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

(11) **EP 2 031 248 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
20.01.2010 Bulletin 2010/03

(43) Date of publication A2:
04.03.2009 Bulletin 2009/10

(21) Application number: **08015209.3**

(22) Date of filing: **28.08.2008**

(51) Int Cl.:
F04B 43/04 *(2006.01)*

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

(30) Priority: **30.08.2007 CN 200710147239**

(71) Applicant: **Microjet Technology Co., Ltd**
Hsin Chu (TW)

(72) Inventors:
- **Chen, Shih Chang**
  Hsinchu (TW)
- **Cheng, Chiang Ho**
  Hsinchu (TW)
- **Yu, Rong Ho**
  Hsinchu (TW)
- **Tsai, Jyh Horng**
  Hsinchu (TW)
- **Chiu, Shih Che**
  Hsinchu (TW)

(74) Representative: **UEXKÜLL & STOLBERG**
Patentanwälte
Beselerstrasse 4
22607 Hamburg (DE)

(54) **Fluid transportation device**

(57) A fluid transportation device (20) includes a valve seat (21), a valve cap (22), a valve membrane (23), multiple buffer chambers (223, 215), a vibration film (241) and an actuator (242). The valve membrane (23) is arranged between the valve seat (21) and the valve cap (22), and includes several hollow-types valve switches (231, 232), which includes at least a first valve switch (231) and a second valve switch (232). The multiple buffer chambers (223, 215) include a first buffer chamber (223) between the valve membrane (23) and the valve cap (22) and a second buffer chamber (215) between the valve membrane (23) and the valve seat (21). The vibration film (241) is separated from the valve cap (22) when the fluid transportation device (20) is in a non-actuation status, thereby defining a pressure cavity (226). The actuator (242) is connected to the vibration film (241). When the actuator (242) is driven to be subject to deformation, the vibration film (241) connected to the actuator (242) is transmitted to render a volume change of the pressure cavity (226) and result in a pressure difference for moving the fluid.

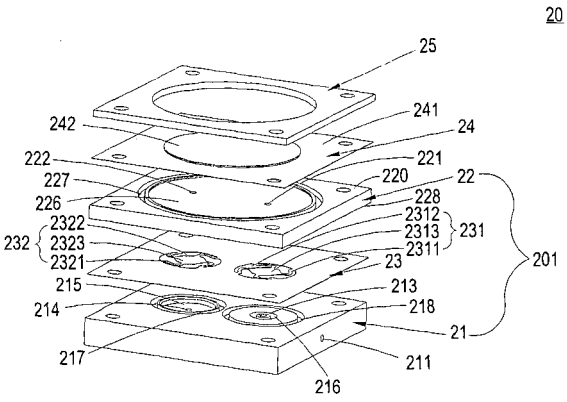

FIG. 3

EP 2 031 248 A3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 08 01 5209

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 6 033 191 A (KAMPER KLAUS-PETER [DE] ET AL) 7 March 2000 (2000-03-07) * abstract; figures 1-4 *	1,3-9, 11-13,15 2,5,6, 10,14	INV. F04B43/04
Y	US 2007/077156 A1 (ORR TROY J [US]) 5 April 2007 (2007-04-05) * figure 4B *	2,14	
Y	DE 102 38 585 B3 (FRAUNHOFER GES FORSCHUNG [DE]) 22 April 2004 (2004-04-22) * claim 8 *	5,6	
Y	US 6 261 066 B1 (LINNEMANN REINHARD [DE] ET AL) 17 July 2001 (2001-07-17) * column 7, lines 42-51 *	10	
A	US 2004/120836 A1 (DAI XUNHU [US] ET AL) 24 June 2004 (2004-06-24) * paragraph [0024]; figure 1 *		TECHNICAL FIELDS SEARCHED (IPC)
A	US 6 334 761 B1 (TAI YU-CHONG [US] ET AL) 1 January 2002 (2002-01-01) * figure 3 *		F04B
A	EP 1 548 284 A (ALPS ELECTRIC CO LTD [JP]) 29 June 2005 (2005-06-29) * paragraph [0030]; figure 2 *		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 December 2009	Olona Laglera, C

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 08 01 5209

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.

07-12-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6033191 A	07-03-2000	DE 19720482 A1	19-11-1998
US 2007077156 A1	05-04-2007	US 2008077068 A1	27-03-2008
DE 10238585 B3	22-04-2004	NONE	
US 6261066 B1	17-07-2001	DE 19719862 A1	19-11-1998
		WO 9851929 A1	19-11-1998
		EP 0966609 A1	29-12-1999
US 2004120836 A1	24-06-2004	AU 2003298633 A1	29-07-2004
		WO 2004061308 A1	22-07-2004
US 6334761 B1	01-01-2002	NONE	
EP 1548284 A	29-06-2005	CN 1637292 A	13-07-2005
		JP 4279662 B2	17-06-2009
		JP 2005188438 A	14-07-2005
		US 2005139002 A1	30-06-2005

EPO FORM P0459

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