



(43) International Publication Date
28 June 2012 (28.06.2012)

(10) International Publication Number
WO 2012/084431 A3

- (51) International Patent Classification:
B01J 2/18 (2006.01) *B06B 1/18* (2006.01)
- (21) International Application Number:
PCT/EP2011/071288
- (22) International Filing Date:
29 November 2011 (29.11.2011)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10196919.4 23 December 2010 (23.12.2010) EP
- (71) Applicant (for all designated States except US): **UREA CASALE SA** [CH/CH]; Via Giulio Pocobelli, 6, CH-6900 Lugano-Besso (CH).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **RIZZI, Enrico** [IT/IT]; Via Manzoni 4, I-22070 Casnate con Bernate (CO) (IT). **MONTINI, Fabiano** [CH/CH]; Via Garavai 6, CH-6807 Taverne (CH).
- (74) Agent: **ZARDI, Marco**; c/o M. ZARDI & Co SA, Via Pioda, 6, CH-6900 Lugano (CH).
- (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, 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, MD, 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:
16 August 2012

(54) Title: PNEUMATIC HIGH-FREQUENCY TURBINE VIBRATOR SUITABLE FOR USE IN A PRILLING BUCKET

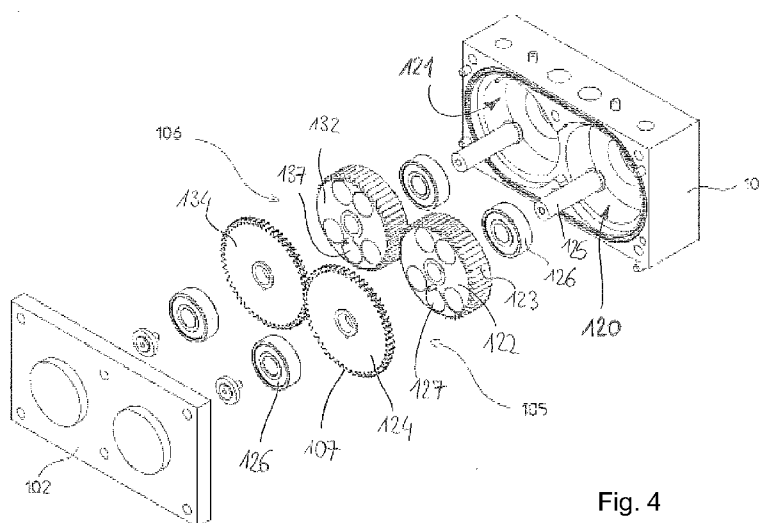


Fig. 4

(57) Abstract: A pneumatic turbine vibrator (100) comprising: a sealed casing (120), a first unbalanced turbine (105) and a second unbalanced turbine (106), said first turbine and second turbine being contained in said casing (120), at least one compressed air feed powering said turbines, said turbines being arranged to produce counter-rotating forces (F1, F2) that add up in a given vibration direction (A) and are balanced in directions other than said vibration direction. A prilling bucket comprising said vibrator is also disclosed.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/071288

A. CLASSIFICATION OF SUBJECT MATTER
INV. B01J2/18 B06B1/18
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)
B06B B01J

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	US 3 292 835 A (GUNTER WOLF) 20 December 1966 (1966-12-20) column 2, lines 15-20; figure 1 column 2, lines 54-69; figure 2 -----	1-8
X	EP 2 070 589 A1 (UREA CASALE SA [CH]) 17 June 2009 (2009-06-17) cited in the application paragraphs [0034] - [0043]; figure 2 paragraphs [0050] - [0056]; figures 4-5 -----	1-8
X	FR 1 412 519 A (PIERRE DE BOSREDON) 1 October 1965 (1965-10-01) page 1; figures 1-2 ----- -/-	1-8



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 application or patent 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

11 June 2012

Date of mailing of the international search report

21/06/2012

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

Trique, Michael

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2011/071288

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 840 354 A (MCKELLAR JOHN D) 24 June 1958 (1958-06-24) column 2, line 7 - column 3, line 5; figures 1-2	1-8
A	----- US 2001/004438 A1 (REIS THOMAS [DE]) 21 June 2001 (2001-06-21) abstract; figure 1 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2011/071288

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3292835	A	20-12-1966	BE 661716 A 27-09-1965
		DE 1247399 B 17-08-1967	
		NL 6503633 A 29-09-1965	
		US 3292835 A 20-12-1966	
EP 2070589	A1	17-06-2009	AU 2008335898 A1 18-06-2009
		CA 2708158 A1 18-06-2009	
		CN 101896256 A 24-11-2010	
		EP 2070589 A1 17-06-2009	
		EP 2227318 A1 15-09-2010	
		RU 2010128241 A 20-01-2012	
		US 2010260876 A1 14-10-2010	
		WO 2009074225 A1 18-06-2009	
FR 1412519	A	01-10-1965	BE 666427 A 03-11-1965
		FR 1412519 A 01-10-1965	
		LU 49227 A 04-10-1965	
		NL 6509279 A 21-02-1966	
US 2840354	A	24-06-1958	NONE
US 2001004438	A1	21-06-2001	DE 29922369 U1 30-03-2000
		EP 1110624 A2 27-06-2001	
		JP 2001246326 A 11-09-2001	
		US 2001004438 A1 21-06-2001	