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Declarations under Rule 4.17:

[Continued on next page]

(54) **Title**: A METHOD FOR ROTATING AN OBJECT ATTACHED TO A SURFACE OF A SUBSTRATE

(57) **Abstract**: A method for rotating an object attached to a surface of a substrate, the method comprising coupling the substrate to a rotary member; rotating the rotary member to apply a force to the object in a direction that is not in parallel to the surface of the substrate; illuminating the surface of the substrate with a light source; and detecting with a light detector a relative motion of the object to the surface of the substrate caused by the force.

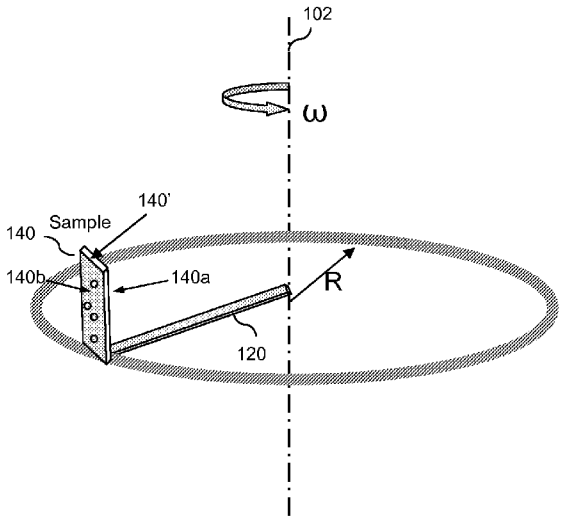

FIG. 2A

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— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. G01N21/47 C12Q1/68 G01N3/08 G01N19/04 G01N33/543

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)
G01N C12Q

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, WPI Data, COMPENDEX, INSPEC, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	AL BITAR L ET AL: "Tarsal morphology and attachment ability of the codling moth Cydia pomonella L. (Lepidoptera, Tortricidae) to smooth surfaces" JOURNAL OF INSECT PHYSIOLOGY, PERGAMON PRESS, OXFORD, GB, vol. 55, no. 11, 1 November 2009 (2009-11-01), pages 1029-1038, XP026613479 ISSN: 0022-1910 [retrieved on 2009-08-05] figure 1 ----- -/--	1-3,5-6, 12-14,21

[X] Further documents are listed in the continuation of Box C.

[X] 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 document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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	Date of mailing of the international search report
12 March 2010	27/07/2010

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/066154

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FEDERLE W ET AL: "Attachment forces of ants measured with a centrifuge: Better 'wax-runners' have a poorer attachment to a smooth surface" JOURNAL OF EXPERIMENTAL BIOLOGY, vol. 203, no. 3, February 2000 (2000-02), pages 505-512, XP002572371 ISSN: 0022-0949 page 506 - page 507; figure 2	1-3,5-7, 12-14, 18-19, 21-22,28
X Y	WO 2008/112980 A2 (INCITOR LLC [US]; SUZARA VINCENT [US]; BENTLEY PAUL [US]) 18 September 2008 (2008-09-18) figures 1-3, 5	29-30, 32-36, 38-46 2-6,8-9, 12, 14-17, 23-28,37
Y	US 2003/166262 A1 (STRICK T R [US] ET AL) 4 September 2003 (2003-09-04) figures 1-3, 13	2-6,8-9, 12, 14-17, 23-28,37
A	JP 11 258081 A (RICOH KK) 24 September 1999 (1999-09-24) figures 1-3, 17	1-9, 12-47
A	EP 0 589 556 A2 (GLYCOMED INC [US]) 30 March 1994 (1994-03-30) claims 17-18	1-9, 12-47
A	SALAZAR-BANDA ET AL: "Determination of the adhesion force between particles and a flat surface, using the centrifuge technique" POWDER TECHNOLOGY, ELSEVIER SEQUOIA, LAUSANNE, CH, vol. 173, no. 2, 24 March 2007 (2007-03-24), pages 107-117, XP022000669 ISSN: 0032-5910 figure 5	1-9, 12-47
A	CHON<A B> J H ET AL: "A von Willebrand factor-derived heparin-binding peptide regulates cell-substrate adhesive strength and chemokinesis behavior" BIOCHIMICA ET BIOPHYSICA ACTA. MOLECULAR CELL RESEARCH, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 1542, no. 1-3, 30 January 2002 (2002-01-30), pages 195-208, XP004341335 ISSN: 0167-4889 page 198	1-9, 12-47

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/066154

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.:
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 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:

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 fees, this Authority did not invite payment of additional fees.

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.:

1-9, 12-47

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-9, 12-47

   Methods for rotating an object such as a particle attached to the surface of a substrate by e.g. a molecular interaction so as to apply a force which is in a direction non parallel to the surface of the substrate and detecting the object with light to determine motion thereof or molecular interaction by which the particle is bound to the surface using in particular surface plasmon resonance.

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2. claims: 10-11, 48-66

   A general apparatus for measuring characteristics of an unspecified sample comprising a detection module including a light source and objective which is mechanically coupled to a rotor whereby the module is rotated so as to apply a force to a sample.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2009/066154

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