

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P44593PCAU	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/AU2019/051319	International filing date (<i>day/month/year</i>) 04 December 2019	(Earliest) Priority Date (<i>day/month/year</i>) 05 December 2018
Applicant CLEGG, Robert, Louis		
This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau. This international search report consists of a total of 4 sheets. <input type="checkbox"/> It is also accompanied by a copy of each prior art document cited in this report.		
<p>1. Basis of the report</p> <p>a. With regard to the language, the international search was carried out on the basis of:</p> <p style="padding-left: 20px;"><input checked="" type="checkbox"/> The international application in the language in which it was filed.</p> <p style="padding-left: 20px;"><input type="checkbox"/> 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)).</p> <p>b. <input type="checkbox"/> This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).</p> <p>c. <input type="checkbox"/> With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.</p> <p>2. <input type="checkbox"/> Certain claims were found unsearchable (See Box No. II).</p> <p>3. <input type="checkbox"/> Unity of invention is lacking (See Box No. III).</p> <p>4. With regard to the title,</p> <p style="padding-left: 20px;"><input checked="" type="checkbox"/> the text is approved as submitted by the applicant.</p> <p style="padding-left: 20px;"><input type="checkbox"/> the text has been established by this Authority to read as follows:</p> <p>5. With regard to the abstract,</p> <p style="padding-left: 20px;"><input checked="" type="checkbox"/> the text is approved as submitted by the applicant.</p> <p style="padding-left: 20px;"><input type="checkbox"/> the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.</p> <p>6. With regard to the drawings,</p> <p>a. the figure of the drawings to be published with the abstract is Figure No. 1</p> <p style="padding-left: 20px;"><input checked="" type="checkbox"/> as suggested by the applicant.</p> <p style="padding-left: 20px;"><input type="checkbox"/> as selected by this Authority, because the applicant failed to suggest a figure.</p> <p style="padding-left: 20px;"><input type="checkbox"/> as selected by this Authority, because this figure better characterizes the invention.</p> <p>b. <input type="checkbox"/> none of the figures is to be published with the abstract.</p>		

A. CLASSIFICATION OF SUBJECT MATTER

C22B 3/02 (2006.01) **C22B 3/04 (2006.01)** **B01J 3/02 (2006.01)** **B01J 3/04 (2006.01)** **B01J 8/08 (2006.01)**
B01D 11/00 (2006.01)

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)

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)

EPOQUE – PATENW with IPC/CPC class marks; C22B3/0001, C22B3/0004, C22B3/02 OR C22B3/04, C22B3/06, C22B3/18, C22B3/20, C22B11/04, C22B11/06, C22B11/08, C22B15/0004, C22B17/04, C22B19/20, C22B23/04, C22B25/04, Y02P10/234, B01J3/02, B01J3/04, B01J8/00, B01J8/08, B01J8/20, B01J2219/00493, B01J2219/00495, B01J2219/00768, C01F7/06, C02F11/02, C02F3, B01D11 & keywords (gas, oxygen CO₂, liquid, slurry, exit, vent, vessel, reactor, autoclave, impeller, link, combine, join, separate, disengage and like terms).
 ESPACENET AND GOOGLE Advanced Patent search with keywords: reactor, liquid, slurry, gas, zone, outlet, combine and similar terms.
 Applicant and Inventor(s) name searched in internal databases provided by IP Australia.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Documents are listed in the continuation of Box C		

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	
"D" document cited by the applicant in the international application	"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	
"E" earlier application or patent but published on or after the international filing date	"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	
"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)	"&" document member of the same patent family	
"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		

Date of the actual completion of the international search
27 February 2020

Date of mailing of the international search report
27 February 2020

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INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		PCT/AU2019/051319
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 106222404 A (CHINA ENFI ENG CORP) 14 December 2016, Bibliography from Espacenet and English machine translation from GOOGLE PATENTS abstract, Fig. 1, claim 1 – 5 and whole document	1 – 7, 11 - 21, 27 – 34
X	US 2926182 A (MACK SUTTON) 23 February 1960 Fig. 1, claims 1 – 9 and from column 1, line 50 to column 4, line 32	1 - 4, 6 – 7, 11 - 12, 27 – 30, 34.
X	US 4971678 B (STRICKLAND) 20 November 1990 Abstract; Fig. 1, claim 1 and column 3, lines 27 – 47	1 – 3, 7, 11 - 12, 29
X	CN 102942971 B (UNIV TAIYUAN TECHNOLOGY; SEDIN ENGINEERING CO LTD) 15 January 2014, Bibliography from Espacenet and English machine translation from GOOGLE PATENTS Fig. 1 and claims 1 - 6 and whole document	1 – 3, 7, 11 - 12, 22 - 25, 29
A	US 2010/0326920 A1 (CUTLER et al.) 30 December 2010 Abstract, Figs. 1- 3 and claims 1 - 7	1 - 34
A	US 1528206 A (W. E. GREENAWALT) 03 March 1925 Fig. 1 and from page 1, line 84 to page 2, line 121	1 - 34
A	TW M540689 U (TEDA SAS [IT]) 01 May 2017, Bibliography from Espacenet and English machine translation from GOOGLE PATENTS Abstract, Fig. 1 and whole document	1 - 34

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2019/051319

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
CN 106222404 A	14 December 2016	CN 106222404 A	14 Dec 2016
		CN 106222404 B	09 Apr 2019
US 2926182 A	23 February 1960	US 2926182 A	23 Feb 1960
US 4971678 B	20 November 1990	None	
CN 102942971 B	15 January 2014	CN 102942971 A	27 Feb 2013
		CN 102942971 B	15 Jan 2014
US 2010/0326920 A1	30 December 2010	US 2010326920 A1	30 Dec 2010
		US 8551330 B2	08 Oct 2013
		CA 2766376 A1	29 Dec 2010
		PE 20121288 A1	21 Sep 2012
		WO 2010151652 A1	29 Dec 2010
		ZA 201200025 B	30 Oct 2013
US 1528206 A	03 March 1925	US 1528206 A	03 Mar 1925
TW M540689 U	01 May 2017		

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

Form PCT/ISA/210 (Family Annex)(July 2019)