



(11) EP 2 378 125 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
26.11.2014 Bulletin 2014/48

(51) Int Cl.:
F04C 29/06 (2006.01) **F04C 25/02** (2006.01)

(43) Date of publication A2:
19.10.2011 Bulletin 2011/42

(21) Application number: 11003265.3

(22) Date of filing: 18.04.2011

(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 RS SE SI SK SM TR**

Designated Extension States:
BA ME

(30) Priority: 19.04.2010 JP 2010096541
19.04.2010 JP 2010096542
19.04.2010 JP 2010096543
19.04.2010 JP 2010096544
19.04.2010 JP 2010096545

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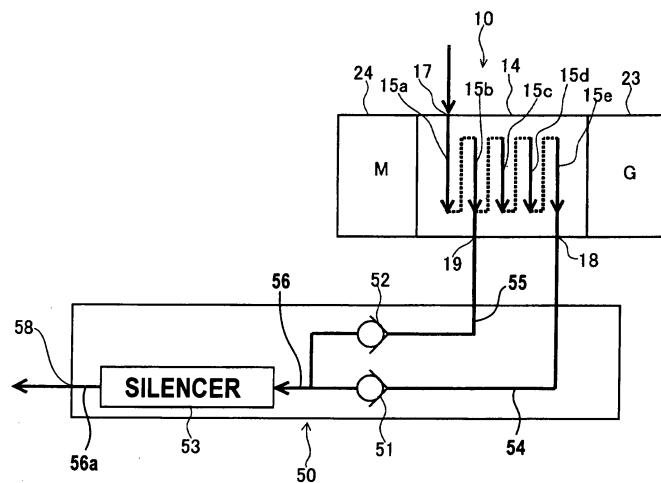
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(54) Dry vacuum pump apparatus

(57) A dry vacuum pump apparatus includes a dry vacuum pump (10) having a final outlet port (18) and an intermediate release outlet port (19), an exhaust section check valve (51) connected to the final outlet port (18) and having an outlet port, an intermediate section check valve (52) connected to the intermediate release outlet port (19) and having an outlet port, and an exhaust pas-

sage (56) connected to the outlet port of the exhaust section check valve (51) and the outlet port of the intermediate section check valve (52), a silencer (53) connected to the exhaust passage (56) and having an outlet port connected to a final exhaust passage (56a) which is vented to the atmosphere.

FIG. 4





EUROPEAN SEARCH REPORT

Application Number

EP 11 00 3265

DOCUMENTS CONSIDERED TO BE RELEVANT					
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)		
Y	EP 1 536 140 A1 (AISIN SEIKI [JP]) 1 June 2005 (2005-06-01) * paragraphs [0008], [0022] * * figures 1,2,3 *	1-3,5	INV. F04C29/06 F04C25/02		
Y	JP 2008 008302 A (ULVAC CORP) 17 January 2008 (2008-01-17)	1-3,5			
A	* abstract * * paragraphs [0002], [0007], [0009], [0014] - [0017] * * figure 4 *	4			
Y	JP 2003 278680 A (AISIN SEIKI) 2 October 2003 (2003-10-02)	5			
A	* abstract * * paragraphs [0016], [0017] * * figures 1-3 *	1,2			
A	US 2007/048162 A1 (IMAI TOSHIRO [JP] ET AL) 1 March 2007 (2007-03-01) * paragraphs [0043] - [0047] * * figures 1-2B *	1	TECHNICAL FIELDS SEARCHED (IPC)		
	-----		F04C		
The present search report has been drawn up for all claims					
Place of search	Date of completion of the search	Examiner			
Munich	23 June 2014	Lange, Christian			
CATEGORY OF CITED DOCUMENTS					
X : particularly relevant if taken alone	T : theory or principle underlying the invention				
Y : particularly relevant if combined with another document of the same category	E : earlier patent document, but published on, or after the filing date				
A : technological background	D : document cited in the application				
O : non-written disclosure	L : document cited for other reasons				
P : intermediate document	& : member of the same patent family, corresponding document				

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Application Number

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CLAIMS INCURRING FEES

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The present European patent application comprised at the time of filing claims for which payment was due.

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

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No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

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LACK OF UNITY OF INVENTION

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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see sheet B

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All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

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As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

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Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

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None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-5

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The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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**LACK OF UNITY OF INVENTION
SHEET B**Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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1. claims: 1-5

Multiple stage vacuum pump with final and intermediate outlet port entering into an exhaust passage and a silencer at the exit of the exhaust passage.

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2. claims: 6-10

Multiple stage vacuum pump with final and intermediate outlet port.

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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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.

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23-06-2014

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
EP 1536140	A1 01-06-2005	CN 2809273	Y 23-08-2006	
		EP 1536140	A1 01-06-2005	
		JP 2005155540	A 16-06-2005	
		US 2005118035	A1 02-06-2005	
JP 2008008302	A 17-01-2008	NONE		
JP 2003278680	A 02-10-2003	NONE		
US 2007048162	A1 01-03-2007	JP 4767625	B2 07-09-2011	
		JP 2007056764	A 08-03-2007	
		US 2007048162	A1 01-03-2007	

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