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(71) Applicant (*for all designated States except US*): **ICT, INTEGRATED CIRCUIT TESTING GESELLSCHAFT FÜR HALBLEITERPRÜFTECHNIK MBH** [DE/DE]; Ammerthalstrasse 20a, 85551 Heimstetten (DE).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **LANIO, Stefan** [DE/DE]; Eichendorffstrasse 1, 85435 Erding (DE).

(74) Agents: **ZIMMERMANN, Gerd** et al.; Zimmermann & Partner, P.O.Box 330 920, 80069 Munich (DE).

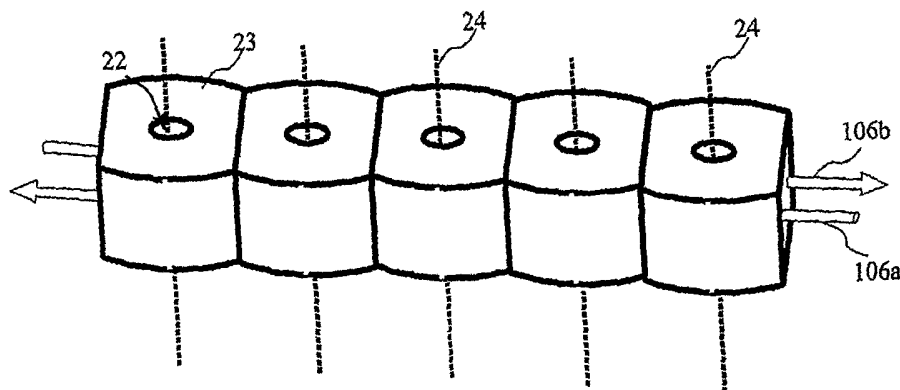
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MULTI-AXIS LENS, BEAM SYSTEM MAKING USE OF THE COMPOUND LENS, AND METHOD OF MANUFACTURING THE COMPOUND LENS



(57) Abstract: The invention provides a lens system for a plurality of charged particle beams. Therein, at least one common excitation coil for at least two lens modules is provided. The lens modules comprise a first pole piece, a second pole piece and at least one opening for a charged particle beam. The lens modules constitute a component and share the excitation coil. Thereby, raw material availability, processing of work pieces and symmetry conditions for the lens fields are improved.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/14141

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01J37/141

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2001/028038 A1 (HARAGUCHI TAKESHI ET AL) 11 October 2001 (2001-10-11) cited in the application	1-5, 8, 9, 14, 17, 19, 34
Y	abstract; figure 1	15, 16
	page 3, paragraph 81 - paragraph 275; figures 3-48	
X	DE 30 10 814 A (SIEMENS AG) 24 September 1981 (1981-09-24)	1-5, 8-10, 14, 17, 19, 34
	page 8, lines 1-11; figure 2 page 4, line 19 - page 5, line 8 page 10, lines 10-16; figure 6	
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
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- *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
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- *&* document member of the same patent family

Date of the actual completion of the international search

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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

Authorized officer

Laing, T

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/14141

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 209 702 A (ONOGUCHI AKIRA ET AL) 24 June 1980 (1980-06-24) abstract column 2, line 7 - column 6, line 13; figures 4-9 -----	1,2,4, 10,14, 17,19,34
X	US 3 715 580 A (SAITOU N ET AL) 6 February 1973 (1973-02-06) cited in the application abstract column 2, line 19 - column 3, line 17; figures 3,4 -----	1,2,4, 14,17, 19,34
Y	FROSJEN J ET AL: "COMPOUND MAGNETIC AND ELECTROSTATIC LENSES FOR LOW-VOLTAGE APPLICATIONS" JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY: PART B, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 7, no. 6, 1 November 1989 (1989-11-01), pages 1874-1877, XP000117179 ISSN: 0734-211X page 1874, left-hand column, last paragraph - page 1875, right-hand column, paragraph 1; figures 2,3 -----	15,16
X	MIKHAILICHENKO A A: "Some features of superconducting dual bore lens" PARTICLE ACCELERATOR CONFERENCE, 1999. PROCEEDINGS OF THE 1999 NEW YORK, NY, USA 27 MARCH-2 APRIL 1999, PISCATAWAY, NJ, USA, IEEE, US, 27 March 1999 (1999-03-27), pages 3218-3220, XP010349109 ISBN: 0-7803-5573-3 abstract page 3218, right-hand column, paragraph 3 - page 3219, left-hand column, last paragraph -----	21,22, 26,27, 29-31,34
X	US 3 417 224 A (EDGAR MEYER ET AL) 17 December 1968 (1968-12-17) abstract column 2, line 10 - column 4, line 13; figures 5,9 -----	21,22, 25-27,34

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/14141

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-20, 34 when dependent from 1

Lens system for a plurality of charged particle beams, comprising an excitation coil providing magnetic flux to at least two lens modules, each lens module comprising a first pole piece and at least one opening for a charged particle beam, whereby each lens module constitutes a component, and additionally comprises a second pole piece.

2. claims: 21-33, 34 when dependent from 21

Lens system for a plurality of charged particle beams, comprising an excitation coil providing magnetic flux to a pole piece unit, the pole piece unit comprising two pole pieces and at least two openings for charged particle beams, whereby the openings are arranged in a row, thereby forming a lens row, and the pole piece unit has elongate shape.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/14141

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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