(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 295 736 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
27.04.2011 Bulletin 2011/17

(43) Date of publication A2:
16.03.2011 Bulletin 2011/11

(21) Application number: **10008824.4**

(22) Date of filing: **25.08.2010**

(51) Int Cl.:
F01K 25/10 *(2006.01)* ***F01K 15/00*** *(2006.01)*
C11B 3/14 *(2006.01)*

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
BA ME RS

(30) Priority: **26.08.2009 BE 200900518**

(71) Applicant: **Schutter Rotterdam B.V.**
2908 LS Capelle a/d Ijssel (NL)

(72) Inventor: **van Beveren, Petrus Carolus**
4631 BB Hoogerheide (NL)

(74) Representative: **Donné, Eddy**
Bureau M.F.J. Bockstael nv
Arenbergstraat 13
2000 Antwerpen (BE)

(54) An apparatus for converting waste heat from a production process into electrical energy

(57) An apparatus for converting the waste heat from a production process into electrical energy, whereby the production process comprises a number of sub-processes, in which the waste heat from at least two sub-processes is simultaneously extracted from the production process by a single closed work-producing cooling circuit (1), and in which there is at least one heat exchanger (3,4) for each sub-process in the form of an evaporator, with a primary section incorporated into the closed cooling circuit (1) and a secondary section through which a fluid is taken from the sub-process concerned to evaporate the coolant in the closed cooling circuit (1), whereby at least one of the aforementioned heat exchangers (3,4) has its secondary section incorporated into a cooling circuit of a sub-process that uses the same coolant, and such that after cooling in the heat exchanger concerned the coolant is mixed with the coolant in the closed cooling circuit by means of a mixer (11) followed by a closed mixing vessel (12) in which the fluid and gas phases of the coolant are separated, and there is a closed mixing vessel (12) in the closed cooling circuit (1) after the mixer (11) in which the liquid and gas phases of the coolant are separated, and coolant is tapped off from this for use in the aforementioned cooling circuit of the sub-process.

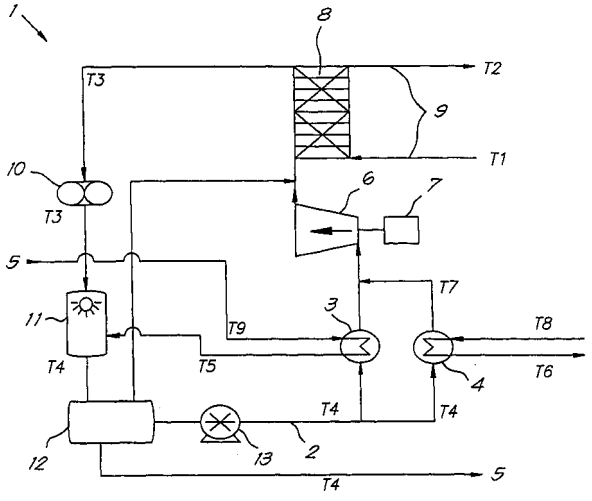

Fig. 1

EP 2 295 736 A3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 10 00 8824

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 10 2006 057448 A1 (IBB TECHNOLOGY GMBH [DE]) 12 June 2008 (2008-06-12) * paragraphs [0019] - [0025], [0029], [0042], [0049], [0050]; figures 1,4 *	1,5-7	INV. F01K25/10 F01K15/00 C11B3/14
A	DE 10 2006 043835 A1 (BAYERISCHE MOTOREN WERKE AG [DE]) 27 March 2008 (2008-03-27) * paragraphs [0002], [0003], [0025] - [0028], [0032], [0034], [0039], [0050]; figures *	1,4,5,7	
A	FR 2 885 169 A1 (RENAULT SAS [FR]) 3 November 2006 (2006-11-03) * page 4, line 12 - line 29 * * page 9, line 4 - page 20, line 10; figures *	1,3-5,7	
A	GB 2 076 062 A (ENGLISH ELECTRIC CO LTD) 25 November 1981 (1981-11-25) * page 1, line 88 - page 3, line 23; figures *	1,3	
			TECHNICAL FIELDS SEARCHED (IPC)
A	WO 96/01363 A1 (RAUSCHER GEORG [DE]) 18 January 1996 (1996-01-18) * page 1, line 23 - page 3, line 15; figures *	1	F01K C11B
A	EP 0 101 889 A2 (STAGE HERMANN) 7 March 1984 (1984-03-07) * page 5, line 24 - page 18, line 15 * * page 22, line 14 - page 25, line 13; figures *	1,6	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 March 2011	Henkes, Roeland

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 00 8824

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-03-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102006057448 A1	12-06-2008	DE 112007002289 A5	20-08-2009
		WO 2008067855 A2	12-06-2008
DE 102006043835 A1	27-03-2008	EP 2064415 A1	03-06-2009
		WO 2008034540 A1	27-03-2008
		JP 2010503795 T	04-02-2010
		US 2009229786 A1	17-09-2009
FR 2885169 A1	03-11-2006	NONE	
GB 2076062 A	25-11-1981	NONE	
WO 9601363 A1	18-01-1996	AU 2926795 A	25-01-1996
		AU 7490894 A	25-01-1996
		DE 4481032 D2	02-10-1997
		WO 9601362 A1	18-01-1996
		EP 0775250 A1	28-05-1997
		EP 0778917 A1	18-06-1997
EP 0101889 A2	07-03-1984	DE 3227669 C1	07-07-1983
		JP 3007240 B	01-02-1991
		JP 59068398 A	18-04-1984
		US 4599143 A	08-07-1986

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82