application Number:

PCT/GB2013/050046

(22) International Filing Date:

11 January 2013 (11.01.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

1200448.7	12 January 2012 (12.01.2012)	GB
1200463.6	12 January 2012 (12.01.2012)	GB
1200469.3	12 January 2012 (12.01.2012)	GB
1200471.9	12 January 2012 (12.01.2012)	GB

(71) Applicant: **BLAYGOW LIMITED** [GB/GB]; Maison du Douet, Rue de la Golarde, St Lawrence, Jersey, JE3 1GW (GB).

(72) Inventors: **ROSS, John Morris**; c/o Girvan Distillery, Grangestone Industrial Estate, Girvan, Ayrshire KA26 9PT (GB). **LYNCH, Cornelius Martin**; Girvan Distillery, Grangestone Industrial Estate, Girvan, Ayrshire KA26 9PT (GB).

(74) Agent: **CHAPMAN, Paul**; Aurora, 120 Bothwell Street, Glasgow G2 7JS (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

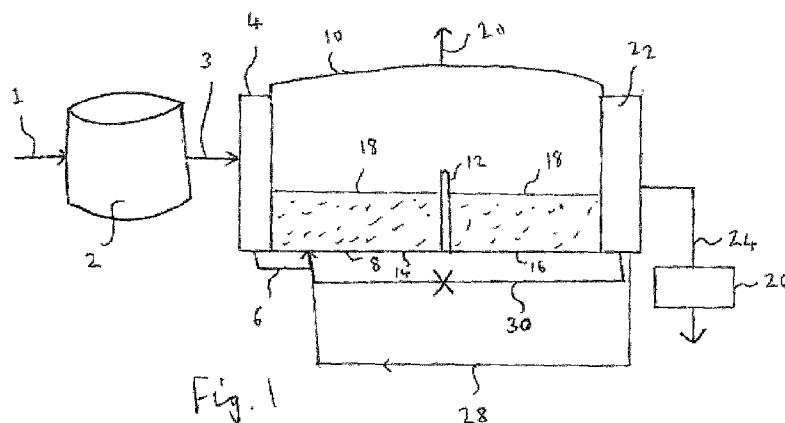
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:
6 September 2013

(54) Title: ANAEROBIC PROCESS



(57) Abstract: The invention relates to processes and equipment for treatment of a feedstock by anaerobic organisms to produce a methane containing biogas that can be used as a source of energy. The invention is particularly concerned with producing methane from a waste plant material such as produced by fermentation processes used in the alcoholic beverages industry, such as from brewing/distilling processes which employ grain material for fermentation.

WO 2013/104911 A3

INTERNATIONAL SEARCH REPORT

International application No PCT/GB2013/050046

A. CLASSIFICATION OF SUBJECT MATTER INV. C10L3/08 C02F3/28 C02F11/04 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) C10L C02F		
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, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2011/066866 A1 (BIOTECHNICAL PROCESSES INTERNAT LTD [IE]; KELLY THOMAS PATRICK [IE]; S) 9 June 2011 (2011-06-09) page 8; table 1 page 11, lines 5-14; figure 1 page 18, lines 28-32 abstract; claims -----	1-11
X	DE 10 2005 025508 A1 (REBO UMWELTTECHNIK GMBH [DE]) 7 December 2006 (2006-12-07) paragraphs [0028], [0029]; figure 1 abstract; claims -----	1-8,10, 11
X	US 2007/095734 A1 (LEE JOHN W JR [US] LEE JR JOHN W [US]) 3 May 2007 (2007-05-03) paragraphs [0026], [0042], [0043]; figure 1 -----	1-8,10, 11
----- -/--		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.	<input checked="" type="checkbox"/> 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		
Date of the actual completion of the international search 3 April 2013	Date of mailing of the international search report 11/07/2013	
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 Bertin, Séverine	

INTERNATIONAL SEARCH REPORT

International application No PCT/GB2013/050046

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>MASAHIRO TATARA ET AL: "High-rate thermophilic methane fermentation on short-chain fatty acids in a down-flow anaerobic packed-bed reactor", BIOPROCESS AND BIOSYSTEMS ENGINEERING, SPRINGER, BERLIN, DE, vol. 27, no. 2, 1 April 2005 (2005-04-01), pages 105-113, XP019347328, ISSN: 1615-7605, DOI: 10.1007/S00449-004-0387-8 abstract; figure 1; example 1 -----</p>	<p>1-8,10, 11</p>

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2013/050046

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.:
1-8, 10, 11

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-8, 10, 11

a process for the anaerobic digestion of a aqueous orr aqueous and oil two phase solution, which has a COD concentration of 30 to 130 kgm-³, comprising the step of a methanogenic stage, producing methane, wherein a liquid output from the methanogenic stage is recycled at no more than a ratio of 2:1 of recycled liquid : input to arrive at a desired COD level for the liquid output.

2. claims: 16-33

a process for producing struvite (NH₄MgPO₄.6H₂O), comprising: the step of subjecting a substantially aqueous spirit distillation effluent to a methanogenic process, producing methane and carbon dioxide and wherein upon exiting from the methanogenic stage of an output stream, at least a portion of the carbon dioxide is evolved from the output stream and struvite is obtained.

3. claims: 9, 12-15, 34-38

a process of processing a liquid which undergoes a methanogenesis step wherein at least one micronutrient metal is monitored in this step and measured in the feed and effluent of the process in order to estimate the amount to be added to the said methanogenesis step.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2013/050046

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011066866 A1	09-06-2011	EP 2558421 A1 WO 2011066866 A1	20-02-2013 09-06-2011

DE 102005025508 A1	07-12-2006	NONE	

US 2007095734 A1	03-05-2007	AU 2002348166 A1 US 2003121851 A1 US 2005274668 A1 US 2007095734 A1 WO 03043939 A2	10-06-2003 03-07-2003 15-12-2005 03-05-2007 30-05-2003
