Title (en)

SPECTROMETER PROVIDED WITH PULSED ION SOURCE AND TRANSMISSION DEVICE TO DAMP ION MOTION AND METHOD OF USE

Title (de)

SPEKTROMETER MIT GEPULSTER IONENQUELLE, KOPPLUNGSVORRICHTUNG ZUR DÄMPFUNG DER IONENBEWEGUNG, UND METHODE ZUR VERWENDUNG DERSELBEN

Title (fr)

SPECTROMETRE A SOURCE IONIQUE A IMPULSIONS ET APPAREIL DE TRANSMISSION VISANT A AMORTIR LA MOBILITE IONIQUE, ET PROCEDE D'UTILISATION

Publication

EP 1050061 A2 20001108 (EN)

Application

EP 99900849 A 19990125

Priority

- CA 9900034 W 19990125
- CA 2227806 A 19980123

Abstract (en)

[origin: WO9938185A2] A method and apparatus are provided for providing an ion transmission device or interface between an ion source and a spectrometer. The ion transmission device can include a multipole rod set and includes a damping gas, to damp spatial and energy spreads of ions generated by a pulsed ion source. The multipole rod set has the effect of guiding the ions along an ion path, so that they can be directed into the inlet of a mass spectrometer. The invention has particular application to MALDI (matrix-assisted laser desorption/ionization) ion sources, which produce a small supersonic jet of matrix molecules and ions, which is substantially non-directional, and can have ions travelling in all available directions from the source and having a wide range of energy spreads. The ion transmission device can have a number of effects, including: substantially spreading out the generated ions along an ion axis to generate a quasi-continuous beam; reducing the energy spread of ions emitted from the source; and at least partially suppressing unwanted fragmentation of analyte ions. Consequently, a number of pulses of ions can be delivered to the time-of-flight or other spectrometer, for each cycle of the ion generation.

IPC 1-7 (main, further and additional classification)

H01J 1/00

IPC 8 full level (invention and additional information)

H01J 49/42 (2006.01); **H01J 1/00** (2006.01); **H01J 49/10** (2006.01); **H01J 49/40** (2006.01)

CPC (invention and additional information)

H01J 49/063 (2013.01); **H01J 49/164** (2013.01); **H01J 49/40** (2013.01)

Citation (search report)

See references of WO 9938185A3

Cited by

GB2420007A; GB2420007B

Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

EPO simple patent family

WO 9938185 A2 19990729; WO 9938185 A3 19991021; AT 273561 T 20040815; AU 2042899 A 19990809; AU 745866 B2 20020411; CA 2227806 A1 19990723; CA 2227806 C 20060718; DE 1050061 T1 20010607; DE 69919325 D1 20040916; DE 69919325 T2 20050217; DE 69919325 T3 20170302; DK 1050061 T3 20041122; DK 1050061 T4 20170123; EP 1050061 A2 20001108; EP 1050061 B1 20040811; EP 1050061 B2 20161019; JP 2002502084 A 20020122; JP 4331398 B2 20090916

INPADOC legal status

2018-05-31 [PGFP FR] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : FR
- Payment date : 20180125
- Year of fee payment : 20

2018-05-31 [PGFP AT] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : AT
- Payment date : 20180104
- Year of fee payment : 20

2018-05-31 [PGFP IT] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : IT
- Payment date : 20180122
- Year of fee payment : 20

2018-05-31 [PGFP BE] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : BE
- Payment date : 20180129
- Year of fee payment : 20

2018-05-31 [PGFP SE] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : SE
- Payment date : 20180129
- Year of fee payment : 20

2018-04-30 [PGFP GB] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : GB
- Payment date : 20180129
- Year of fee payment : 20

2018-04-30 [PGFP DE] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : DE
- Payment date : 20180129
- Year of fee payment : 20

2018-04-30 [PGFP CH] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : CH
- Payment date : 20180127
- Year of fee payment : 20

2018-04-30 [PGFP DK] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : DK
- Payment date : 20180125
- Year of fee payment : 20

2018-03-30 [PGFP NL] POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE
- Ref Country Code : NL
- Payment date : 20180126
- Year of fee payment : 20

2018-01-25 [REG FR PLFP] FEE PAYMENT
- Year of fee payment : 20

2017-02-07 [REG SE RPEO] EP PATENT HAS BEEN REPUBLISHED IN MODIFIED FORM AFTER OPPOSITION AT EPO

2017-01-25 [REG FR PLFP] FEE PAYMENT
- Year of fee payment : 19

2017-01-23 [REG DK T4] AMENDED EP PATENT WITH DANISH CLAIMS
- Effective date : 20170120

2016-12-07 [REG NL FP] TRANSLATION FOR EP FILED (ENTRY OF EP INTO COUNTRY)

2016-10-31 [REG CH AELC] CONTINUATION IN CHANGED FORM

2016-10-19 [27A] MAINTAINED AS AMENDED
- Effective date : 20161019

2016-10-19 [AK] DESIGNATED CONTRACTING STATES:
- Kind Code of Ref Document : B2
- Designated State(s) : AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

2016-10-19 [REG DE R102] EPO DECISION MAINTAINING PATENT IN AMENDED FORM NOW FINAL
- Document : DE 69919325

2016-01-26 [REG FR PLFP] FEE PAYMENT
- Year of fee payment : 18

2015-10-28 [RIC2] CLASSIFICATION (CORRECTION)
- IPC : H01J 49/06 20060101AFI20150924BHEP

2015-10-28 [RIC2] CLASSIFICATION (CORRECTION)
- IPC : H01J 49/40 20060101ALI20150924BHEP

2015-10-28 [RIC2] CLASSIFICATION (CORRECTION)
- IPC : H01J 49/10 20060101ALI20150924BHEP

2015-04-15 [R26] OPPOSITION FILED (CORRECTION)
- Opponent name : THERMO FINNIGAN LLC
- Effective date : 20050509

2008-01-02 [PG25 PT] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : PT
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20050111

2005-11-02 [REG IE MM4A] PATENT LAPSED

2005-09-01 [NLR1] NL: OPPOSITION HAS BEEN FILED WITH THE EPO
- Opponent name : THERMO FINNIGAN LLC

2005-08-01 [NLR4] NL: RECEIPT OF CORRECTED TRANSLATION IN THE NETHERLANDS LANGUAGE AT THE INITIATIVE OF THE PROPRIETOR OF THE PATENT

2005-07-06 [R26] OPPOSITION FILED (CORRECTION)
- Opponent name : THERMO FINNIGAN LLC
- Effective date : 20050509

2005-06-29 [26] OPPOSITION FILED
- Opponent name : THERMO FINNIGAN LLC
- Effective date : 20050509

2005-06-17 [REG FR CL] CONCESSION TO GRANT LICENCES

2005-05-13 [ET] FR: TRANSLATION FILED

2005-01-31 [PG25 MC] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : MC
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20050131

2005-01-25 [PG25 IE] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : IE
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20050125

2005-01-25 [PG25 LU] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : LU
- Free text : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES
- Effective date : 20050125

2005-01-25 [PG25 CY] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : CY
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20050125

2004-11-23 [REG SE TRGR] TRANSLATION OF GRANTED EP PATENT

2004-11-22 [PG25 ES] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : ES
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20041122

2004-11-22 [REG DK T3] EP PATENT WITH DANISH CLAIMS

2004-11-15 [REG CH NV] NEW AGENT
- Representative's name : PATENTANWAELTE SCHAAD, BALASS, MENZL & PARTNER AG

2004-11-11 [PG25 GR] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : GR
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20041111

2004-09-16 [REF] CORRESPONDS TO:
- Document : DE 69919325 P 20040916

2004-09-08 [REG IE FG4D] EUROPEAN PATENTS GRANTED DESIGNATING IRELAND

2004-08-31 [REG CH NV] NEW AGENT
- Representative's name : MICHELI & CIE INGENIEURS-CONSEILS

2004-08-13 [REG CH EP] ENTRY IN THE NATIONAL PHASE

2004-08-11 [AK] DESIGNATED CONTRACTING STATES:
- Kind Code of Ref Document : B1

- Designated State(s) : AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

2004-08-11 [REG GB FG4D] EUROPEAN PATENT GRANTED

2004-08-11 [PG25 FI] LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO
- Ref Country Code : FI
- Free text : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT
- Effective date : 20040811

2004-04-14 [111L] LICENCES
- Free text : 0100 MDS INC.
- Effective date : 20031212

2004-04-14 [111L] LICENCES
- Free text : 0101 APPLIED BIOSYSTEMS/MDS SCIEX
- Effective date : 20031212

2004-04-14 [RAP1] TRANSFER OF RIGHTS OF AN APPLICATION
- Owner name : UNIVERSITY OF MANITOBA

2003-07-09 [17Q] FIRST EXAMINATION REPORT
- Effective date : 20030528

2001-06-07 [DET] DE: TRANSLATION OF PATENT CLAIMS

2001-04-15 [TCAT] AT: TRANSLATION OF PATENT CLAIMS FILED

2000-11-08 [17P] REQUEST FOR EXAMINATION FILED
- Effective date : 20000814

2000-11-08 [AK] DESIGNATED CONTRACTING STATES:
- Kind Code of Ref Document : A2
- Designated State(s) : AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE