

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
31 May 2007 (31.05.2007)

PCT

(10) International Publication Number
WO 2007/060436 A3

- (51) International Patent Classification:
H01J 49/42 (2006.01)
- (21) International Application Number:
PCT/GB2006/004385
- (22) International Filing Date:
23 November 2006 (23.11.2006)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0524042.9 25 November 2005 (25.11.2005) GB
60/749,917 13 December 2005 (13.12.2005) US
- (71) Applicant (for all designated States except US): **MICRO-MASS UK LIMITED** [GB/GB]; Atlas Park, Simonsway, Manchester, M22 5PP (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **GREEN, Martin** [GB/GB]; Grange Croft, Grange Road, Bowden, Altrincham, Cheshire WA14 3EE (GB).
- (74) Agent: **FRANK B. DEHN & CO.**; St Bride's House, 10 Salisbury Square, London EC4Y 8JD (GB).

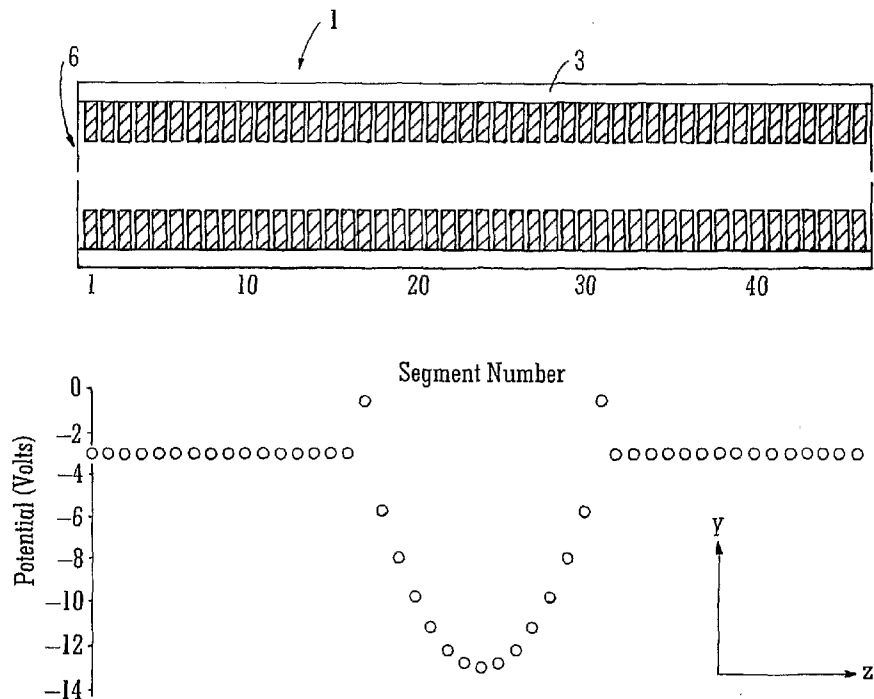
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: MASS SPECTROMETER



(57) Abstract: An ion trap mass analyser (1) is disclosed comprising a segmented rod set. Ions are trapped radially within the mass analyser by a radial pseudo-potential well. The ions are also confined axially within a quadratic axial potential well. A supplemental AC voltage or potential is applied to the electrodes comprising the ion trap mass analyser (1) in order to excite parametrically ions within the ion trap (1).

WO 2007/060436 A3



(88) Date of publication of the international search report:
27 March 2008

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/004385

<p>A. CLASSIFICATION OF SUBJECT MATTER INV. H01J49/42</p>		
<p>According to International Patent Classification (IPC) or to both national classification and IPC</p>		
<p>B. FIELDS SEARCHED</p>		
<p>Minimum documentation searched (classification system followed by classification symbols) H01J</p>		
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>		
<p>Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, INSPEC</p>		
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WELLING M ET AL: "Ion/molecule reactions, mass spectrometry and optical spectroscopy in a linear ion trap" INTERNATIONAL JOURNAL OF MASS SPECTROMETRY, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 172, no. 1-2, 1998, pages 95-114, XP004109270 ISSN: 1387-3806 pages 98-102; figures 2,3 ----- -/--</p>	1-140
<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.</p>		
<p>* Special categories of cited documents :</p>		
<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p>		<p>*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</p>
<p>*E* earlier document but published on or after the international filing date</p>		<p>*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</p>
<p>*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)</p>		<p>*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.</p>
<p>*O* document referring to an oral disclosure, use, exhibition or other means</p>		<p>* & * document member of the same patent family</p>
<p>*P* document published prior to the international filing date but later than the priority date claimed</p>		
<p>Date of the actual completion of the international search 29 January 2008</p>		<p>Date of mailing of the international search report 07/02/2008</p>
<p>Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016</p>		<p>Authorized officer Loiseleur, Pierre</p>

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/004385

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	COLLINGS B A ET AL: "Observation of higher order quadrupole excitation frequencies in a linear ion trap" JOURNAL OF THE AMERICAN SOCIETY FOR MASS SPECTROMETRY, ELSEVIER SCIENCE INC., NEW YORK, NY, US, vol. 11, no. 11, November 2000 (2000-11), pages 1016-1022, XP004224837 ISSN: 1044-0305 page 1016 - page 1018; figure 2	1-140
X	US 5 783 824 A (BABA TAKASHI [JP] ET AL) 21 July 1998 (1998-07-21) cited in the application column 7, line 49 - column 8, line 58 columns 9-10; figures 9-11	137-140
A	US 2003/071206 A1 (BELOV MIKHAIL [US] ET AL) 17 April 2003 (2003-04-17) paragraphs [0025] - [0032]; figures 1,2	1-140
A	US 5 847 386 A (THOMSON BRUCE A [CA] ET AL) 8 December 1998 (1998-12-08) the whole document	1-140
P,X	WO 2006/075182 A (MICROMASS LTD [GB]; GILES KEVIN [GB]; GREEN MARTIN [GB]; WILDGOOSE JAS) 20 July 2006 (2006-07-20) abstract; figure 2 page 50 claim 1	1-140

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/GB2006/004385

Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date
US 5783824	A	21-07-1998	NONE	
US 2003071206	A1	17-04-2003	NONE	
US 5847386	A	08-12-1998	AU 6653296 A	12-03-1997
			CA 2229070 A1	27-02-1997
			WO 9707530 A1	27-02-1997
			EP 0843887 A1	27-05-1998
			JP 11510946 T	21-09-1999
			JP 2007095702 A	12-04-2007
			JP 2007317669 A	06-12-2007
WO 2006075182	A	20-07-2006	CA 2595631 A1	20-07-2006
			EP 1839325 A2	03-10-2007
			EP 1854125 A2	14-11-2007
			WO 2006075189 A2	20-07-2006