(51) International Patent Classification: G01T 1/172

(21) International Application Number: PCT/IL01/00730

(22) International Filing Date: 8 August 2001 (08.08.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 137821

10 August 2000 (10.08.2000) IL

(71) Applicant (for all designated States except US): U.C.G. TECHNOLOGIES LTD. [IL/IL]; P.O. Box 212, 36601 Nesher (IL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): SHWARTZ, Shoulamit, C. [IL/IL]; P.O. Box 183, 30300 Atlit (IL). OHAHA, Israel [IL/IL]; 47/3 Laskov str., 34950 Haifa (IL).

(74) Agent: MILLER - SIERADZKI ADVOCATES & PATENT ATTORNEYS; P.O. Box 6145, 31061 Haifa (IL).

(54) Title: SPECT GAMMA CAMERA


(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (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

(88) Date of publication of the international application: 25 April 2002

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.

(57) Abstract: A method and apparatus of obtaining and reconstructing an image of a portion of a body, administered by a radiopharmaceutical substance, by using Single-photon emission computerized tomography (SPECT) for determination of functional information thereon. The method comprises: acquiring gamma ray photons (3) emitted from said portion by means of a detector (2) capable of converting the photons into electric signals, the detector having at least one crystal (6) and allowing said gamma rays having incident angles essentially exceeding 5 degrees and, preferably, exceeding 10 degrees to be detected; processing said electric signals by a position logic circuitry (7) and thereby transforming them into data indicative of positions on said photon detector crystal (6), where the photons (3) have impinged the detector (2); and reconstructing an image of a spatial distribution of the pharmaceutical substance within the portion of the body (5) by processing said data and taking into consideration weight values which are functions of angles and, possibly, distances between different elements of the portion (4) of the body (5) and corresponding elements of this position's projection on the detector (2).
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G01T 1/172
US CL : 250/363.04

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)

U.S.: 250/363.04, 363.02; 378/4, 21

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 practicable, search terms used)
USPTO/WEST 2.0

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>US 6,242,743 B1 (DE VITO et al) 05 June 2001 (05/06/01), see entire document.</td>
<td>1-55</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C. See patent family annex.

Date of the actual completion of the international search: 16 January 2002 (16.01.2002)

Date of mailing of the international search report: 13 FEB 2002

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer
Seungsuk Ham

Telephone No. 703-308-0956

Form PCT/ISA/210 (second sheet) (July 1998)
INFORMATION SEARCH REPORT

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

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

1. □ Claim Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claim Nos.: 56 and 57
   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:
   the claims were not searched as they are too vague and are prohibited by PCT Rule 6.2(a).

3. □ Claim 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:

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.

Form PCT/ISA/210 (continuation of first sheet(1)) (July 1998)