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(54) Title: ROTATING BIOPSY DEVICE AND BIOPSY ROBOT

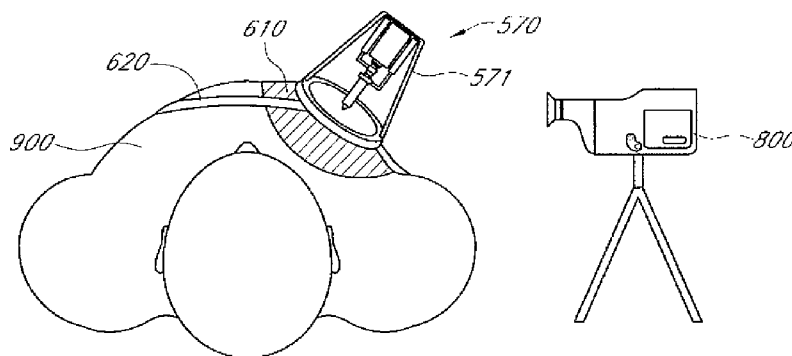


FIG. 57

(57) Abstract: Embodiments of a needle biopsy device (1, 570) having a rotating needle mechanism to automatically cut sample tissue that can be operated remotely. A portable small biopsy robot (1, 570) can improve biopsy accuracy, reduce the pain and complications, and shorten the duration of the total biopsy time by using an automatic needle rotating mechanism and a needle localization system that allows a medical practitioner to perform the biopsy procedure from a remote distance. The needle biopsy device (1, 570) can include a cannula (20) and a rotational biopsy needle (10, 240, 241, 242) with a blade (40) the rotational biopsy needle axially and rotatably moveable within the cannula lumen (21), the blade configured to remove a tissue sample from the target tissue site through rotation of the blade, and to hold the tissue sample in the rotational biopsy needle during proximal retraction from the patient.



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A. CLASSIFICATION OF SUBJECT MATTER*A61B 17/32(2006.01)i, A61B 17/34(2006.01)i*

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 : A61B 10/00, A61B 17/32, A61B 17/34

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

- Korean Utility models and applications for Utility models since 1975
- Japanese Utility models and applications for Utility models since 1975

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

eKIPASS(KIPO internal) & keywords : 'biopsy', 'needle', and 'blade'

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5769086 A (RITCHART, MARK A. et al.) 23 Jun. 1998 See Column 2, line 54 - Column 3, line 51 and Column 5, line 2 - Column 5, line 17; Claims 1, 4, 5, and 19	1-2, 7-9, 23, 25
A	The whole documents.	3-6, 10-11, 24
A	US 2006-0184063 A1 (MILLER, MICHAEL E.) 17 Aug. 2006 The whole documents.	1-11, 23-25
A	US 6860860 B2 (VIOLA, FRANK J.) 1 Mar. 2005 The whole documents.	1-11, 23-25

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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.: 12 - 22
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 12-22 pertain to methods for diagnosis or treatment of human or animal body by surgery, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT.
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 No. III Observations where unity of invention is lacking (Continuation of item 3 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 and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

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