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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/423,669	06/12/2006	Michael W. Recknor	24377-11758	6275

758 7590 08/25/2011
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

KWAK, DEAN P

ART UNIT	PAPER NUMBER
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1773

NOTIFICATION DATE	DELIVERY MODE
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08/25/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOC@Fenwick.com

Notice of Abandonment	Application No.		Applicant(s)	
	11/423,669		RECKNOR ET AL.	
	Examiner		Art Unit	
	DEAN KWAK		1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 06 January 2011.
 - (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
 - (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.
(A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
 - (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
 - (d) ☒ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
 - (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
 - (b) ☐ The submitted fee of \$_____ is insufficient. A balance of \$_____ is due.
The issue fee required by 37 CFR 1.18 is \$_____. The publication fee, if required by 37 CFR 1.18(d), is \$_____.
 - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
 - (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
 - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

/Jill Warden/
Supervisory Patent Examiner, Art Unit 1773

/D. K./
Examiner, Art Unit 1773

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2009 <i>(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)</i>		Docket Number (Optional) 24377-11758 US	
Application Number 11/423,669		Filed June 12, 2006	
For Tip Tray Assembly For Optical Sensors			
Art Unit 1773		Examiner Dean P. Kwak	
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):			
	<u>Fee</u>	<u>Small Entity Fee</u>	
☒ One month (37 CFR 1.17(a)(1))	\$130	\$65	\$ <u>65</u>
☐ Two months (37 CFR 1.17(a)(2))	\$490	\$245	\$ _____
☐ Three months (37 CFR 1.17(a)(3))	\$1110	\$555	\$ _____
☐ Four months (37 CFR 1.17(a)(4))	\$1730	\$865	\$ _____
☐ Five months (37 CFR 1.17(a)(5))	\$2350	\$1175	\$ _____
☒ Applicant claims small entity status. See 37 CFR 1.27.			
☐ A check in the amount of the fee is enclosed.			
☐ Payment by credit card. Form PTO-2038 is attached.			
☐ The Director has already been authorized to charge fees in this application to a Deposit Account.			
☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>19-2555</u> .			
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.			
I am the ☐ applicant/inventor.			
☐ assignee of record of the entire interest. See 37 CFR 3.71.			
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).			
☒ attorney or agent of record. Registration Number <u>58,004</u>			
☐ attorney or agent under 37 CFR 1.34.			
Registration number if acting under 37 CFR 1.34 _____			
<u>/Pauline Farmer-Koppenol/</u>		<u>3 May 2011</u>	
Signature		Date	
<u>Pauline Farmer-Koppenol, Reg. No. 58,004</u>		<u>415-875-2406</u>	
Typed or printed name		Telephone Number	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
☒ Total of <u>1</u> forms are submitted.			

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	11423669			
Filing Date:	12-Jun-2006			
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS			
First Named Inventor/Applicant Name:	Michael W. Recknor			
Filer:	Pauline Farmer-Koppenol/Heather Orosco			
Attorney Docket Number:	24377-11758			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with \$0 paid	2251	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				65

Electronic Acknowledgement Receipt

EFS ID:	10014161
Application Number:	11423669
International Application Number:	
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor/Applicant Name:	Michael W. Recknor
Customer Number:	00758
Filer:	Pauline Farmer-Koppenol
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	03-MAY-2011
Filing Date:	12-JUN-2006
Time Stamp:	19:44:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$65
RAM confirmation Number	6512
Deposit Account	192555
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	11758_US_Petition_for_Extension_of_Time.pdf	313224	no	2
			811b1c48995057e94d137154aaef1fd1884108a3		

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	30466	no	2
			fd11a5a29f29bfeb85e45cf9ce0ec05da0c3ce132		

Warnings:

Information:

Total Files Size (in bytes):			343690
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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11/423,669	06/12/2006	Michael W. Recknor	24377-11758	6275

758 7590 01/06/2011
FENWICK & WEST LLP
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MOUNTAIN VIEW, CA 94041

EXAMINER

KWAK, DEAN P

ART UNIT	PAPER NUMBER
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1773

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01/06/2011

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PTOC@Fenwick.com

Office Action Summary	Application No. 11/423,669	Applicant(s) RECKNOR ET AL.	
	Examiner Dean Kwak	Art Unit 1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/09/2010 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 48-51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claim 48, it is unclear if the claim is independent to the apparatus claim 35. If claim 48 is an independent claim, it is advisable to amend the claim including all the limitations of the apparatus claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 35-41 & 43-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (PG Pub 2002/0006362) and further in view of Klein et al. (PG Pub 2005/0176155).

Regarding Claim 35, Ohta et al. disclose an apparatus (e.g., sample assaying apparatus, Abstract & Fig. 1),

- the apparatus comprising an agitation assembly (e.g., vibrating mechanism, P10/[0151] & Fig. 1 (80)) operably coupled to a container with a plurality of wells containing solution (e.g., assay plate or microplate, P3/[0056]),

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- the optical sensing assembly being configured for measuring a characteristic of the solution (e.g., photometer (70), Claim 4),
- wherein the agitation assembly comprises an agitation device (e.g., vibrating motor (82)) that moves the container relative to the optical sensing assembly (see the vibrating mechanism 80 that is capable of moving in X, Y & Z direction (Figs. 4 & 5) relative to the photometer 70) and according to a specified type of motion to agitate the solution relative to the optical assembly to create flow of the solution relative to the optical assembly (P4/[0075]).

Regarding Claim 35, although Ohta et al. disclose a use of a photometer (optical sensing assembly) for determining the reaction within each of the reaction vessel (well), Ohta et al. do not explicitly disclose the reaction vessel being configured for holding the photometer.

Klein et al. disclose an apparatus (e.g., well plate reactor, Abstract),

- the apparatus comprising an agitation assembly (e.g., agitator (158), P4/[0057]) operably coupled to a container with a plurality of wells containing solution (e.g., well plate, Fig. 1 (100)),
- each well being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being configured for measuring a characteristic of the solution (e.g., optical fiber probes (500), P8/[0093]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify optical fiber probes, as taught by Klein et al. to the sample assay

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apparatus so that each well can be monitored individually. This may be advantageous when each well is intended to study for different variables and requires use of different type of probes, as Klein et al. disclose that a plurality of measuring devices may be used, see P8/[0092-0096].

Regarding Claim 35, Ohta et al. & Klein et al. meet all the structural limitations recited by the instant invention. Applicants' preamble recites "for maintaining flow of the solution". A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding Claims 36-39, 41, 43, 45, 46 & 52, Ohta et al. further disclose the apparatus wherein:

- the agitation device is driven by an electrical motor (e.g., vibrating motor (82), P4/[0075]);
- the specified type of motion is repetitive motion of the solution in the well, relative to the optical assembly (see the vibration is made at a predetermined rotation angle, P4/[0076]);
- the repetitive motion is circular motion (P4/[0077]);
- the agitation device is driven by an actuator for creating repetitive motion that is not in orbital trajectory (e.g., circular motion, P4/[0077]);

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- the agitation device is operably coupled with the optical assembly to move the assembly relative to the sample (see the photometer (70) and vibrating mechanism (80) operably couple as shown in Fig. 1);
- the agitation assembly further comprises a heater adapter (e.g., temperature maintaining mechanism, Fig. 1 (50));
- the agitation assembly is included in a robotic instrument (Fig. 2 (10));
- a robotic arm (see P5/[0094] & Fig. 10 (A)); and
- a controller (e.g., personal computer, P3/[0053] & P4/[0076, 0079]) operably coupled to the agitation device.

Regarding Claim 40, although Ohta et al. do not explicitly disclose the motion is random motion, the reference discloses the vibrating mechanism being able to move in X, Y & Z direction. It would have been obvious to one having ordinary skill in the art at the time the invention was made to control the vibrating mechanism to vibrate in random motion to enhance mixing of the solution.

Regarding Claim 44, Ohta et al. fail to disclose the agitation assembly is coupled to the container.

Klein et al. further disclose a plurality of heating elements (206) associated with each well (110), P5/[0061].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate heating elements with agitation assembly to minimize temperature gradient of the solution.

Regarding limitations recited in Claims 35, 47, 43, 45, 46 & 52-54 which are directed to a manner of operating disclosed apparatus (e.g., “wherein said measuring a characteristic comprises kinetic analysis”, “that moves the container relative to the optical sensing assembly”, “said flow being sufficient for said kinetic analysis”, “the kinetic analysis comprises molecular binding kinetic analysis”, “for providing heated flow of solution”, “for assay with the container mounted on the agitation assembly”, “robotic arm moves the optical sensing assembly”, “that causes the agitation device to agitate the solution to create the flow of the solution wherein the flow is sufficient for the kinetic analysis”, “motion is circular motion from 10 rpm to 5000 rpm”, “motion is circular motion from 100 rpm to 2000 rpm”), it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

Regarding claims 48-51, Ohta et al. teach a method for measuring a characteristic of a solution, the method comprising:

- providing the apparatus of claim 35 (see above); and
- agitating the solution (see e.g., vibrating mechanism 80 to agitate solution).

Although Ohta et al. disclose a use of a photometer (optical sensing assembly) for determining the reaction within each of the reaction vessel (well), Ohta et al. do not explicitly disclose the reaction vessel being configured for holding the photometer.

Klein et al. disclose an apparatus (e.g., well plate reactor, Abstract),

- the apparatus comprising an agitation assembly (e.g., agitator (158), P4/[0057]) operably coupled to a container with a plurality of wells containing solution (e.g., well plate, Fig. 1 (100)),
- each well being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being configured for measuring a characteristic of the solution (e.g., optical fiber probes (500), P8/[0093]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify optical fiber probes, as taught by Klein et al. to the sample assay apparatus so that each well can be monitored individually. This may be advantageous when each well is intended to study for different variables and requires use of different type of probes, as Klein et al. disclose that a plurality of measuring devices may be used, see P8/[0092-0096].

However, modified Ohta et al. fail to teach the measuring comprises kinetic analysis.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform various kinetic analysis, since the device of Ohta et al. is fully capable performing a multi-step assay using a controller to schedule and initiate assay measurements, see e.g., ¶ 0053, 0057, 0162.

9. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (PG Pub 2002/0006362) in view of Klein et al. (PG Pub 2005/0176155) and further in view of Bartick et al. (US 6579002).

Regarding Claim 42, Ohta et al. further disclose the apparatus wherein the apparatus rests on a surface suspended above the agitation device (see Fig. 6). However, Ohta et al. fail to disclose a use of suspensions.

Bartick et al. disclose a laboratory shaker (1) mounted on a suspension with springs (14) and/or dampers/shock absorbers to reduce vibration during operation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the agitation device of Ohta et al. to comprise suspensions since it was known in the art of laboratory shaker/agitator to use suspensions to minimize vibration caused during operation as disclosed by Bartick et al. (C7/L20-34).

Regarding limitations recited in Claim 42, which is directed to a manner of operating disclosed apparatus (e.g., “creating surface flow of the solution”), it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

Response to Arguments

10. Applicant's arguments filed 11/09/2010 have been fully considered but they are not persuasive.

11. In response to Applicants' argument regarding an agitation device that moves the container relative to the optical sensing assembly, Ohta et al. teach at least a vibrating motor (82) & a vibrating mechanism 80 that are capable of moving in X, Y & Z direction (Figs. 4 & 5) relative to the photometer 70. In addition, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

12. With respect to claim 52, Ohta et al. teach a personal computer (P3/[0053] & P4/[0076, 0079]) operably coupled to the agitation device. It is reminded that applicants are claiming a device and it is the structural limitations that considered in determining the patentability of the apparatus itself and not the device in "in practice".

13. With respect to claim 48-51, a new rejection has been placed as set forth above. If claim 48 is an independent claim, it is advisable to amend the claim including all the limitations of the apparatus claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean Kwak whose telephone number is 571-270-7072. The examiner can normally be reached on M-TH, 5:30 am - 4:00 pm EST.

Art Unit: 1773

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

27 December 2010

/LYLE A ALEXANDER/
Primary Examiner, Art Unit 1773

/D. K./
Examiner, Art Unit 1773

<i>Index of Claims</i> *1142366 9*	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner DEAN KWAK	Art Unit 1773

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant						☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE									
Final	Original	08/15/2009	10/27/2009	06/05/2010	12/27/2010						
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	2	÷	N	-	-						
	3	÷	N	-	-						
	4	÷	N	-	-						
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	6	÷	N	-	-						
	7	÷	N	-	-						
	8	÷	N	-	-						
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	32	÷	N	-	-						
	33	÷	N	-	-						

<i>Index of Claims</i> *1142366 9*	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner DEAN KWAK	Art Unit 1773

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant						☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE									
Final	Original	08/15/2009	10/27/2009	06/05/2010	12/27/2010						
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	47			✓	✓						
	48			✓	✓						
	49			✓	✓						
	50			✓	✓						
	51			✓	✓						
	52				✓						
	53				✓						
	54				✓						

Search Notes *1142366 9*	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner Dean Kwak	Art Unit 1773

SEARCHED			
Class	Subclass	Date	Examiner
422	102	10/28/2009	DK
	CLASS/SUBCLASS - UPDATED	6/5/2010	DK
	CLASS/SUBCLASS UPDATED	12/27/2010	DK

SEARCH NOTES		
Search Notes	Date	Examiner
PLUS SEARCH	8/24/2009	DK
EAST TEXT SEARCH	10/28/2009	DK
INVENTOR NAME SEARCH	10/28/2009	DK
INVENTOR SEARCH - UPDATED	6/5/2010	DK
INVENTOR SEARCH UPDATED	12/27/2010	DK

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	6	((MICHAEL) near2 (RECKNOR)).INV.	US-PGPUB; USPAT	OR	ON	2010/12/27 16:36
L2	127	((HONG) near2 (TAN)). INV.	US-PGPUB; USPAT	OR	ON	2010/12/27 16:36
L3	55	((ROBERT) near2 (ZUK)). INV.	US-PGPUB; USPAT	OR	ON	2010/12/27 16:36
L4	15	((KRISTA) near2 (WITTE)). INV.	US-PGPUB; USPAT	OR	ON	2010/12/27 16:36
L5	6	((SAE) near2 (CHOO)). INV.	US-PGPUB; USPAT	OR	ON	2010/12/27 16:37
L6	5	((SCOTT) near2 (LOCKARD)).INV.	US-PGPUB; USPAT	OR	ON	2010/12/27 16:37
L7	56	(L1 or L2 or L3 or L4 or L5 or L6) and (agitat\$5 or shak\$4 or vibrat\$5)	US-PGPUB; USPAT	OR	ON	2010/12/27 16:37
L8	25	L7 and optic\$4	US-PGPUB; USPAT	OR	ON	2010/12/27 16:38
S1	4	((MICHAEL) near2 (RECKNOR)).INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:14
S2	111	((HONG) near2 (TAN)). INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:14
S3	52	((ROBERT) near2 (ZUK)). INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:15
S4	10	((KRISTA) near2 (WITTE)). INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:15
S5	4	((SAE) near2 (CHOO)). INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:16
S6	3	((SCOTT) near2 (LOCKARD)).INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:16
S7	3	("5804453" "6436351" "6838051").PN.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:23

S8	49	(US-5779978-\$ or US-5944660-\$ or US-5958704-\$ or US-6009632-\$ or US-6060256-\$ or US-4775637-\$ or US-5220161-\$ or US-5280130-\$ or US-5349181-\$ or US-5357732-\$ or US-5374395-\$ or US-5399315-\$ or US-5409666-\$ or US-5477326-\$ or US-5498549-\$ or US-5557398-\$ or US-5673814-\$ or US-5946083-\$ or US-6020047-\$ or US-6048623-\$ or US-6115528-\$ or US-6151111-\$ or US-6188813-\$ or US-6191847-\$ or US-6203983-\$ or US-6274384-\$).did. or (US-6287765-\$ or US-6306347-\$ or US-6387709-\$ or US-6526188-\$ or US-6764226-\$ or US-6816241-\$ or US-6862301-\$ or US-6951545-\$ or US-6952603-\$ or US-7002688-\$ or US-7054258-\$ or US-7079468-\$ or US-7200100-\$ or US-7223367-\$ or US-7262847-\$ or US-7267798-\$ or US-7277210-\$ or US-7319525-\$ or US-7354772-\$ or US-7366063-\$ or US-7385695-\$ or US-7394547-\$ or US-7450980-\$).did.	USPAT	OR	ON	2009/10/27 16:23
S9	2	wo-2006138293-\$.did.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 17:00
S10	2	("20020009391").PN.	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2009/10/27 17:17
S11	118350	(multiwell or multi-well or (multi adj well) or ("96" adj well) or (96-well))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:45
S12	51352	S11 and (agitat\$5 or shak \$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:46
S13	13383	S11 same (agitat\$5 or shak \$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:46
S14	21	S13 same heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:47

S15	191809	plate same (agitat\$5 or shak\$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:49
S16	2474	S15 same heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:50
S17	59	S16 and (optical near3 measur\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:50
S18	1472	S11 with (agitat\$5 or shak\$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:05
S19	1043	S18 and heat\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:05
S21	33	S18 and heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:06
S22	29	S21 not S14	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:06
S23	117275	plate with (agitat\$5 or shak\$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:40
S24	951	S23 same heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:40
S25	13	S24 and (optical near3 measur\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:41
S26	15244	(plate or dish) near5 (shak\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 21:14
S27	93999	("422").CLAS.	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2009/10/28 21:15
S28	232	S26 and S27	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 21:15
S29	43	S28 and heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 21:15
S30	3	((("20040022677") or ("20050052646")).PN.	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2009/10/28 21:17
S31	2	S30 and shak\$5	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 21:23

S32	27	S29 and optic\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 23:45
S33	0	S32 and (spring near3 suspension)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/29 01:28
S34	32	S26 and (spring near3 suspension)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/29 01:28
S35	4	((MICHAEL) near2 (RECKNOR)).INV.	US-PGPUB; USPAT	OR	ON	2010/06/05 23:36
S36	117	((HONG) near2 (TAN)). INV.	US-PGPUB; USPAT	OR	ON	2010/06/05 23:36
S37	53	((ROBERT) near2 (ZUK)). INV.	US-PGPUB; USPAT	OR	ON	2010/06/05 23:36
S38	13	((KRISTA) near2 (WITTE)). INV.	US-PGPUB; USPAT	OR	ON	2010/06/05 23:36
S39	5	((SAE) near2 (CHOO)). INV.	US-PGPUB; USPAT	OR	ON	2010/06/05 23:36
S40	4	((SCOTT) near2 (LOCKARD)).INV.	US-PGPUB; USPAT	OR	ON	2010/06/05 23:36

EAST Search History (Interference)

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12/ 27/ 2010 4:40:23 PM

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Tray_Recknor et al_27Oct09.wsp**

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)

Application Number	11/423,669	Filing Date	2006-06-12	Docket Number (if applicable)	24377-11758 US	Art Unit	1773
First Named Inventor	Michael W. Recknor			Examiner Name	Dean P. Kwak		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☒ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☒ Other Amendment and Reply filed Nov. 9, 2010.

☐ Enclosed

☐ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☐ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No _____

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	/Pauline Farmer-Koppenol/	Date (YYYY-MM-DD)	2010-11-22
Name	Pauline Farmer-Koppenol	Registration Number	58004

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	11423669			
Filing Date:	12-Jun-2006			
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS			
First Named Inventor/Applicant Name:	Michael W. Recknor			
Filer:	Pauline Farmer-Koppenol/Heather Orosco			
Attorney Docket Number:	24377-11758			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 3 months with \$245 paid	2253	1	310	310

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Request for continued examination	2801	1	405	405
Total in USD (\$)				715

Electronic Acknowledgement Receipt

EFS ID:	8893166
Application Number:	11423669
International Application Number:	
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor/Applicant Name:	Michael W. Recknor
Customer Number:	00758
Filer:	Pauline Farmer-Koppenol
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	22-NOV-2010
Filing Date:	12-JUN-2006
Time Stamp:	23:21:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$715
RAM confirmation Number	8140
Deposit Account	192555
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	11758_US_RCE.pdf	697887 40852e10a90aff98c5885677de7871cc704157b1	no	3
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	32162 2b5da3c7f38b86a09fafc95309d62166aa37ab64	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			730049		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 11/423,669		Filing Date 06/12/2006		☐ To be Mailed			
APPLICATION AS FILED – PART I												
(Column 1)			(Column 2)		SMALL ENTITY ☒ OR			OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)		
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A			N/A			
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A			N/A			
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A			N/A			
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$	=		X \$	=		X \$	=		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=		X \$	=		X \$	=		
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))												
* If the difference in column 1 is less than zero, enter "0" in column 2.												
APPLICATION AS AMENDED – PART II												
(Column 1)			(Column 2)		(Column 3)			SMALL ENTITY OR			OTHER THAN SMALL ENTITY	
AMENDMENT	11/22/2010	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 46	= 0	X \$26 =	0		X \$ =		X \$ =	
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0	X \$110 =	0		X \$ =		X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
						TOTAL ADD'L FEE	0		TOTAL ADD'L FEE			
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =			X \$ =		X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =			X \$ =		X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
						TOTAL ADD'L FEE			TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.												

Legal Instrument Examiner:
/CRYSTAL QUEEN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Michael W. Recknor, et al.
SERIAL NO.: 11/423,669
FILING DATE: June 12, 2006
TITLE: Tip Tray Assembly For Optical Sensors
EXAMINER: Dean P. Kwak
GROUP ART UNIT: 1797
ATTY. DKT. NO.: 24377-11758

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the **Pacific Time Zone** of the United States on the local date shown below.

Dated: 9 November 2010

By: /Pauline Farmer-Koppenol/

Pauline Farmer-Koppenol, Reg. No. 58,004

AMENDMENT B

Sir:

This amendment for the patent application identified above is in response to the Office action dated June 9, 2010, which set a shortened statutory period for response that expired on September 9, 2010. The fee for two months' extension is included herewith and thus this response is timely filed.

Amendments to the claims begin on page 2 of this paper.

Remarks begin on page 5 of this paper.

Kindly amend this application as indicated herein.

DO NOT ENTER: /D.K./

11/10/2010



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/423,669	06/12/2006	Michael W. Recknor	24377-11758	6275

758 7590 11/19/2010
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

KWAK, DEAN P

ART UNIT	PAPER NUMBER
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1773

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

11/19/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOC@Fenwick.com

Advisory Action Before the Filing of an Appeal Brief	Application No. 11/423,669	Applicant(s) RECKNOR ET AL.	
	Examiner Dean Kwak	Art Unit 1773	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 09 November 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
- (a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
- (b) ☐ They raise the issue of new matter (see NOTE below);
- (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
- (d) ☒ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: See Continuation Sheet. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
- The status of the claim(s) is (or will be) as follows:
- Claim(s) allowed: none.
- Claim(s) objected to: _____.
- Claim(s) rejected: 35-51.
- Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:
See Continuation Sheet.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/LYLE A ALEXANDER/
 Primary Examiner, Art Unit 1773

Continuation of 3. NOTE: New claims 52-54 raise new issues that would require further consideration and/search. In addition, applicants have added without canceling finally rejected claims.

Continuation of 11. does NOT place the application in condition for allowance because: Regarding "... that moves the container relative to the optical sensing assembly..." of claim 35, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Michael W. Recknor, et al.
SERIAL NO.: 11/423,669
FILING DATE: June 12, 2006
TITLE: Tip Tray Assembly For Optical Sensors
EXAMINER: Dean P. Kwak
GROUP ART UNIT: 1797
ATTY. DKT. NO.: 24377-11758

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

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Dated: 9 November 2010

By: /Pauline Farmer-Koppenol/

Pauline Farmer-Koppenol, Reg. No. 58,004

AMENDMENT B

Sir:

This amendment for the patent application identified above is in response to the Office action dated June 9, 2010, which set a shortened statutory period for response that expired on September 9, 2010. The fee for two months' extension is included herewith and thus this response is timely filed.

Amendments to the claims begin on page 2 of this paper.

Remarks begin on page 5 of this paper.

Kindly amend this application as indicated herein.

In the Claims:

Claim 35 is amended herein. Claims 52-54 are added. All pending claims are produced below.

1. 34. (Canceled)

35. (Previously presented) An apparatus for maintaining flow of the solution, the apparatus comprising

an agitation assembly operably coupled to a container with a plurality of wells containing solution, each well being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being configured for measuring a characteristic of the solution wherein said measuring a characteristic comprises kinetic analysis and wherein the agitation assembly comprises an agitation device that moves the container relative to the optical sensing assembly and according to a specified type of motion to agitate the solution relative to the optical assembly to create flow of the solution relative to the optical assembly ~~said flow being sufficient for said kinetic analysis.~~

36. (Original) The apparatus of claim 35, wherein the agitation device is driven by an electrical motor.

37. (Original) The apparatus of claim 35, wherein the specified type of motion is repetitive motion of the solution in the well, relative to the optical assembly.

38. (Original) The apparatus of claim 37, wherein the repetitive motion is circular motion.

39. (Original) The apparatus of claim 35, wherein the agitation device is driven by an actuator for creating repetitive motion that is not in orbital trajectory.

40. (Original) The apparatus of claim 35, wherein the specified type of motion is random motion of the solution in the well, relative to the optical assembly.

41. (Original) The apparatus of claim 35, wherein the agitation device is operably coupled with the optical assembly to move the assembly relative to the sample.

42. (Original) The apparatus of claim 35, wherein the apparatus rests on a surface suspended above the agitation device with suspensions, the agitation device providing agitation of the container creating surface flow of the solution relative to the optical assembly.

43. (Original) The apparatus of claim 35, wherein the agitation assembly further comprises a heater adapter for providing heated flow of solution.

44. (Original) The apparatus of claim 43, wherein the heater adapter is positioned between the container and the agitation assembly and is operable coupled to the container and the agitation assembly.
45. (Original) The apparatus of claim 35, wherein the agitation assembly is included in a robotic instrument for assay with the container mounted on the agitation assembly, the container and agitation assembly being mounted in the instrument adjacent to a substrate for holding an optical sensing assembly.
46. (Original) The apparatus of claim 45, wherein a robotic arm moves the optical sensing assembly from the substrate to the container to dip the assembly in the solution, the solution being simultaneously agitated by the agitation device.
47. (Previously Presented) The apparatus of claim 35 wherein the kinetic analysis comprises molecular binding kinetic analysis.
48. (Previously Presented) A method for measuring a characteristic of a solution, the method comprising:
- providing the apparatus of claim 35;
 - agitating the solution;
 - contacting the solution with the optical sensing assembly; and
 - measuring the characteristic of the solution with the optical assembly wherein the measuring comprises kinetic analysis.
49. (Previously Presented) The method of claim 48 wherein said measuring comprises biolayer interferometry.
50. (Previously Presented) The method of claim 48 wherein the kinetic analysis comprises molecular binding kinetic analysis.
51. (Previously Presented) The method of claim 48 wherein the characteristic comprises molecular binding.
52. (New) The apparatus of claim 35 further comprising a controller operably coupled to the agitation device that causes the agitation device to agitate the solution to create the flow of the solution wherein the flow is sufficient for the kinetic analysis.
53. (New) The apparatus of claim 52 wherein the specified type of motion is circular motion from 10 rpm to 5000 rpm.

54. (New) The apparatus of claim 53 wherein the specified type of motion is circular motion from 100 rpm to 2000 rpm.

REMARKS

Claims 35-41 and 43-51 were pending and presented for examination and in this application. In an Office Action dated June 9, 2010 claims 35-41 and 43-51 were rejected. The Applicants thank the Examiner for examination of the claims pending in this application and address the Examiner's comments below.

The Applicants are amending claim 35 and adding claims 52-54 in this Amendment and Response. Support for the amendment to claim 35 can be found throughout the application as filed and particularly at paragraphs [0047] and [0090]. Support for new claims 52-54 can be found throughout the application as filed and particularly at paragraph [0091].

In view of the Amendments herein and the Remarks that follow, the Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections, and withdraw them.

Interview Summary

On August 5, 2010 a telephonic interview was conducted between the Applicants' representatives, Pauline Farmer-Koppenol and Antonia Sequeira and Examiner Kwak and Examiner Conley. The Applicants thank the Examiners for their time. The Ohta and Klein references were discussed as well as claim 35. No agreement was reached.

Response to Rejection Under 35 USC §103(a)

The Examiner rejected claims 35-41 and 43-51 under 35 USC §103(a) as allegedly being unpatentable over Ohta et al. (Publication No. 2002/0006362) ("Ohta") and further in view of Klein et al. (Publication No. 2005/0176155 ("Klein")). That rejection is now moot.

As amended, claim 35 recites:

An apparatus for maintaining flow of the solution, the apparatus comprising
an agitation assembly operably coupled to a container with a plurality of wells
containing solution, each well being configured for holding a discrete optical
sensing assembly therein, the optical sensing assembly being configured for
measuring a characteristic of the solution wherein said measuring a
characteristic comprises kinetic analysis and wherein the agitation assembly
comprises an **agitation device that moves the container relative to the
optical sensing assembly** and according to a specified type of motion to
agitate the solution relative to the optical assembly to create flow of the
solution relative to the optical assembly.

Thus, the claimed apparatus comprises, *inter alia*, an agitation device that moves the
container relative to the optical assembly. Neither Ohta nor Klein disclose or suggest an
agitation device that moves the container relative to the optical assembly.

The Examiner recites Klein as disclosing wells being configured for holding a
discrete optical sensing assembly therein. The apparatus of Klein when combined with the
apparatus of Ohta would not however allow for an agitation device that moves the container
relative to the optical sensing assembly. As shown in FIG. 19 and accompanying paragraph
[0092], of Klein, the probes 500 extend downward from and are attached to the lid 502 of the
well plate 100. The lid 502 is then placed on the well plate 100. In such an embodiment, the
well plate 100, which the Examiner argues is analogous to the container of the claimed
apparatus, would not move relative to the probes 500, which the Examiner argues are
analogous to the optical sensing assembly. To the contrary, the well plate 100 and lid 502
would move together when the well plate 100 is moved. Thus neither Klein nor Ohta,
separately or in combination, disclose or suggest an agitation device that moves the container
relative to the optical sensing assembly and all claims are distinguished over Klein and Ohta.

Further, new claim 52 (which depends from claim 35) recites a controller operably
coupled to the agitation device that causes the agitation device to agitate the solution to

create the flow of the solution wherein the flow is sufficient for the kinetic analysis. Neither Klein nor Ohta disclose or suggest a controller operably coupled to the agitation device that causes the agitation device to agitate the solution to create the flow of the solution wherein the flow is sufficient for kinetic analysis. As stated in paragraph [0008] of the Instant Application, without proper flow, it is impossible to provide a valid environment for kinetic analysis. The apparatus disclosed in Ohta is described as an enzyme immunoassay. Ohta at [0001]. Enzyme immunoassays are not kinetic assays and Ohta does not suggest that the disclosed apparatus is suitable for kinetic assays in addition to enzyme immunoassays.

Klein does not remedy the deficiencies of Ohta. Klein discloses a well plate and supporting devices providing capabilities to control oxygen level, pH and temperature of the contents of the wells. The optical probes disclosed in [0093] of Klein are oxygen and pH sensors. Klein does not disclose an optical sensing assembly configured for kinetic analysis. Nor does Klein disclose that its agitator creates flow sufficient for kinetic analysis. For this additional reason, claim 52 and its dependent claims 53 and 54 are distinguished over Ohta and Klein.

Claim 48 is a claim directed to a method of using the apparatus of claim 35. The Examiner states the method of measuring a characteristic of a solution is given little patentable weight in product claims. Claim 48 is however not a product claim, it is a method claim. One of the steps of the claimed method recites using an apparatus having the features of the apparatus of claim 35 but then there are additional steps to the method. As stated in MPEP § 2143.03, “ ‘All words in a claim must be considered in judging the patentability of that claim against the prior art.’ ”

Neither Klein nor Ohta, alone or in combination, teach or suggest a method for measuring a characteristic of a solution wherein the measuring comprises kinetic analysis, regardless of apparatus. As stated previously, Ohta and Klein both recite various types of analysis but none of them are kinetic analyses. Thus claim 48 and its dependent claims, 49-51, are distinguished over both Ohta and Klein, separately or in combination.

The Examiner rejected claim 42 under 35 USC §103(a) as allegedly being unpatentable over Ohta further in view of Klein and further in view of Bartick et al. (U.S. Patent No. 6,579,002) (“Bartick”). This rejection is respectfully traversed.

Claim 42 depends from claim 35 and as such is distinguished over Ohta and Klein. Bartick does not remedy the deficiencies of Ohta and Bartick. Bartick discloses a high performance shaker but does not disclose doing kinetic analysis or an optical assembly. Therefore, claim 42 is distinguished over Ohta, Klein and Bartick, individually or in combination.

/ / /

Conclusion

In sum, Applicants respectfully submit that claims 35-41 and 43-54, as presented herein, are patentably distinguishable over the cited references. Therefore, Applicants request reconsideration of the basis for the rejections to these claims and request allowance of them. In addition, Applicants respectfully invite Examiner to contact Applicants' representative at the number provided below if Examiner believes it will help expedite furtherance of this application.

Respectfully Submitted,
MICHAEL W. RECKNOR, ET AL.

Date: 9 November 2010

By: /Pauline Farmer-Koppenol/

Pauline Farmer-Koppenol, Attorney of Record
Registration No. 58,004
FENWICK & WEST LLP
801 California Street
Mountain View, CA 94041
Phone (650) 335-7181
Fax (650) 938-5200

Electronic Patent Application Fee Transmittal

Application Number:	11423669			
Filing Date:	12-Jun-2006			
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS			
First Named Inventor/Applicant Name:	Michael W. Recknor			
Filer:	Pauline Farmer-Koppenol/Heather Orosco			
Attorney Docket Number:	24377-11758			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with \$0 paid	2252	1	245	245

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				245

Electronic Acknowledgement Receipt

EFS ID:	8799147
Application Number:	11423669
International Application Number:	
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor/Applicant Name:	Michael W. Recknor
Customer Number:	00758
Filer:	Pauline Farmer-Koppenol
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	09-NOV-2010
Filing Date:	12-JUN-2006
Time Stamp:	14:13:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		11758_US_Amendment_B.pdf	144377 d65d2307133b85e450d17617e786a81f52c84ca1	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment After Final	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	9

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	30490	no	2
			0f8ad0b3866ce5919d2534f26ce58b592446d492		

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Total Files Size (in bytes):			174867
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Patent Application Fee Transmittal

Application Number:	11423669			
Filing Date:	12-Jun-2006			
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS			
First Named Inventor/Applicant Name:	Michael W. Recknor			
Filer:	Pauline Farmer-Koppenol			
Attorney Docket Number:	24377-11758			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with \$0 paid	2252	1	245	245

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				245

Electronic Acknowledgement Receipt

EFS ID:	8799281
Application Number:	11423669
International Application Number:	
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor/Applicant Name:	Michael W. Recknor
Customer Number:	00758
Filer:	Pauline Farmer-Koppenol
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	09-NOV-2010
Filing Date:	12-JUN-2006
Time Stamp:	14:17:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 245
RAM confirmation Number	438
Deposit Account	192555
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (PTO-875)	fee-info.pdf	30424	no	2
			f67d37b8320ab1007ed78e09470e73ad8e40becc		

Warnings:

Information:

Total Files Size (in bytes):	30424
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 11/423,669		Filing Date 06/12/2006		☐ To be Mailed			
APPLICATION AS FILED – PART I												
(Column 1)			(Column 2)		SMALL ENTITY ☒ OR			OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)		
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A			N/A			
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A			N/A			
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A			N/A			
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$	=		X \$	=		X \$	=		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=		X \$	=		X \$	=		
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))												
* If the difference in column 1 is less than zero, enter "0" in column 2.												
APPLICATION AS AMENDED – PART II												
(Column 1)			(Column 2)		(Column 3)			SMALL ENTITY OR			OTHER THAN SMALL ENTITY	
AMENDMENT	11/09/2010	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 46	=	0		X \$	=		X \$	=
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	=	0		X \$	=		X \$	=
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
	TOTAL ADD'L FEE											
(Column 1) (Column 2) (Column 3)												
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=		X \$	=		X \$	=	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		X \$	=		X \$	=	
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
	TOTAL ADD'L FEE											
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.												

Legal Instrument Examiner:
/BRENDA MURPHY/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/423,669	06/12/2006	Michael W. Recknor	24377-11758

CONFIRMATION NO. 6275

PUBLICATION NOTICE



OC000000043989373

758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

Title:TIP TRAY ASSEMBLY FOR OPTICAL SENSORS

Publication No.US-2010-0261288-A1

Publication Date:10/14/2010

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/423,669

06/12/2006

Michael W. Recknor

24377-11758

6275

758 7590 08/19/2010

FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

KWAK, DEAN P

ART UNIT

PAPER NUMBER

1797

NOTIFICATION DATE

DELIVERY MODE

08/19/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOC@Fenwick.com

Interview Summary	Application No. 11/423,669	Applicant(s) RECKNOR ET AL.	
	Examiner Dean Kwak	Art Unit 1797	

All participants (applicant, applicant's representative, PTO personnel):

(1) Dean Kwak. (3) Pauline Farmer-Koppenol.

(2) Sean Conley, Primary 1797. (4) Antonia Sequeira.

Date of Interview: 05 August 2010.

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
If Yes, brief description: _____.

Claim(s) discussed: 35.

Identification of prior art discussed: Ohta et al. (PG Pub 2002/0006362).

Agreement with respect to the claims f) ☐ was reached. g) ☒ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Examiners suggested to further amend the claim to add structural limitations to overcome prior art. Allowance with respect to the claims was not reached at this time.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Sean E Conley/ Primary Examiner, Art Unit 1797	
--	--

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

FENWICK & WEST LLP

555 CALIFORNIA STREET, 12TH FLOOR SAN FRANCISCO, CA 94104
TEL 415.875.2300 FAX 415.281.1350 WWW.FENWICK.COM

CCFACSIMILE TRANSMISSION**CONFIDENTIAL****DATE:** August 3, 2010**CLIENT-MATTER NUMBER:** 24377-11758 US**To:**

NAME:	FAX NO.:	PHONE NO.:
Examiner Dean P. Kwak USPTO	571-270-8072	571-270-7072

FROM: Pauline Farmer-Koppenol **PHONE:** (415) 875-2406**RE:** Interview Request Form for Application 11/423,669

NUMBER OF PAGES WITH COVER PAGE: 2	
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MESSAGE:

Examiner Kwak,
Following please find an Applicant Initiated Interview Request Form. A telephonic interview has been requested for August 3, 2010 at 2:30 PM (ET).

Best regards,
Pauline Farmer-Koppenol

CAUTION - CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS FACSIMILE MESSAGE IS PRIVILEGED AND CONFIDENTIAL INFORMATION INTENDED ONLY FOR THE USE OF THE INDIVIDUAL OR ENTITY NAMED ABOVE OR ITS DESIGNEE. IF THE READER OF THIS MESSAGE IS NOT THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION, DISTRIBUTION OR COPY OF THIS COMMUNICATION IS STRICTLY PROHIBITED. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR PLEASE IMMEDIATELY NOTIFY US BY TELEPHONE AND RETURN THE ORIGINAL MESSAGE TO US AT THE ABOVE ADDRESS VIA THE U.S. POSTAL SERVICE. THANK YOU.

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AS SOON AS POSSIBLE.**

24377/11758/SF/5304716.1

Doc Code: M865 or FAI.REQ.INTV

PTOL-413A (10-09)
 Approved for use through 07/31/2012. OMB 0651-0031
 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

Application No.: 11/423,669 First Named Applicant: Michael W. Recknor
 Examiner: Dean P. Kwak Art Unit: 1797 Status of Application: pending

Tentative Participants:

(1) Pauline Farmer-Koppenol (2) Antonia Sequeira

(3) _____ (4) _____

Proposed Date of Interview: Aug. 3, 2010 Proposed Time: 2:30 ET (AM/PM) PM

Type of Interview Requested:

(1) ☒ Telephonic (2) ☐ Personal (3) ☐ Video Conference

Exhibit To Be Shown or Demonstrated: ☐ YES ☒ NO

If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) <u>35 USC 103</u>	<u>35</u>	<u>Ohta and Klein</u>	☐	☐	☐
(2) _____	_____	_____	☐	☐	☐
(3) _____	_____	_____	☐	☐	☐
(4) _____	_____	_____	☐	☐	☐

☐ Continuation Sheet Attached

☐ Proposed Amendment or Arguments Attached

Brief Description of Arguments to be Presented:

Neither Ohta nor Klein disclose apparatus capable of
providing a valid environment for kinetic analysis.

An interview was conducted on the above-identified application on _____.

NOTE: This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP § 713.01).

This application will not be delayed from issue because of applicant's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible.

/Pauline Farmer-Koppenol/
 Applicant/Applicant's Representative Signature

 Examiner/SPE Signature

Pauline Farmer-Koppenol
 Typed/Printed Name of Applicant or Representative

58,004

Registration Number, if applicable

This collection of information is required by 37 CFR 1.133. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

AUG 02 2010

Doc Code: M865 or FAI.REQ.INTV.

PTOL-413A (10-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE**Applicant Initiated Interview Request Form**Application No.: 11/423,669 First Named Applicant: Michael W. Recknor
Examiner: Dean P. Kwak Art Unit: 1797 Status of Application: pending**Tentative Participants:**(1) Pauline Farmer-Koppenol (2) Antonia Sequeira

(3) _____ (4) _____

Proposed Date of Interview: Aug. 3, 2010 Proposed Time: 2:30 ET (AM/PM) PM**Type of Interview Requested:**(1) ☒ Telephonic (2) ☐ Personal (3) ☐ Video ConferenceExhibit To Be Shown or Demonstrated: ☐ YES ☒ NO

If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) <u>35 USC 103</u>	<u>35</u>	<u>Ohta and Klein</u>	☐	☐	☐
(2) _____	_____	_____	☐	☐	☐
(3) _____	_____	_____	☐	☐	☐
(4) _____	_____	_____	☐	☐	☐

☐ Continuation Sheet Attached☐ Proposed Amendment or Arguments Attached**Brief Description of Arguments to be Presented:**

Neither Ohta nor Klein disclose apparatus capable of
providing a valid environment for kinetic analysis.

An interview was conducted on the above-identified application on _____.

NOTE: This form should be completed by applicant and submitted to the examiner in advance of the interview (see MPEP § 713.01).

This application will not be delayed from issue because of applicant's failure to submit a written record of this interview. Therefore, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible.

/Pauline Farmer-Koppenol/
Applicant/Applicant's Representative Signature

Examiner/SPE Signature

Pauline Farmer-Koppenol
Typed/Printed Name of Applicant or Representative

58,004_____
Registration Number, if applicable

This collection of information is required by 37 CFR 1.133. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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AUG 02 2010

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555 CALIFORNIA STREET, 12TH FLOOR SAN FRANCISCO, CA 94104
TEL 415.875.2300 FAX 415.281.1350 WWW.FENWICK.COM

CCFACSIMILE TRANSMISSION**CONFIDENTIAL****DATE:** August 2, 2010**CLIENT-MATTER NUMBER:** 24377-11758 US**To:**

NAME:	FAX NO.:	PHONE NO.:
Examiner Dean P. Kwak USPTO	571-273-8300	571-270-7072

FROM: Pauline Farmer-Koppenol **PHONE:** (415) 875-2406**RE:** Interview Request Form for Application 11/423,669**NUMBER OF PAGES WITH COVER PAGE:** 2**MESSAGE:**

Examiner Kwak,
Following please find an Applicant Initiated Interview Request Form. A telephonic interview has been requested for August 3, 2010 at 2:30 PM (ET).

Best regards,
Pauline Farmer-Koppenol

CAUTION - CONFIDENTIAL

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24377/11758/SF/5304640.1



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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/423,669	06/12/2006	Michael W. Recknor	24377-11758

CONFIRMATION NO. 6275

NEW OR REVISED PPD NOTICE



758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

NOTICE OF NEW OR REVISED PROJECTED PUBLICATION DATE

The above-identified application has a new or revised projected publication date. The current projected publication date for this application is 10/14/2010. If this is a new projected publication date (there was no previous projected publication date), the application has been cleared by Licensing & Review or a secrecy order has been rescinded and the application is now in the publication queue.

If this is a revised projected publication date (one that is different from a previously communicated projected publication date), the publication date has been revised due to processing delays in the USPTO or the abandonment and subsequent revival of an application. The application is anticipated to be published on a date that is more than six weeks different from the originally-projected publication date.

More detailed publication information is available through the private side of Patent Application Information Retrieval (PAIR) System. The direct link to access PAIR is currently <http://pair.uspto.gov>. Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Questions relating to this Notice should be directed to the Office of Data Management, Application Assistance Unit at (571) 272-4000, or (571) 272-4200, or 1-888-786-0101.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/423,669

06/12/2006

Michael W. Recknor

24377-11758

6275

758

7590

06/09/2010

FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

KWAK, DEAN P

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

06/09/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 11/423,669	Applicant(s) RECKNOR ET AL.	
	Examiner Dean Kwak	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 May 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 35-41 & 43-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (PG Pub 2002/0006362) and further in view of Klein et al. (PG Pub 2005/0176155).

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Regarding Claim 35, Ohta et al. disclose an apparatus (e.g., sample assaying apparatus, Abstract & Fig. 1),

- the apparatus comprising an agitation assembly (e.g., vibrating mechanism, P10/[0151] & Fig. 1 (80)) operably coupled to a container with a plurality of wells containing solution (e.g., assay plate or microplate, P3/[0056]),
- the optical sensing assembly being configured for measuring a characteristic of the solution (e.g., photometer (70), Claim 4),
- wherein the agitation assembly comprises an agitation device that moves the container according to a specified type of motion to agitate the solution relative to the optical assembly to create flow of the solution relative to the optical assembly (P4/[0075]).

Regarding Claim 35, although Ohta et al. disclose a use of a photometer (optical sensing assembly) for determining the reaction within each of the reaction vessel (well), Ohta et al. do not explicitly disclose the reaction vessel being configured for holding the photometer.

Klein et al. disclose an apparatus (e.g., well plate reactor, Abstract),

- the apparatus comprising an agitation assembly (e.g., agitator (158), P4/[0057]) operably coupled to a container with a plurality of wells containing solution (e.g., well plate, Fig. 1 (100)),

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- each well being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being configured for measuring a characteristic of the solution (e.g., optical fiber probes (500), P8/[0093]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify optical fiber probes, as taught by Klein et al. to the sample assay apparatus so that each well can be monitored individually. This may be advantageous when each well is intended to study for different variables and requires use of different type of probes, as Klein et al. disclose that a plurality of measuring devices may be used, see P8/[0092-0096].

Regarding Claim 35, Ohta et al. & Klein et al. meet all the structural limitations recited by the instant invention. Applicants' preamble recites "*for maintaining flow of the solution*". A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding Claims 36-39, 41, 43, 45 & 46, Ohta et al. further disclose the apparatus wherein:

- the agitation device is driven by an electrical motor (e.g., vibrating motor (82), P4/[0075]);

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- the specified type of motion is repetitive motion of the solution in the well, relative to the optical assembly (see the vibration is made at a predetermined rotation angle, P4/[0076]);
- the repetitive motion is circular motion (P4/[0077]);
- the agitation device is driven by an actuator for creating repetitive motion that is not in orbital trajectory (e.g., circular motion, P4/[0077]);
- the agitation device is operably coupled with the optical assembly to move the assembly relative to the sample (see the photometer (70) and vibrating mechanism (80) operably couple as shown in Fig. 1);
- the agitation assembly further comprises a heater adapter (e.g., temperature maintaining mechanism, Fig. 1 (50));
- the agitation assembly is included in a robotic instrument (Fig. 2 (10)); and
- a robotic arm (see P5/[0094] & Fig. 10 (A)).

Regarding Claim 40, although Ohta et al. do not explicitly disclose the motion is random motion, the reference discloses the vibrating mechanism being able to move in X, Y & Z direction. It would have been obvious to one having ordinary skill in the art at the time the invention was made to control the vibrating mechanism to vibrate in random motion to enhance mixing of the solution.

Regarding Claim 44, Ohta et al. fail to disclose the agitation assembly is coupled to the container.

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Klein et al. further disclose a plurality of heating elements (206) associated with each well (110), P5/[0061].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate heating elements with agitation assembly to minimize temperature gradient of the solution.

Regarding limitations recited in Claims 35, 47, 43, 45 & 46 which are directed to a manner of operating disclosed apparatus (e.g., “*wherein said measuring a characteristic comprises kinetic analysis*”, “*said flow being sufficient for said kinetic analysis*”, “*the kinetic analysis comprises molecular binding kinetic analysis*”, “*for providing heated flow of solution*”, “*for assay with the container mounted on the agitation assembly*”, “*robotic arm moves the optical sensing assembly*”), it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

Regarding limitations recited in Claims 48-51, which are directed to method of measuring a characteristic of a solution, it is noted that said limitations are given little patentable weight in the product claims. In addition, determination of patentability is based on the product

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itself and does not depend on its method of use. Therefore, since the structure body as recited in Claims 48-51 are the same as the structure body disclosed by modified Ohta et al., as set forth above, the claim is unpatentable.

5. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (PG Pub 2002/0006362) in view of Klein et al. (PG Pub 2005/0176155) and further in view of Bartick et al. (US 6579002).

Regarding Claim 42, Ohta et al. further disclose the apparatus wherein the apparatus rests on a surface suspended above the agitation device (see Fig. 6). However, Ohta et al. fail to disclose a use of suspensions.

Bartick et al. disclose a laboratory shaker (1) mounted on a suspension with springs (14) and/or dampers/shock absorbers to reduce vibration during operation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the agitation device of Ohta et al. to comprise suspensions since it was known in the art of laboratory shaker/agitator to use suspensions to minimize vibration caused during operation as disclosed by Bartick et al. (C7/L20-34).

Regarding limitations recited in Claim 42, which is directed to a manner of operating disclosed apparatus (e.g., “*creating surface flow of the solution*”), it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states

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“Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

Response to Arguments

6. Applicant's arguments filed 05/04/2010 have been fully considered but they are not persuasive.

7. In response to applicant's argument that "*an agitation device ... to create flow of the solution., the flow being sufficient for said kinetic analysis.*", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

8. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean Kwak whose telephone number is 571-270-7072. The examiner can normally be reached on M-TH, 5:30 am - 4:00 pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

05 Jun 2010

/LYLE A ALEXANDER/
Primary Examiner, Art Unit 1797

/D. K./
Examiner, Art Unit 1797

<i>Index of Claims</i> 	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner DEAN KWAK	Art Unit 1797

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant					☐ CPA					☐ T.D.					☐ R.1.47				
CLAIM		DATE																	
Final	Original	08/15/2009	10/27/2009	06/05/2010															
	1	÷	N	-															
	2	÷	N	-															
	3	÷	N	-															
	4	÷	N	-															
	5	÷	N	-															
	6	÷	N	-															
	7	÷	N	-															
	8	÷	N	-															
	9	÷	N	-															
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	11	÷	N	-															
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	14	÷	N	-															
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	30	÷	N	-															
	31	÷	N	-															
	32	÷	N	-															
	33	÷	N	-															
	34	÷	N	-															
	35	÷	✓	✓															
	36	÷	✓	✓															

<i>Index of Claims</i> 	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner DEAN KWAK	Art Unit 1797

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant		☐ CPA		☐ T.D.		☐ R.1.47			
CLAIM		DATE							
Final	Original	08/15/2009	10/27/2009	06/05/2010					
	37	÷	✓	✓					
	38	÷	✓	✓					
	39	÷	✓	✓					
	40	÷	✓	✓					
	41	÷	✓	✓					
	42	÷	✓	✓					
	43	÷	✓	✓					
	44	÷	✓	✓					
	45	÷	✓	✓					
	46	÷	✓	✓					
	47			✓					
	48			✓					
	49			✓					
	50			✓					
	51			✓					

Search Notes 	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner Dean Kwak	Art Unit 1797

SEARCHED			
Class	Subclass	Date	Examiner
422	102	10/28/2009	DK
	CLASS/SUBCLASS - UPDATED	6/5/2010	DK

SEARCH NOTES		
Search Notes	Date	Examiner
PLUS SEARCH	8/24/2009	DK
EAST TEXT SEARCH	10/28/2009	DK
INVENTOR NAME SEARCH	10/28/2009	DK
INVENTOR SEARCH - UPDATED	6/5/2010	DK

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Michael W. Recknor, et al.
SERIAL NO.: 11/423,669
FILING DATE: June 12, 2006
TITLE: Tip Tray Assembly For Optical Sensors
EXAMINER: Dean P. Kwak
GROUP ART UNIT: 1797
ATTY. DKT. NO.: 24377-11758

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the **Pacific Time Zone** of the United States on the local date shown below.

Dated: 4 May 2010

By: /Pauline Farmer-Koppenol/

Pauline Farmer-Koppenol, Reg. No. 58,004

AMENDMENT A

Sir:

This amendment for the patent application identified above is in response to the Office action dated November 4, 2009, which set a shortened statutory period for response that expired on February 4, 2010. The fee for three months' extension is included herewith and thus this response is timely filed.

Amendments to the claims begin on page 3 of this paper.

Remarks begin on page 8 of this paper.

Kindly amend this application as indicated herein.

OBJECTION TO THE DRAWINGS

The Examiner has objected to Figure 13c as being too dark.

A substitute drawing sheet for Figure 13c is submitted with the Amendment and Response. Entry of the substitute drawing sheet is respectfully requested. Applicants also request that Examiner explicitly indicate his approval of the substitute drawing sheet in the next official communication.

IN THE CLAIMS:

Claims 1-34 are canceled. Claim 35 are amended herein. Claims 47-49 are added
All pending claims are produced below.

1. 34. (Canceled)

35. (Currently Amended) An apparatus for maintaining flow of the solution, the apparatus comprising an agitation assembly operably coupled to a container with a plurality of wells containing solution, each well being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being configured for measuring a characteristic of the solution wherein said measuring a characteristic comprises kinetic analysis and wherein the agitation assembly comprises an agitation device that moves the container according to a specified type of motion to agitate the solution relative to the optical assembly to create flow of the solution relative to the optical assembly said flow being sufficient for said kinetic analysis.
36. (Original) The apparatus of claim 35, wherein the agitation device is driven by an electrical motor.
37. (Original) The apparatus of claim 35, wherein the specified type of motion is repetitive motion of the solution in the well, relative to the optical assembly.
38. (Original) The apparatus of claim 37, wherein the repetitive motion is circular motion.
39. (Original) The apparatus of claim 35, wherein the agitation device is driven by an actuator for creating repetitive motion that is not in orbital trajectory.
40. (Original) The apparatus of claim 35, wherein the specified type of motion is random motion of the solution in the well, relative to the optical assembly.
41. (Original) The apparatus of claim 35, wherein the agitation device is operably coupled with the optical assembly to move the assembly relative to the sample.
42. (Original) The apparatus of claim 35, wherein the apparatus rests on a surface suspended above the agitation device with suspensions, the agitation device providing agitation of the container creating surface flow of the solution relative to the optical assembly.

43. (Original) The apparatus of claim 35, wherein the agitation assembly further comprises a heater adapter for providing heated flow of solution.
44. (Original) The apparatus of claim 43, wherein the heater adapter is positioned between the container and the agitation assembly and is operable coupled to the container and the agitation assembly.
45. (Original) The apparatus of claim 35, wherein the agitation assembly is included in a robotic instrument for assay with the container mounted on the agitation assembly, the container and agitation assembly being mounted in the instrument adjacent to a substrate for holding an optical sensing assembly.
46. (Original) The apparatus of claim 45, wherein a robotic arm moves the optical sensing assembly from the substrate to the container to dip the assembly in the solution, the solution being simultaneously agitated by the agitation device.
47. (New) The apparatus of claim 35 wherein the kinetic analysis comprises molecular binding kinetic analysis.
48. (New) A method for measuring a characteristic of a solution, the method comprising:
providing the apparatus of claim 35;
agitating the solution;
contacting the solution with the optical sensing assembly; and
measuring the characteristic of the solution with the optical assembly wherein the measuring comprises kinetic analysis.
49. (New) The method of claim 48 wherein said measuring comprises biolayer interferometry.
50. (New) The method of claim 48 wherein the kinetic analysis comprises molecular binding kinetic analysis.
51. (New) The method of claim 48 wherein the characteristic comprises molecular binding.

REMARKS

Claims 35-46 were pending and presented for examination and in this application. In an Office Action dated November 4, 2009 claims 35-46 were rejected. Applicants thank Examiner for examination of the claims pending in this application and addresses Examiner's comments below.

Applicants are canceling claims 1-34, amending claim 35 and adding claims 47-51 in this Amendment and Response. Support for the amendment to claim 35 and added claim 47 can be found throughout the application as filed and particularly at paragraphs [0047], [0090], [0097], and [00101]. Support for claims 48-51 can be found throughout the application as filed and particularly at [00101].

In view of the Amendments herein and the Remarks that follow, Applicants respectfully request that Examiner reconsider all outstanding objections and rejections, and withdraw them.

Response to Rejection Under 35 USC §103(a)

The Examiner rejected claims 35-41 and 43-46 under 35 USC §103(a) as allegedly being unpatentable over Ohta et al. (Publication No. 2002/0006362) ("Ohta") and further in view of Klein et al. (Publication No. 2005/0176155 ("Klein")).

As amended, claim 35 reads:

An apparatus for maintaining flow of the solution, the apparatus comprising an agitation assembly operably coupled to a container with a plurality of wells containing solution, each well being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being configured for measuring a characteristic of the solution wherein the measuring a characteristic comprises kinetic analysis and wherein the agitation assembly

comprises an agitation device that moves the container according to a specified type of motion to agitate the solution relative to the optical assembly to create flow of the solution relative to the optical assembly the flow being sufficient for said kinetic analysis.

Thus, the claimed apparatus comprises, *inter alia*, an optical sensing assembly configured for kinetic analysis and an agitation device that agitates the solution relative to the optical assembly to create flow that is sufficient for the kinetic analysis. As stated in paragraph [0008] of the Instant Application, without proper flow, it is impossible to provide a valid environment for kinetic analysis. Neither Ohta nor Klein disclose apparatus capable of providing a valid environment for kinetic analysis.

The apparatus disclosed in Ohta is described as an enzyme immunoassay (Ohta at [0001]. Enzyme immunoassays are not kinetic assays and Ohta does not suggest that the disclosed apparatus is suitable for kinetic assays in addition to enzyme immunoassays. Thus, Ohta does not disclose an apparatus comprising, “an agitation device ... to create flow of the solution... the flow being sufficient for said kinetic analysis.” Therefore, claim 35 and its dependent claims, 36-51, are distinguished over Ohta.

Klein does not remedy the deficiencies of Ohta. Klein discloses a well plate and supporting devices providing capabilities to control oxygen level, pH and temperature of the contents of the wells. The optical probes disclosed in [0093] of Klein are oxygen and pH sensors. Klein does not disclose an optical sensing assembly configured for kinetic analysis. Nor does Klein disclose that its agitator creates flow sufficient for kinetic analysis. Therefore claim 35 and its dependent claims, 36-51, are also distinguished over Klein.

The Examiner rejected claim 42 under 35 USC §103(a) as allegedly being unpatentable over Ohta further in view of Klein and further in view of Bartick et al. (U.S. Patent No. 6,579,002) (“Bartick”). This rejection is respectfully traversed.

Claim 42 depends from claim 35 and as such is distinguished over Ohta and Klein. Bartick does not remedy the deficiencies of Ohta and Bartick. Bartick discloses a high performance shaker but does not disclose doing kinetic analysis or an optical assembly. Therefore, claim 42 is distinguished over Bartick as well.

In summary, the Examiner has failed to point out any prior art teaching which anticipates or renders obvious the explicit recitation in the language of claim 35, “An apparatus for maintaining flow of the solution, ... wherein the measuring a characteristic comprises kinetic analysis and ... the flow being sufficient for said kinetic analysis.” Therefore, it is respectfully submitted that the rejection of claim 35 and its dependent claims is improper and should be withdrawn.

Conclusion

Applicants have added new claims 47-51 for which Applicants request consideration and examination.

In sum, Applicants respectfully submit that claims 35-51, as presented herein, are patentably distinguishable over the cited references. Therefore, Applicants request reconsideration of the basis for the rejections to these claims and request allowance of them.

/ / /

In addition, Applicants respectfully invite Examiner to contact Applicants' representative at the number provided below if Examiner believes it will help expedite furtherance of this application.

Respectfully Submitted,
MICHAEL W. RECKNOR, ET AL.

Date: 4 May 2010

By: /Pauline Farmer-Koppenol/

Pauline Farmer-Koppenol, Attorney of Record
Registration No. 58,004
FENWICK & WEST LLP
801 California Street
Mountain View, CA 94041
Phone (650) 335-7181
Fax (650) 938-5200

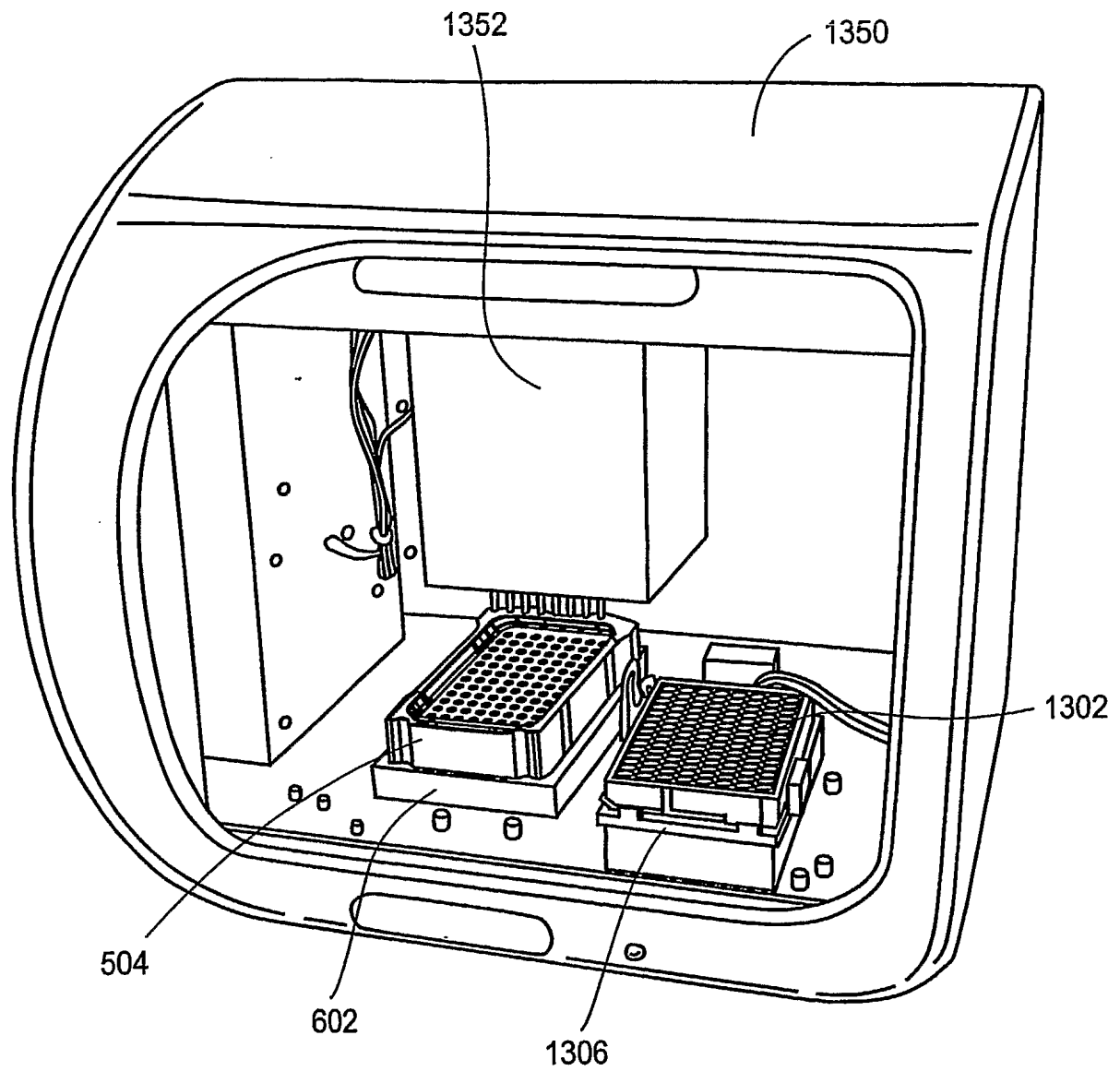


FIG. 13C

Electronic Patent Application Fee Transmittal

Application Number:	11423669			
Filing Date:	12-Jun-2006			
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS			
First Named Inventor/Applicant Name:	Michael W. Recknor			
Filer:	Pauline Farmer-Koppenol/Heather Orosco			
Attorney Docket Number:	24377-11758			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 3 months with \$0 paid	2253	1	555	555

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				555

Electronic Acknowledgement Receipt

EFS ID:	7551358
Application Number:	11423669
International Application Number:	
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor/Applicant Name:	Michael W. Recknor
Customer Number:	00758
Filer:	Pauline Farmer-Koppenol
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	04-MAY-2010
Filing Date:	12-JUN-2006
Time Stamp:	19:58:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$555
RAM confirmation Number	5831
Deposit Account	192555
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		11758_US_Amendment_and_Response.pdf	44690 b750141a13c0716b73cc0fa2195fbd09435785a7	yes	8
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Drawings-only black and white line drawings		2	2	
	Claims		3	4	
	Applicant Arguments/Remarks Made in an Amendment		5	8	
Warnings:					
Information:					
2	Drawings-only black and white line drawings	11758_US_Replacement_Figure_13C.pdf	38514 583c825942deceba69ef376bd28d31aa157992f0	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	30362 2d43372ad66c5998afe8dab624abcb5647e68625	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			113566		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 11/423,669		Filing Date 06/12/2006		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)		SMALL ENTITY ☒ OR			OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$	=		X \$	=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=		X \$	=			
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)		SMALL ENTITY OR			OTHER THAN SMALL ENTITY		
AMENDMENT	05/04/2010	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 17	Minus	** 46	=	0		X \$	=	
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	=	0		X \$	=	
☐ Application Size Fee (37 CFR 1.16(s))										
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
					TOTAL ADD'L FEE	0		TOTAL ADD'L FEE		
(Column 1)			(Column 2)		SMALL ENTITY OR			OTHER THAN SMALL ENTITY		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=			X \$	=	
	Independent (37 CFR 1.16(h))	*	Minus	***	=			X \$	=	
☐ Application Size Fee (37 CFR 1.16(s))										
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
					TOTAL ADD'L FEE			TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

Legal Instrument Examiner:
/MONIQUE BRUNSON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/423,669

06/12/2006

Michael W. Recknor

24377-11758

6275

758

7590

11/04/2009

FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

KWAK, DEAN P

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

11/04/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 11/423,669	Applicant(s) RECKNOR ET AL.	
	Examiner Dean Kwak	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/19/2006, 03/19/2008</u> . | 6) ☐ Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 1-34 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in the reply filed on 10/02/2009.

Drawings

2. The drawings are objected to because Fig. 13c is too dark. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 35-41 & 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (PG Pub 2002/0006362) and further in view of Klein et al. (PG Pub 2005/0176155).

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Regarding Claim 35, Ohta et al. disclose an apparatus (e.g., sample assaying apparatus, Abstract & Fig. 1),

- the apparatus comprising an agitation assembly (e.g., vibrating mechanism, P10/[0151] & Fig. 1 (80)) operably coupled to a container with a plurality of wells containing solution (e.g., assay plate or microplate, P3/[0056]),
- the optical sensing assembly being configured for measuring a characteristic of the solution (e.g., photometer (70), Claim 4),
- wherein the agitation assembly comprises an agitation device that moves the container according to a specified type of motion to agitate the solution relative to the optical assembly to create flow of the solution relative to the optical assembly (P4/[0075]).

Regarding Claim 35, although Ohta et al. disclose a use of a photometer (optical sensing assembly) for determining the reaction within each of the reaction vessel (well), Ohta et al. do not explicitly disclose the reaction vessel being configured for holding the photometer.

Klein et al. disclose an apparatus (e.g., well plate reactor, Abstract),

- the apparatus comprising an agitation assembly (e.g., agitator (158), P4/[0057]) operably coupled to a container with a plurality of wells containing solution (e.g., well plate, Fig. 1 (100)),

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- each well being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being configured for measuring a characteristic of the solution (e.g., optical fiber probes (500), P8/[0093]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify optical fiber probes, as taught by Klein et al. to the sample assay apparatus so that each well can be monitored individually. This may be advantageous when each well is intended to study for different variables and requires use of different type of probes, as Klein et al. disclose that a plurality of measuring devices may be used, see P8/[0092-0096].

Regarding Claim 35, Ohta et al. & Klein et al. meet all the structural limitations recited by the instant invention. Applicants' preamble recites "for maintaining flow of the solution". A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding Claims 36-39, 41, 43, 45 & 46, Ohta et al. further disclose the apparatus wherein:

- the agitation device is driven by an electrical motor (e.g., vibrating motor (82), P4/[0075]);

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- the specified type of motion is repetitive motion of the solution in the well, relative to the optical assembly (see the vibration is made at a predetermined rotation angle, P4/[0076]);
- the repetitive motion is circular motion (P4/[0077]);
- the agitation device is driven by an actuator for creating repetitive motion that is not in orbital trajectory (e.g., circular motion, P4/[0077]);
- the agitation device is operably coupled with the optical assembly to move the assembly relative to the sample (see the photometer (70) and vibrating mechanism (80) operably couple as shown in Fig. 1);
- the agitation assembly further comprises a heater adapter (e.g., temperature maintaining mechanism, Fig. 1 (50));
- the agitation assembly is included in a robotic instrument (Fig. 2 (10)); and
- a robotic arm (see P5/[0094] & Fig. 10 (A)).

Regarding limitations recited in Claims 43, 45 & 46, which are directed to a manner of operating disclosed apparatus (e.g., “for providing heated flow of solution”, “for assay with the container mounted on the agitation assembly”, “robotic arm moves the optical sensing assembly”), it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents

Art Unit: 1797

thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

Regarding Claim 40, although Ohta et al. do not explicitly disclose the motion is random motion, the reference discloses the vibrating mechanism being able to move in X, Y & Z direction. It would have been obvious to one having ordinary skill in the art at the time the invention was made to control the vibrating mechanism to vibrate in random motion to enhance mixing of the solution.

Regarding Claim 44, Ohta et al. fail to disclose the agitation assembly is coupled to the container.

Klein et al. further disclose a plurality of heating elements (206) associated with each well (110), P5/[0061].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate heating elements with agitation assembly to minimize temperature gradient of the solution.

7. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (PG Pub 2002/0006362) in view of Klein et al. (PG Pub 2005/0176155) and further in view of Bartick et al. (US 6579002).

Regarding Claim 42, Ohta et al. further disclose the apparatus wherein the apparatus rests on a surface suspended above the agitation device (see Fig. 6). However, Ohta et al. fail to disclose a use of suspensions.

Bartick et al. disclose a laboratory shaker (1) mounted on a suspension with springs (14) and/or dampers/shock absorbers to reduce vibration during operation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the agitation device of Ohta et al. to comprise suspensions since it was known in the art of laboratory shaker/agitator to use suspensions to minimize vibration caused during operation as disclosed by Bartick et al. (C7/L20-34).

Regarding limitations recited in Claim 42, which is directed to a manner of operating disclosed apparatus (e.g., “creating surface flow of the solution”), it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean Kwak whose telephone number is 571-270-7072. The examiner can normally be reached on M-TH, 5:30 am - 4:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LYLE A ALEXANDER/
Primary Examiner, Art Unit 1797

28Oct09
/D. K./
Examiner, Art Unit 1797

Notice of References Cited	Application/Control No. 11/423,669		Applicant(s)/Patent Under Reexamination RECKNOR ET AL.	
	Examiner Dean Kwak		Art Unit 1797	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2002/0006362	01-2002	Ohta et al.	422/102
*	B	US-6,579,002	06-2003	Bartick et al.	366/112
*	C	US-2005/0176155	08-2005	Klein et al.	436/163
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<i>Index of Claims</i> 	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner DEAN KWAK	Art Unit 1797

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	08/15/2009	10/27/2009						
	1	÷	N						
	2	÷	N						
	3	÷	N						
	4	÷	N						
	5	÷	N						
	6	÷	N						
	7	÷	N						
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	27	÷	N						
	28	÷	N						
	29	÷	N						
	30	÷	N						
	31	÷	N						
	32	÷	N						
	33	÷	N						
	34	÷	N						
	35	÷	✓						
	36	÷	✓						

<i>Index of Claims</i> 	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner DEAN KWAK	Art Unit 1797

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	08/15/2009	10/27/2009						
	37	÷	✓						
	38	÷	✓						
	39	÷	✓						
	40	÷	✓						
	41	÷	✓						
	42	÷	✓						
	43	÷	✓						
	44	÷	✓						
	45	÷	✓						
	46	÷	✓						

Search Notes 	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner Dean Kwak	Art Unit 1797

SEARCHED			
Class	Subclass	Date	Examiner
422	102	10/28/2009	DK

SEARCH NOTES		
Search Notes	Date	Examiner
PLUS SEARCH	8/24/2009	DK
EAST TEXT SEARCH	10/28/2009	DK
INVENTOR NAME SEARCH	10/28/2009	DK

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	15244	(plate or dish) near5 (shak\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 21:14
L7	93999	("422").CLAS.	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2009/10/28 21:15
L8	232	L6 and L7	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 21:15
L9	43	L8 and heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 21:15
L10	3	((("20040022677") or ("20050052646")).PN.	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2009/10/28 21:17
L11	2	L10 and shak\$5	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 21:23
L12	27	L9 and optic\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 23:45
L16	0	L12 and (spring near3 suspension)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/29 01:28
L17	32	L6 and (spring near3 suspension)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/29 01:28
S1	4	((MICHAEL) near2 (RECKNOR)).INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:14
S2	111	((HONG) near2 (TAN)). INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:14
S3	52	((ROBERT) near2 (ZUK)). INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:15
S4	10	((KRISTA) near2 (WITTE)). INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:15
S5	4	((SAE) near2 (CHOO)). INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:16
S6	3	((SCOTT) near2 (LOCKARD)).INV.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:16
S7	3	("5804453" "6436351" "6838051").PN.	US-PGPUB; USPAT	OR	ON	2009/10/27 16:23

S8	49	(US-5779978-\$ or US-5944660-\$ or US-5958704-\$ or US-6009632-\$ or US-6060256-\$ or US-4775637-\$ or US-5220161-\$ or US-5280130-\$ or US-5349181-\$ or US-5357732-\$ or US-5374395-\$ or US-5399315-\$ or US-5409666-\$ or US-5477326-\$ or US-5498549-\$ or US-5557398-\$ or US-5673814-\$ or US-5946083-\$ or US-6020047-\$ or US-6048623-\$ or US-6115528-\$ or US-6151111-\$ or US-6188813-\$ or US-6191847-\$ or US-6203983-\$ or US-6274384-\$).did. or (US-6287765-\$ or US-6306347-\$ or US-6387709-\$ or US-6526188-\$ or US-6764226-\$ or US-6816241-\$ or US-6862301-\$ or US-6951545-\$ or US-6952603-\$ or US-7002688-\$ or US-7054258-\$ or US-7079468-\$ or US-7200100-\$ or US-7223367-\$ or US-7262847-\$ or US-7267798-\$ or US-7277210-\$ or US-7319525-\$ or US-7354772-\$ or US-7366063-\$ or US-7385695-\$ or US-7394547-\$ or US-7450980-\$).did.	USPAT	OR	ON	2009/10/27 16:23
S9	2	wo-2006138293-\$.did.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 17:00
S10	2	("20020009391").PN.	US-PGPUB; USPAT; JPO; DERWENT	OR	OFF	2009/10/27 17:17
S11	118350	(multiwell or multi-well or (multi adj well) or ("96" adj well) or (96-well))	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:45
S12	51352	S11 and (agitat\$5 or shak \$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:46
S13	13383	S11 same (agitat\$5 or shak \$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:46
S14	21	S13 same heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:47

S15	191809	plate same (agitat\$5 or shak\$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:49
S16	2474	S15 same heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:50
S17	59	S16 and (optical near3 measur\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/27 23:50
S18	1472	S11 with (agitat\$5 or shak\$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:05
S19	1043	S18 and heat\$4	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:05
S21	33	S18 and heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:06
S22	29	S21 not S14	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:06
S23	117275	plate with (agitat\$5 or shak\$5 or vibrat\$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:40
S24	951	S23 same heater	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:40
S25	13	S24 and (optical near3 measur\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/10/28 00:41

EAST Search History (Interference)

< This search history is empty >

10/ 29/ 2009 2:00:41 AM
**C:\ Documents and Settings\ dkwak\ My Documents\ EAST\ Workspaces\ 11423669_ Tip
 Tray_ Recknor et al_27Oct09.wsp**

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Complete if Known	
				Application No.	11/423,669
				Filing Date	June 12, 2006
				First Named Inventor	Michael W. Recknor
				Art Unit	1744
				Examiner Name	Natalia A. Levkovich
Sheet	1	of	1	Attorney Docket Number	24377-11758

U.S. PATENT DOCUMENTS				
Examiner Initials*	Cite No. ¹	Document No. Number – Kind Code ² (if known)	Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
/D.K./	A1	US-6,838,051 B2	01-04-2005	Marquiss et al.
/D.K./	A2	US-6,436,351 B1	08-20-2002	Gubernator et al.
/D.K./	A3	US-5,804,453 A	09-08-1998	Chen

FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Foreign Patent Document Country Code ³ – Number ⁴ Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T ⁶

OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS					
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published			T ⁶
/D.K./	C1	PCT International Search Report and Written Opinion, PCT International Patent Application No. PCT/US06/22963, September 17, 2007.			

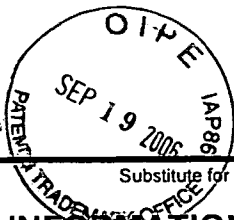
Examiner Signature	/Dean Kwak/	Date Considered	10/28/2009
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

24377/11758/DOCS/1882163.1



Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Complete if Known

Application No.	11/423,669
Filing Date	June 12, 2006
First Named Inventor	Michael W. Recknor
Art Unit	1744
Examiner Name	Not Yet Known
Attorney Docket Number	24377-11758

Sheet	1	of	1
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document No. Number – Kind Code ² (if known)	Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		US-		
		US-		
		US-		
		US-		

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document Country Code ³ – Number ⁴ Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T ⁶

OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ⁶
/D.K./	C1	BRAND Pipette Tips, BrandTech Scientific, Inc., 2005, 3 pages, [online] [Retrieved on September 6, 2006] Retrieved from the Internet <URL:http://www.brandtech.com/prodpage.asp?prodid=702504>	
/D.K./	C2	Microtiter & PCR Plates, Rose Scientific Ltd., pp. 1 – 6.	
/D.K./	C3	Microtiter Plate Guide, Thermo Electron Corporation, pp. 1 – 12.	
/D.K./	C4	Pipette Tips Filter Tips, Brand, 8 pages.	
/D.K./	C5	Pipettes & Tips, Pipette Tips, Brand, BrandTech Scientific, pp. 16 & 18.	

Examiner Signature	/Dean Kwak/	Date Considered	10/28/2009
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

24377/11758/DOCS/1654099.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Michael W. Recknor, et al.
SERIAL NO.: 11/423,669
FILING DATE: June 12, 2006
TITLE: Tip Tray Assembly For Optical Sensors
EXAMINER: Dean P. Kwak
GROUP ART UNIT: 1797
ATTY. DKT. NO.: 24377-11758

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the **Pacific Time Zone** of the United States on the local date shown below.

Dated: 2 October 2009

By: /Pauline Farmer-Koppenol/

Pauline Farmer-Koppenol, Reg. No. 58,004

RESPONSE TO RESTRICTION REQUIREMENT

Sir:

Responsive to the Office Action (Restriction Requirement) dated September 2, 2009 received in the above-identified patent application, please consider the accompanying remarks. The Commissioner is hereby authorized to charge to Deposit Account No. 19-2555 for any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.21 which may be required by this paper, with the exception of the payment of the Issue Fee. Reconsideration of the application in view of the following remarks is respectfully requested.

REMARKS

Claims 1-46 were pending and presented for examination and in this application.

RESPONSE TO RESTRICTION REQUIREMENT

In the Office Action, the Examiner subject the application to a restriction requirement under 35 U.S.C. § 121 to one of the following inventions:

Group I. Claims 1-34

Group II. Claims 35-46

Applicants provisionally elect Group II without traverse. Applicants reserve the right to pursue the unelected subject matter in one or more related divisional, continuation, or continuation-in-part applications.

Conclusion

In addition, Applicants respectfully invite Examiner to contact Applicants' representative at the number provided below if Examiner believes it will help expedite furtherance of this application.

Respectfully Submitted,
MICHAEL W. RECKNOR, ET AL.

Date: 2 October 2009

By: /Pauline Farmer-Koppenol/

Pauline Farmer-Koppenol, Attorney of Record
Registration No. 58,004
FENWICK & WEST LLP
801 California Street
Mountain View, CA 94041
Phone (650) 335-7181
Fax (650) 938-5200

Electronic Acknowledgement Receipt

EFS ID:	6197107
Application Number:	11423669
International Application Number:	
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor/Applicant Name:	Michael W. Recknor
Customer Number:	00758
Filer:	Pauline Farmer-Koppenol
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	02-OCT-2009
Filing Date:	12-JUN-2006
Time Stamp:	19:03:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		11758_Response_to_Restriction.pdf	72021 7ba4d1fa22ad12308677730d43c9e457b1fb69ef	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Response to Election / Restriction Filed	1	1
	Applicant Arguments/Remarks Made in an Amendment	2	2
Warnings:			
Information:			
Total Files Size (in bytes):		72021	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.			



UNITED STATES PATENT AND TRADEMARK OFFICE

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/423,669

06/12/2006

Michael W. Recknor

24377-11758

6275

758 7590 09/02/2009

FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

KWAK, DEAN P

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

09/02/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 11/423,669	Applicant(s) RECKNOR ET AL.	
	Examiner DEAN KWAK	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-46 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) ☐ Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-34, drawn to an apparatus for packaging an optical sensing assembly, classified in class 422, subclass 102.
 - II. Claims 35-46, drawn to an apparatus for maintaining flow of the solution, classified in class 422, subclass 100.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group I and Group II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, the different inventions of Group I & II have different modes of operation, e.g., an apparatus for packaging optical sensing assembly vs. an apparatus for maintaining flow of the solution.
3. Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:
 - (a) the inventions have acquired a separate status in the art in view of their different classification;
 - (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

Art Unit: 1797

- (c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);
- (d) the prior art applicable to one invention would not likely be applicable to another invention;
- (e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either

Art Unit: 1797

instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

4. A telephone call was made to SEQUEIRA, ANTONIA on 24Aug09 to request an oral election to the above restriction requirement, but did not result in an election being made.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEAN KWAK whose telephone number is 571-270-7072. The examiner can normally be reached on M-TH, 5:30 am - 4:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lyle A Alexander/
Primary Examiner, Art Unit 1797

27Aug09

/D. K./
Examiner, Art Unit 1797

<i>Index of Claims</i> 	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner DEAN KWAK	Art Unit 1797

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant			☐ CPA			☐ T.D.			☐ R.1.47		
CLAIM		DATE									
Final	Original	08/15/2009									
	1	÷									
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	3	÷									
	4	÷									
	5	÷									
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<i>Index of Claims</i> 	Application/Control No. 11423669	Applicant(s)/Patent Under Reexamination RECKNOR ET AL.
	Examiner DEAN KWAK	Art Unit 1797

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant		☐ CPA		☐ T.D.		☐ R.1.47			
CLAIM		DATE							
Final	Original	08/15/2009							
	37	÷							
	38	÷							
	39	÷							
	40	÷							
	41	÷							
	42	÷							
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PLUS Search Results for S/N 11423669, Searched Mon Aug 24 12:54:22 EDT 2009
The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

5779978 99	7450980 98
5944660 99	
5958704 99	
6009632 99	
6060256 99	
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4775637 98	
5220161 98	
5280130 98	
5349181 98	
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7277210 98	
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7354772 98	
7366063 98	
7385695 98	
7394547 98	

PLUS Search Results for S/N 11423669, Searched Mon Aug 24 12:54:22 EDT 2009
The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Michael W. Recknor et al.
APPLICATION NO.: 11/423,669
FILING DATE: June 12, 2006
TITLE: Tip Tray Assembly for Optical Sensors
EXAMINER: Natalia A. Levkovich
GROUP ART UNIT: 1797
ATTY. DKT. NO.: 24377-11758

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the Pacific Time Zone of the United States on the local date shown below.

Dated: March 19, 2008

By: /Antonia L. Sequeira/

Antonia L. Sequeira, Reg. No.: 54,670

COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
Under 37 CFR §§ 1.56 and 1.97-98

SIR:

Pursuant to the provisions of 37 CFR §§ 1.56 and 1.97-98, enclosed herewith is modified form PTO/SB/08A listing references for consideration by the Examiner.

The filing of this Information Disclosure Statement shall not be construed as a representation regarding the completeness of the list of references, or that inclusion of a reference in this list is an admission that it is prior art or is pertinent to this application, or that a search has been made, or as an admission that the information listed is, or may be considered to be, material to patentability, or that no other material information exists, and shall not be construed as an admission against interest in any manner.

This Information Disclosure Statement is being filed:

- ☒ within three months of the filing date of the application, or date of entry into the national stage of an international application, or before the mailing date of a first office action on the merits, whichever event last occurred;
- ☐ before the mailing of a first official action after the filing of a request for continued examination (RCE) under 37 CFR § 1.114;
- ☐ after three months of the filing date of this national application or the date of entry of the national stage in an international application, or after the mailing

date of the first official action on the merits, whichever event last occurred, but before the mailing date of the first to occur of either: (1) a final action under 37 CFR §1.113; or (2) an action that otherwise closes prosecution in the application, and:

- ☐ attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(c); OR
- ☐ Applicant certifies pursuant to 37 CFR § 1.97(e) that:
 - ☐ each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement; OR
 - ☐ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement;
- ☐ on or before the payment of the issue fee but after the mailing date of the first to occur of either: (1) a final action under 37 CFR § 1.113; (2) a notice of allowance under 37 CFR § 1.311; or (3) an action that otherwise closes prosecution in the application, and:
 - ☐ Applicant certifies pursuant to 37 CFR. § 1.97(e) that:
 - ☐ each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement;
 - ☐ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any

individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement; AND

- ☐ attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(d); OR
- ☐ after the payment of the issue fee. Applicant requests that the information contained in this Information Disclosure Statement be placed in the file according to 37 CFR § 1.97(i), although the information may not be considered by the USPTO.
- ☐ Enclosed is a copy of each listed reference that may be material to the examination of this application, and for which there may be a duty to disclose.
- ☐ This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior application No. _____, filed on _____, and the references cited therein are hereby referenced, but are not required to be provided in this application under 37 CFR § 1.98(d).
- ☒ Copies of any foreign patent documents and non-patent literature cited herein are enclosed.
- ☐ Each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not received by any individual designated in 37 CFR § 1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement. 37 CFR § 1.704(d).
- ☒ Applicant submits that no fee is required for the consideration of this Information Disclosure Statement.

Consideration of the listed references and favorable action are solicited.

Respectfully submitted,
MICHAEL W. RECKNOR ET AL.

Dated: March 19, 2008

By: /Antonia L. Sequeira/
Antonia L. Sequeira, Reg. No.: 54,670
Fenwick & West LLP
Silicon Valley Center
801 California Street
Mountain View, CA 94041
Tel.: (650) 335-7185
Fax.: (650) 938-5200

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT****Complete if Known**

Application No.	11/423,669		
Filing Date	June 12, 2006		
First Named Inventor	Michael W. Recknor		
Art Unit	1744		
Examiner Name	Natalia A. Levkovich		
Attorney Docket Number	24377-11758		

Sheet

1

of

1

U.S. PATENT DOCUMENTS

U.S. PATENT DOCUMENTS				
Examiner Initials*	Cite No. ¹	Document No. Number – Kind Code ² (if known)	Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
	A1	US-6,838,051 B2	01-04-2005	Marquiss et al.
	A2	US-6,436,351 B1	08-20-2002	Gubernator et al.
	A3	US-5,804,453 A	09-08-1998	Chen

FOREIGN PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Foreign Patent Document Country Code ³ – Number ⁴ Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T ⁶

OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ⁶
	C1	PCT International Search Report and Written Opinion, PCT International Patent Application No. PCT/US06/22963, September 17, 2007.	

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

24377/11758/DOCS/1882163.1

Electronic Acknowledgement Receipt

EFS ID:	3024793
Application Number:	11423669
International Application Number:	
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor/Applicant Name:	Michael W. Recknor
Customer Number:	758
Filer:	Antonia L. Sequeira
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	19-MAR-2008
Filing Date:	12-JUN-2006
Time Stamp:	17:14:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement Letter	11758_US_SIDS.pdf	100599 bef36cbc4106f5a50fe44d369dfb7eb2353b57a	no	3

Warnings:

Information:

2	Information Disclosure Statement (IDS) Filed	11758_US_8A.pdf	84833	no	1
			32e574b7427811d70120a4be1d5ad6f8 377e72c2		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	NPL Documents	11758_PCT_ISR_WO.PDF	748772	no	11
			0b5e698b64d62be0bab25c3a20b3611f1 9bf0410a		
Warnings:					
Information:					
Total Files Size (in bytes):				934204	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
11/423,669	06/12/2006	1744	1140	24377-11758	13	46	3

CONFIRMATION NO. 6275

758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA94041

UPDATED FILING RECEIPT

Date Mailed: 02/02/2007

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

Michael W. Recknor, Oakland, CA;
Hong Tan, San Jose, CA;
Robert Zuk, Atherton, CA;
Krista Leah Witte, Hayward, CA;
Sae Choo, Sunnyvale, CA;
Scott Lockard, Los Gatos, CA;

Assignment For Published Patent Application

ForteBio, Inc., Menlo Park, CA

Power of Attorney: The patent practitioners associated with Customer Number 758

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/690,325 06/13/2005

Foreign Applications

If Required, Foreign Filing License Granted:

Projected Publication Date: To Be Determined - pending completion of Security Review

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

TIP TRAY ASSEMBLY FOR OPTICAL SENSORS

Preliminary Class

435

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER**Title 35, United States Code, Section 184****Title 37, Code of Federal Regulations, 5.11 & 5.15****GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under

37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

IN THE UNITED STATES

PATENT AND TRADEMARK OFFICE

APPLICANTS: Michael W. Recknor et al.
APPLICATION NO.: 11/423,669
FILING DATE: June 12, 2006
TITLE: Tip Tray Assembly for Optical Sensors
EXAMINER: Not Yet Known
GROUP ART UNIT: 1744
ATTY. DKT. NO.: 24377-11758

MAIL STOP MISSING PARTS
COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION

SIR:

Responsive to the Notice of Missing Parts dated December 1, 2006, received in the above-identified patent application,

☒ Enclosed are:

- ☐ a copy of the Notice to File Missing Parts;
- ☒ Statement Of Small Entity Status;
- ☒ an executed Declaration;
- ☒ an executed Power of Attorney;
- ☒ an executed Statement Under 37 CFR 3.73(b);
- ☒ Supplemental Application Data Sheet (which is a first-filed Application Data Sheet that is labeled "Supplemental" pursuant to MPEP § 601.05, which states that "If no ADS was originally filed, but applicant wants to submit an ADS to correct, modify, or augment the original application data, the ADS, even though it is the first-filed ADS, must be titled "Supplemental Application Data Sheet." No changes were indicated on this Supplemental ADS, as this is a first-filed ADS.)
- ☒ payment in the amount of \$1,140.00 for the
 - ☒ application filing fee (\$425.00);

☒ fee for additional claims (\$650.00); and

☒ missing parts surcharge (\$65.00).

☐ Other:

☒ Applicant claims small entity status under 37 C.F.R. 1.27.

Respectfully submitted,
MICHAEL W. RECKNOR ET AL.

Dated: January 24, 2007

By: /Antonia L. Sequeira/
Antonia L. Sequeira, Reg. No.: 54,670
Fenwick & West LLP
Silicon Valley Center
801 California Street
Mountain View, CA 94041
Tel.: (650) 335-7185
Fax.: (650) 938-5200

STATEMENT UNDER 37 CFR 3.73(b)

Inventor(s)/Patent Owner(s): Michael W. Recknor, Hong Tan, Robert Zuk, Krista Leah Witte, Sae Choo, Scott Lockard

Application No./Patent No.: 11/423,669 Filed/Issue Date: June 12, 2006

Entitled: Tip Tray Assembly for Optical Sensors

FortéBio, Inc., a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is _____%
in the patent application/patent identified above by virtue of either:

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 018791, Frame 0071, or for which a copy thereof is attached and is concurrently submitted for recordation.

OR

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached and is concurrently submitted for recordation.
2. From _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached and is concurrently submitted for recordation.
3. From _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached and is concurrently submitted for recordation.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

- ☐ Copies of assignments or other documents in the chain of title are attached.
[NOTE: A separate copy (*i.e.*, a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment has not been recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

January 24, 2007
Date

Antonia L. Sequeira, Reg. No.: 54,670
Typed or printed name

(650) 335-7185
Telephone number

/Antonia L. Sequeira/
Signature

Attorney for Applicant
Title

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b)

I hereby appoint:

☒ Practitioners associated with the Customer Number

758

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

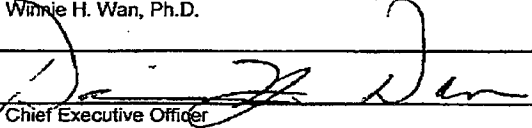
Assignee Name and Address:

FortéBio, Inc.
1360 Willow Road, Suite 205
Menlo Park, CA 94025

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Name	Winnie H. Wan, Ph.D.	Date	1/05/06
Signature		Telephone	(650) 322-1360, x112
Title	Chief Executive Officer		

24377/11096/SF/5158620.1

**DECLARATION (37 CFR 1.63) FOR
UTILITY OR DESIGN APPLICATION
USING AN APPLICATION DATA SHEET
(37 CFR 1.76)**

Application Number	11/423,669
Filing Date	June 12, 2006
First Named Inventor	Michael W. Recknor
Title	Tip Tray Assembly for Optical Sensors
Group Art Unit	1744
Attorney Docket Number	24377-11758

As the below named inventor(s), I/we declare that:

This declaration is directed to:

- ☐ The attached application, or
☒ Application No. 11/423,669, filed on June 12, 2006,
☐ as amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

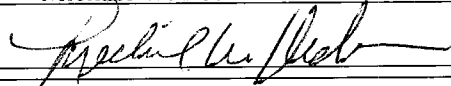
I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 1.56, including material information which became available between the filing date of the prior application and the National or PCT International filing date of the continuation-in-part application, if applicable; and

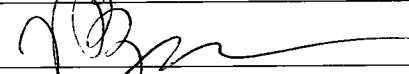
All statements made herein of my/our knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)

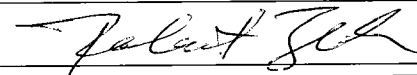
Inventor one: Michael W. Recknor Citizen of: US

Signature:  Date: Jan 16, 2007

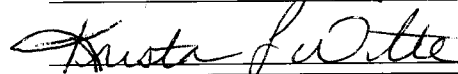
Inventor two: Hong Tan Citizen of: US

Signature:  Date: January 5, 2007

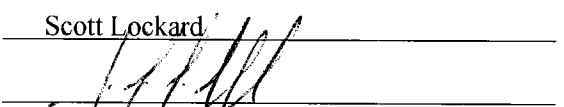
Inventor three: Robert Zuk Citizen of: US

Signature:  Date: 1-5-07

Inventor four: Krista Leah Witte Citizen of: US

Signature:  Date: 1/05/2007

☒ Additional inventors are being named on 1 additional form(s) attached hereto.

DECLARATION	ADDITIONAL INVENTOR(S) Supplemental Sheet
As the below named inventor(s), I/we declare that: This declaration is directed to: ☐ The attached application, or ☒ Application No. 11/423,669,, filed on June 12, 2006, ☐ as amended on _____ (if applicable);	
FULL NAME OF INVENTOR(S)	
Inventor five: <u>Sae Choo</u>	Citizen of: <u>US</u>
Signature: <u></u>	Date: <u>1-5-07</u>
Inventor six: <u>Scott Lockard</u>	Citizen of: <u>US</u>
Signature: <u></u>	Date: <u>1-12-07</u>

**IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE**

APPLICANTS: Michael W. Recknor et al.
APPLICATION NO.: 11/423,669
FILING DATE: June 12, 2006
TITLE: Tip Tray Assembly for Optical Sensors
EXAMINER: Not Yet Known
GROUP ART UNIT: 1744
ATTY. DKT. NO.: 24377-11758

COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

STATEMENT OF SMALL ENTITY STATUS

SIR:

In accordance with MPEP 509.03 IV and 37 CFR § 1.27(c)(1), Applicant hereby notifies the Patent and Trademark Office that the Applicant claims small entity status. Pursuant to 37 CFR § 1.27(c), fees will be paid on the subject patent at the rate applicable to small entity status.

Respectfully submitted,
MICHAEL W. RECKNOR ET AL.

Dated: January 24, 2007

By: /Antonia L. Sequeira/
Antonia L. Sequeira, Reg. No.: 54,670
Fenwick & West LLP
Silicon Valley Center
801 California Street
Mountain View, CA 94041
Tel.: (650) 335-7185
Fax.: (650) 938-5200

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Supplemental Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24377-11758
		Application Number	11/423,669
Title of Invention	Tip Tray Assembly for Optical Sensors		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

- ☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1					
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Michael	W.	Recknor		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Oakland	State/Province	CA	Country of Residence i	US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		6153 Castle Drive			
Address 2					
City	Oakland	State/Province	CA		
Postal Code	94611-2737	Country i	US		
Applicant 2					
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Hong		Tan		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	San Jose	State/Province	CA	Country of Residence i	US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		1031 Prouty Way			
Address 2					
City	San Jose	State/Province	CA		
Postal Code	95129	Country i	US		
Applicant 3					
Applicant Authority ☒ Inventor		☐ Legal Representative under 35 U.S.C. 117		☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Robert		Zuk		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Atherton	State/Province	CA	Country of Residence i	US

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Supplemental Application Data Sheet 37 CFR 1.76		Attorney Docket Number		24377-11758	
		Application Number		11/423,669	
Title of Invention		Tip Tray Assembly for Optical Sensors			

Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		2 Heather Drive			
Address 2					
City	Atherton		State/Province	CA	
Postal Code	94027-2006		Country ⁱ	US	
Applicant 4					
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	
				☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name		Middle Name		Family Name
	Krista		Leah		Witte
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Hayward		State/Province	CA	Country of Residence ⁱ
					US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		27924 Farm Hill			
Address 2					
City	Hayward		State/Province	CA	
Postal Code	94542		Country ⁱ	US	
Applicant 5					
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	
				☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name		Middle Name		Family Name
	Sae				Choo
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Sunnyvale		State/Province	CA	Country of Residence ⁱ
					US
Citizenship under 37 CFR 1.41(b) i		US			
Mailing Address of Applicant:					
Address 1		991 Asilomar Terr. #4 Sunnyvale			
Address 2					
City	Sunnyvale		State/Province	CA	
Postal Code	94086		Country ⁱ	US	
Applicant 6					
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	
				☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name		Middle Name		Family Name
	Scott				Lockard
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Los Gatos		State/Province	CA	Country of Residence ⁱ
					US
Citizenship under 37 CFR 1.41(b) i		US			

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Supplemental Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24377-11758
		Application Number	11/423,669
Title of Invention	Tip Tray Assembly for Optical Sensors		

Mailing Address of Applicant:			
Address 1	16806 Frank Avenue		
Address 2			
City	Los Gatos	State/Province	CA
Postal Code	95032-3307	Country	US
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add			

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	00758		
Email Address	asequeira@fenwick.com	Add Email	Remove Email

Application Information:

Title of the Invention	Tip Tray Assembly for Optical Sensors		
Attorney Docket Number	24377-11758	Small Entity Status Claimed ☒	
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	13	Suggested Figure for Publication (if any)	
Publication Information:			
☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)			
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not been and will not be the subject of an application filed in another country, or under a multilateral agreement, that requires publication at eighteen months after filing.			

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.			
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ US Representative (37 CFR 11.9)
Customer Number	00758		

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Supplemental Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24377-11758
		Application Number	11/423,669
Title of Invention	Tip Tray Assembly for Optical Sensors		

Domestic Priority Information:

This section allows for the applicant to claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c). Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	60690325	2005-06-13

Additional Domestic Priority Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove			
Application Number	Country ⁱ	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			☐ Yes ☒ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1

If the Assignee is an Organization check here. ☒

Organization Name	ForteBio, Inc.		
-------------------	----------------	--	--

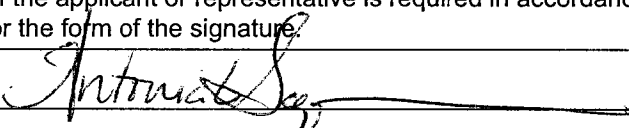
Mailing Address Information:

Address 1	1360 Willow Road, Suite 205		
Address 2			
City	Menlo Park	State/Province	CA
Country ⁱ	US	Postal Code	94025-1516
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button.

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	2007-01-24
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Supplemental Application Data Sheet 37 CFR 1.76		Attorney Docket Number	24377-11758		
		Application Number	11/423,669		
Title of Invention	Tip Tray Assembly for Optical Sensors				
First Name	Antonia L.	Last Name	Sequeira	Registration Number	54670

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	11423669			
Filing Date:	12-Jun-2006			
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS			
First Named Inventor/Applicant Name:	Michael W. Recknor			
Filer:	Antonia L. Sequeira/Larisa Burshteyn			
Attorney Docket Number:	24377-11758			
Filed as Small Entity				
Utility Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	75	75
Utility Search Fee	2111	1	250	250
Utility Examination Fee	2311	1	100	100
Pages:				
Claims:				
Claims in excess of 20	2202	26	25	650
Miscellaneous-Filing:				
Late filing fee for oath or declaration	2051	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1140

Electronic Acknowledgement Receipt

EFS ID:	1464796
Application Number:	11423669
International Application Number:	
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor/Applicant Name:	Michael W. Recknor
Customer Number:	758
Filer:	Antonia L. Sequeira
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	25-JAN-2007
Filing Date:	12-JUN-2006
Time Stamp:	18:37:24
Application Type:	Utility

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$ 1140
RAM confirmation Number	867
Deposit Account	192555
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	11758_ResponseNMP.pdf	75466	no	2
Warnings:					
Information:					
2	Assignee showing of ownership per 37 CFR 3.73(b).	11758_Statement_3_73b.pdf	97756	no	1
Warnings:					
Information:					
3	Power of Attorney	11758_POA.pdf	39661	no	1
Warnings:					
Information:					
4	Oath or Declaration filed	11758_Declaration.pdf	64679	no	2
Warnings:					
Information:					
5	Miscellaneous Incoming Letter	11758_StatementSmallEntity_Status.pdf	72161	no	1
Warnings:					
Information:					
6	Application Data Sheet	11758_ADS.pdf	312280	no	6
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
7	Fee Worksheet (PTO-06)	fee-info.pdf	8609	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			670612		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
11/423,669	06/12/2006	1744	0.00	24377-11758	13	46	3

CONFIRMATION NO. 6275

00758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA94041

FILING RECEIPT

Date Mailed: 12/01/2006

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

Michael W. Recknor, Residence Not Provided;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/690,325 06/13/2005

Foreign Applications

If Required, Foreign Filing License Granted:

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

TIP TRAY ASSEMBLY FOR OPTICAL SENSORS

Preliminary Class

435

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a

patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
 United States Patent and Trademark Office
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 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/423,669	06/12/2006	Michael W. Recknor	24377-11758

00758
 FENWICK & WEST LLP
 SILICON VALLEY CENTER
 801 CALIFORNIA STREET
 MOUNTAIN VIEW, CA 94041

CONFIRMATION NO. 6275
FORMALITIES
LETTER

Date Mailed: 12/01/2006

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
Applicant must submit \$ 300 to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).
- The oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of **\$1300** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$2430** for a non-small entity

- **\$300** Statutory basic filing fee.
- **\$130** Surcharge.

- The application search fee has not been paid. Applicant must submit **\$500** to complete the search fee.
- The application examination fee has not been paid. Applicant must submit **\$200** to complete the examination fee for a non-small entity.

- Total additional claim fee(s) for this application is **\$1300**
 - **\$1300** for **26** total claims over 20.

Replies should be mailed to: Mail Stop Missing Parts
 Commissioner for Patents
 P.O. Box 1450
 Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
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Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
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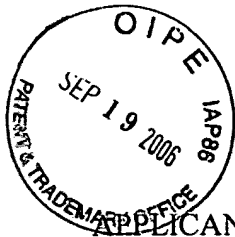
TRANSMITTAL FORM (to be used for all correspondence during pendency of filed application)	Application Number	11/423,669	
	Filing Date	June 12, 2006	
	First Named Inventor	Michael W. Recknor	
	Group Art Unit Number	1744	
	Examiner Name	Not Yet Known	
Total Number of Pages in This Submission	5*	Attorney Docket Number	24377-11758

ENCLOSURES (check all that apply)	
☐ Fee Transmittal Form (in duplicate) ☐ Check Enclosed	☐ Issue Fee Transmittal
☒ Return Receipt Postcard	☐ Letter to Chief Draftsperson
☐ Response to Notice to File Missing Parts	☐ Formal Drawing(s): [] Sheet(s) of Figure(s) []
☐ Assignment & Recordation Cover Sheet	☐ Appeal Communication to Board of Appeals and Interferences
☐ Declaration	☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
☐ Power of Attorney	☐ Certified Copy of Priority Document(s)
☐ Application Data Sheet	☐ After Allowance Communication to Group
☒ Information Disclosure Statement & PTO/SB/08A ☒ Copies of IDS Cited Non-Patent References	☐
☐ Request for Corrected Filing Receipt	☐
☐ Request for Correction of Recorded Assignment	☐
☐ Amendment/Response: [] Page(s) ☐ After Final	☐
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☐ Revocation and Substitute Power of Attorney	☐

REMARKS: *Page count does not reflect cited references.

SIGNATURE OF ATTORNEY OR AGENT		
Signature:		
Attorney/Reg. No.:	Antonia L. Sequeira, Reg. No. 54,670	Dated: 9/14/06

CERTIFICATE OF MAILING		
I hereby certify that this correspondence, including the enclosures identified above, is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. If the Express Mail Mailing Number is filled in below, then this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service pursuant to 37 CFR 1.10.		
Signature:		
Typed or Printed Name:	Antonia L. Sequeira	Dated: 9/14/06
Express Mail Mailing Number (optional):		



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Michael W. Recknor et al.
APPLICATION NO.: 11/423,669
FILING DATE: June 12, 2006
TITLE: Tip Tray Assembly for Optical Sensors
EXAMINER: Not Yet Known
GROUP ART UNIT: 1744
ATTY. DKT. NO.: 24377-11758

CERTIFICATE OF MAILING

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Dated: 9/14/06

By: Antonia L. Sequeira
Antonia L. Sequeira, Reg. No.: 54,670

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INFORMATION DISCLOSURE STATEMENT

Under 37 CFR §§ 1.56 and 1.97-98

SIR:

Pursuant to the provisions of 37 CFR §§ 1.56 and 1.97-98, enclosed herewith is modified form PTO/SB/08A listing references for consideration by the Examiner.

The filing of this Information Disclosure Statement shall not be construed as a representation regarding the completeness of the list of references, or that inclusion of a reference in this list is an admission that it is prior art or is pertinent to this application, or that a search has been made, or as an admission that the information listed is, or may be considered to be, material to patentability, or that no other material information exists, and shall not be construed as an admission against interest in any manner.

This Information Disclosure Statement is being filed:

- ☒ within three months of the filing date of the application, or date of entry into the national stage of an international application, or before the mailing date of a first office action on the merits, whichever event last occurred;
- ☐ before the mailing of a first official action after the filing of a request for continued examination (RCE) under 37 CFR § 1.114;

- ☐ after three months of the filing date of this national application or the date of entry of the national stage in an international application, or after the mailing date of the first official action on the merits, whichever event last occurred, but before the mailing date of the first to occur of either: (1) a final action under 37 CFR §1.113; or (2) an action that otherwise closes prosecution in the application, and:
 - ☐ attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(c); OR
 - ☐ Applicant certifies pursuant to 37 CFR § 1.97(e) that:
 - ☐ each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement; OR
 - ☐ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement;
- ☐ on or before the payment of the issue fee but after the mailing date of the first to occur of either: (1) a final action under 37 CFR § 1.113; (2) a notice of allowance under 37 CFR § 1.311; or (3) an action that otherwise closes prosecution in the application, and:
 - ☐ Applicant certifies pursuant to 37 CFR. § 1.97(e) that:
 - ☐ each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement;
 - ☐ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing this

certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement; AND

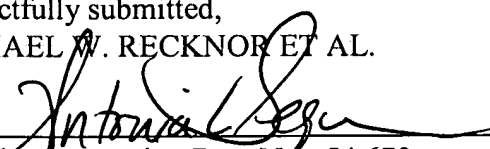
- ☐ attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(d); OR
- ☐ after the payment of the issue fee. Applicant requests that the information contained in this Information Disclosure Statement be placed in the file according to 37 CFR § 1.97(i), although the information may not be considered by the USPTO.
- ☒ Enclosed is a copy of each listed reference that may be material to the examination of this application, and for which there may be a duty to disclose.
- ☐ This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior application No. _____, filed on _____, and the references cited therein are hereby referenced, but are not required to be provided in this application under 37 CFR § 1.98(d).
- ☒ Copies of any foreign patent documents and non-patent literature cited herein are enclosed.
- ☐ Each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not received by any individual designated in 37 CFR § 1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement. 37 CFR § 1.704(d).
- ☒ Applicant submits that no fee is required for the consideration of this Information Disclosure Statement.

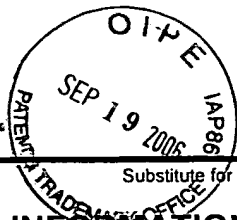
Consideration of the listed references and favorable action are solicited.

Respectfully submitted,
MICHAEL W. RECKNOR ET AL.

Dated: _____

9/14/06

By: 
Antonia L. Sequeira, Reg. No.: 54,670
Fenwick & West LLP
Silicon Valley Center
801 California Street
Mountain View, CA 94041
Tel.: (650) 335-7185
Fax.: (650) 938-5200



Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT****Complete if Known**

Application No.	11/423,669
Filing Date	June 12, 2006
First Named Inventor	Michael W. Recknor
Art Unit	1744
Examiner Name	Not Yet Known
Attorney Docket Number	24377-11758

Sheet 1 of 1

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document No. Number – Kind Code ² (if known)	Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		US-		
		US-		
		US-		
		US-		

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document Country Code ³ – Number ⁴ Kind Code ⁵ (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T ⁶

OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ⁶
	C1	BRAND Pipette Tips, BrandTech Scientific, Inc., 2005, 3 pages, [online] [Retrieved on September 6, 2006] Retrieved from the Internet <URL:http://www.brandtech.com/prodpage.asp?prodid=702504>	
	C2	Microtiter & PCR Plates, Rose Scientific Ltd., pp. 1 – 6.	
	C3	Microtiter Plate Guide, Thermo Electron Corporation, pp. 1 – 12.	
	C4	Pipette Tips Filter Tips, Brand, 8 pages.	
	C5	Pipettes & Tips, Pipette Tips, Brand, BrandTech Scientific, pp. 16 & 18.	

Examiner Signature	Date Considered
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

24377/11758/DOCS/1654099.1

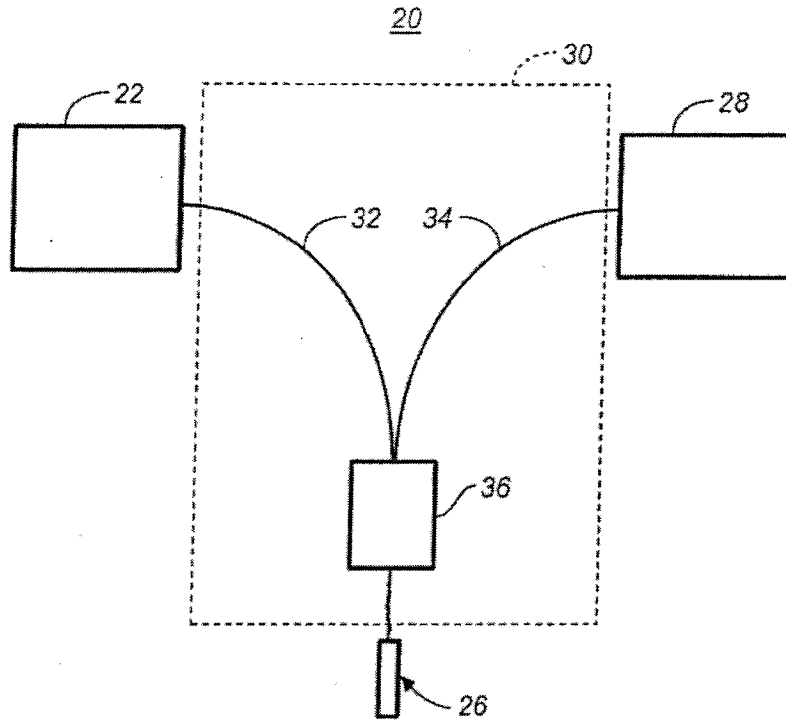


FIG. 1

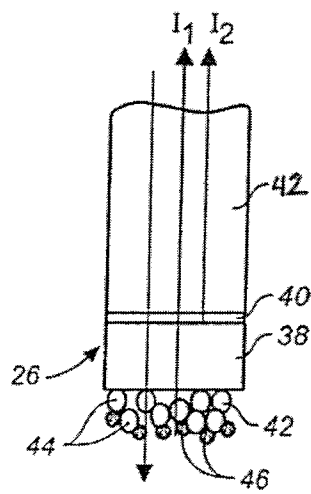
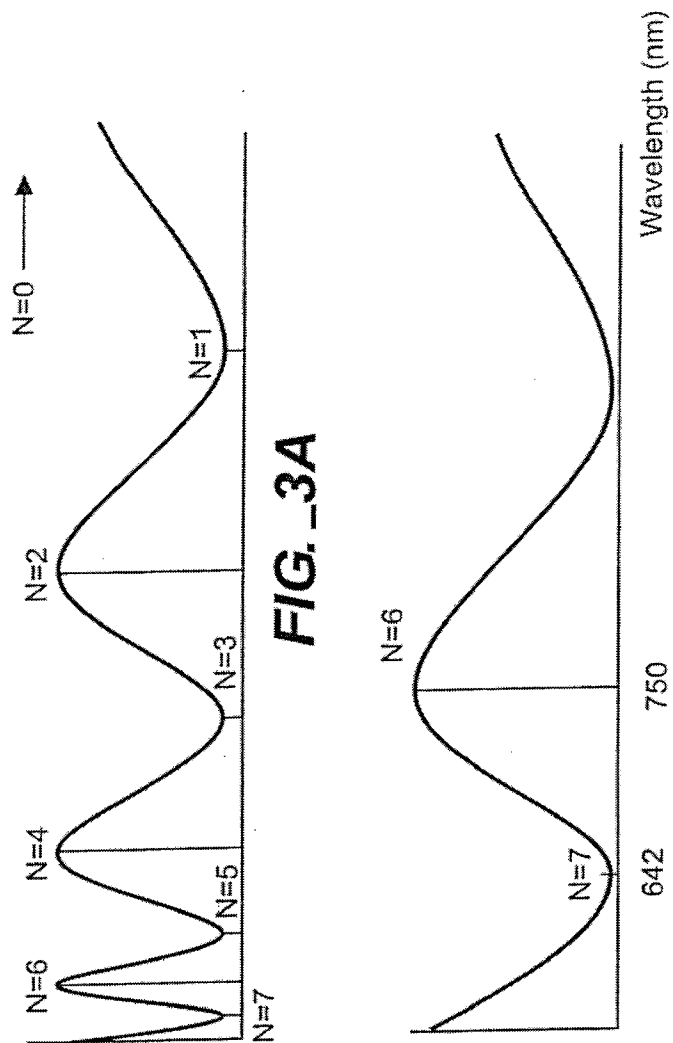


FIG. 2



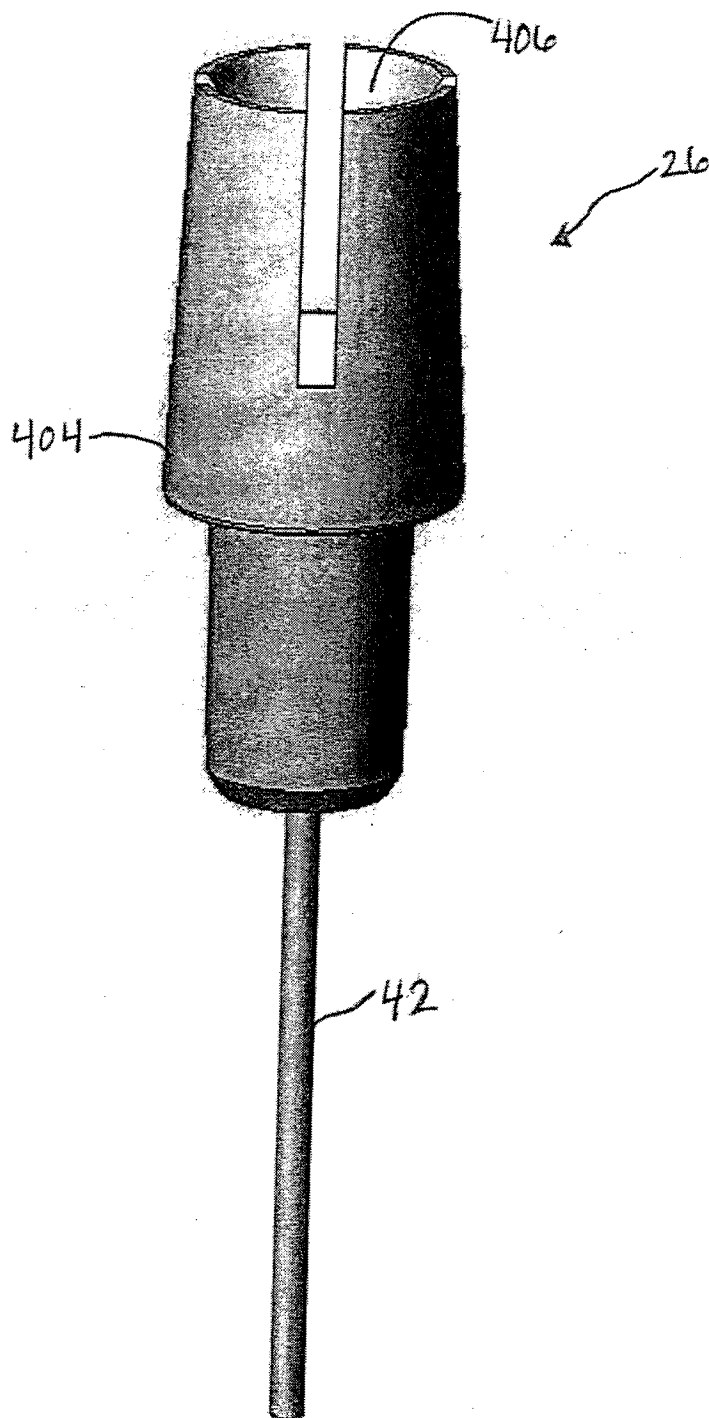
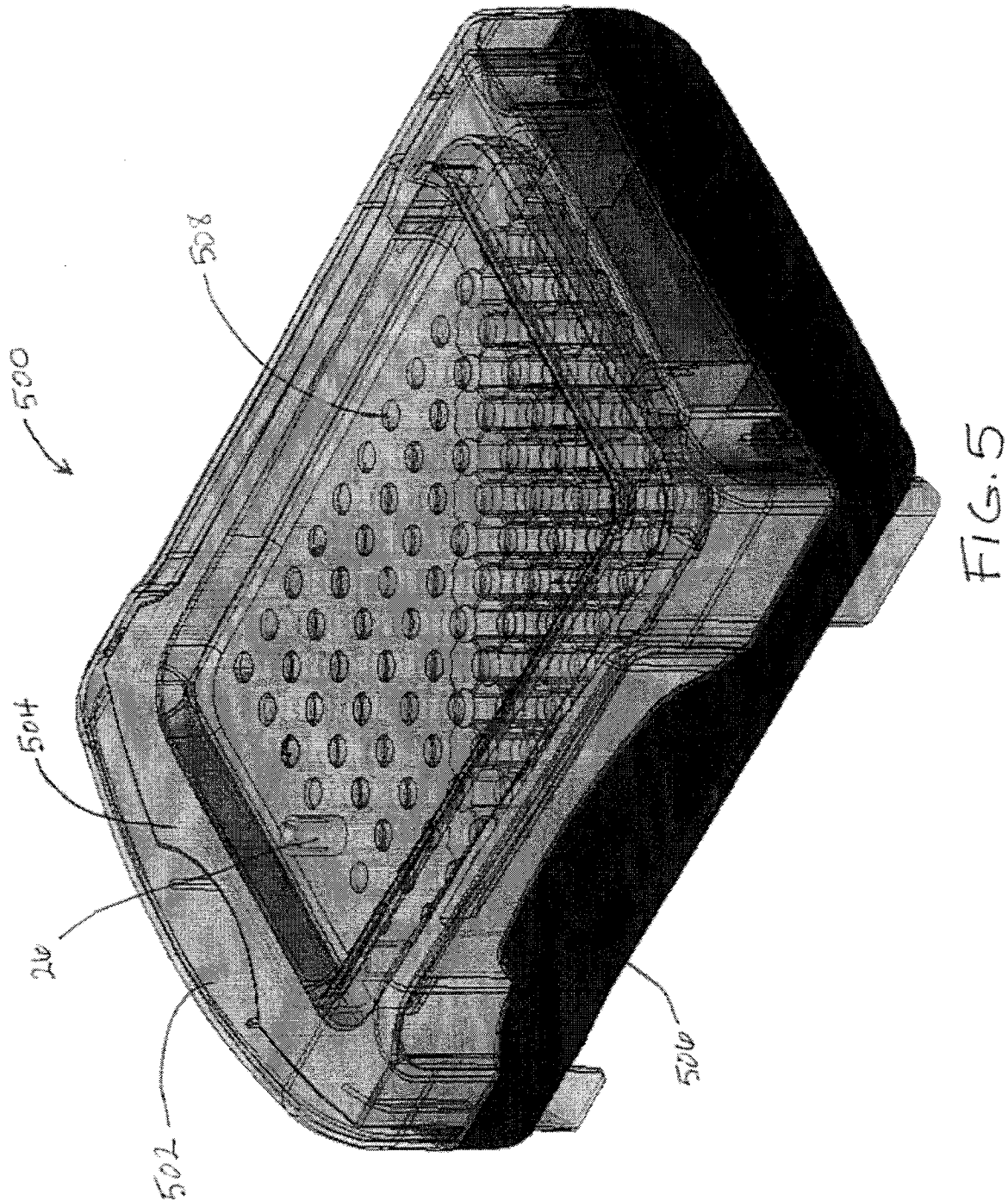
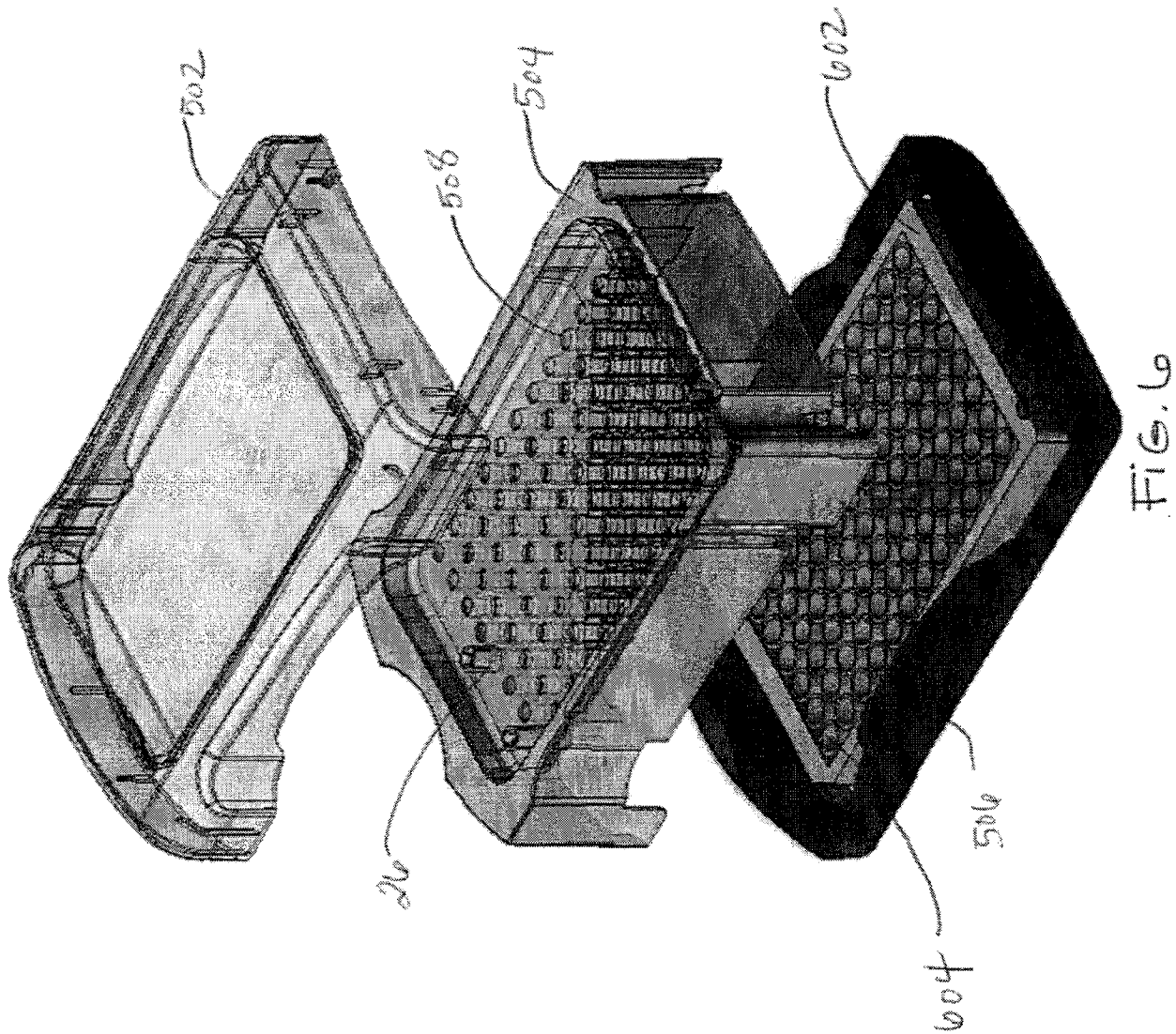
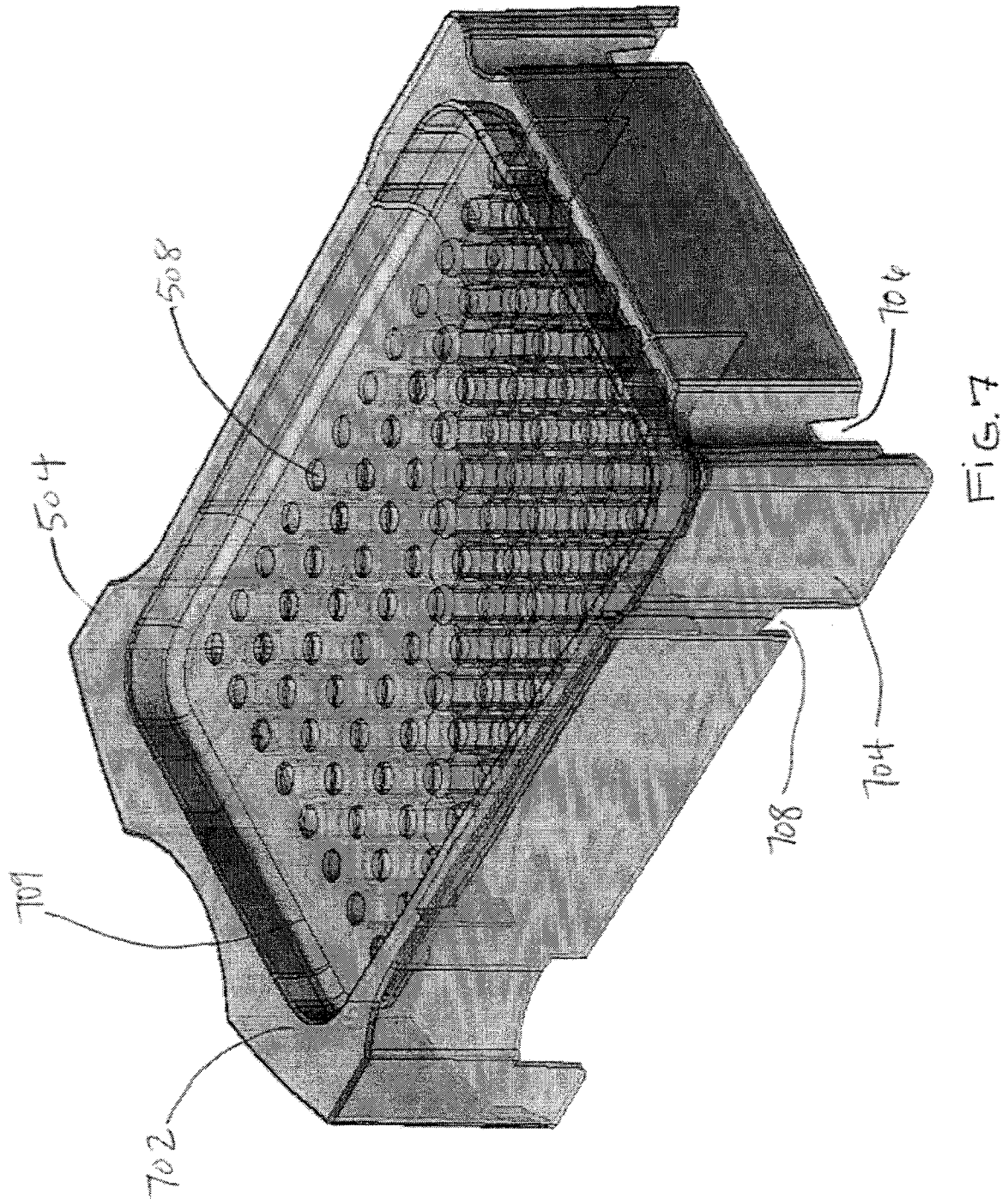


FIG. 4







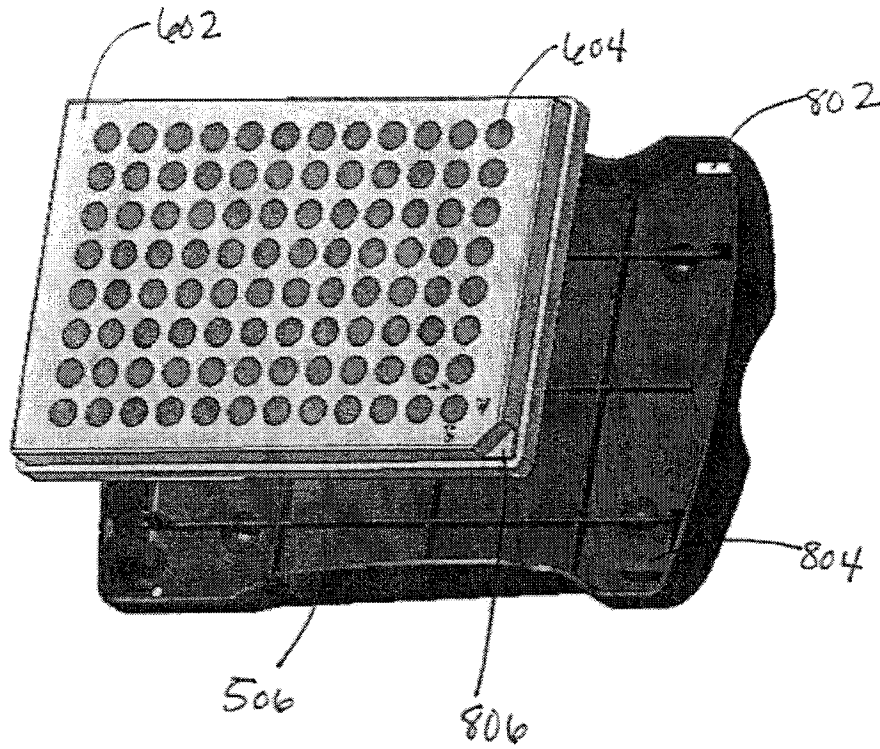


FIG. 8

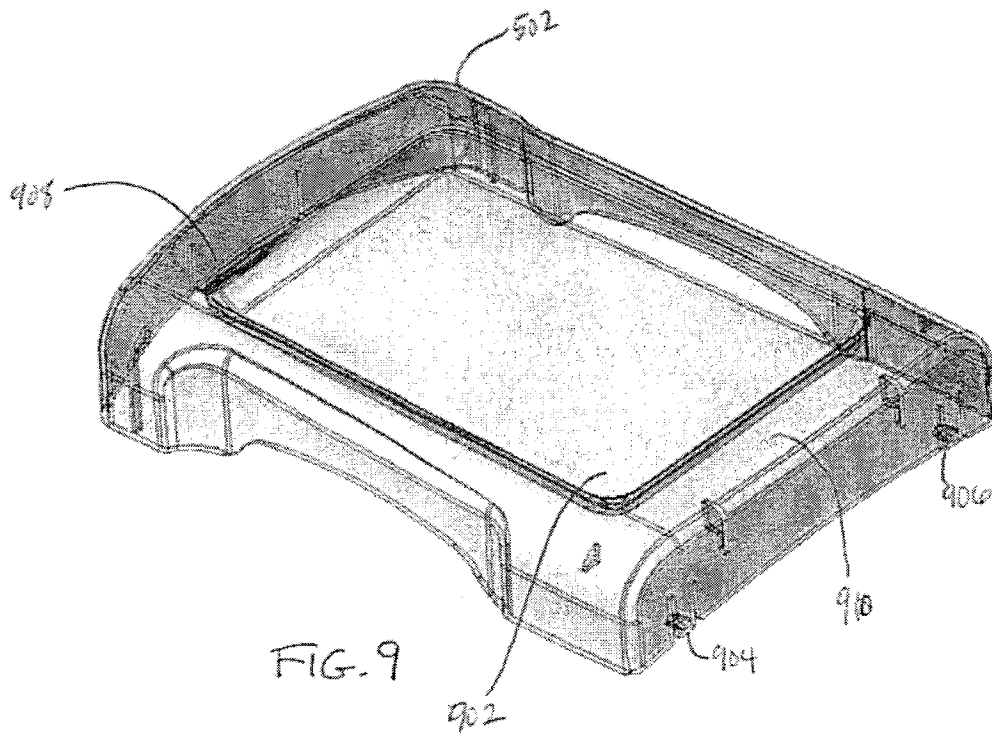
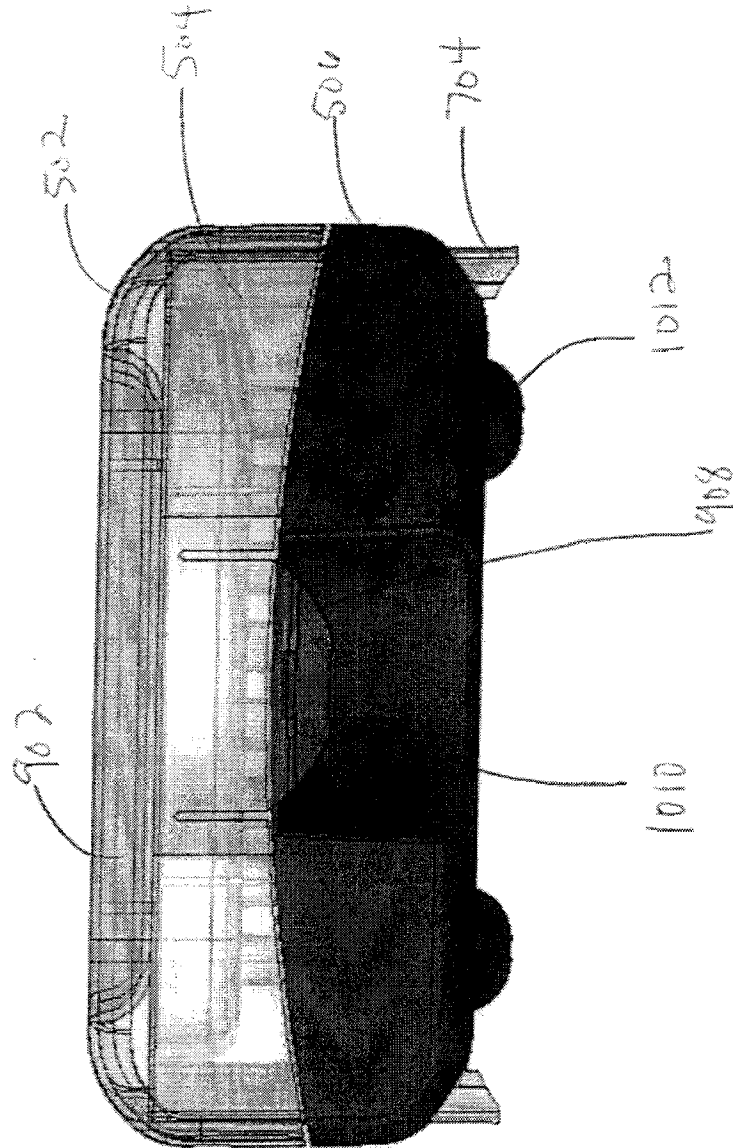


FIG. 9



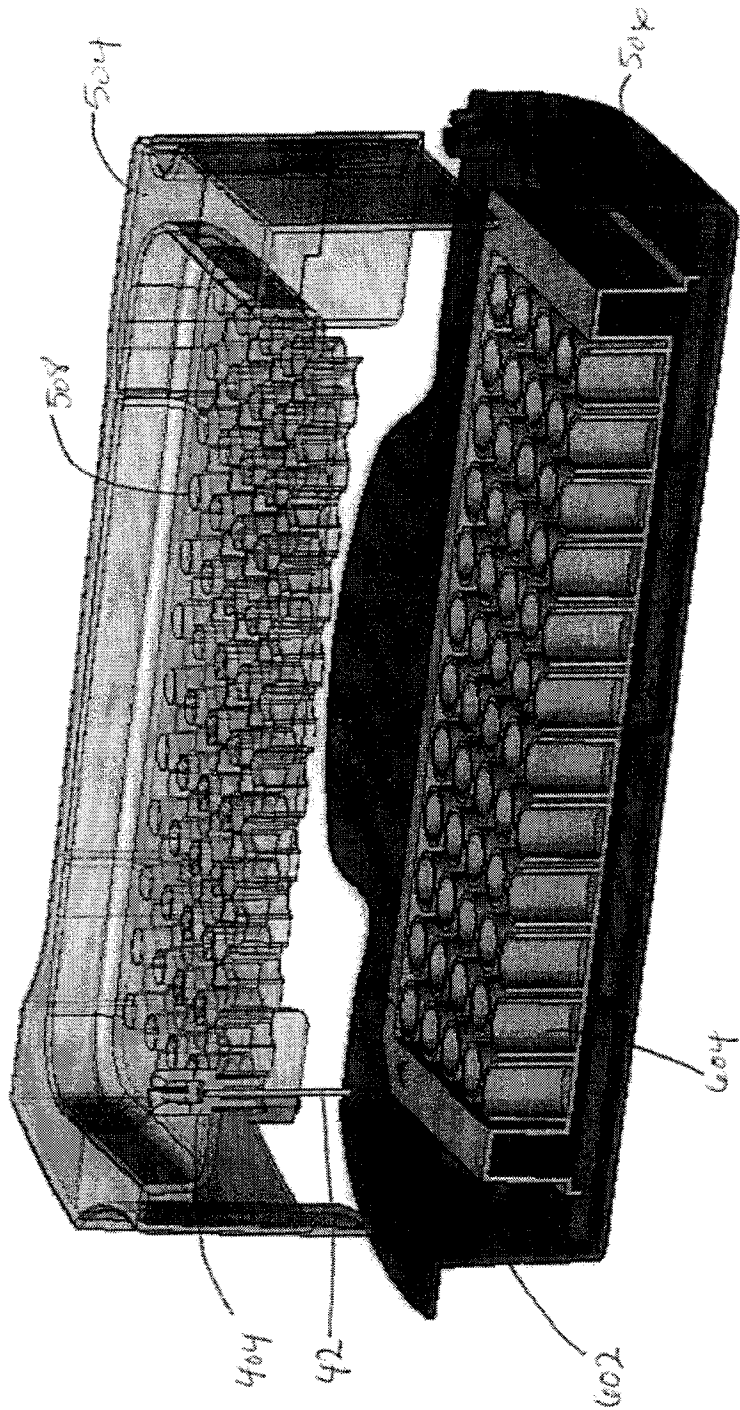
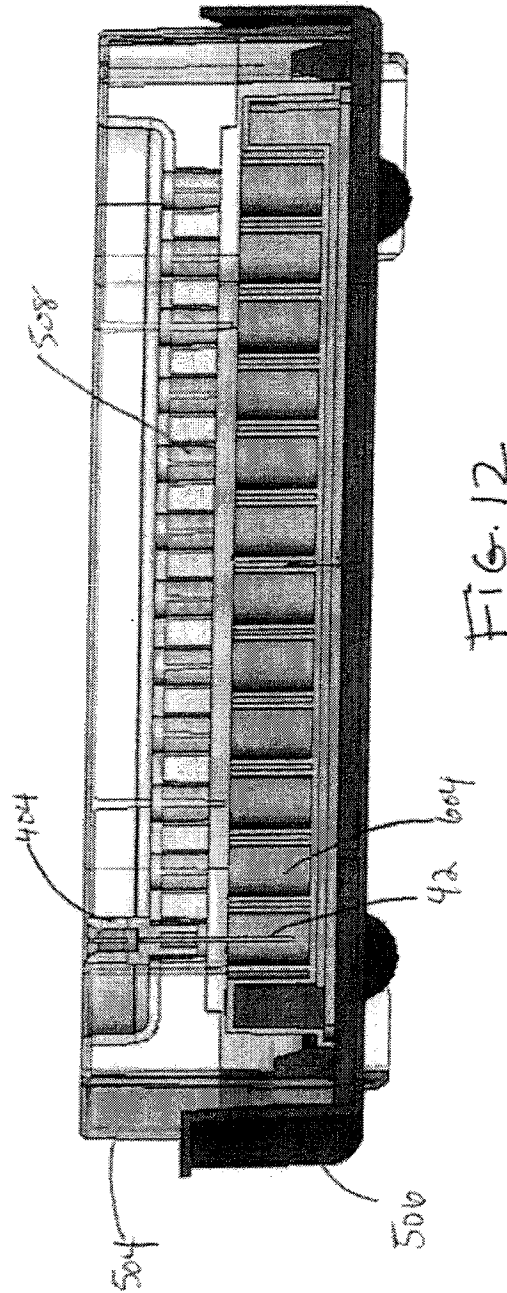


FIG. 11



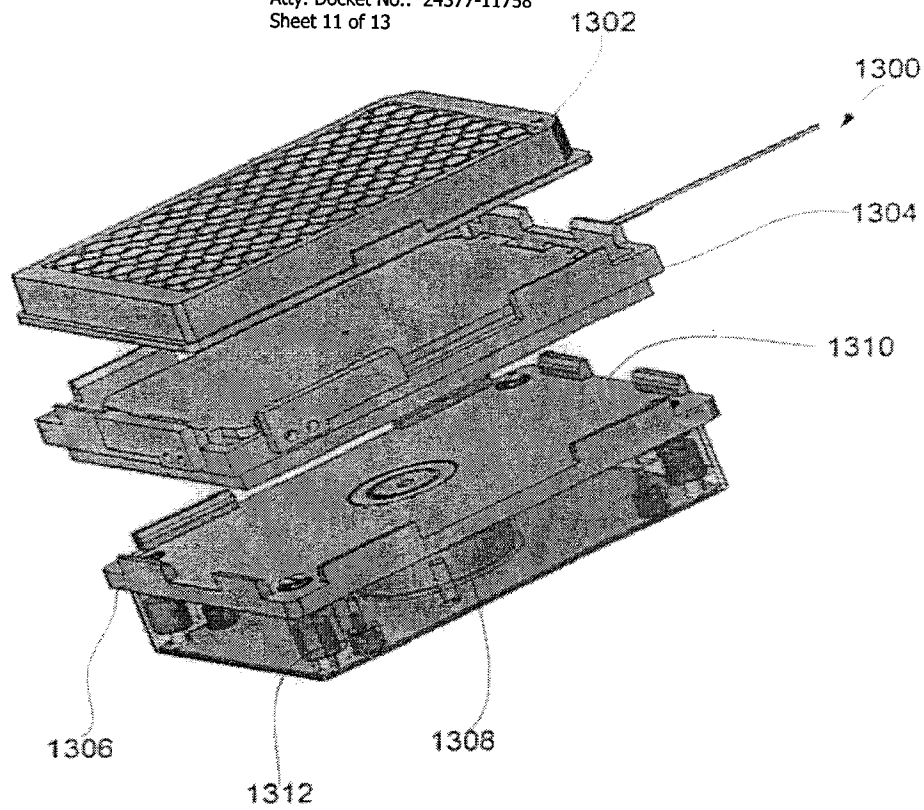


FIG. 13a

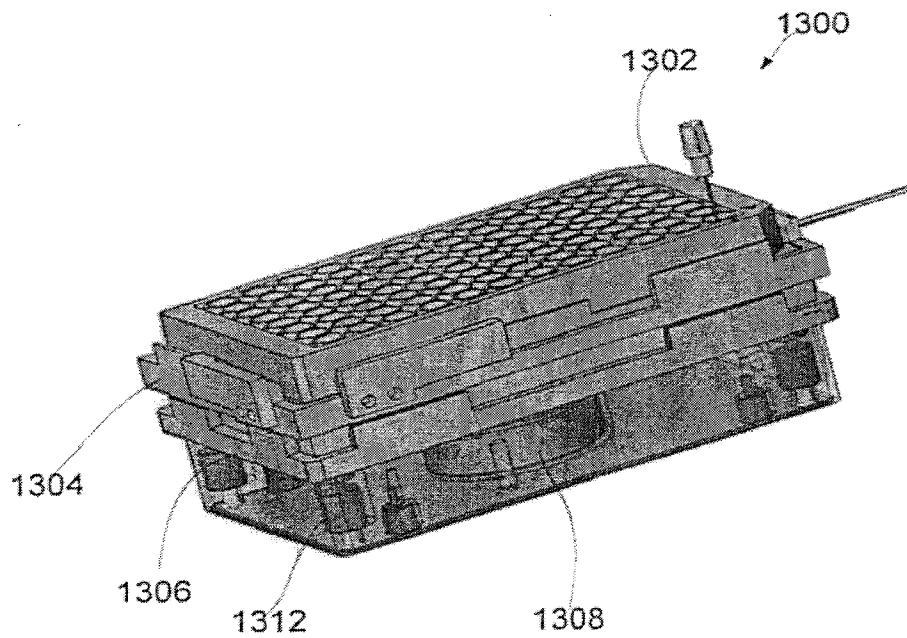
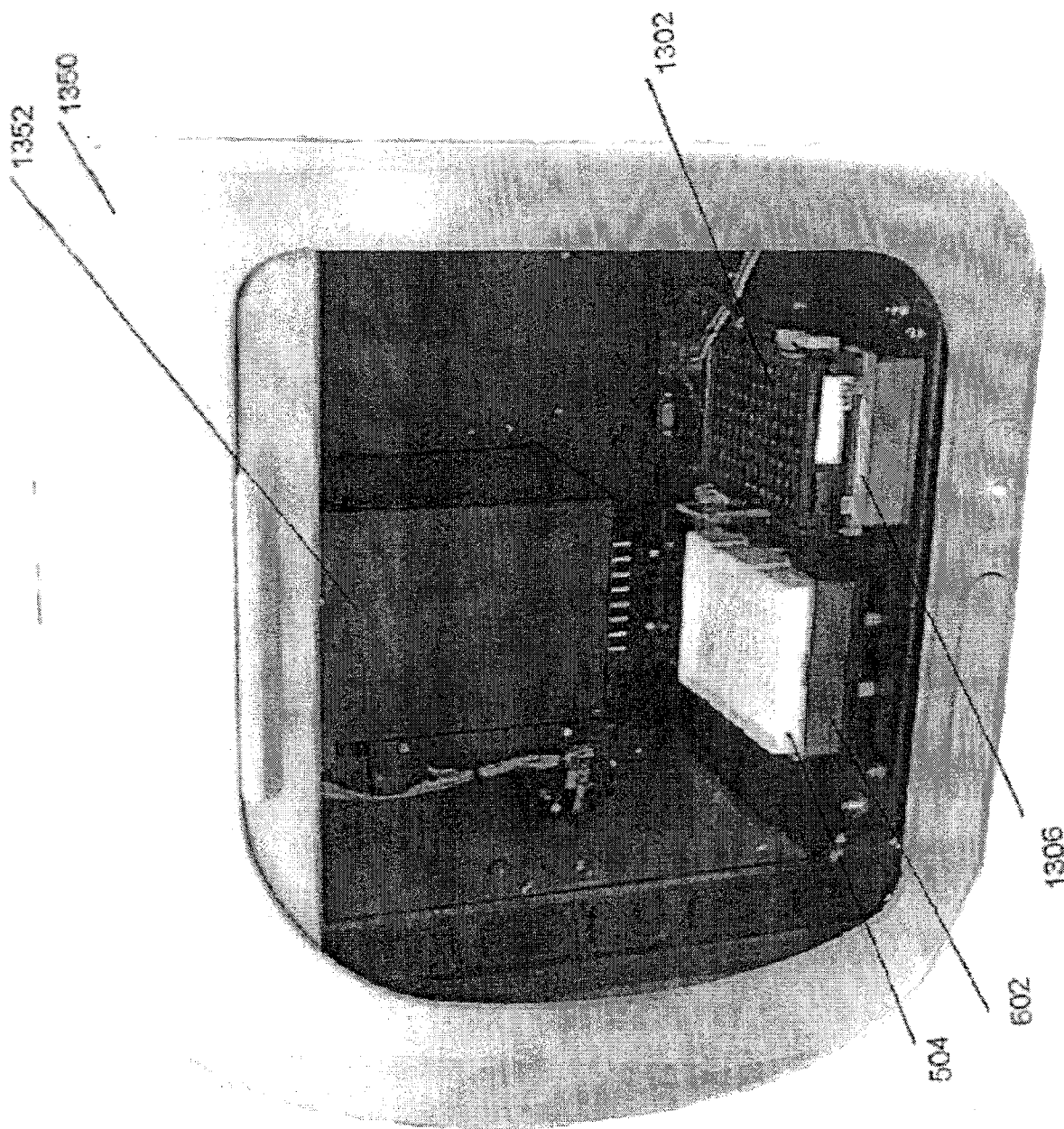


FIG. 13b



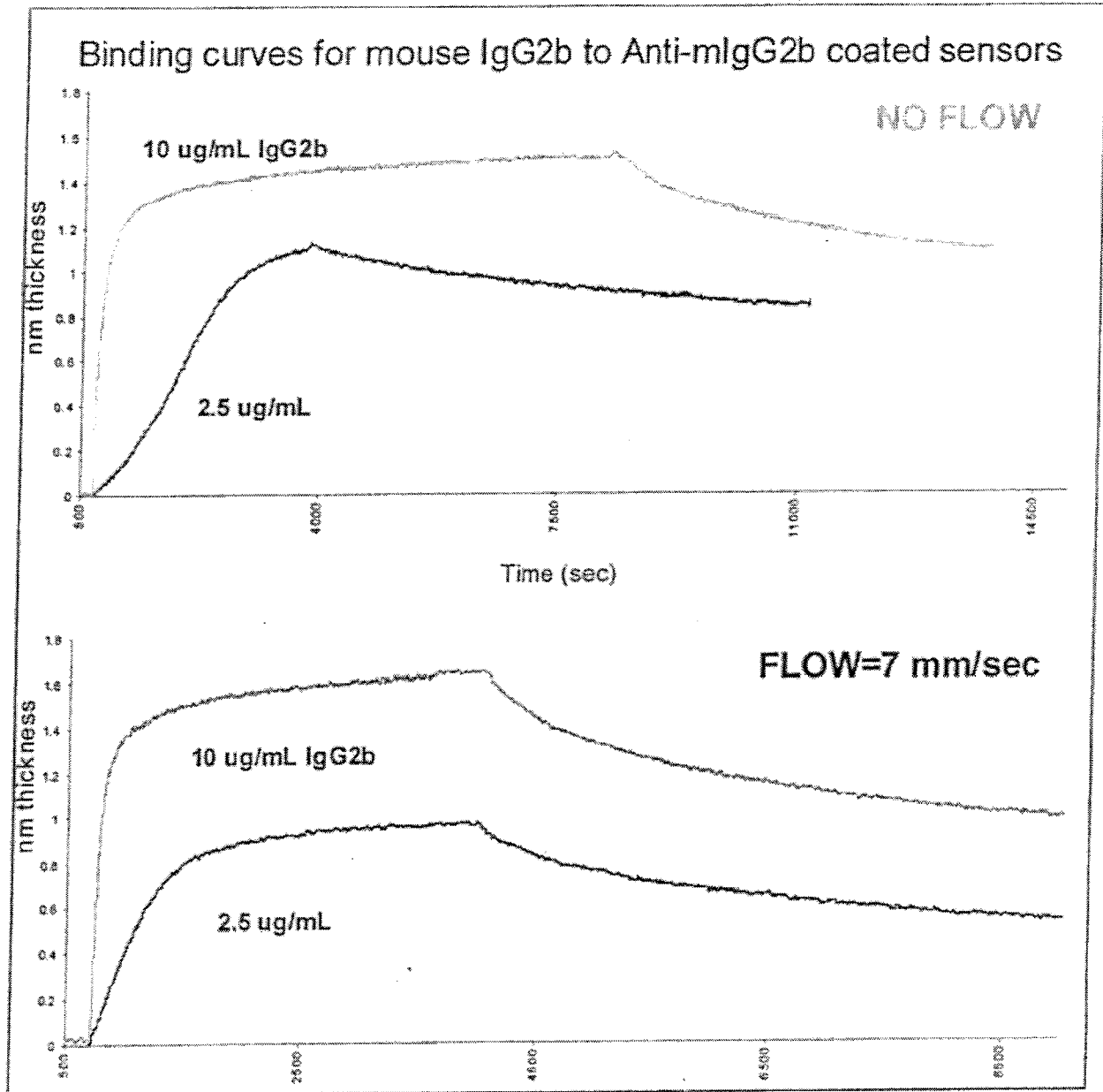


FIG. 14

Tip Tray Assembly for Optical Sensors

Michael W. Recknor
Hong Tan
Robert Zuk
Krista Leah Witte
Sae Choo
Scott Lockard

BACKGROUND OF THE INVENTION

Cross-Reference to Related Applications

[0001] This application claims the benefit of U.S. Provisional Application No. 60/690,325, filed on June, 13, 2005, entitled “Tip Tray Assembly for Optical Sensors,” the entire disclosure of which is hereby incorporated by reference herein, including any appendices or attachments thereof, in its entirety for all purposes.

Field of the invention

[0002] The present invention relates to an apparatus and method based on fiber optic interferometry, and in particular, to a tip tray apparatus for packaging of optical sensors used in detecting analytes and mechanisms for creating flow of solution.

Description of the Related Art

[0003] Diagnostic tests based on a binding event between members of an analyte-anti-analyte binding pair are widely used in medical, veterinary, agricultural and research applications. Typically, such methods are employed to detect the presence or amount of an analyte in a sample, and/or the rate of binding of the analyte to the anti-analyte. Typical analyte-anti-analyte pairs include complementary strands of nucleic acids, antigen-antibody pairs, and receptor-receptor binding agent, where the analyte can be either member of the pair, and the anti-analyte molecule, the opposite member.

[0004] Diagnostics methods of this type often employ a solid surface having immobilized anti-analyte molecules to which sample analyte molecules will bind specifically and with high affinity at a defined detection zone. In this type of assay, known as a solid-phase assay, the solid surface is exposed to the sample under conditions that promote analyte binding to immobilized anti-analyte molecules. The binding event can be detected directly, *e.g.*, by a change in the mass, reflectivity, thickness, color or other characteristic indicative of a binding event. Where the analyte is pre-labeled, *e.g.*, with a chromophore, or fluorescent or radiolabel, the binding event is detectable by the presence and/or amount of detectable label at the detection zone. Alternatively, the analyte can be labeled after it is bound at the detection zone, *e.g.*, with a secondary, fluorescent-labeled anti-analyte antibody.

[0005] Co-owned U.S. Patent No. 5,804,453, (the '453 patent) which is incorporated herein by reference, discloses a fiber-optic interferometer assay device designed to detect analyte binding to a fiber-optic end surface. Analyte detection is based on a change in the thickness at the end surface of the optical fiber resulting from the binding of analyte molecules to the surface, with greater amount of analyte producing a greater thickness-related change in the interference signal. The change in interference signal is due to a phase shift between light reflected from the end of the fiber and from the binding layer carried on the fiber end, as illustrated particularly in Figs. 7a and 7b of the '453 patent. The device is simple to operate and provides a rapid assay method for analyte detection.

[0006] The optical tip tray device described herein can be used with a fiber-optic interferometer assay device, as described above. Specifically it provides a mechanism for packaging and holding discrete fiber optic sensors in a format that allows for easy use of the

sensors. Before the types of assays described above are conducted, the sensors can undergo some type of pre-wetting. Techniques can also be used to immobilize molecules, such as proteins, to the surface of the sensor. "Pre-wet," as used herein, is a procedure in which a sensor coated with immobilized binding proteins is hydrated to restore their biological activity. Sensors coated with proteins can be stored dry in order to preserve the activity of the proteins until they are to be used in an assay. In immobilization procedures, sensors are put into contact with sample solutions, such as protein-containing samples, and the proteins or other molecules in the sample are immobilized to the surface of biosensors coated with the appropriate surface chemistry. In the device disclosed herein, discrete optical sensors are packaged in a format (e.g., a format that corresponds to the 96-well format of a standard microtiter plate) that allows the sensors to be easily dipped into pre-wet or protein-immobilization solutions. Thus, in some embodiments, the device provides for off-line incubation, pre-wet, and/or immobilization. In contrast, current devices for holding biosensors are either in flow cell format or have sensors located as a part of the bottom of a microplate well, both of which require different pre-wetting and immobilization procedures. In addition, these systems do not provide flexibility for users to arrange or configure the biosensors to customize the sensor arrangement for immobilization. Users do not have the option to simply remove and save unused biosensors, but are instead forced to use an entire set of sensors for each experiment even if only a few were needed.

[0007] Therefore, there is a need for an easy mechanism for off-line incubation, pre-wetting, and immobilization where the user has the flexibility to move around the sensors and customize the arrangement. There is also a need for a device that stores these types of discrete sensors in a format for easy pick up of the sensors, for transfer of the sensors to a second

microplate for assay, and for mapping of sensors to sample wells. Furthermore, these types of discrete sensors need to be packaged to avoid damage during shipping, handling, and storage of the sensors.

[0008] Current devices also have limitations with regard the mechanism for providing flow in wells during an assay. For molecular kinetic analyses and other types of analyses, the device must include some sort of mechanism for providing flow (e.g., within the wells of the microtiter plate containing sample or the second microtiter plate), for example, to measure the disassociation of molecules from the sensor surfaces. Where the sensor surface is located at the bottom of a microtiter plate, however, it is difficult to create any flow. Without proper flow, it is impossible to provide a valid environment for molecular binding kinetic analysis. Current systems use flow cells to create sample or buffer flow over the sensing surface. For example, some current systems use microfluidics and fluidic channels to move the fluid around to bring reagents into contact with a particular biosensor. However, these types of designs put a large design and support burden on the instrumentation. Thus, there is needed a mechanism that allows for fluidic motion without the need for microfluidics or fluidic channels. There is a need for a mechanism that allows exposure of the biosensor to a relatively large bulk of reagents by providing continuous flow of reagent over the biosensor.

[0009] The present invention is designed to overcome these and other limitations with a design that allows flexibility for arrangement or configuration of biosensors, biosensor mapping capability to sample wells in a microtiter plate, off-line incubation, pre-wet, and immobilization, and an effective mechanism for orbital flow of the reagent over the biosensors, among other advantages.

SUMMARY OF THE INVENTION

[0010] The invention includes, in one aspect, an apparatus and method for packaging of an optical sensing fiber. The apparatus includes a substrate with a plurality of openings, and each opening is configured for holding an optical sensing assembly. The assembly is positioned in the opening with a tip of the assembly extending through the opening to be suspended from the substrate. In addition, openings are arranged so the assembly positioned therein avoids contacting another assembly positioned therein. In some embodiments, the apparatus further includes a support member for supporting the substrate and positioning the substrate so the tip of the assembly suspended from the opening in the substrate contacts solution in one of a plurality of wells in a container adjacent to the substrate. The assembly can be configured for preparing of the optical assembly for assay.

[0011] In one particular design, the apparatus includes both a cover and a base that can lock together around the substrate to form an enclosure around the optical sensing assembly. A container (e.g., a microtiter plate) can be positioned inside the base, beneath the substrate, in a manner that allows the tips of the optical assemblies to line up in a predetermined orientation for immersion in the solution inside the wells of the container. The discrete optical assemblies can be moved around and arranged within the substrate to customize an array of assemblies. In some embodiments, the wells in the container are filled with different types of protein solution or another type of solution to customize the array. In some embodiments, different sensors (or sensors coated with different reagents) are arranged within the substrate to customize the array. The optical assemblies can be mapped to wells in a sample container or microtiter plate to allow a user to keep track of the samples being assayed and the different sensors being used in the assay.

[0012] In another aspect, the invention includes a method for packaging an optical sensing assembly for assay. The method includes placing a discrete optical sensing assembly in one of a plurality of openings in a substrate that is supported by a support member. The optical sensing assembly is positioned in the opening with a tip of the optical sensing assembly extending through the opening to be suspended from the opening in the substrate. In addition, the openings are arranged so the optical sensing assembly positioned therein avoids contacting another optical sensing assembly positioned therein. In some embodiments, the method further includes positioning the substrate so the tip of the optical sensing assembly suspended from the opening in the substrate contacts solution in one of a plurality of wells in a container adjacent to the substrate. In addition, the method can include preparing the optical sensing assembly for assay, such as by immobilization or pre-wet of the optical assembly before assay.

[0013] In one design, the substrate can hold the array of optical assemblies on a robotic instrument. In this embodiment, the substrate may or may not be positioned over a container of wells (e.g., a microtiter plate containing protein samples for immobilization on the sensor tips). One or more of the optical assemblies can be moved by a robotic arm from the tip tray apparatus to another location (e.g., a second microtiter plate containing samples and mounted on the robotic instrument next to the substrate). In some embodiments, the tip tray apparatus holds the sensors in position for manual transfer by a standard pipette or other device to another location (e.g., to a wastebasket or other location). Still other embodiments of the method include covering the substrate with a cover and setting the substrate over the container that is resting in a base. The base and cover can lock together to surround the optical sensing assembly for storage.

[0014] In yet another aspect, the invention includes an apparatus for maintaining flow of the solution. The apparatus includes an agitation assembly operably coupled to a container (e.g., the second sample-containing microtiter plate described above) with a plurality of wells containing solution. Each of the wells is configured for having a discrete optical sensing assembly immersed therein. The optical sensing assembly is also configured for measuring a characteristic of the solution. In addition, the agitation assembly comprises an agitation device that moves the container according to a specified type of motion to agitate the solution relative to the optical assembly to create flow of the solution relative to the optical assembly.

[0015] In one design, the agitation device can be a motor or an actuator, or other type of device for providing movement of the solution to create surface flow. The specified type of motion created by the agitation device can be a repetitive or a random motion of the solution, thus causing it to flow over the optical sensing assembly for the assay. In some embodiments, the apparatus is placed on a surface above the agitation device, and the device thereby causes movement or vibration of the solution relative to the optical sensing assembly.

[0016] In some embodiments of the invention, the substrate that holds an array of sensors (e.g., as part of the tip tray apparatus) over a first container (e.g., a first microtiter plate) is mounted on a robotic instrument adjacent to a sample container (e.g., a second microtiter plate containing sample) that is mounted on the agitation assembly within the robotic instrument. A robotic arm (e.g., a robotic system with 8 SMA's) can pick up one or more sensors (e.g., a row of eight sensors) and transfer them over to the second container outside the tip tray apparatus for dipping of the sensors in the sample contained in the second container.

[0017] These and other objects and features of the present invention will become more fully apparent when the following detailed description of the invention is read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0018] These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, and accompanying drawings, where:

[0019] **Fig. 1** shows the basic system setup for the biosensor and tip tray apparatus, according to an embodiment of the invention;

[0020] **Fig. 2** shows an interferometer system constructed according to an embodiment of the invention;

[0021] **Figs. 3A and 3B** show a portion of an interference wave over 7 peak and valley orders (**3A**), and over in a visible portion of the spectrum (**3B**);

[0022] **Fig. 4** shows an optical sensing assembly constructed according to an embodiment of the invention;

[0023] **Fig. 5** shows an apparatus including a substrate and an optical sensing assembly stored in an opening in the substrate, according to an embodiment of the invention;

[0024] **Fig. 6** shows an exploded view of the apparatus illustrating a cover, a substrate, a base, and a container of wells, according to an embodiment of the invention;

[0025] **Fig. 7** shows perspective view of the substrate with an array of openings therein, according to an embodiment of the invention;

[0026] **Fig. 8** shows an exploded view of the container of wells and a base structure, according to an embodiment;

[0027] **Fig. 9** shows a perspective view of the cover for the apparatus, according to an embodiment of the invention;

[0028] **Fig. 10** shows a side view of the apparatus, according to an embodiment of the invention.

[0029] **Fig. 11** shows a cross-section of a side view of the apparatus with the tip lined up with the well, according to a embodiment of the invention;

[0030] **Fig. 12** shows a cross-section of a side view of the apparatus with the tip of the optical sensing assembly inside the well, according to an embodiment of the invention;

[0031] **Figs. 13a and b** show an apparatus for agitation of solution in a well relative to an optical sensing assembly, according to an embodiment of the invention.

[0032] **Fig. 13c** shows a robotic instrument for assay, according to an embodiment of the invention.

[0033] **Fig. 14** shows a graphical illustration of binding curves with and without flow, according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Definitions

[0034] Terms used in the claims and specification are to be construed in accordance with their usual meaning as understood by one skilled in the art except and as defined as set forth below. Numeric ranges recited in the claims and specification are to be construed as including the limits bounding the recited ranges.

[0035] The term "in vivo" refers to processes that occur in a living organism.

[0036] An "analyte-binding" molecule refers to any molecule capable of participating in a specific binding reaction with an analyte molecule. Examples include but are not limited to, *e.g.*, antibody-antigen binding reactions, and nucleic acid hybridization reactions.

[0037] A "specific binding reaction" refers to a binding reaction that is saturable, usually reversible, and that can be competed with an excess of one of the reactants. Specific binding reactions are characterized by complementarity of shape, charge, and other binding determinants as between the participants in the specific binding reaction.

[0038] An "antibody" refers to an immunoglobulin molecule having two heavy chains and two light chains prepared by any method known in the art or later developed and includes polyclonal antibodies such as those produced by inoculating a mammal such as a goat, mouse, rabbit, etc. with an immunogen, as well as monoclonal antibodies produced using the well-known Kohler Milstein hybridoma fusion technique. The term includes antibodies produced using genetic engineering methods such as those employing, *e.g.*, SCID mice reconstituted with human immunoglobulin genes, as well as antibodies that have been humanized using art-known resurfacing techniques.

[0039] An "antibody fragment" refers to a fragment of an antibody molecule produced by chemical cleavage or genetic engineering techniques, as well as to single chain variable fragments (SCFvs) such as those produced using combinatorial genetic libraries and phage display technologies. Antibody fragments used in accordance with the present invention usually retain the ability to bind their cognate antigen and so include variable sequences and antigen combining sites.

[0040] A "small molecule" refers to an organic compound having a molecular weight less than about 500 daltons. Small molecules are useful starting materials for screening to identify drug lead compounds that then can be optimized through traditional medicinal chemistry, structure activity relationship studies to create new drugs. Small molecule drug compounds have the benefit of usually being orally bioavailable. Examples of small molecules include compounds listed in the following databases: MDL/ACD (<http://www.mdli.com/>), MDL/MDDR (<http://www.mdli.com/>), SPECS (<http://www.specs.net/>), the China Natural Product Database (CNPD) (<http://www.neotrident.com/>), and the compound sample database of the National Center for Drug Screening (<http://www.screen.org.cn/>).

[0041] Abbreviations used in this application include the following: "ss" refers to single-stranded; "SNP" refers to single nucleotide polymorphism; "PBS" refers to phosphate buffered saline (0.01 M phosphate buffer, 0.0027 M potassium chloride and 0.137 M sodium chloride, pH 7.4); "NHS" refers to N-hydroxysuccinimide; "MW" refers to molecular weight; "Sulfo-SMCC" refers to sulfosuccinimidyl 4-[N-maleimidomethyl]cyclohexane-1-carboxylate.

[0042] It must be noted that, as used in the specification and the appended claims, the singular forms "a," "an" and "the" include plural referents unless the context clearly dictates otherwise.

Advantages and utility

[0043] The advantages and utility of the invention are illustrated by reference to the Figures and Examples as described in greater detail below. These include an apparatus that holds and stores discrete optical fiber sensors in a format that is useful for off-line pre-wetting or protein immobilization, for transfer with a robotic or other type of instrument, etc. In some

embodiments, a substrate holds the sensors in a format that corresponds to a standard 96-well microplate (i.e., an 8 x 12 format with approximately 9 mm spacing between the sensors). This positioning allows a microplate or other container to be placed in the tip tray apparatus under the sensors so that each tip of each sensor is suspended over and can be immersed in a liquid in the microplate wells. This design provides a means for immersing the end of the sensor so that the tips of the sensors do not have to rub against or otherwise contact the sides of the package or one another, thus protecting them from contamination or damage.

[0044] Holding the sensors in this type of format can serve a number of purposes. As one example, this format can be useful in pre-wetting of the sensors. The sensors can be coated with immobilized binding proteins and stored dry in order to preserve the activity of the proteins. Then a container, such as a microtiter plate, containing simple buffer or other solution can be placed in the tip tray beneath the sensors to immerse the tips of the sensors in the buffer. This immersion allows the sensors to become hydrated, thus restoring their biological activity prior to their transfer to the sample containing microplate (e.g., a second microtiter plate outside the tip tray) for assay. As another example, this format can be useful in immobilization of molecules, such as proteins, to the surface of the sensors (or e.g., for measurement of interaction with another protein already immobilized on the optical sensing assembly). For example, protein-containing samples can be dispensed into microplate wells and the microplate can be placed in the tip tray under the tips of the sensors that have the appropriate surface chemistry so that binding of the protein to the sensor occurs. These samples may be, e.g., the same for all wells or different in different wells for preparing a homogenous or heterogenous set of sensors. Since protein immobilization does not entail optical thickness

measurements, the immobilization procedure can be performed off-line or outside of the use of the instrument for assay (i.e., in some embodiments the sensors do not have to be on the robotic instrument during immobilization).

[0045] Another advantage of the apparatus described herein is that the biosensors are each discrete structures that do not have to be connected to one another or connected to the apparatus that supports them (e.g., they are not located at the bottom of microplate wells, etc), so a user can move around the various sensors or customize the arrangement as desired. Since the sensors are discrete, the user can remove and save extra sensors that are not needed for a smaller-sized assay, rather than wasting these unused sensors as might occur in an apparatus where the sensors are located at the bottom of microplate wells. In addition, as described above, the tip tray apparatus can have a microtiter plate or other container optionally placed inside the base of the tip tray apparatus for pre-wet (pre-conditioning of tips) or off-line immobilization of proteins, and different proteins can be used in each well of the plate, thereby allowing for a customized array of sensor tips.

[0046] A further advantage includes the ability to map the sensors and their specific arrangement to the sample container (e.g., a second microtiter plate outside of the tip tray) including wells filled with sample. The position of each sensor can be mapped to the corresponding position of the well of sample that the sensor will contact during assay. Yet other advantages include the design of the sensors that allow them to be positioned for automatic pick-up and usage by a robotic instrument or by a standard pipette. In embodiments in which the sensors are positioned in a 96-well format, the sensors can then be easily transferred to a second microplate for measurement. Furthermore, the overall apparatus is

configured to protect the sensors during shipping, handling, and storage. The sensors rest neatly in separate openings in the apparatus and, in some embodiments, the apparatus includes a hard-sided bottom portion and a top portion that effectively surround the sensors in a safe and protected environment.

[0047] A further advantage is provided in the mechanism for creating orbital flow without the need for microfluidics and fluidic channels. As described above, this is needed for providing a valid environment for molecular binding kinetic analysis. In the invention described herein, an orbital agitation device is provided for creating relative motion between an optical fiber sensor surface and the samples in a microtiter plate. In one embodiment, the plate is rotated in a plane that is perpendicular to the fiber sensors. An angle between the plate bottom and sensor fibers is also possible to reduce the reflected light (i.e., background noise).

[0048] FIG. 1 shows, in schematic view, an interferometer system 20 constructed in accordance with the invention. In its most basic elements, the system 20 includes a light source 22, a biosensor or optical sensing assembly 26 that functions as a sensing element or detector tip, and a detector unit 28 for detecting interference signals produced by interfering light waves reflected from the optical sensing assembly 26.

[0049] Light from source 22 is directed onto the optical sensing assembly 26, and reflected back to the detector through an optical coupling assembly indicated by dashed lines at 30. In a preferred embodiment, the coupling assembly includes a first fiber cable 32 extending from the light source 22 to the optical sensing assembly 26, and a second fiber cable 34 which carries reflected light from the optical sensing assembly 26 to the detector 28. Optionally, an optical

coupler may be used to optically couple the fiber cables 32, 34 to the optical sensing assembly 26.

[0050] The light source 22 in the system 20 can be a white light source, such as a light emitting diode (LED) which produces light over a broad spectrum, e.g., 400 nm or less to 700 nm or greater, typically over a spectral range of at least 100 nm. Alternatively, the light source 22 can be a plurality of sources each having a different characteristic wavelength, such as LEDs designed for light emission at different selected wavelengths in the visible light range. The same function can be achieved by a single light source 22, e.g., white light source, with suitable filters for directing light with different selected wavelengths onto the optical sensing assembly 26.

[0051] The detector 28 can be a spectrometer, such as charge-coupled device (CCD), capable of recording the spectrum of the reflected interfering light from the optical sensing assembly 26. Alternatively, where the light source 22 operates to direct different selected wavelengths onto the optical sensing assembly 26, the detector 28 can be a simple photodetector for recording light intensity at each of the different irradiating wavelengths. In still another embodiment, the detector 28 can include a plurality of filters which allows detection of light intensity, e.g., from a white-light source, at each of a plurality of selected wavelengths of the interference reflectance wave.

[0052] FIG. 2 shows the optically functional part of an optical sensing assembly 26 constructed in accordance with one embodiment of the invention. The optical sensing assembly 26 includes a short length of optical fiber 42, to which the remainder of the optical sensing assembly 26 is fixedly attached. The other end of optical fiber 42 couples to the fiber

cables 32 and 34, respectively. As seen, the assembly 26 includes a transparent optical element 38 having first and second reflecting surfaces 42, 40 formed on its lower (distal) and upper (proximal) end faces, respectively. According to an important feature of the invention, the thickness "d" of the optical element 38 between its distal and proximal surfaces, i.e., between the two reflecting surfaces, is at least 50 nm, and preferably at least 100 nm. An exemplary thickness is between about 100-5,000 nm, preferably 400-1,000 nm. The first reflecting surface 42 is formed of a layer of analyte-binding molecules, such as molecules 44, which are effective to bind analyte molecules 46 specifically and with high affinity. That is, the analyte and anti-analyte molecules are opposite members of a binding pair of the type described above, which can include, without limitations, antigen-antibody pairs, complementary nucleic acids, and receptor-binding agent pairs.

[0053] The index of refraction of the optical element 38 is preferably similar to that of the first reflecting surface 42, so that reflection from the lower distal end of the end optical sensing assembly 26 occurs predominantly from the layer formed by the analyte-binding molecules 44, rather than from the interface between the optical element 38 and the analyte-binding molecules 44. Similarly, as analyte molecules 46 bind to the lower layer of the optical sensing assembly 26, light reflection from the lower end of the assembly 26 occurs predominantly from the layer formed by the analyte-binding molecules 44 and bound analyte 46, rather than from the interface region. One exemplary material forming the optical element 38 is SiO₂, e.g., a high-quality quality glass having an index of refraction of about 1.4-1.5. The optical element 38 can also be formed of a transparent polymer, such as polystyrene or polyethylene, having an index of refraction preferably in the 1.3-1.8 range.

[0054] The second reflecting surface 40 in the optical sensing assembly 26 formed as a layer of transparent material having an index of refraction that is substantially higher than that of the optical element 38, such that this layer functions to reflect a portion of the light directed onto the optical sensing assembly 26. Preferably, the second layer has a refractive index greater than 1.8. One exemplary material for the second layer is Ta₂O₅ with refractive index equal to 2.1. The layer is typically formed on the optical element 38 by a conventional vapor deposition coating or layering process, to a layer thickness of less than 50 nm, typically between 5 and 30 nm.

[0055] The thickness of the first (analyte-binding) layer is designed to optimize the overall sensitivity based on specific hardware and optical components. Conventional immobilization chemistries are used in chemically, e.g., covalently, attaching a layer of analyte-binding molecules to the lower surface of the optical element. For example, a variety of bifunctional reagents containing a siloxane group for chemical attachment to SiO₂, and an hydroxyl, amine, carboxyl or other reaction group for attachment of biological molecules, such as proteins (*e.g.*, antigens, antibodies), or nucleic acids. It is also well known to etch or otherwise treat glass a glass surface to increase the density of hydroxyl groups by which analyte-binding molecules can be bound. Where the optical element 38 is formed of a polymer, such as polystyrene, a variety of methods are available for exposing available chemically-active surface groups, such as amine, hydroxyl, and carboxyl groups.

[0056] The analyte-binding layer 44 is preferably formed under conditions in which the distal surface of the optical element 38 is densely coated, so that binding of analyte molecules

46 to the layer forces a change in the thickness of the layer, rather than filling in the layer. The analyte-binding layer 44 can be either a monolayer or a multi-layer matrix.

[0057] The measurement of the presence, concentration, and/or binding rate of analyte 46 to the optical sensing assembly 26 is enabled by the interference of reflected light beams from the two reflecting surfaces 40, 42 in the optical sensing assembly 26. Specifically, as analyte molecules 46 attach to or detach from the surface, the average thickness of the first reflecting layer 42 changes accordingly. Because the thickness of all other layers remains the same, the interference wave formed by the light waves reflected from the two surfaces is phase shifted in accordance with this thickness change.

[0058] Assume that there are two reflected beams: The first beam is reflected from the first surface, which is the distal end interface between analyte-binding molecules 44 and bound analyte 46 and the surrounding medium; and the second beam is reflected from the second surface, which is the proximal interface between the optical element (the first layer) and the high-index of refraction layer (the second layer). The overall wavelength -dependent intensity of the interference wave is:

$$I = I_1 + I_2 + 2\sqrt{I_1 I_2} \cos\left(\frac{2\pi\Delta}{\lambda}\right)$$

where I is the intensity, I_1 and I_2 are the intensity of two interference beams, Δ is the optical path difference, and λ is the wavelength.

[0059] When $(2\pi\Delta/\lambda) = N\pi$, the curve is at its peak or valley if N is an integer 0, 1, 2,.... The thickness of the first layer $d = \Delta/2n$. Therefore, $\lambda = 4nd/N$ at peaks or valleys (extrema). For the first several values of N, *i.e.*, 0, 1, 2, ...7, and assuming a d of 770 nm, the equation gives:

$$\begin{aligned}
 N=0: \lambda &= \infty \quad (\text{peak}) \\
 N=1: \lambda &= 4nd = 4,496.80 \text{ nm} \quad (\text{Valley}) \\
 N=2: \lambda &= 2nd = 2,248.40 \text{ nm} \quad (\text{Peak}) \\
 N=3: \lambda &= 4nd/3 = 1,498.9 \text{ nm} \quad (\text{Valley}) \\
 N=4: \lambda &= nd = 1,124.20 \text{ nm} \quad (\text{Peak}) \\
 N=5: \lambda &= 4nd/5 = 899.36 \text{ nm} \quad (\text{Valley}) \\
 N=6: \lambda &= 2nd/3 = 749.47 \text{ nm} \quad (\text{Peak}) \\
 N=7: \lambda &= 4nd/7 = 642 \text{ nm} \quad (\text{Valley}) \\
 N=8: \lambda &= nd/2 = 562 \text{ nm} \quad (\text{Peak}) \\
 N=9: \lambda &= 4nd/9 = 499.64 \text{ nm} \quad (\text{Valley}) \\
 N=10: \lambda &= 4nd/10 = 449.6 \text{ nm} \quad (\text{Peak})
 \end{aligned}$$

As can be seen, and illustrated further in FIGS. 3A and 3B, at least three peaks/valleys ($N=7-9$) occur in the visible spectral range.

[0060] If the 7th order valley is used to calculate the change in molecular layer thickness, when the molecular layer attached to the first layer increases from 0 nm to 10 nm, the 7th order valley will shift to 650.74 nm. Therefore, the ratio between the actual the phase shift of the 7th order valley and thickness change equals $(650.74-642.40)/10 = 0.834$.

[0061] By contrast, if the initial spacing between the two reflecting layers 40, 42 is made up entirely of the analyte-binding molecules 44 on the end of the fiber, assuming a thickness of this layer of 25 nm, then the first order peak will occur at 146 nm, clearly out of the range of the visible spectrum, so that the device will only see a portion of the region between the 0-order

valley and the first order peak, but will not see any peaks, making a shift in the spectral characteristics of the interference wave difficult to measure accurately.

[0062] Not until the total thickness of the reflecting layer approaches about 100 nm will the first-order peak appear in the visible spectrum. Assuming a total thickness change of up to 50 nm, the thickness of the optical element can then be as small as 50 nm, but is preferably on the order of several hundred nm, so that the phase shift or change in periodicity of the interference wave can be measured readily by a shift in the spectral positions of higher-order peaks or valleys, *e.g.*, where $N=3-10$.

[0063] The ratio between the actual thickness and the measured phase shift is considered as a key factor of measurement sensitivity. It can be appreciated how one can adjust the thickness of the optical element 38 and its refractive index to improve and optimize the sensitivity to accommodate the electronics and optical designs.

[0064] Referring now to FIG. 4, there is shown an illustration of a side view of the full optical sensing assembly 26 (or biosensor or sensor), according to an embodiment of the invention. The sensors can be fabricated from cut lengths of optical fiber 42 bonded into a hub 404, similar in structure to a hypodermic needle and its hub. A portion of the fiber 42 can be immersed in sample during an assay. As shown in FIG. 2, a portion of the fiber 42 can be coated with a substance, such as analyte-binding molecules 44, to which the sample (*e.g.*, analyte molecules 46) will bind. In some embodiments, the analyte-binding molecule is a protein, a small molecule, a nucleic acid, a carbohydrate, or some other type of molecule. Where the molecule is a protein, the protein can be an avidin, a streptavidin, an antibody, an antibody fragment, or another type of protein. In some embodiments, the optical sensing

assembly 26 is used to measure the amount of analyte in the sample based on the amount of analyte that binds to the analyte-binding molecule coated on the assembly 26. In other embodiments, the optical sensing assembly 26 is used to measure the kinetics of a binding reaction between the analyte in the sample and the analyte-binding molecule coated on the optical sensing assembly.

[0065] Before these types of assays are conducted, the optical sensing assemblies 26 can be immersed in a specific molecule-containing immobilization solution for immobilization of molecules, such as proteins, to the assemblies 26 that are coated with the appropriate surface chemistry for this immobilization. Similarly, the assemblies 26 can be immersed into a pre-wet solution to hydrate the sensors restoring biological activity of previously bound molecules (e.g., binding proteins) just prior to the transfer of the sensors to a second microplate or other container for assay, as explained above.

[0066] The hub 404 of the optical sensing assembly 26 extends from fiber 402 and provides a base onto which a robotic instrument, standard pipette, or other instrument can attach to the sensor and move it from a first location to a second location. Specifically, the instrument used for moving the optical sensing assembly 26 can be attached at opening 406, and the assembly 26 can thus be moved to a different location as desired. The instrument for moving the assembly 26 can be designed for moving an array of assemblies 26 at one time, and thus the instrument can pick up a number of the discrete assemblies 26 from the tip tray holding the assemblies 26 (see FIG. 5) to move the assemblies 26 to a second location (e.g., a second microtiter containing sample to be tested).

[0067] FIG. 5 shows a tip tray apparatus 500 for packaging one or more optical assemblies 26, according to an embodiment of the present invention. The tip tray apparatus 500 includes a substrate 504, which is the portion of the tip tray apparatus 500 that includes a number of openings 508 for containing one or more discrete optical assemblies 26. The optical sensing assemblies 26 are discrete in that they are not connected or attached directly to other optical assemblies 26, and each assembly 26 can be moved around within the tip tray 500 to any configuration the user selects. Other devices may be attached to the optical sensing assemblies 26 in the tray 500, such as a standard pipette device, a robotic instrument, an optical fiber assembly (as shown in FIG. 1), etc., and these devices may indirectly and temporarily link these assemblies 26 together for a particular purpose. However, the user can still have the ability to move the assemblies 26 around at some point to configure them for the assay. In some embodiments, the optical sensing assemblies 26 are disposable tips that are to be used for an assay and then thrown away and replaced by new tips for the next assay.

[0068] The optical assemblies 26 are suspended in the openings 508 with the tip of the optical sensing assembly 26 extending away from the substrate 504. Each discrete optical sensing assembly 26 can rest in an opening 508 in the substrate 504, and the optical sensing assembly 26 is positioned in the opening so that the tip of the optical sensing assembly 26 is suspended below the substrate 504 while the hub of the optical sensing assembly 26 rests above the substrate 504. Thus, in FIG. 5, the hub 404 portion of the optical sensing assembly 26 can be seen resting above the opening 508, while the fiber 42 portion of the assembly 26 is positioned through the opening 508 and below the substrate 504. In some embodiments, the optical sensing assembly 26 rests loosely within the opening 508. In other embodiments, the

optical sensing assembly 26 is snapped or locked into place in the opening 508. In some embodiments, the substrate 504 includes an array of 96 openings 508 in an 8 x 12 pattern, similar to the structure of the wells in a standard 96-well microtiter plate. In other embodiments, the substrate 504 includes an array of 384 openings 508 or 1536 openings, similar to the wells in a standard 384-well or 1536-well microtiter plate. However, the array of openings 508 can be arranged in a number of other ways and can include any other number of openings 508, as suitable. In general, the openings are arranged so that the optical sensing assemblies 26 positioned in the openings avoid contacting other optical sensing assemblies 26, and thus the optical sensing assemblies 26 remain as discrete sensors within the tip tray.

[0069] Also illustrated in FIG. 5 is a base structure 506 and a cover 502 that make up a part of tip tray apparatus 500. The substrate 504 rests on the base 506 and the cover 502 rests on top of the base 506 to enclose the upper portion of the substrate 504. In this manner, the optical assemblies 26 in the substrate 504 are protected from the environment in the closed compartment created by base 506 and cover 502. The optical assemblies 26 can be stored in an enclosed manner for protection, and the assemblies 206 can also be protected during shipping and handling. The hard-sided base 506 and cover 502 can lock into an enclosed position and thus protect the contents of apparatus 500. The base 506 and cover 502 can form an injection-molded plastic box, as shown in FIG. 5, or the apparatus 500 can be constructed from materials other than plastic. As shown in FIG. 5, the cover 502 can be transparent or translucent, allowing the user to see the optical assemblies 26 and substrate 504 beneath the cover 502.

[0070] Referring now to FIG. 6, there is shown an exploded view of the tip tray apparatus 500, according to an embodiment of the invention. This Figure illustrates how the various

pieces of the tip tray apparatus 500 fit together. As shown in FIG. 5, each of the pieces of the apparatus can be completely separated from one another. The cover 502 can be completely removed from the substrate 504 and base 506, to expose the optical assemblies 26 below. Furthermore, the substrate 504 can be completely separated from the base 506 to expose container 602 below. Container 602 can be a standard 96-well, 384-well, or 1536-well microtiter plate that includes an array of wells 604 for holding sample. Container 602 can also include any other number of wells (e.g., 1 well, 8 wells, 384 wells, etc.) and any other well arrangement or overall configuration, as desired. Container 602 can be an injection-molded plastic plate, as shown in FIG. 5, or container 602 can be made of another material, as suitable.

[0071] As FIG. 6 illustrates, the openings 508 in the substrate 504 correspond generally with the wells 604 in container 602. When the tip of an optical sensing assembly 26 is placed into an opening 508 in the substrate 504, the fiber 42 portion (not shown) of the optical sensing assembly 26 will extend below the substrate 504 and into the well 604 of container 602. The substrate 504 can be arranged to be a distance from container 602 that permits a portion of fiber 42 (not shown) of the optical sensing assembly 26 to be immersed in sample contained in the well 604. The container 602 can also be separated from the base 506 to allow the container to be removed from the apparatus 500. Thus, a user can place pre-wet or immobilization solution in the wells 604, for example, while the container 602 is separate from the tip tray apparatus 500, and the user can then insert the container 602 into the base 506 when the wells 604 have been filled. In addition, the substrate 504 can be used by itself without the container 602. For example, the substrate 504 can be mounted on a robotic instrument and can simply hold the optical assemblies in place for a robotic arm to attach to one or more of the assemblies and

move the assemblies to a container of sample to be tested (e.g., a microtiter plate that is separate from the tip tray apparatus). In this example, the container 602 can be included under the substrate 504 on the robotic instrument, but the container 602 can be optionally left out, as desired.

[0072] The apparatus 500 described herein is useful in a number of ways. As described previously, the apparatus 500 is useful in orienting and positioning the optical assemblies 26 (i.e., in a 96-well format) so that they can easily be picked up by a robotic instrument or a standard pipette and transferred to another location. In addition, the apparatus 500 protects the optical sensing assemblies 26 during shipping, handling, and storage by enclosing them within a protected compartment. The apparatus 500 also provides a means to map selected sensors to selected wells in a microtiter plate or other container. Furthermore, as explained above, the apparatus can be used in incubation, immobilization, pre-wet, etc. In some embodiments, the immobilization is conducted off-line, separate from the robotic instrument used for assay. However, in some embodiments, the substrate 504 plus container 602 filled with solution for immobilization of molecules to the optical assemblies 26 (e.g., protein solution) can be placed onto the robotic instrument. In some embodiments, the immobilization step occurs while the substrate 504 is on the instrument.

[0073] In some embodiments, the apparatus 500 or some of the components of the apparatus 500 can be mounted on a robotic system, as described above. In some embodiments, the substrate 504 is placed above a first microtiter plate containing samples or solution (e.g., protein immobilization solution). The substrate 504 can be mounted alongside a second microtiter plate (that is separate from the substrate 504) also mounted on the robotic system.

The second plate can contain the same or different samples included in the first plate. One or more of the optical assemblies 26 in the substrate 504 can be picked up with a robotic system and transferred to the second plate for immersion in the samples to be tested. In some embodiments, the first microtiter plate is not included, and instead only the substrate 504 is mounted on the instrument. In some embodiments, the second plate is mounted on an agitation assembly for creating orbital flow of sample within the wells of the second plate, as will be described in more detail below. In still other embodiments, the substrate 504 (or possibly a second substrate 504) is used to position the sensors over the second microtiter plate (or over another container holding samples to be tested) during an assay.

[0074] Numerous different types of assays can be conducted using the discrete optical assemblies 26. For example, assays can involve an anti-species antibody carried on the sensor tip, for screening hybridoma expression lines for cell lines with high antibody expression, or an antigen carried on the tip, to characterize high affinity antibodies against that antigen. Other assays can include a protein carried on the tip, for identifying and characterizing binding partners (DNA, RNA, proteins, carbohydrates, organic molecules) for that protein, or a carbohydrate or glycosyl moiety carried on the tip, for identifying and characterizing binding partners (such as, *e.g.*, DNA, RNA, proteins, carbohydrates, organic molecules) for that carbohydrate. Still other assays can include a protein thought to participate in a multi-protein complex carried on the tip, for characterizing the binding components and/or kinetics of complex formation, or a small protein-binding molecule carried on the tip, for identifying and characterizing protein binders for that molecule. These are but a few examples of assays that could be conducted, and these are in no way meant to limit the scope of the invention.

[0075] In some embodiments, every opening 508 in the substrate 504 contains an optical sensing assembly 26, and every well 604 in container 602 contains a solution (i.e., an immobilization or pre-wet solution, a sample, etc.) that is contacted by each optical sensing assembly 26. However, the user can move around the assemblies 26 and customize the array of assemblies 26, as desired. For example, the user may wish to only use one row of optical assemblies 26 for an assay, and may use only a corresponding row of wells 604 in container 602. The user can leave all of the other openings 508 in the substrate 504 and all of the other wells 604 in the container 602 empty during pre-wetting and immobilization, for example. In this manner, the user can avoid wasting a number of sensors needlessly by simply omitting the sensors that are not going to be used during an assay. In contrast, in an apparatus in which the sensors are all included at the bottom of wells in a microtiter plate, an entire set of sensors must be used for each assay, even if the assay only includes 10 wells filled with sample. In some embodiments, the user may wish to use different types of samples or protein immobilization solutions in different wells 604 or different kinds of optical assemblies 26 (or assemblies 26 with different coatings on the tip) to customize the array.

[0076] As explained above, the apparatus 500 arranges the optical assemblies 26 in a manner that allows the optical assemblies 26 to be mapped to the array of wells in the sample container or second microtiter plate that will be used in conducting the assay. A combination of software can provide programmable control of the sample plate and of which samples are tested and/or which sensors are used (e.g., different sensors coated with different proteins). In some embodiments, the user can view the assay on a computer display or other type of display, and thus can see which wells in the sample plate are filled with which types of sample and/or

can keep track of which sensors are used and into which sample wells these sensors are dipped into in the sample-containing second microtiter plate. In this manner, the user will know what optical assemblies 26 are associated with what samples.

[0077] Referring now to FIG. 7, there is shown an illustration of the substrate 504 and openings 508, according to an embodiment of the invention. The openings 508 of the substrate 504 extend down below the substrate 504 to a sufficient distance to prevent the optical assemblies 26 inside the openings 508 from tilting or swaying from side to side a substantial amount. The depth of the openings 508 will be illustrated more clearly in FIGS. 11 and 12.

[0078] In some embodiments, the substrate 504 includes one or more support members 704 that extend from the substrate 504 and provide support. In the embodiment of FIG. 7, the substrate 504 includes four support members 704, one at each corner of the substrate.

However, these support members can be designed in various ways and there can be more than four or fewer than four, as suitable. The support members 704 provide support to the substrate 504, and can support the substrate 504 when resting on a surface, on a robotic instrument, in the base 506, or other locations. In some embodiments, the substrate 504 is designed to be a sufficient height that when the substrate 504 is loaded with optical assemblies 26 and set on a surface without the base 506 or container 602 below, the tips of the optical assemblies 26 will still not contact the surface or contact each other. The support members 704 allow the substrate 504 to be positioned on the base 506 by extending through slots in the base (see FIG. 8). The support members 704 can slide into the openings in the base 506 and the notches 706, 708 further contact the base to allow the substrate 504 to be securely positioned on the base 506.

[0079] In some embodiments, the support members 704 are designed to extend down into a robotic instrument platform or other device to locate the sensors with respect to the instrument robotics. The support members 704 can make contact with a mating surface in the instrument and provide datum surfaces for location during installation. Thus, any position tolerance increase that might have been contributed to by the base 506 is therefore avoided, since the base 506 does not need to be used for location in the instrument.

[0080] The substrate 504 illustrated in the embodiment of FIG. 7 also includes a raised edge 702 that surrounds the center surface of the substrate 504 and a recess 709 into which the optical assemblies 26 are placed. Thus, the optical assemblies can be positioned down into the recess 709 and can be protected by the edge 702. The edge 702 provides the sensors with some protection against getting knocked out of the openings 508 when the cover 502 is not in place. The recess 709 further provides some protection of the sensors when the cover 502 is in place, since the cover has a corresponding recess that helps to hold the sensors in position (see FIG. 9).

[0081] FIG. 8 shows an exploded view of the base 506 and container 602, according to an embodiment of the invention. The container 602 can be placed in the base 506 so that the ends of the optical assemblies 26 are aligned with the wells 604 in the container 602. FIG. 8 also illustrates that container 602 can be removed from the base 506 and replaced as required. Where the container 602 is a standard microtiter plate, the used plate can easily be removed after use in pre-wetting or immobilization and replaced with a new, clean plate, as needed.

[0082] As described previously, the base 506 can include openings or slots 802 for placement of the substrate 504. In the embodiment of FIG. 8, there are four slots 802 in the

base 506, one at each corner. As the substrate 504 is placed over the base 506, the substrate 504 is guided into position while preventing contact between the ends of the optical assemblies 26 and other surfaces. The support members 704 of the substrate 504 are guided into the slots 802 in the base to provide secure positioning of the substrate 504 in the base 506. The base 506 thus can protect the tips of the optical assemblies 26 when the substrate 504 is positioned on the base 506 without the container 602 in between. The base 506 can also assist in guiding the substrate 504 into place for the proper positioning of the optical assemblies 26 in the wells 604 when the substrate 504 is positioned on the base 506 over container 602.

[0083] In some embodiments, the base 506 also includes a mounting notch 804 that mates with the corner orientation notch 806 of the container 602. In this manner, the user can easily find the correct orientation of the container 602 in the base 506. The container 602 can be secured into position by sliding the orientation notch 806 under the mounting notch 804 to force the container 602 into its specified orientation.

[0084] Referring now to FIG. 9, there is shown the cover 502 for the apparatus 500, according to an embodiment of the invention. The cover 502 can be generally contoured to fit the shape of the substrate, including a raised outer edge 910 around the periphery of the cover 502 and a recess 902 in the center of the cover 502. The cover 502 fits over the top of the substrate 504 and protects the hub 404 end of the optical sensing assembly 26 from environmental contamination or other damage. The cover 502 can be designed to fit such that the sensors cannot lift from the holes in the substrate 504, regardless of the position of the apparatus 500 in space. For example, in this embodiment, even if the apparatus 500 is held upside down, the cover will retain the sensors in position in the opening 508 of the substrate

504. One feature that allows the cover 502 to hold the optical assemblies 26 firmly in place is the recess 902 in the top of the cover. This recess 902 corresponds with the recess 709 in the substrate 504, and thus the center portion of the cover 502 extends down into the recess 709 of the substrate 504. In this manner, the center portion of the cover 502 is lowered close to the hubs 404 of the optical assemblies 26 when the assemblies 26 are positioned in the openings 508 of substrate 504 to maintain the assemblies 26 in the openings 508.

[0085] In some embodiments, the cover includes structures 904 and 906 that engage the base 506 to snap the cover 502 into position on the base 506. Various other types of locking mechanisms can be used, as well, for locking the cover to the base. In some embodiments, the cover 502 and the base 506 lock into the substrate 504 rather than locking into each other. In some embodiments, the cover 502 further includes flap 908 that engages a notched portion of the base 506 (that will be illustrated in FIG. 10), and provides a gripping means for the user to grip the cover 502 and separate the cover 502 from the apparatus 500. In addition, the recess 902 can also provide for nestled stacking of assemblies 500 during storage. The base 506 includes feet (that will be illustrated in FIG. 10) that will rest in the recess 902 when one apparatus is placed on top of another, thus securing the stacked configuration.

[0086] FIG. 10 shows a side view of the apparatus 500, according to an embodiment of the invention. FIG. 10 further illustrates the flap 908 of the cover 502, and how this flap 908 rests against notch 1010 in the base, according to an embodiment of the invention. The notch 1010 provides a space into which a user can slip his/her fingers to grip the flap 908 and remove the cover 502. In addition, FIG. 10 illustrates the stacking feet 1012 of base 506 that permit nestled stacking of assemblies 500, according to an embodiment. In this embodiment, the feet

1012 of one apparatus 500 can rest in the recess 902 of another apparatus 500, thus holding the two assemblies 500 in place during storage. The stacking feet 500 can also provide support for the apparatus 500 when the apparatus is resting on a surface. FIG. 10 further illustrates the support members 704 of substrate 504, and shows how these engage the base for secure fitting, according to an embodiment of the invention.

[0087] FIG. 11 shows a cross-sectional view of the side of the apparatus 500, including the substrate 504, the container 602, and the base 506, according to an embodiment of the invention. FIG. 11 illustrates how the hub 404 rests at the top of the substrate 504, and the fiber 42 is suspended below the substrate 504 from the opening 508, according to some embodiments. The optical sensing assembly 26 is positioned above one of the wells 604, and is positioned for insertion of the fiber 42 inside the well 604.

[0088] FIG. 12 further shows another cross-sectional view of the side of the apparatus 500, including the substrate 504, the container 602, and the base 506, according to an embodiment of the invention. This view shows the fiber 42 inside of a well 604 that can be filled with solution or sample. The optical sensing assembly 26 is positioned so that only a portion of the fiber is inside the well, and thus only a portion will contact the solution (however, this positioning can vary as needed). FIG. 12 further illustrates the length of the opening 508 in this embodiment. The opening 508 at the upper surface of the substrate 504 can have an elongated barrel below the surface that extends a distance beyond the surface of the substrate 504. This design can provide additional support for the optical sensing assembly 26 to avoid tipping or swaying of the optical sensing assembly 26 and to keep the assembly 26 from contacting other nearby assemblies 26 or other surfaces.

[0089] While the many of the embodiments shown herein include both a cover 502 and a base 506, these elements are optional. In some embodiments, either the cover 502 or base 506, or both, are excluded from the apparatus 500. In addition, the shape of the apparatus 500 can vary, as suitable.

[0090] Referring now to FIGS. 13a and 13b, there is shown illustrations of an orbital flow apparatus 1300, according to an embodiment of the present invention. The orbital flow apparatus 1300 can include a container 1302, an agitation assembly 1306, an agitation device 1306 and a heater adapter 1304. However, one or more of these parts can be left out of the apparatus or other parts can be added, as suitable for a given application. Instead of using a flow cell or microfluidics to create surface flow in a well, the invention disclosed herein describes a different manner for creating flow. The orbital flow apparatus 1300 shown in FIG. 13 provides a mechanism for creating the flow needed in a sample well of a container 1302 for a molecular binding kinetic analysis or movement of buffer solution in a well. Without proper flow, it is very difficult to measure the disassociation of molecules from the sensor surfaces. Container 1302 is similar to container 602, and thus it can be a 96-well microtiter plate as shown in FIGS. 13a and b, a 384-well or 1536-well microtiter plate, or some other type of container. The orbital flow mechanism allows for the exposure of a biosensor or optical sensing assembly 26 to a relatively large bulk of reagents. This apparatus 1300 can provide for continuous flow of reagent over an optical sensing assembly 26 by rotating the container 1302 to create orbital flow within the wells. FIG. 13b illustrates an optical sensing assembly 26 as was shown in FIGS. 1-12. This assembly 26 is suspended in a solution in the wells of container 1302. The apparatus 1300 is designed to create relative flow between the assembly

26 and the sample in which the biosensor is immersed by moving or rotating the container 1302 in a plane perpendicular to the optical assemblies 26, according to a specified type of motion (e.g., repetitive motion, random motion, etc.).

[0091] One embodiment of the apparatus 1300 uses a repetitive flow mechanism. In this embodiment, the mechanism creates a repetitive motion, resulting in relative movement of the assembly 26 and the sample in the well. This type of mechanism can be designed in a number of manners. One example is shown in FIG. 13 that includes a surface 1310, which can be a substantially flat surface that rests on suspensions 1312. In the example shown in FIG. 13, there are four flexible suspensions 1312, but any other type of mechanism can be used. The example shown in FIG. 13 further includes an agitation assembly 1306 with an agitation device 1308 (e.g., an electrical motor or another type of device for providing movement or agitation) that is positioned below the surface 1310 (or adjacent to the surface 1310). The agitation device 1308 includes a driving mechanism for the repetitive motion, in this embodiment. In the example illustrated in FIG. 13, the motor rotates the container 1302 in a plane that is perpendicular to the optical sensing assembly 26 to cause the agitation to occur. This movement of the motor causes the sample to move relative to the assembly 26, thus causing continuous flow of the sample over the biosensor surface. In some embodiments, the orbital motion can be controlled from 10 rpm to 5000 rpm. In other embodiments, the motion can be controlled from 1 rpm to 10,000 rpm, from 100 rpm to 2000 rpm.

[0092] Some embodiments of the apparatus 1300 include an actuator (e.g. electrical motor, piezo actuator, solenoids, etc.) to create a repetitive motion that is not in orbital trajectory. The

possible trajectories can include linear, elliptical, sinusoidal, etc., or any combination of these motions in the three-dimensional space.

[0093] Another embodiment of the apparatus 1300 uses a random flow mechanism. In this embodiment, the mechanism generates a random motion or vibration that agitates the sample in the wells, and thus creates relative movement of sample against the biosensor surface 26. For example, an ultrasound source can be used to agitate the sample or solution to create flow of the sample over the biosensor 26.

[0094] In still other embodiments, instead of causing orbital movement of the solution inside the well relative to the optical assembly 26, the assembly 26 is agitated while the solution is kept substantially stable. An agitation assembly 1306 can be attached to the assembly to cause the assembly 26 to move relative to the sample, thus creating relative movement of the sample over the biosensor. Additionally, both the solution and the optical assembly 26 can be agitated in some embodiments.

[0095] In addition, movement of either the optical assembly 26 or the sample is not limited to circular or elliptical motion. Agitation can be created using numerous other types of motion, such as movement up and down (i.e., by moving the sample up and down or the biosensor up and down), movement in a straight line, vibrational movement, etc.

[0096] In some embodiments, the agitation assembly 1306 includes a heater adapter 1304 that connects to the container 1302 and the agitation assembly 1306 by being sandwiched in between the two. The heater adapter 1304 is mounted onto the orbital flow device to provide heated flow during binding measurements. FIG. 13 shows how the pieces of apparatus 1300 fit together, and can lock into place.

[0097] As described above, the orbital flow apparatus 1300 can be included in a robotic instrument for assay. FIG. 13c better illustrates this usage of the inventions described herein in a robotic instrument for assay. Robotic instrument 1350 is shown in FIG. 13c, and this instrument can be included as a part of interferometer system 20, described above. In some embodiments, container 1302 can be mounted to the agitation assembly 1306 and can contain samples to be tested during assay (e.g., the second microtiter plate referred to above). The container 1302 can be mounted alongside substrate 504 that is holding optical assemblies 26. A robotic arm 1352 can transfer one or more of the assemblies 26 from the substrate 504 over to the container 1302 and can dip the assemblies 26 into the samples in the wells of container 1302. The agitation assembly 1306 causes agitation of the container 1302 while the tips of the assemblies 26 are dipped into the samples, thus creating flow of the sample over the optical assemblies 26 for kinetic analyses or other types of assays.

[0098] The following example illustrates a method of the invention for creating orbital flow, but is in no way intended to limit its scope.

EXAMPLES

[0099] Below is an example of a specific embodiment for carrying out the present invention. The example is offered for illustrative purposes only, and is not intended to limit the scope of the present invention in any way. Efforts have been made to ensure accuracy with respect to numbers used (*e.g.*, amounts, temperatures, *etc.*), but some experimental error and deviation should, of course, be allowed for.

[00100] The practice of the present invention will employ, unless otherwise indicated, conventional methods of protein chemistry, biochemistry, recombinant DNA techniques and

pharmacology, within the skill of the art. Such techniques are explained fully in the literature. See, e.g., T.E. Creighton, *Proteins: Structures and Molecular Properties* (W.H. Freeman and Company, 1993); A.L. Lehninger, *Biochemistry* (Worth Publishers, Inc., current addition); Sambrook, et al., *Molecular Cloning: A Laboratory Manual* (2nd Edition, 1989); *Methods In Enzymology* (S. Colowick and N. Kaplan eds., Academic Press, Inc.); *Remington's Pharmaceutical Sciences*, 18th Edition (Easton, Pennsylvania: Mack Publishing Company, 1990); Carey and Sundberg *Advanced Organic Chemistry 3rd Ed.* (Plenum Press) Vols A and B(1992).

Example 1: Multi-concentration kinetic experiment with direct comparison of flow = 0 and flow = 140 rpm.

[00101] This example demonstrates the creation of orbital flow of a sample relative to the biosensor. In this example, a set of biosensors was coated with an antibody against mouse IgG2b. The analyte (mouse IgG2b) was added into an assay buffer (1mg/mL bovine serum albumin in phosphate buffered saline, 0.02% Tween-20) at the concentration specified in FIG. 14. FIG. 14 shows, in two graphs, the binding curves for the mouse IgG2b to the Anti-mouse IgG2b-coated sensors where flow is equal to 0 (e.g., no flow; depicted in the upper graph) and where flow is equal to 7 mm/sec (depicted in the lower graph). Binding of the analyte to the antibody was monitored using the technique of Biolayer Interferometry, and binding was recorded as a nanometer (nm) increase in thickness of the binding layer (i.e., the layer formed by binding of the analyte to the anti-analyte) as a function of time (in seconds). The graphs show that the orbital flow (i.e., where flow = 7) eliminates the early “lag” phase of binding of a 2.5 ug/ml sample of mouse IgG2b to the coated sensor due to diffusional barriers (i.e., which can be seen where flow = 0). Therefore, the apparatus 1300 for creating orbital flow allows for

flow of the sample over the biosensor resulting in binding without the “lag” phase that occurs when the apparatus 1300 is not used to create orbital flow.

[00102] While the invention has been particularly shown and described with reference to a preferred embodiment and various alternate embodiments, it will be understood by persons skilled in the relevant art that various changes in form and details can be made therein without departing from the spirit and scope of the invention.

[00103] All references, issued patents and patent applications cited within the body of the instant specification are hereby incorporated by reference in their entirety, for all purposes.

CLAIMS

What is claimed is:

1. An apparatus for packaging an optical sensing assembly, the apparatus comprising a substrate with a plurality of openings, each opening being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being positioned in the opening with a tip of the optical sensing assembly extending through the opening to be suspended from the substrate, wherein the plurality of openings are arranged so the optical sensing assembly positioned therein avoids contacting another optical sensing assembly positioned therein.
2. The apparatus of claim 1, further comprising a support member for supporting the substrate, the support member positioning the substrate so the tip of the optical sensing assembly suspended from the opening in the substrate contacts a solution in one of a plurality of wells in a container adjacent to the substrate, wherein the substrate is configured for preparing the optical assembly for assay.
3. The apparatus of claim 2, wherein the container is a microtiter plate including 96 wells.
4. The apparatus of claim 1, wherein the optical sensing assembly further comprises a hub at an end of the assembly opposite the tip, the hub being designed for attachment to a device that moves the assembly from a first location to a second location.
5. The apparatus of claim 1, wherein the openings include elongated barrels that allow the optical sensing assembly to be immersed in a solution in a container below the substrate without the tip of the optical sensing assembly contacting a tip of another optical sensing assembly in the substrate.
6. The apparatus of claim 1, wherein a plurality of discrete optical sensing assemblies coated with different reagents are moved around and arranged in the plurality of openings to create a customized array.
7. The apparatus of claim 2, wherein the optical sensing assembly in the substrate is mapped to wells in a second container containing different samples.

- 8.** The apparatus of claim 2, wherein the solution is a pre-wet solution into which the optical sensing assembly is immersed.
- 9.** The apparatus of claim 2, wherein the solution is a protein solution into which the optical sensing assembly is immersed for immobilization of protein on the optical sensing assembly, or for measurement of interaction with another protein already immobilized on the optical sensing assembly.
- 10.** The apparatus of claim 2, wherein the substrate being configured for preparing the optical sensing assembly for assay further comprises the substrate being configured for pre-wet of the optical assembly before assay.
- 11.** The apparatus of claim 2, wherein the substrate being configured for preparing the optical sensing assembly for assay further comprises the substrate being configured protein immobilization of the optical assembly before assay.
- 12.** The apparatus of claim 1, wherein the optical sensing assembly comprises a hub at an end opposite the tip, and the optical sensing assembly is inserted into the opening with the hub of the assembly remaining on a first side of the substrate and the tip of the assembly being inserted through the opening to be suspended from a second side of the substrate.
- 13.** The apparatus of claim 1, further comprising a cover on a first side of the substrate to protect the optical sensing assembly.
- 14.** The apparatus of claim 1, further comprising a base on a second side of the substrate to protect the tip of the optical sensing assembly.
- 15.** The apparatus of claim 14, wherein a container is positioned inside the base beneath the substrate, the container being positioned so the tip of the suspended optical sensing assembly contacts solution in one of the plurality of wells in the container.
- 16.** The apparatus of claim 13, wherein the cover is designed to maintain the optical sensing assembly in the opening in the substrate.

17. The apparatus of claim 1, further comprising a cover and a base, the cover and base being designed to lock together around the substrate forming an enclosure around the optical sensing assembly.

18. The apparatus of claim 17, wherein the base of the apparatus is designed fit together with the cover of other apparatuses to be stackable with the other apparatuses for storage.

19. A method for packaging an optical sensing assembly for assay, the method comprising placing a discrete optical sensing assembly in one of a plurality of openings in a substrate that is supported by a support member, the optical sensing assembly being positioned in the opening with a tip of the optical sensing assembly extending through the opening to be suspended from the opening in the substrate, wherein the plurality of openings are arranged so the optical sensing assembly positioned therein avoids contacting another optical sensing assembly positioned therein.

20. The method of claim 19, further comprising:

positioning the substrate so the tip of the optical sensing assembly suspended from the opening in the substrate contacts solution in one of a plurality of wells in a container adjacent to the substrate; and

preparing the optical sensing assembly for assay.

21. The method of claim 19, wherein the optical sensing assembly further comprises a hub on an end of the assembly opposite the tip.

22. The method of claim 21, wherein placing the optical sensing assembly in one of a plurality of openings in a substrate further comprises inserting the tip of the optical sensing assembly into the opening so that the hub of the assembly rests on a first side of the substrate and the tip of the assembly is suspended from a second side of the substrate.

23. The method of claim 20, wherein positioning the substrate further comprises placing the container below the substrate with one of the plurality of wells lined up with the tip of the optical sensing assembly so the tip is immersed in solution in the well.

24. The method of claim 19, further comprising:

creating an array of discrete optical sensing assemblies in the substrate; and
moving around the assemblies coated with different reagents in the plurality of
openings to arrange the assemblies in a customized array.

25. The method of claim 20, further comprising mapping configuration of the optical sensing assembly to a plurality of sample wells in a second container for assay.

26. The method of claim 20, wherein the container is a microtiter plate with wells in an 8 x 12 pattern.

27. The method of claim 19, further comprising covering the substrate with a cover for protecting the optical sensing assembly.

28. The method of claim 27, further comprising setting the substrate on a base that locks into place with the cover to enclose the optical sensing assembly within a protective enclosure.

29. The method of claim 20, further comprising:

setting the container on a base; and

setting the substrate on the base over the container with the tip of the optical sensing assembly being immersed in the solution in one of the plurality of wells of the container.

30. The method of claim 20, wherein preparing the optical sensing assembly further comprises immersing the optical assembly in a pre-wet solution.

31. The method of claim 20, wherein preparing the optical sensing assembly further comprises immersing the optical assembly in a protein solution for immobilization of proteins on the tip of the assembly.

32. The method of claim 21, further comprising attaching a device to the hub of the optical sensing assembly for moving the assembly from a first location to a second location.

33. The method of claim 32, wherein the device is a robotic machine for attaching to the discrete optical assembly in the substrate and for moving the assembly from the substrate to a second location.

34. The method of claim 32, wherein the device is a pipette for attaching to the discrete optical assembly in the substrate and for moving the array of assemblies from the substrate to a second location.

35. An apparatus for maintaining flow of the solution, the apparatus comprising an agitation assembly operably coupled to a container with a plurality of wells containing solution, each well being configured for holding a discrete optical sensing assembly therein, the optical sensing assembly being configured for measuring a characteristic of the solution, wherein the agitation assembly comprises an agitation device that moves the container according to a specified type of motion to agitate the solution relative to the optical assembly to create flow of the solution relative to the optical assembly.

36. The apparatus of claim 35, wherein the agitation device is driven by an electrical motor.

37. The apparatus of claim 35, wherein the specified type of motion is repetitive motion of the solution in the well, relative to the optical assembly.

38. The apparatus of claim 37, wherein the repetitive motion is circular motion.

39. The apparatus of claim 35, wherein the agitation device is driven by an actuator for creating repetitive motion that is not in orbital trajectory.

40. The apparatus of claim 35, wherein the specified type of motion is random motion of the solution in the well, relative to the optical assembly.

41. The apparatus of claim 35, wherein the agitation device is operably coupled with the optical assembly to move the assembly relative to the sample.

42. The apparatus of claim 35, wherein the apparatus rests on a surface suspended above the agitation device with suspensions, the agitation device providing agitation of the container creating surface flow of the solution relative to the optical assembly.

43. The apparatus of claim 35, wherein the agitation assembly further comprises a heater adapter for providing heated flow of solution.

44. The apparatus of claim 43, wherein the heater adapter is positioned between the container and the agitation assembly and is operable coupled to the container and the agitation assembly.

45. The apparatus of claim 35, wherein the agitation assembly is included in a robotic instrument for assay with the container mounted on the agitation assembly, the container and agitation assembly being mounted in the instrument adjacent to a substrate for holding an optical sensing assembly.

46. The apparatus of claim 45, wherein a robotic arm moves the optical sensing assembly from the substrate to the container to dip the assembly in the solution, the solution being simultaneously agitated by the agitation device.

TIP TRAY ASSEMBLY FOR OPTICAL SENSORS

ABSTRACT

An apparatus and method for packaging of an optical sensing fiber is disclosed. The apparatus includes a substrate with a plurality of openings, and each opening is configured for holding an optical sensing assembly. The assembly is positioned in the opening with a tip of the assembly extending through the opening to be suspended from the substrate. In addition, openings are arranged so the assembly positioned therein avoids contacting another assembly positioned therein. The apparatus can include a support member for supporting the substrate and positioning the substrate so the tip of the assembly suspended from the opening in the substrate contacts solution in one of a plurality of wells in a container adjacent to the substrate. The assembly can be configured for preparing of the optical assembly for assay. An agitation assembly for agitating the container to create flow of the solution in the container wells over an optical sensing assembly is also disclosed.

24377/01000/DOCS/1631208

Electronic Acknowledgement Receipt

EFS ID:	1075904
Application Number:	11423669
Confirmation Number:	6275
Title of Invention:	TIP TRAY ASSEMBLY FOR OPTICAL SENSORS
First Named Inventor:	Michael W. Recknor
Customer Number:	00758
Filer:	Antonia L. Sequeira
Filer Authorized By:	
Attorney Docket Number:	24377-11758
Receipt Date:	12-JUN-2006
Filing Date:	
Time Stamp:	19:39:59
Application Type:	Utility
International Application Number:	

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APPLICATION AS FILED – PART I						
(Column 1)		(Column 2)		SMALL ENTITY		OR
OTHER THAN SMALL ENTITY						
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))						300
SEARCH FEE (37 CFR 1.16(k), (l), or (m))						500
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))						200
TOTAL CLAIMS (37 CFR 1.16(i))	46	minus 20 = *		26		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3	minus 3 = *				
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))						
* If the difference in column 1 is less than zero, enter "0" in column 2.						
APPLICATION AS AMENDED – PART II						
(Column 1)		(Column 2)		(Column 3)		
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA			
	Total (37 CFR 1.16(i))	Minus **	=			
	Independent (37 CFR 1.16(h))	Minus ***	=			
	Application Size Fee (37 CFR 1.16(s))					
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
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AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA			
	Total (37 CFR 1.16(i))	Minus **	=			
	Independent (37 CFR 1.16(h))	Minus ***	=			
	Application Size Fee (37 CFR 1.16(s))					
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
(Column 1)		(Column 2)		(Column 3)		
SMALL ENTITY		OTHER THAN SMALL ENTITY		SMALL ENTITY		OR
RATE (\$)		ADDITIONAL FEE (\$)		RATE (\$)		ADDITIONAL FEE (\$)
X =		X =		X =		X =
X =		X =		X =		X =
N/A		N/A		N/A		N/A
TOTAL		TOTAL		TOTAL		TOTAL
ADD'T FEE		ADD'T FEE		ADD'T FEE		ADD'T FEE
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