



- (51) International Patent Classification:
E21B 41/00 (2006.01) G02B 6/00 (2006.01)
B65G 5/00 (2006.01) C12M 1/00 (2006.01)
- (21) International Application Number:
PCT/GB2009/002136
- (22) International Filing Date:
7 September 2009 (07.09.2009)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0816859.3 15 September 2008 (15.09.2008) GB
- (71) Applicant (for all designated States except US): **PLYMOUTH MARINE LABORATORY** [GB/GB]; Prospect Place, West Hoe, Plymouth, Devon PL1 3DH (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **ALLEN, Julian, Icarus** [GB/GB]; 2 Wilton Street, Plymouth PL1 5 LT (GB). **SOMERFIELD, Paul, John** [GB/GB]; 97 Wilton Street, Plymouth PL1 5LT (GB). **SMYTH, Timothy, James** [GB/GB]; 39 Stone Barton Close, Plympton, Plymouth PL7 4LN (GB).
- (74) Agents: **GREENWOOD, Matthew** et al.; Bryer, Shelley, John Amor, Greenwood LLP, 7 Gay Street, Bath BA1 2PH (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, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (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, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to the identity of the inventor (Rule 4.17(i))

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:
19 May 2011

(54) Title: MARINE CARBON SEQUESTRATION

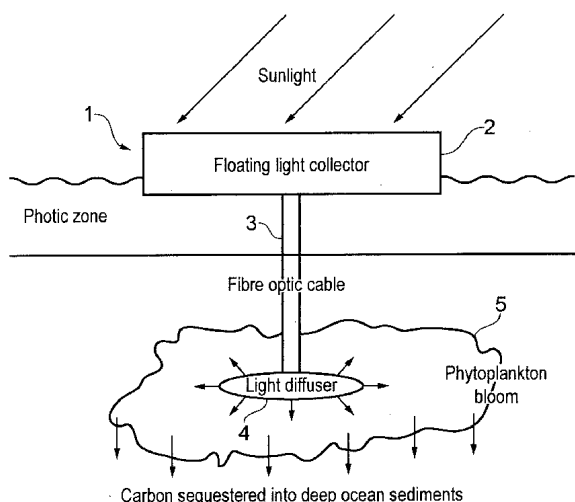


FIG. 2

(57) Abstract: There is provided a marine-based carbon sequestration device (1) comprising: a light collector (2); a light conduit (3) for transferring light from the collector (2) to a deeper marine level; and means for emitting light from the conduit at a deeper marine level whereby to provide a light zone (80) for promoting organic growth. In use, resulting organic material sinks to greater depths and becomes incorporated into seabed sediment.

WO 2010/029285 A3

A. CLASSIFICATION OF SUBJECT MATTER

INV. E21B41/00 B65G5/00 G02B6/00 C12M1/00
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)

E21B B65G G02B C12M

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 practical, 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.
Y	EP 1 913 809 A2 (MARKELS MICHAEL JR [US] GREENSEA VENTURE INC [US]) 23 April 2008 (2008-04-23) paragraphs [0023], [0024] the whole document	1-25
Y	GB 2 224 365 A (MORI KEI) 2 May 1990 (1990-05-02) the whole document	1-25
A	US 2007/264708 A1 (BAYLESS DAVID J [US] ET AL) 15 November 2007 (2007-11-15) paragraphs [0041], [0042] the whole document	1-25
A	DE 103 22 111 A1 (BACKHAUS JAN O [DE]) 2 December 2004 (2004-12-02) the whole document	1-25
	----- -/--	

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

"E" earlier document but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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.

"&" document member of the same patent family

Date of the actual completion of the international search

23 March 2011

Date of mailing of the international search report

29/03/2011

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

van Berlo, André

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>NEUSHUL M: "Algal refossilization of atmospheric carbon dioxide", INTERNET CITATION, 1 July 1991 (1991-07-01), pages 1-2, XP002510851, Retrieved from the Internet: URL:http://osti.gov/energycitations/product.biblio.jsp?osti_id=5559709 [retrieved on 2009-01-19] the whole document</p> <p style="text-align: center;">-----</p>	1-25

Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date
EP 1913809	A2	23-04-2008	NONE	

GB 2224365	A	02-05-1990	AU 4020189 A	03-05-1990
			CN 1042039 A	16-05-1990
			DE 3933486 A1	03-05-1990
			DK 528589 A	28-04-1990
			ES 2015484 A6	16-08-1990
			FI 893973 A	28-04-1990
			FR 2638318 A1	04-05-1990
			IT 1237497 B	08-06-1993
			JP 2117331 A	01-05-1990
			NL 8902387 A	16-05-1990
			SE 8903571 A	28-04-1990
			US 5027550 A	02-07-1991

US 2007264708	A1	15-11-2007	AU 2007249404 A1	22-11-2007
			CA 2651915 A1	22-11-2007
			EP 2016166 A2	21-01-2009
			JP 2009536528 T	15-10-2009
			KR 20090021345 A	03-03-2009
			WO 2007134141 A2	22-11-2007

DE 10322111	A1	02-12-2004	NONE	
