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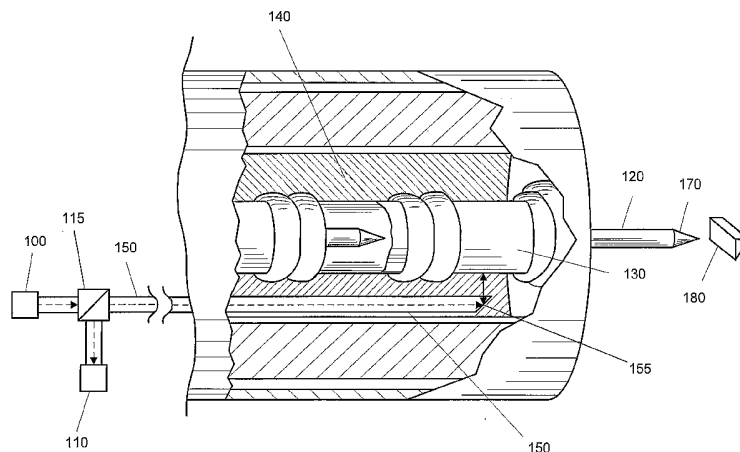
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(54) Title: APPARATUS AND METHOD OF DETECTING PROBE TIP CONTACT WITH A SURFACE



(57) Abstract: We disclose an apparatus and method for detecting probe-tip (120) contact with a surface, generally inside a focused ion-beam instrument, where the probe tip (120) is attached to a capsule (130), and the capsule (130) is movably secured in a probe shaft (140). There is a fiber-optic cable (150) having a first end and a second end; a beam splitter (115) having first and second output ports; and a light source (100) connected to the beam splitter (115). The first output port of the beam splitter (115) is connected to the first end of the fiber-optic cable (150), and the second output port of the beam splitter (115) is connected to a photodiode (110). The second end of the fiber-optic cable (150) has a mirror (155) for reflecting incident light at approximately a ninety-degree angle to the axis of the optical path in the fiber-optic cable (150) and onto the capsule (130), so that the intensity of the light reflected back from the capsule (130) through the fiber-optic cable (150) is proportional to the deflection of the capsule (130) as the probe tip (120) makes contact with the surface.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/39940

A. CLASSIFICATION OF SUBJECT MATTER

IPC: G01J 1/04(2006.01);H01J 3/14(2006.01)

USPC: 250/227.11,234

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. : 250/227.11, 227.14, 234; 356/615

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

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


C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,479,024 A (HILLNER et al) 26 December 1995 (26.12.1995), Figure 1; column 2, lines 28-50; column 6, lines 46-50.	1, 3, 4, 8 ----- 2, 5-7, 9, 10, 13
X --- Y	US 5,324,935 A (YASUTAKE) 28 June 1994 (28.06.1994), Figure 1; column 3, lines 58-63; column 4, lines 15-45, 48-55.	11, 12, 16-18 ----- 13-15
Y	US 6,713,743 B2 (KIM et al) 30 March 2004 (30.03.2004), Figure 3; column 4, lines 28-34, 39-41; column 5, lines 19-25.	2, 6, 7, 9, 10, 15
Y	US 2004/0061872 A1 (NAKANO) 01 April 2004 (01.04.2004), Figure 1; paragraph 0026.	5, 10, 14

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

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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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"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		

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Continuation of B. FIELDS SEARCHED Item 3:

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