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| APPLICATION NO.                                                                                                                   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.             | CONFIRMATION NO.            |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------|---------------------------------|-----------------------------|
| 11/303,458                                                                                                                        | 12/16/2005  | David M. Doolin      | 010030-000910US                 | 6302                        |
| 37490 7590 12/17/2008<br>Trellis Intellectual Property Law Group, PC<br>1900 EMBARCADERO ROAD<br>SUITE 109<br>PALO ALTO, CA 94303 |             |                      | EXAMINER<br>LU, SHIRLEY         |                             |
|                                                                                                                                   |             |                      | ART UNIT<br>2612                | PAPER NUMBER                |
|                                                                                                                                   |             |                      | NOTIFICATION DATE<br>12/17/2008 | DELIVERY MODE<br>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):

megan@trellislaw.com  
jack@trellislaw.com  
docket@trellislaw.com

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Notice of Abandonment</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 11/303,458             | DOOLIN ET AL.       |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | SHIRLEY LU             | 2612                |  |

**-- 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 08 May 2008.
  - (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:  
  
A timely reply has not been received.

/Daniel Wu/  
Supervisory Patent Examiner, Art Unit 2612

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.



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| APPLICATION NO.                                                                                                                   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.             | CONFIRMATION NO.            |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------|---------------------------------|-----------------------------|
| 11/303,458                                                                                                                        | 12/16/2005  | David M. Doolin      | 010030-000910US                 | 6302                        |
| 37490 7590 05/08/2008<br>Trellis Intellectual Property Law Group, PC<br>1900 EMBARCADERO ROAD<br>SUITE 109<br>PALO ALTO, CA 94303 |             |                      | EXAMINER<br>LU, SHIRLEY         |                             |
|                                                                                                                                   |             |                      | ART UNIT<br>2612                | PAPER NUMBER                |
|                                                                                                                                   |             |                      | NOTIFICATION DATE<br>05/08/2008 | DELIVERY MODE<br>ELECTRONIC |

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

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megan@trellislaw.com  
jack@trellislaw.com  
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|                              |                        |  |                     |  |
|------------------------------|------------------------|--|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> |  | <b>Applicant(s)</b> |  |
|                              | 11/303,458             |  | DOOLIN ET AL.       |  |
|                              | <b>Examiner</b>        |  | <b>Art Unit</b>     |  |
|                              | SHIRLEY LU             |  | 2612                |  |

**-- 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 12/16/05.

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) 1-10 and 46-49 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) 1-10 and 46-49 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)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/16/05, 11/27/06.

4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: \_\_\_\_\_.

### **Election Restrictions**

During a telephone conversation with Charles Kulas on 4/22/08 a provisional election was made without traverse to prosecute the invention of I, claims 1-10, 46-49. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-45 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-10, 46-49, drawn to a system for monitoring a fire comprising a plurality of devices, classified in class 340, subclass 870.05.
- II. Claims 11-16, 41-45, drawn to a method comprising dispersing several self-networking nodes in a region, classified in class 340, subclass 539.22.
- III. Claims 17-40, drawn to selectively controlling the sensor network, classified in class 348, subclass 153.

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

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because of both reasons. The subcombination has separate utility such as monitoring a fire.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art due to their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

***Claim(s) Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**1. Claim(s) 1-2, 4-6, 10 is/are rejected under 35 U.S.C. 102(b) as being anticipated by Brogi (5734335).**

As to claim(s) 1, 6, Brogi discloses:

A system for monitoring a plurality of mobile objects, the system comprising:  
a plurality of devices coupled to the mobile objects, wherein each device includes a plurality of sensors, wherein the sensors include environmental sensors ([4, 26-44]);

a base station for communicating with the devices; a processing system for receiving data from the sensors via the base station ([4, 1-15]);

a process executing on one or more of the devices for organizing a flow of data from the devices to the base station after deployment of the devices ([4, 45-65]; [4, 1-15]).

As to claim(s) 2, Brogi discloses:

first means for pre-deploying the devices in an area ([4, 65 et seq.]).

As to claim(s) 4, 5, 10, Brogi discloses:

further including first means for modifying data collection priorities according to data type, data collection rate, and/or values of data collected.

### ***Claim Rejections - 35 USC § 103***

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 negatived by the manner in which the invention was made.

**2. Claim(s) 3, 7-9 is/are rejected under 35 U.S.C. 103(a) as being unpatentable over Brogi (5734335) in view of Schmidt (7005980).**

As to claim(s) 3,

Brogi does not expressly teach the first means further includes: second means for deploying the devices during a fire event.

Schmidt discloses the first means further includes: second means for deploying the devices during a fire event ([3, 21-30]).

It would have been obvious to one of ordinary skill in the art to modify the above art/combination to teach the first means further includes: second means for deploying the devices during a fire event, so as to provide additional environmental conditions, and to provide conditions of a firefighter.

As to claim(s) 7, 8,

Brogi does not expressly teach a mobile object includes a person or vehicle; the plurality of sensors include one or more sensors for measuring biological information of the user.

Schmidt discloses a mobile object includes a person or vehicle; the plurality of sensors include one or more sensors for measuring biological information of the user ([3, 21-30]).

It would have been obvious to one of ordinary skill in the art to modify the above art/combination to teach a mobile object includes a person or vehicle; the plurality of sensors include one or more sensors for measuring biological information of the user, so as to provide additional environmental conditions, and to provide conditions of a firefighter.

As to claim(s) 9,

Brogi does not expressly teach the base station is mobile.

Schmidt discloses the base station is mobile ([5, 26-49]).

It would have been obvious to one of ordinary skill in the art to modify the above art/combination to teach the base station is mobile, so as to provide environmental conditions, and conditions of a firefighter to other rescuers.

**3. Claim(s) 46-49 is/are rejected under 35 U.S.C. 103(a) as being unpatentable over Brogi (5734335) in view of Sheahan (4459582).**

As to claim(s) 46, Brogi discloses:

A system for monitoring a fire, the system comprising:

a plurality of devices, each with a plurality of sensors (see claim 1),

a base station for communicating with the devices; and a processing system for receiving data from the sensors via the base station (see claim 1),

The above art/combination above does not expressly teach wherein a priority is assigned to two or more sensors; wherein the data is received from the sensors according to the priority

Sheahan discloses wherein a priority is assigned to two or more sensors; wherein the data is received from the sensors according to the priority ([3, 1-12]).

It would have been obvious to one of ordinary skill in the art to modify the above art/combination to teach wherein a priority is assigned to two or more sensors; wherein the data is received from the sensors according to the priority, so as to conserve remaining battery power and resources for continued operation of the higher priority sensors in the system.

As to claim(s) 47-49,

Brogi does not expressly teach a process executing at a device for preventing operation of a sensor depending on a criterion; the criterion includes a determination of a low-power condition and a restricted bandwidth condition

Sheahan discloses a process executing at a device for preventing operation of a sensor depending on a criterion; the criterion includes a determination of a low-power condition ([3, 1-12]; abstract).

It would have been obvious to one of ordinary skill in the art to modify the above art/combination to teach a process executing at a device for preventing operation of a sensor depending on a criterion; the criterion includes a determination of a low-power condition and a restricted bandwidth condition, so as to conserve remaining battery power and resources for continued operation of the higher priority sensors in the system.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shirley Lu whose telephone number is (571) 272-8546. The examiner can normally be reached on 8:30-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Bugg can be reached on (571) 272-2998. 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).

SL

/George A Bugg/

Acting SPE of Art Unit 2612

|                                   |                                       |                                                             |             |
|-----------------------------------|---------------------------------------|-------------------------------------------------------------|-------------|
| <b>Notice of References Cited</b> | Application/Control No.<br>11/303,458 | Applicant(s)/Patent Under<br>Reexamination<br>DOOLIN ET AL. |             |
|                                   | Examiner<br>SHIRLEY LU                | Art Unit<br>2612                                            | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * |   | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Name           | Classification |
|---|---|--------------------------------------------------|-----------------|----------------|----------------|
| * | A | US-5,734,335                                     | 03-1998         | Brogi et al.   | 340/870.05     |
| * | B | US-7,005,980                                     | 02-2006         | Schmidt et al. | 340/539.13     |
| * | C | US-4,459,582                                     | 07-1984         | Sheahan et al. | 340/539.16     |
|   | 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<br>Country Code-Number-Kind Code | Date<br>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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : DOOLIM et al.                      Art Unit : Unassigned  
Serial No. : Unassigned                      Examiner : Unassigned  
Filed : Herewith  
Title : SYSTEM FOR SENSING ENVIROMENTAL CONDITIONS

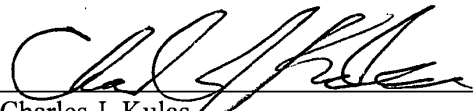
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Copies of the references listed on the attached form PTO-1449 not are enclosed.  
This filing is being made with the filing of a new application. No fee is required.  
Please apply any appropriate charges or credits to Deposit Account No. 50-3000.

Respectfully submitted,

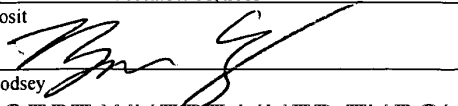
Date: December 16, 2005

  
\_\_\_\_\_  
Charles J. Kulas  
Reg. No. 35,809

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1900 Embarcadero Rd., Suite 109  
Palo Alto, CA 94303  
Tel.: 650-842-0300  
Fax: 650-842-0304

CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

December 16, 2005  
\_\_\_\_\_  
Date of Deposit  
  
\_\_\_\_\_  
Megan A. Godsey

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.L./

Approved for use through 07/31/2006. OMB 0651-0031

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[illegible][illegible]

|                       |              |                    |            |
|-----------------------|--------------|--------------------|------------|
| Examiner<br>Signature | /Shirley Lu/ | Date<br>Considered | 04/22/2008 |
|-----------------------|--------------|--------------------|------------|

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

This collection of information is required by 37 CFR 1.97 and 1.98. 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 2 hours 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, 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 (1-800-786-9199) and select option 2.**

Motorola Solutions, Inc., Ex1010, p. 14

## EAST Search History

| Ref # | Hits | Search Query                                                          | DBs                                                               | Default Operator | Plurals | Time Stamp          |
|-------|------|-----------------------------------------------------------------------|-------------------------------------------------------------------|------------------|---------|---------------------|
|       |      | "20060138246".pn. and crystal)                                        | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/30<br>14:18 |
|       |      | resuscitation with yessame medical adj<br>information                 | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2007/07/27<br>17:24 |
|       |      | resuscitation with yes with "no" with same<br>medical adj information | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2007/07/27<br>17:24 |
|       |      | resuscitation with yes with no with same<br>medical adj information   | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2007/07/27<br>17:24 |
|       |      | remote near S52 radar with police                                     | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>18:37 |
|       |      | police same vehicle with cut\$out                                     | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:53 |
|       |      | vehicle wiht decoy                                                    | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:38 |
|       |      | "6046686.pn.                                                          | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/30<br>17:21 |
| S1    | 1591 | ((340/428,426) or (342/357.07,357.09) or<br>(327/310)).CCLS.          | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/24<br>16:05 |
| S2    | 2148 | ((340/988,426) or (342/357.04,357.09)).<br>CCLS.                      | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:07 |
| S3    | 2    | "290092".apn.                                                         | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:18 |
| S4    | 0    | "6046686.pn"                                                          | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:18 |
| S5    | 0    | "6046686.pn."                                                         | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:18 |
| S6    | 1    | "6046686".pn.                                                         | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:22 |
| S7    | 20   | police adj vehicle with sign                                          | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:46 |
| S8    | 2    | police adj vehicle with (photo photograph<br>\$1 pictures\$1)         | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:46 |
| S9    | 5    | police adj vehicle same (photo photograph<br>\$1 pictures\$1)         | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:36 |
| S10   | 272  | police with (photo photograph\$1 pictures<br>\$1)                     | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:26 |
| S11   | 2    | police with decoy                                                     | US-PGPUB;<br>USPAT                                                | OR               | OFF     | 2007/07/26<br>14:36 |

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|-----|--------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----|-----|---------------------|
| S12 | 3      | police same decoy                                                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:36 |
| S13 | 1      | (police and decoy).ti.                                                                               | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:37 |
| S14 | 1      | police.ti. and decoy                                                                                 | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:37 |
| S15 | 186    | vehicle same decoy                                                                                   | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:38 |
| S16 | 645987 | vehicle with decoy                                                                                   | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:38 |
| S17 | 135    | vehicle with decoy                                                                                   | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:38 |
| S18 | 7      | S17 and police                                                                                       | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:39 |
| S19 | 0      | billboard same police adj vehicle                                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:39 |
| S20 | 0      | billboard\$1 same police adj vehicle                                                                 | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:40 |
| S21 | 23     | billboard\$1 and police adj vehicle                                                                  | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:41 |
| S22 | 629    | police adj vehicle                                                                                   | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:41 |
| S23 | 13     | police adj vehicle same (photo\$1<br>photograph\$1 picture\$1)                                       | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>15:03 |
| S24 | 272    | police with (photo photograph\$1 pictures<br>\$1)                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:47 |
| S25 | 17     | police adj vehicle with image\$1                                                                     | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:48 |
| S26 | 210    | police same vehicle with image\$1                                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:53 |
| S27 | 0      | police adj vehicle with cut\$out                                                                     | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>14:53 |
| S28 | 0      | cardboard adj police                                                                                 | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>15:03 |
| S29 | 3      | cardboard with police                                                                                | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>15:04 |
| S30 | 24     | cardboard same police                                                                                | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>15:09 |
| S31 | 4      | police with poster                                                                                   | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>15:09 |
| S32 | 2      | police with decoy                                                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>15:37 |
| S33 | 7      | (cutout cut-out cardboard card-board<br>decoy) near15 (police patrol traffic) near5<br>(car vehicle) | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>15:38 |
| S34 | 22     | (cutout cut-out cardboard card-board<br>decoy) near15 (police patrol traffic) near5<br>(car vehicle) | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>17:14 |

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| S35 | 2 | (cutout cut-out cardboard card-board decoy) near15 (police patrol traffic) near5 (car vehicle) and radar | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>16:19 |
| S36 | 0 | "6046686".pn. and panel                                                                                  | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>18:09 |
| S37 | 1 | "6046686".pn. and (panel\$1 mounted)                                                                     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>16:44 |
| S38 | 0 | "6046686".pn. and wheel\$1                                                                               | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>16:44 |
| S39 | 0 | "6046686".pn. and image\$1                                                                               | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>16:47 |
| S40 | 2 | "6046686".pn. and light\$1                                                                               | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>16:52 |
| S41 | 1 | "6046686".pn. and (battery solar)                                                                        | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>16:53 |
| S42 | 2 | "6046686".pn. and radar                                                                                  | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>16:57 |
| S43 | 0 | "6046686".pn. and fold\$4                                                                                | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>16:57 |
| S44 | 0 | S34 and naper.in.                                                                                        | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>17:14 |

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| S45 | 43  | S34 road adj warning adj signs                                   | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>17:14 |
| S46 | 2   | S34 and napper.in.                                               | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>17:15 |
| S47 | 0   | S46 and (batter\$4 solar)                                        | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>17:15 |
| S48 | 1   | "6046686".pn. and power                                          | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/26<br>18:30 |
| S49 | 1   | ("20010054970").PN.                                              | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>18:31 |
| S50 | 1   | remote with speed adj detector\$1 same police                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>18:32 |
| S51 | 35  | speed adj detector\$1 with police                                | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>18:35 |
| S52 | 28  | remote with radar same police                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>18:36 |
| S53 | 22  | remote with radar with police                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>18:37 |
| S54 | 13  | remote near5 radar with police                                   | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>18:38 |
| S55 | 1   | "6046686".pn.                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>18:39 |
| S56 | 0   | "6046686".pn. and (police officer\$1)                            | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/26<br>18:43 |
| S57 | 399 | (340/431,915).CCLS.                                              | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>12:23 |
| S58 | 0   | facebook.as.                                                     | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>12:27 |
| S59 | 0   | thefacebook.as.                                                  | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>12:28 |
| S60 | 4   | zuckerberg.in.                                                   | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>12:31 |
| S61 | 1   | "580210".apn.                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>12:35 |
| S62 | 1   | "5855609".pn.                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>12:44 |
| S63 | 1   | dental adj applique and bar adj code and medical adj information | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>12:45 |
| S64 | 1   | dental adj applique and bar adj code                             | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>12:45 |

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| S65 | 170    | human same implant same tooth                                                                                                                                         | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>12:45 |
| S66 | 1      | human same implant same tooth and<br>medical adj information                                                                                                          | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>12:46 |
| S67 | 4      | human same implant same tooth and bar<br>adj code                                                                                                                     | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:11 |
| S68 | 0      | human same implant same tooth same<br>reader                                                                                                                          | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:11 |
| S69 | 1      | implant same tooth same reader                                                                                                                                        | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:11 |
| S70 | 4      | implant same (tooth teeth) same reader                                                                                                                                | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:12 |
| S71 | 691    | appliauesame (tooth teeth) same reader                                                                                                                                | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:12 |
| S72 | 0      | appliaue same (tooth teeth) same reader                                                                                                                               | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:12 |
| S73 | 1      | applique same (tooth teeth) same reader                                                                                                                               | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:13 |
| S74 | 12     | computer with chip with (tooth teeth)                                                                                                                                 | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:14 |
| S75 | 1      | flippen.in. and (dental teeth tooth)                                                                                                                                  | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:43 |
| S76 | 2760   | (dental teeth tooth) with electronic\$4                                                                                                                               | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:43 |
| S77 | 305    | (dental teeth tooth) with electronic\$4<br>same information                                                                                                           | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:43 |
| S78 | 625500 | S77 and bar code                                                                                                                                                      | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:44 |
| S79 | 24     | S77 and bar adj code                                                                                                                                                  | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:45 |
| S80 | 3      | denture\$1 same bar adj code                                                                                                                                          | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:50 |
| S81 | 1235   | (teeth tooth denture\$1) with memory                                                                                                                                  | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:51 |
| S82 | 21     | (teeth tooth denture\$1) with memory and<br>bar adj code                                                                                                              | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:52 |
| S83 | 10     | (dental) with memory and bar adj code                                                                                                                                 | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:55 |
| S84 | 1      | "287050".apn. and remote                                                                                                                                              | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:58 |
| S85 | 10     | ((("5855609") or ("5041826") or<br>("4333072") or ("6012415") or<br>("5300120") or ("5674288") or<br>("5716407") or ("5725578") or<br>("5977431") or ("6356789")).PN. | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>16:00 |
| S86 | 0      | S85 and (teeth tooth dental denture\$1)                                                                                                                               | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>15:58 |
| S87 | 5      | "5509805"                                                                                                                                                             | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>16:02 |
| S88 | 1      | dental with implant\$1 same applique                                                                                                                                  | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>16:03 |
| S89 | 1      | dental with implant\$1 and applique                                                                                                                                   | US-PGPUB;<br>USPAT | OR | OFF | 2007/07/27<br>16:03 |

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| S90 | 1     | dental with implant\$1 and applique  | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:05 |
| S91 | 22209 | "977"                                | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:06 |
| S92 | 5     | "6447294"                            | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:06 |
| S93 | 0     | denture\$1 same applique same memory | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:07 |
| S94 | 1     | dental same applique same memory     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:07 |
| S95 | 23    | applique with memory                 | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:29 |
| S96 | 3989  | rfid with memory                     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:10 |
| S97 | 5     | rfid with denture\$1                 | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:10 |
| S98 | 2     | "287050".apn.                        | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:45 |
| S99 | 22    | "287050"                             | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:29 |

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| S100 | 1    | "287050".apn. and mains                                                                           | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>16:58 |
| S101 | 1    | "5509805".pn. and bar adj code                                                                    | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>17:23 |
| S102 | 0    | resuscitation with yes with "no" same medical adj information                                     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>17:24 |
| S103 | 0    | resuscitation with yes same medical adj information                                               | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>17:24 |
| S104 | 6    | resuscitation with medical adj information                                                        | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/27<br>17:37 |
| S105 | 3743 | (340/573.1,10.51,572.8,568).CCLS.                                                                 | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/27<br>17:42 |
| S106 | 227  | rfid with induction                                                                               | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>11:14 |
| S107 | 1    | "283464".apn.                                                                                     | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>11:44 |
| S108 | 6    | ((("20040041033") or ("4696428") or ("4563780") or ("4420811") or ("4931938") or ("0343445")).PN. | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>11:45 |
| S109 | 33   | faucet with display same temperature                                                              | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>11:46 |
| S110 | 33   | faucet with display with temperature                                                              | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>11:50 |
| S111 | 10   | S110 and audible                                                                                  | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>11:54 |
| S112 | 10   | S111 and rlad < "20051121"                                                                        | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>12:05 |
| S113 | 1    | "20060138246".pn. and alarm                                                                       | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>12:05 |
| S114 | 1    | "20060138246".pn. and audible                                                                     | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>13:42 |
| S115 | 0    | "20060138246".pn. and light\$1                                                                    | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>13:42 |
| S116 | 0    | "20060138246".pn. and led                                                                         | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>13:43 |
| S117 | 1    | "20060138246".pn. and temperature with sensor                                                     | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:07 |

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| S118 | 0      | "20060138246".pn. and interface                      | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:07 |
| S119 | 0      | "20060138246".pn. and interface                      | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:07 |
| S120 | 1      | "20060138246".pn. and operator adj input             | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:10 |
| S121 | 1      | "20060138246".pn. and display                        | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:18 |
| S122 | 532521 | "20060138246".pn. and liquid crystal                 | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:18 |
| S123 | 1      | "20060138246".pn. and (liquid crystal)               | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:18 |
| S124 | 0      | "20060138246".pn. and crystal                        | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:28 |
| S125 | 1      | "20060138246".pn. and sensor                         | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:35 |
| S126 | 33     | faucet with display with temperature                 | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>14:36 |
| S127 | 25     | S126 and (led crystal light)                         | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>15:01 |
| S128 | 1      | "20060045167".pn. and alarm                          | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>15:01 |
| S129 | 0      | "20060045167".pn. and audible                        | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>15:11 |
| S130 | 1585   | ((340/587) or (236/12.12) or<br>(374/148,141)).OCLS. | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>15:49 |
| S131 | 1      | "194656".apn.                                        | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:10 |
| S132 | 0      | (driver adj fatigue).ti. and gaze with<br>mirror     | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:12 |
| S133 | 0      | (driver adj fatigue).ti. and gaze with<br>mirror     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:12 |
| S134 | 0      | (driver and fatigue).ti. and gaze with<br>mirror     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:19 |
| S135 | 0      | (driver and fatigue).ti. and gaze with<br>stimulu    | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:13 |
| S136 | 1      | (driver and fatigue).ti. and gaze with<br>stimulus   | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:13 |

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| S137 | 1   | (driver and fatigue).ti. and gaze                 | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:13 |
| S138 | 22  | (driver adj fatigue) and gaze                     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:51 |
| S139 | 9   | S138 and @rlad < "20041208"                       | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:14 |
| S140 | 0   | (driver adj fatigue) and gaze same peripheral     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:18 |
| S141 | 1   | (driver adj fatigue) and stimulus same peripheral | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:18 |
| S142 | 1   | (driver and fatigue).ti. and gaze                 | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:19 |
| S143 | 118 | (driver and fatigue).ti.                          | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:19 |
| S144 | 8   | S143 and peripheral                               | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:19 |
| S145 | 12  | (driver and fatigue).ti. and fatigue              | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:22 |
| S146 | 5   | (driver and fatigue).ti. and peripheral           | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:35 |
| S147 | 8   | (driver and fatigue).ti. and peripheral           | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:23 |

|      |    |                                                                                           |                                                                   |    |     |                     |
|------|----|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----|-----|---------------------|
| S148 | 1  | (driver and (drowsiness alertness attentiveness)).ti. and peripheral                      | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:30 |
| S149 | 0  | (driver and (drowsiness alertness attentiveness)).ti. and gaze with threshold             | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:30 |
| S150 | 0  | (driver and (drowsiness alertness attentiveness)).ti. and gaze same threshold             | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:30 |
| S151 | 0  | (driver and (drowsiness alertness attentiveness fatigue)).ti. and gaze same threshold     | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:30 |
| S152 | 1  | (driver and fatigue).ti. and gaze                                                         | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:35 |
| S153 | 1  | (driver and fatigue).ti. and angle with (view\$4 look\$4 gaz\$5)                          | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:35 |
| S154 | 3  | (driver and fatigue).ti. and angle                                                        | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:36 |
| S155 | 5  | (driver and fatigue).ti. and field with vision                                            | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:37 |
| S156 | 6  | (driver and fatigue).ti. and peripher\$4                                                  | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:37 |
| S157 | 7  | (driver and (fatigue drowsiness attentiveness)).ti. and peripher\$4                       | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:54 |
| S158 | 9  | (driver and (fatigue drowsiness attentiveness alert\$4)).ti. and peripher\$4              | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:37 |
| S159 | 19 | (driver adj fatigue) and (stimulus stimuli)                                               | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:53 |
| S160 | 2  | "20020105426"                                                                             | US-PGPUB;<br>USPAT;<br>USOCR; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR | OFF | 2007/07/30<br>17:53 |
| S161 | 0  | ("2002/0105426").URPN.                                                                    | USPAT                                                             | OR | OFF | 2007/07/30<br>17:54 |
| S162 | 7  | (driver and (fatigue drowsiness attentiveness sleepiness)).ti. and (periphery peripheral) | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:55 |
| S163 | 3  | "6426702"                                                                                 | US-PGPUB;<br>USPAT                                                | OR | OFF | 2007/07/30<br>17:55 |

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|------|------|------------------------------------------------------------------------|---------------------------|----|-----|---------------------|
| S164 | 2    | ((("6278413") or ("6121878"))).PN.                                     | US-PGPUB;<br>USPAT; USOCR | OR | OFF | 2008/04/21<br>15:28 |
| S165 | 1    | ("5734355").PN.                                                        | US-PGPUB;<br>USPAT; USOCR | OR | OFF | 2008/04/22<br>12:23 |
| S166 | 9    | brogi.in.                                                              | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>12:23 |
| S167 | 0    | "5734335".pn. and priority                                             | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>12:27 |
| S168 | 0    | "5734335".pn. and priorit\$4                                           | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>12:27 |
| S169 | 0    | ((forest adj fire\$1) and monitor\$4).ti. and<br>mobile and priorit\$4 | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>12:28 |
| S170 | 0    | ((forest and fire\$1) and monitor\$4).ti. and<br>mobile and priorit\$4 | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>12:28 |
| S171 | 0    | ((forest and fire\$1) and monitor\$4).ti. and<br>mobile                | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>12:28 |
| S172 | 1    | ((forest and fire\$1) and monitor\$4).ti.                              | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>12:29 |
| S173 | 2    | "303458".apn.                                                          | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>15:48 |
| S174 | 1    | "5734335".pn. and moving                                               | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>16:45 |
| S175 | 1    | "5734335".pn. and platform\$1                                          | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>16:45 |
| S176 | 1    | "5734335".pn. and mov\$4                                               | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>16:52 |
| S177 | 1    | "5734335".pn. and mov\$6                                               | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>16:52 |
| S178 | 1    | "5734335".pn. and fire                                                 | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>16:53 |
| S179 | 1    | "5734335".pn. and central                                              | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>16:55 |
| S180 | 2    | alarm with sensor\$1 with priority with<br>(power bandwidth)           | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>17:31 |
| S181 | 1    | "4459582".pn. and priority                                             | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>17:33 |
| S182 | 1    | "4459582".pn. and priorit\$4                                           | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>17:33 |
| S183 | 1    | "4459582".pn. and power                                                | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>17:34 |
| S184 | 956  | (340/539.22,870.05,870.04).CCLS.                                       | US-PGPUB;<br>USPAT; USOCR | OR | OFF | 2008/04/22<br>17:47 |
| S185 | 0    | (340/539).CCLS.                                                        | US-PGPUB;<br>USPAT; USOCR | OR | OFF | 2008/04/22<br>17:48 |
| S186 | 1131 | (340/539.13).CCLS.                                                     | US-PGPUB;<br>USPAT; USOCR | OR | OFF | 2008/04/22<br>17:53 |
| S187 | 242  | S186 and fire                                                          | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/22<br>17:53 |
| S188 | 0    | "5892441".pn. and flood                                                | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/23<br>16:06 |
| S189 | 1    | "5892441".pn. and attach\$4                                            | US-PGPUB;<br>USPAT        | OR | OFF | 2008/04/23<br>16:07 |

|      |   |                                                    |                    |    |     |                     |
|------|---|----------------------------------------------------|--------------------|----|-----|---------------------|
| S190 | 1 | "5892441".pn. and storage with vehicle             | US-PGPUB;<br>USPAT | OR | OFF | 2008/04/23<br>16:13 |
| S191 | 0 | "5892441".pn. and storage adj rea                  | US-PGPUB;<br>USPAT | OR | OFF | 2008/04/23<br>16:13 |
| S192 | 1 | "5892441".pn. and items                            | US-PGPUB;<br>USPAT | OR | OFF | 2008/04/23<br>16:14 |
| S193 | 1 | "5892441".pn. and item\$1 with vehicle             | US-PGPUB;<br>USPAT | OR | OFF | 2008/04/23<br>16:23 |
| S194 | 1 | "5892441".pn. and any with (object\$1 item<br>\$1) | US-PGPUB;<br>USPAT | OR | OFF | 2008/04/23<br>16:32 |
| S195 | 1 | "5892441".pn. and any with attach\$4               | US-PGPUB;<br>USPAT | OR | OFF | 2008/04/23<br>16:32 |

4/ 23/ 2008 11:42:21 PM

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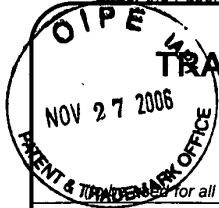
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PTO/SB/21 (09-04)

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Total Number of Pages in This Submission 15

|                        |                   |
|------------------------|-------------------|
| Application Number     | 11/303,458        |
| Filing Date            | December 16, 2005 |
| First Named Inventor   | DOOLIN, et al.    |
| Art Unit               | 2632              |
| Examiner Name          | Unassigned        |
| Attorney Docket Number | 010030-000910US   |

## ENCLOSURES (Check all that apply)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| Remarks _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

|              |                                             |          |        |
|--------------|---------------------------------------------|----------|--------|
| Firm Name    | Trellis Intellectual Property Law Group, PC |          |        |
| Signature    |                                             |          |        |
| Printed name | Charles J. Kulas                            |          |        |
| Date         | November 22, 2006                           | Reg. No. | 35,809 |

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11303458 - GAU: 2612

Attorney Docket No.: 010030-000910US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : DOOLIN, et al.                      Art Unit : 2632  
Serial No. : 11/303,458                      Examiner : Unassigned  
Filed : December 16, 2005  
Title : SYSTEM FOR SENSING ENVIROMENTAL CONDITIONS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

A copy of the reference C1 listed on the attached form PTO-1449 is enclosed.

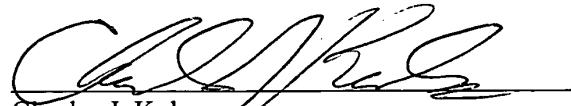
The Information Disclosure Statement is being submitted with before the issuance of the first office action, therefore Applicant submits that no fee is required for the consideration of the accompanying Information Disclosure Statement.

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Please apply any appropriate charges or credits to Deposit Account No. 50-3000.

Respectfully submitted,

Date: November 22, 2006

  
Charles J. Kulas  
Reg. No. 35,809

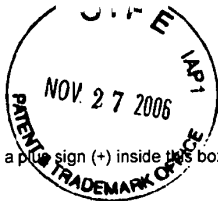
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PTO/SB/08A (08-00)

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Sheet 1 of 1

**Complete if Known**

|                        |                   |
|------------------------|-------------------|
| Application Number     | 11/303,459        |
| Filing Date            | December 16, 2005 |
| First Named Inventor   | DOOLIN et al.     |
| Group Art Unit         | 2632              |
| Examiner Name          | Unassigned        |
| Attorney Docket Number | 010030-000910US   |

**OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

| Examiner<br>Initials * | Cite<br>No. <sup>1</sup> | 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 <sup>2</sup> |
|------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                        | C1                       | MEIER, Rene, et al., "STEAM: Event-Based Middleware for Wireless Ad Hoc Networks", Department of Computer Science, Trinity College; Dublin, Ireland; publication date: 2002, <a href="http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=1030841">http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=1030841</a> ; pgs. 639-644 |                |
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Examiner  
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/Shirley Lu/

Date  
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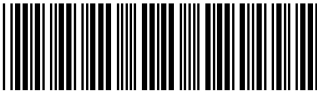
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## BIB DATA SHEET

CONFIRMATION NO. 6302

| SERIAL NUMBER                                                                                                                                                                                                                                                                                                                                                                          | FILING or 371(c)<br>DATE                                                                                          | CLASS                                                    | GROUP ART UNIT                    | ATTORNEY DOCKET<br>NO.                                                                                                                                                                                                                                                    |                               |                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------|
| 11/303,458                                                                                                                                                                                                                                                                                                                                                                             | 12/16/2005                                                                                                        | 340                                                      | 2612                              | 010030-000910US                                                                                                                                                                                                                                                           |                               |                                    |
| <b>APPLICANTS</b><br>David M. Doolin, El Cerrito, CA;<br>Steve Glaser, Berkeley, CA;<br>Nicholas Sitar, Orinda, CANADA;<br>John Radke, Berkeley, CANADA;<br><b>** CONTINUING DATA *****</b><br>This appln claims benefit of 60/637,279 12/17/2004<br><b>** FOREIGN APPLICATIONS *****</b><br><b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY **</b><br>02/01/2006 |                                                                                                                   |                                                          |                                   |                                                                                                                                                                                                                                                                           |                               |                                    |
| Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Verified and /SHIRLEY LU/<br>Acknowledged Examiner's Signature                                                                                                                   |                                                                                                                   | <input type="checkbox"/> Met after Allowance<br>Initials | <b>STATE OR<br/>COUNTRY</b><br>CA | <b>SHEETS<br/>DRAWINGS</b><br>4                                                                                                                                                                                                                                           | <b>TOTAL<br/>CLAIMS</b><br>49 | <b>INDEPENDENT<br/>CLAIMS</b><br>8 |
| <b>ADDRESS</b><br>Trellis Intellectual Property Law Group, PC<br>1900 EMBARCADERO ROAD<br>SUITE 109<br>PALO ALTO, CA 94303<br>UNITED STATES                                                                                                                                                                                                                                            |                                                                                                                   |                                                          |                                   |                                                                                                                                                                                                                                                                           |                               |                                    |
| <b>TITLE</b><br>System for sensing environmental conditions                                                                                                                                                                                                                                                                                                                            |                                                                                                                   |                                                          |                                   |                                                                                                                                                                                                                                                                           |                               |                                    |
| <b>FILING FEE<br/>RECEIVED</b><br>1790                                                                                                                                                                                                                                                                                                                                                 | FEES: Authority has been given in Paper<br>No. _____ to charge/credit DEPOSIT ACCOUNT<br>No. _____ for following: |                                                          |                                   | <input type="checkbox"/> All Fees<br><input type="checkbox"/> 1.16 Fees (Filing)<br><input type="checkbox"/> 1.17 Fees (Processing Ext. of time)<br><input type="checkbox"/> 1.18 Fees (Issue)<br><input type="checkbox"/> Other _____<br><input type="checkbox"/> Credit |                               |                                    |

|                                                                                                          |                                |  |                                                |  |
|----------------------------------------------------------------------------------------------------------|--------------------------------|--|------------------------------------------------|--|
| <b>Search Notes</b><br> | <b>Application/Control No.</b> |  | <b>Applicant(s)/Patent under Reexamination</b> |  |
|                                                                                                          | 11/303,458                     |  | DOOLIN ET AL.                                  |  |
|                                                                                                          | <b>Examiner</b>                |  | <b>Art Unit</b>                                |  |
|                                                                                                          | SHIRLEY LU                     |  | 2612                                           |  |

| SEARCHED |                                         |           |          |
|----------|-----------------------------------------|-----------|----------|
| Class    | Subclass                                | Date      | Examiner |
| 340      | 539.13,<br>539.22,<br>870.05,<br>870.04 | 4/22/2008 | SL       |
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| INTERFERENCE SEARCHED |          |      |          |
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| Class                 | Subclass | Date | Examiner |
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| SEARCH NOTES<br>(INCLUDING SEARCH STRATEGY) |           |      |
|---------------------------------------------|-----------|------|
|                                             | DATE      | EXMR |
| east                                        | 4/22/2008 | SL   |
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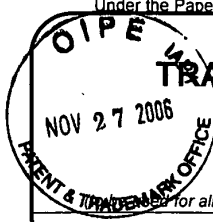
IFW

PTO/SB/21 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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# TRANSMITTAL FORM

|                                          |    |                   |
|------------------------------------------|----|-------------------|
| Application Number                       |    | 11/303,458        |
| Filing Date                              |    | December 16, 2005 |
| First Named Inventor                     |    | DOOLIN, et al.    |
| Art Unit                                 |    | 2632              |
| Examiner Name                            |    | Unassigned        |
| Attorney Docket Number                   |    | 010030-000910US   |
| Total Number of Pages in This Submission | 15 |                   |

| ENCLOSURES (Check all that apply)                                         |                                                                           |                                                                                         |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <input type="checkbox"/> Fee Transmittal Form                             | <input type="checkbox"/> Drawing(s)                                       | <input type="checkbox"/> After Allowance Communication to TC                            |
| <input type="checkbox"/> Fee Attached                                     | <input type="checkbox"/> Licensing-related Papers                         | <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences     |
| <input type="checkbox"/> Amendment/Reply                                  | <input type="checkbox"/> Petition                                         | <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) |
| <input type="checkbox"/> After Final                                      | <input type="checkbox"/> Petition to Convert to a Provisional Application | <input type="checkbox"/> Proprietary Information                                        |
| <input type="checkbox"/> Affidavits/declaration(s)                        | <input type="checkbox"/> Power of Attorney, Revocation                    | <input type="checkbox"/> Status Letter                                                  |
| <input type="checkbox"/> Extension of Time Request                        | <input type="checkbox"/> Change of Correspondence Address                 | <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):         |
| <input type="checkbox"/> Express Abandonment Request                      | <input type="checkbox"/> Terminal Disclaimer                              | Postcard                                                                                |
| <input checked="" type="checkbox"/> Information Disclosure Statement      | <input type="checkbox"/> Request for Refund                               |                                                                                         |
| <input type="checkbox"/> Certified Copy of Priority Document(s)           | <input type="checkbox"/> CD, Number of CD(s) _____                        |                                                                                         |
| <input type="checkbox"/> Reply to Missing Parts/Incomplete Application    | <input type="checkbox"/> Landscape Table on CD                            |                                                                                         |
| <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53 | Remarks                                                                   |                                                                                         |

| SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT |                                             |                 |
|--------------------------------------------|---------------------------------------------|-----------------|
| Firm Name                                  | Trellis Intellectual Property Law Group, PC |                 |
| Signature                                  |                                             |                 |
| Printed name                               | Charles J. Kulas                            |                 |
| Date                                       | November 22, 2006                           | Reg. No. 35,809 |

| CERTIFICATE OF TRANSMISSION/MAILING                                                                                                                                                                                                                                                                           |                 |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------|
| I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage 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: |                 |                        |
| Signature                                                                                                                                                                                                                                                                                                     |                 |                        |
| Typed or printed name                                                                                                                                                                                                                                                                                         | Megan A. Godsey | Date November 22, 2006 |

This collection of information is required by 37 CFR 1.5. 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 2 hours 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.



Attorney Docket No.: 010030-000910US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : DOOLIN, et al.                      Art Unit : 2632  
Serial No. : 11/303,458                      Examiner : Unassigned  
Filed : December 16, 2005  
Title : SYSTEM FOR SENSING ENVIROMENTAL CONDITIONS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

A copy of the reference C1 listed on the attached form PTO-1449 is enclosed.

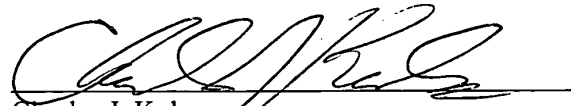
The Information Disclosure Statement is being submitted with before the issuance of the first office action, therefore Applicant submits that no fee is required for the consideration of the accompanying Information Disclosure Statement.

As provided for by 37 CFR 1.97(g) and (h), no inference should be made that the information and references cited are prior art merely because they are in this statement and no representation is being made that a search has been conducted or that this statement encompasses all the possible relevant information.

Please apply any appropriate charges or credits to Deposit Account No. 50-3000.

Respectfully submitted,

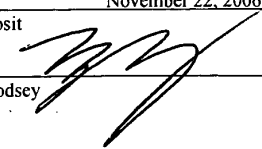
Date: November 22, 2006

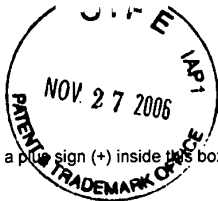
  
Charles J. Kulas  
Reg. No. 35,809

Trellis Intellectual Property Law Group, PC  
1900 Embarcadero Rd., Suite 109  
Palo Alto, CA 94303  
Tel.: 650-842-0300  
Fax: 650-842-0304

CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

November 22, 2006  
Date of Deposit  
  
Megan A. Godsey



Please type a plus sign (+) inside this box →



PTO/SB/08A (08-00)

Approved for use through 10/31/2002. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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Substitute for form 1449A/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 1

### Complete if Known

|                        |                   |
|------------------------|-------------------|
| Application Number     | 11/303,459        |
| Filing Date            | December 16, 2005 |
| First Named Inventor   | DOOLIN et al.     |
| Group Art Unit         | 2632              |
| Examiner Name          | Unassigned        |
| Attorney Docket Number | 010030-000910US   |

### OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

| Examiner<br>Initials * | Cite<br>No. <sup>1</sup> | 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 <sup>2</sup> |
|------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                        | C1                       | MEIER, Rene, et al., "STEAM: Event-Based Middleware for Wireless Ad Hoc Networks", Department of Computer Science, Trinity College; Dublin, Ireland; publication date: 2002, <a href="http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=1030841">http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=1030841</a> ; pgs. 639-644 |                |
|                        |                          |                                                                                                                                                                                                                                                                                                                                           |                |
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Examiner  
Signature

Date  
Considered

\*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.

<sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



PTO/SB/21 (09-04)  
Approved for use through 07/31/2006. OMB 0651-0031  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE  
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|                                                                                                |                      |                        |                 |
|------------------------------------------------------------------------------------------------|----------------------|------------------------|-----------------|
| <b>TRANSMITTAL FORM</b><br><br><i>(to be used for all correspondence after initial filing)</i> | Application Number   | 11/303,458             |                 |
|                                                                                                | Filing Date          | 12/16/2005             |                 |
|                                                                                                | First Named Inventor | DOOLIN et al.          |                 |
|                                                                                                | Art Unit             | 2632                   |                 |
|                                                                                                | Examiner Name        | Unassigned             |                 |
| Total Number of Pages in This Submission                                                       | 12                   | Attorney Docket Number | 010030-000910US |

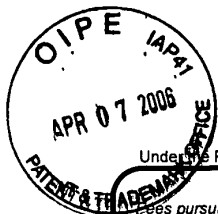
| ENCLOSURES (Check all that apply)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Fee Transmittal Form<br><input checked="" type="checkbox"/> Fee Attached<br><input type="checkbox"/> Amendment/Reply<br><input type="checkbox"/> After Final<br><input type="checkbox"/> Affidavits/declaration(s)<br><input checked="" type="checkbox"/> Extension of Time Request<br><input type="checkbox"/> Express Abandonment Request<br><input type="checkbox"/> Information Disclosure Statement<br><br><input type="checkbox"/> Certified Copy of Priority Document(s)<br><input checked="" type="checkbox"/> Reply to Missing Parts/<br>Incomplete Application<br><input checked="" type="checkbox"/> Reply to Missing Parts<br>under 37 CFR 1.52 or 1.53 | <input type="checkbox"/> Drawing(s)<br><input type="checkbox"/> Licensing-related Papers<br><br><input type="checkbox"/> Petition<br><input type="checkbox"/> Petition to Convert to a<br>Provisional Application<br><input checked="" type="checkbox"/> Power of Attorney, Revocation<br>Change of Correspondence Address<br><input type="checkbox"/> Terminal Disclaimer<br><input type="checkbox"/> Request for Refund<br><input type="checkbox"/> CD, Number of CD(s) _____<br><input type="checkbox"/> Landscape Table on CD | <input type="checkbox"/> After Allowance Communication to TC<br><br><input type="checkbox"/> Appeal Communication to Board<br>of Appeals and Interferences<br><br><input type="checkbox"/> Appeal Communication to TC<br>(Appeal Notice, Brief, Reply Brief)<br><br><input type="checkbox"/> Proprietary Information<br><br><input type="checkbox"/> Status Letter<br><input checked="" type="checkbox"/> Other Enclosure(s) (please identify<br>below):<br>Postcard, Check #1034 for \$1850 |
| <b>Remarks</b><br>Please apply any appropriate charges or credits to Deposit Account No. 50-3000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT |                                             |          |        |
|--------------------------------------------|---------------------------------------------|----------|--------|
| Firm Name                                  | Trellis Intellectual Property Law Group, PC |          |        |
| Signature                                  |                                             |          |        |
| Printed name                               | Charles J. Kulas                            |          |        |
| Date                                       | April 4, 2006                               | Reg. No. | 35,809 |

| CERTIFICATE OF TRANSMISSION/MAILING                                                                                                                                                                                                                                                                           |                 |      |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|---------------|
| I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage 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: |                 |      |               |
| Signature                                                                                                                                                                                                                                                                                                     |                 |      |               |
| Typed or printed name                                                                                                                                                                                                                                                                                         | Megan A. Godsey | Date | April 4, 2006 |

This collection of information is required by 37 CFR 1.5. 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 2 hours 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.



PTO/SB/17 (01-06)

Approved for use through 07/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

# FEE TRANSMITTAL For FY 2006

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 1850

**Complete if Known**

|                      |                 |
|----------------------|-----------------|
| Application Number   | 11/303,458      |
| Filing Date          | 12/16/2005      |
| First Named Inventor | DOOLIN et al.   |
| Examiner Name        | Unassigned      |
| Art Unit             | 2632            |
| Attorney Docket No.  | 010030-000910US |

**METHOD OF PAYMENT** (check all that apply)☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): \_\_\_\_\_☐ Deposit Account Deposit Account Number: 50-3000 Deposit Account Name: Trellis Law Group

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below☐ Charge fee(s) indicated below, **except for the filing fee**☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17☒ Credit any overpayments**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.**FEE CALCULATION** (All the fees below are due upon filing or may be subject to a surcharge.)**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

| Application Type | FILING FEES |                       | SEARCH FEES |                       | EXAMINATION FEES |                       | Fees Paid (\$) |
|------------------|-------------|-----------------------|-------------|-----------------------|------------------|-----------------------|----------------|
|                  | Fee (\$)    | Small Entity Fee (\$) | Fee (\$)    | Small Entity Fee (\$) | Fee (\$)         | Small Entity Fee (\$) |                |
| Utility          | 300         | 150                   | 500         | 250                   | 200              | 100                   | 500            |
| Design           | 200         | 100                   | 100         | 50                    | 130              | 65                    |                |
| Plant            | 200         | 100                   | 300         | 150                   | 160              | 80                    |                |
| Reissue          | 300         | 150                   | 500         | 250                   | 600              | 300                   |                |
| Provisional      | 200         | 100                   | 0           | 0                     | 0                | 0                     |                |

**2. EXCESS CLAIM FEES****Fee Description**

Each claim over 20 (including Reissues)

| Fee (\$) | Small Entity Fee (\$) |
|----------|-----------------------|
| 50       | 25                    |

Each independent claim over 3 (including Reissues)

|     |     |
|-----|-----|
| 200 | 100 |
|-----|-----|

Multiple dependent claims

|     |     |
|-----|-----|
| 360 | 180 |
|-----|-----|

| Total Claims | Extra Claims | Fee (\$) | Fee Paid (\$) |
|--------------|--------------|----------|---------------|
| 49           | 29           | 25       | 725           |

HP = highest number of total claims paid for, if greater than 20.

| Indep. Claims | Extra Claims | Fee (\$) | Fee Paid (\$) |
|---------------|--------------|----------|---------------|
| 8             | 5            | 100      | 500           |

HP = highest number of independent claims paid for, if greater than 3.

**3. APPLICATION SIZE FEE**

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), 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).

| Total Sheets | Extra Sheets | Number of each additional 50 or fraction thereof | Fee (\$) | Fee Paid (\$) |
|--------------|--------------|--------------------------------------------------|----------|---------------|
| - 100 =      | / 50 =       | (round up to a whole number) x                   |          |               |

**4. OTHER FEE(S)**

Non-English Specification, \$130 fee (no small entity discount)

**Fees Paid (\$)**Other (e.g., late filing surcharge): Late filing surcharge & extension of time fee

125

**SUBMITTED BY**

|                   |                  |                                          |                        |
|-------------------|------------------|------------------------------------------|------------------------|
| Signature         |                  | Registration No. (Attorney/Agent) 35,809 | Telephone 650-842-0300 |
| Name (Print/Type) | Charles J. Kulas |                                          | Date April 4, 2006     |

This collection of information is required by 37 CFR 1.136. 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 30 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.



Attorney Docket No.: 010030-000910US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : DOOLIN et al.                      Art Unit : 2632  
Serial No. : 11/303,458                      Examiner : Unassigned  
Filed : December 16, 2006  
Title : SYSTEM FOR SENSING ENVIROMENTAL CONDITIONS

**MAIL STOP MISSING PARTS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION

In response to the Notice to File Missing Parts of Application under 37 CFR §1.53(b) mailed February 2, 2006 (copy enclosed), applicant as a small entity submits herewith the following:

- ☒ Payment of the basic filing fee of \$500;
- ☒ Payment of the additional/multiple dependent claims fees of \$1225;
- ☒ Payment of the surcharge of \$65 for late filing of the basic filing fee and/or declaration;
- ☒ Payment of the surcharge of \$60 for Petition to Extend Time;
- ☒ A check in the total amount of \$1850 is attached; and
- ☒ Signed declarations, supplemental application data sheets, and a power of attorney.

It is understood that this perfects the application and no additional papers or filing fees are required. Please apply any other appropriate charges or credits to Deposit Account No. 50-3000.

Respectfully submitted,

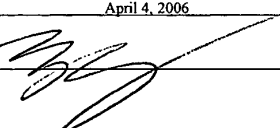
Date: April 4, 2006

  
Charles J. Kulas  
Reg. No. 35,809

Trellis Intellectual Property Law Group, PC  
1900 Embarcadero Road  
Suite 109  
Palo Alto, CA 94303  
Tel.: 415-842-0300  
Fax: 650-842-0304

CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

April 4, 2006  
Date of Deposit  
  
Megan A. Godsey



## 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 | FIRST NAMED APPLICANT | ATTORNEY DOCKET NUMBER |
|--------------------|------------------------|-----------------------|------------------------|
| 11/303,458         | 12/16/2005             | David M. Doolin       | 010030-000910US        |

37490  
Trellis Intellectual Property Law Group, PC  
1900 EMBARCADERO ROAD  
SUITE 109  
PALO ALTO, CA 94303



CONFIRMATION NO. 6302  
FORMALITIES  
LETTER

Date Mailed: 02/02/2006

## 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 \$ 150 to complete the basic filing fee for a small entity.*
- 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 **\$1225** as a 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 \$65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

**SUMMARY OF FEES DUE:**

Total additional fee(s) required for this application is **\$1790** for a Small Entity.

- **\$150** Statutory basic filing fee.

04/10/2006 BABRAHA1 00000006 11303458

|            |        |    |
|------------|--------|----|
| 01 FC:2011 | 150.00 | OP |
| 02 FC:2111 | 250.00 | OP |
| 03 FC:2311 | 100.00 | OP |
| 04 FC:2401 | 65.00  | OP |
| 05 FC:2202 | 725.00 | OP |
| 06 FC:2201 | 500.00 | OP |

- **\$65** Surcharge.
- The application search fee has not been paid. Applicant must submit **\$250** to complete the search fee.
- The application examination fee has not been paid. Applicant must submit **\$100** to complete the examination fee for a small entity in compliance with 37 CFR 1.27
- Total additional claim fee(s) for this application is **\$1225**
  - **\$500** for **5** independent claims over 3.
  - **\$725** for **29** total claims over 20.

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

---

*A copy of this notice **MUST** be returned with the reply.*



Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382  
PART 2 - COPY TO BE RETURNED WITH RESPONSE

04/04/2006 16:12 5106653420

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PAGE 02/02



## BEST AVAILABLE COPY

PTO/S&amp;D/A (06-04)

Approved for use through 07/31/2006, OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

|                    |                                             |
|--------------------|---------------------------------------------|
| Title of Invention | SYSTEM FOR SENSING ENVIRONMENTAL CONDITIONS |
|--------------------|---------------------------------------------|

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

This declaration is directed to:

☐ The attached application, or

☒ Application No. 11/003 456, filed on 12/10/2005

☐ 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 for continuation-in-part applications, 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.

All statements made herein of my/own 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: <u>David M. Doolin</u>  |                           |
| Signature: <u>[Signature]</u>         | Citizen of: <u>USA</u>    |
| Inventor two: <u>Steve Glaser</u>     |                           |
| Signature: _____                      | Citizen of: <u>USA</u>    |
| Inventor three: <u>Nicholas Silar</u> |                           |
| Signature: _____                      | Citizen of: <u>Canada</u> |
| Inventor four: <u>John Radke</u>      |                           |
| Signature: _____                      | Citizen of: <u>Canada</u> |

☐ Additional inventors or a legal representative are being named on \_\_\_\_\_ additional form(s) attached hereto.

This collection of information is required by 35 U.S.C. 110 and 37 CFR 1.63. 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. The collection is estimated to take 1 minute 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 1682, Alexandria, VA 22313-1450.

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



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

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| <b>Title of<br/>Invention</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>SYSTEM FOR SENSING ENVIRONMENTAL CONDITIONS</b> |
| <p>As the below named inventor(s), I/we declare that:</p> <p>This declaration is directed to:</p> <p><input type="checkbox"/> The attached application, or</p> <p><input checked="" type="checkbox"/> Application No. <u>11/303,458</u>, filed on <u>12/16/2005</u>,</p> <p><input type="checkbox"/> as amended on _____ (if applicable);</p> <p>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;</p> <p>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;</p> <p>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 for continuation-in-part applications, 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.</p> <p>All statements made herein of my/own 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.</p> |                                                    |

|                                                                                                                                      |                           |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>FULL NAME OF INVENTOR(S)</b>                                                                                                      |                           |
| Inventor one: <u>David M. Doolin</u>                                                                                                 |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>USA</u>    |
| Inventor two: <u>Steve Glaser</u>                                                                                                    |                           |
| Signature: <u>[Signature]</u>                                                                                                        | Citizen of: <u>USA</u>    |
| Inventor three: <u>Nicholas Sitar</u>                                                                                                |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>Canada</u> |
| Inventor four: <u>John Radka</u>                                                                                                     |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>Canada</u> |
| <input type="checkbox"/> Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto. |                           |

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN  
APPLICATION DATA SHEET (37 CFR 1.76)**

|                               |                                                    |
|-------------------------------|----------------------------------------------------|
| <b>Title of<br/>Invention</b> | <b>SYSTEM FOR SENSING ENVIRONMENTAL CONDITIONS</b> |
|-------------------------------|----------------------------------------------------|

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

This declaration is directed to:

☐ The attached application, or

☒ Application No. 11/303,458, filed on 12/16/2005,

☐ 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 for continuation-in-part applications, 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.

All statements made herein of my/own 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.

|                                                                                                                                      |                           |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>FULL NAME OF INVENTOR(S)</b>                                                                                                      |                           |
| Inventor one: <u>David M. Doolin</u>                                                                                                 |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>USA</u>    |
| Inventor two: <u>Steve Glaser</u>                                                                                                    |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>USA</u>    |
| Inventor three: <u>Nicholas Sitar</u>                                                                                                |                           |
| Signature: <u>Nicholas Sitar</u>                                                                                                     | Citizen of: <u>Canada</u> |
| Inventor four: <u>John Radke</u>                                                                                                     |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>Canada</u> |
| <input type="checkbox"/> Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto. |                           |

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PTO/SB/01A (09-04)

Approved for use through 07/31/2008. OMB 0851-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

|                    |                                             |
|--------------------|---------------------------------------------|
| Title of Invention | SYSTEM FOR SENSING ENVIRONMENTAL CONDITIONS |
|--------------------|---------------------------------------------|

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

This declaration is directed to:

☐ The attached application, or

☒ Application No. 11/303,458, filed on 12/16/2005,

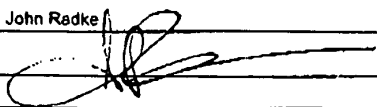
☐ as amended on \_\_\_\_\_ (if applicable);

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 for continuation-in-part applications, 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.

All statements made herein of my/own 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: <u>David M. Doolin</u>                                                                                                 |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>USA</u>    |
| Inventor two: <u>Steve Glaser</u>                                                                                                    |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>USA</u>    |
| Inventor three: <u>Nicholas Sitar</u>                                                                                                |                           |
| Signature: _____                                                                                                                     | Citizen of: <u>Canada</u> |
| Inventor four: <u>John Radke</u>                                                                                                     |                           |
| Signature:                                        | Citizen of: <u>Canada</u> |
| <input type="checkbox"/> Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto. |                           |

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PTO/SB/81 (11-04)  
Approved for use through 11/30/2005. OMB 0651-0035  
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**POWER OF ATTORNEY  
and  
CORRESPONDENCE ADDRESS  
INDICATION FORM**

|                        |                                     |
|------------------------|-------------------------------------|
| Application Number     | 11/303,458                          |
| Filing Date            | 12/16/2005                          |
| First Named Inventor   | DOOLIN et al.                       |
| Title                  | System for Sensing Environmental... |
| Art Unit               | 2632                                |
| Examiner Name          | Unassigned                          |
| Attorney Docket Number | 010030-000910US                     |

I hereby revoke all previous powers of attorney given in the above-identified application.

I hereby appoint:

☒ Practitioners associated with the Customer Number:

37490

OR

☐ Practitioner(s) named below:

| Name | Registration Number |
|------|---------------------|
|      |                     |
|      |                     |
|      |                     |
|      |                     |

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

Please recognize or change the correspondence address for the above-identified application to:

☐ The address associated with the above-mentioned Customer Number:

OR

☒ The address associated with Customer Number:

37490

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Fax

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)

**SIGNATURE of Applicant or Assignee of Record**

|                   |                                                              |           |                       |
|-------------------|--------------------------------------------------------------|-----------|-----------------------|
| Signature         | <i>Veronica Lanier</i>                                       | Date      | <i>March 23, 2006</i> |
| Name              | Veronica Lanier                                              | Telephone | <i>570-643-7201</i>   |
| Title and Company | Acting Director, The Regents of the University of California |           |                       |

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 1 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 3 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.



PTO/SB/22 (08-03)

| <b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     | Docket Number (Optional)<br>010030-000910US |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------|-------|-----|------------------|--|-------------------------------------------------------------------|-------|------|-------|---------------------------------------------------------|-------|-------|----|-----------------------------------------------------------|--------|-------|----|----------------------------------------------------------|--------|-------|----|----------------------------------------------------------|--------|--------|----|
| <b>FY 2006</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                                             |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| Application Number 11/303,458                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Filed 12/16/2005    |                                             |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| For DOOLIN et al.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                                             |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| Art Unit 2632                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Examiner Unassigned |                                             |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <p>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.</p> <p>The requested extension and appropriate non-small-entity fee are as follows (check time period desired):</p> <table><thead><tr><th></th><th>Fee</th><th>Small Entity Fee</th><th></th></tr></thead><tbody><tr><td><input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))</td><td>\$120</td><td>\$60</td><td>\$ 60</td></tr><tr><td><input type="checkbox"/> Two months (37 CFR 1.17(a)(2))</td><td>\$450</td><td>\$225</td><td>\$</td></tr><tr><td><input type="checkbox"/> Three months (37 CFR 1.17(a)(3))</td><td>\$1020</td><td>\$510</td><td>\$</td></tr><tr><td><input type="checkbox"/> Four months (37 CFR 1.17(a)(4))</td><td>\$1590</td><td>\$795</td><td>\$</td></tr><tr><td><input type="checkbox"/> Five months (37 CFR 1.17(a)(5))</td><td>\$2160</td><td>\$1080</td><td>\$</td></tr></tbody></table> <p><input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.</p> <p><input checked="" type="checkbox"/> A check in the amount of the fee is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director has already been authorized to charge fees in this application to a Deposit Account.</p> <p><input checked="" type="checkbox"/> The Director is hereby authorized to charge any other fees which may be required, or credit any overpayment, to Deposit Account Number 50-3000. I have enclosed a duplicate copy of this sheet.</p> <p><b>WARNING: Information on this form may become public. Credit card information should not be included on this form. Proved credit card information and authorization on PTO-2038.</b></p> <p>I am the <input type="checkbox"/> applicant/inventor.</p> <p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71<br/>Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).</p> <p><input checked="" type="checkbox"/> attorney or agent of record.. Registration No. 35,809</p> <p><input type="checkbox"/> attorney or agent under 37 CFR 1.34(a).<br/>Registration number if acting under 37 CFR 1.34(a). _____</p> <p><br/>Signature</p> <p>Charles J. Kulas<br/>Typed or printed name</p> <p>April 4, 2006<br/>Date</p> <p>650-842-0300<br/>Telephone Number</p> <p>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*.</p> <p><input checked="" type="checkbox"/> *Total of 1 forms are submitted.</p> |                     |                                             |       | Fee | Small Entity Fee |  | <input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1)) | \$120 | \$60 | \$ 60 | <input type="checkbox"/> Two months (37 CFR 1.17(a)(2)) | \$450 | \$225 | \$ | <input type="checkbox"/> Three months (37 CFR 1.17(a)(3)) | \$1020 | \$510 | \$ | <input type="checkbox"/> Four months (37 CFR 1.17(a)(4)) | \$1590 | \$795 | \$ | <input type="checkbox"/> Five months (37 CFR 1.17(a)(5)) | \$2160 | \$1080 | \$ |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Fee                 | Small Entity Fee                            |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | \$120               | \$60                                        | \$ 60 |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input type="checkbox"/> Two months (37 CFR 1.17(a)(2))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | \$450               | \$225                                       | \$    |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input type="checkbox"/> Three months (37 CFR 1.17(a)(3))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | \$1020              | \$510                                       | \$    |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input type="checkbox"/> Four months (37 CFR 1.17(a)(4))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | \$1590              | \$795                                       | \$    |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input type="checkbox"/> Five months (37 CFR 1.17(a)(5))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | \$2160              | \$1080                                      | \$    |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |

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## **Application Data Sheet**

### **Application Information**

|                                 |                                                |
|---------------------------------|------------------------------------------------|
| Application number::            | 11/303,458                                     |
| Filing Date::                   | 12/16/2005                                     |
| Application Type::              | Regular                                        |
| Subject Matter::                | Utility                                        |
| Title::                         | SYSTEM FOR SENSING ENVIRONMENTAL<br>CONDITIONS |
| Attorney Docket Number::        | 010030-000910US                                |
| Request for Early Publication:: | No                                             |
| Request for Non-Publication::   | No                                             |
| Suggested Drawing Figure::      | 1                                              |
| Total Drawing Sheets::          | 4                                              |
| Small Entity?::                 | Yes                                            |
| Petition included?::            | No                                             |
| Secrecy Order in Parent Appl.:: | No                                             |

### **Applicant Information**

|                                  |                   |
|----------------------------------|-------------------|
| Applicant Authority Type::       | Inventor          |
| Primary Citizenship Country::    | US                |
| Status::                         | Full Capacity     |
| Given Name::                     | David             |
| Middle Name::                    | M.                |
| Family Name::                    | DOOLIN            |
| City of Residence::              | El Cerrito        |
| State or Province of Residence:: | CA                |
| Country of Residence::           | USA               |
| Street of Mailing Address::      | 6016 B Avila Ave. |
| City of Mailing Address::        | El Cerrito        |

State or Province of mailing address:: CA  
Country of mailing address:: USA  
Postal or Zip Code of mailing address:: 94530

Applicant Authority Type:: Inventor  
Primary Citizenship Country:: US  
Status:: Full Capacity  
Given Name:: Steve  
Family Name:: GLASER  
City of Residence:: Berkeley  
State or Province of Residence:: CA  
Country of Residence:: USA  
Street of Mailing Address:: 1115 Woodside Rd.  
City of Mailing Address:: Berkeley  
State or Province of mailing address:: CA  
Country of mailing address:: USA  
Postal or Zip Code of mailing address:: 94708

Applicant Authority Type:: Inventor  
Primary Citizenship Country:: Canada  
Status:: Full Capacity  
Given Name:: Nicholas  
Family Name:: SITAR  
City of Residence:: Orinda  
State or Province of Residence:: CA  
Country of Residence:: USA  
Street of Mailing Address:: 64 Donna Maria Way  
City of Mailing Address:: Orinda  
State or Province of mailing address:: CA  
Country of mailing address:: USA  
Postal or Zip Code of mailing address:: 94563

Applicant Authority Type:: Inventor  
Primary Citizenship Country:: Canada  
Status:: Full Capacity  
Given Name:: John  
Family Name:: RADKE  
City of Residence:: Berkeley  
State or Province of Residence:: CA  
Country of Residence:: USA  
Street of Mailing Address:: 51 Crestview  
City of Mailing Address:: Orinda  
State or Province of mailing address:: CA  
Country of mailing address:: USA  
Postal or Zip Code of mailing address:: 94563

#### **Correspondence Information**

Correspondence Customer Number:: 37490

#### **Representative Information**

Representative Customer Number:: 37490

#### **Domestic Priority Information**

|               |                                                            |                      |                      |
|---------------|------------------------------------------------------------|----------------------|----------------------|
| Application:: | Continuity Type::                                          | Parent Application:: | Parent Filing Date:: |
|               | An application claiming the benefit<br>under 35 USC 119(e) | 60/637,279           | December 17, 2004    |

#### **Foreign Priority Information**

|           |                      |               |
|-----------|----------------------|---------------|
| Country:: | Application number:: | Filing Date:: |
|-----------|----------------------|---------------|

#### **Assignee Information**

|                             |                                             |
|-----------------------------|---------------------------------------------|
| Assignee Name::             | The Regents of the University of California |
| Street of mailing address:: | 1111 Franklin St, 12 <sup>th</sup> Floor    |
|                             | Page 3                                      |
|                             | Supplemental 4/4/2006                       |

City of mailing address:: Oakland  
State or Province of mailing address:: CA  
Country of mailing address:: USA  
Postal or Zip Code of mailing address:: 94607-52000



PTO/SB/22 (08-03)

| <b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     | Docket Number (Optional)<br>010030-000910US |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------|-------|-----|------------------|--|-------------------------------------------------------------------|-------|------|-------|---------------------------------------------------------|-------|-------|----|-----------------------------------------------------------|--------|-------|----|----------------------------------------------------------|--------|-------|----|----------------------------------------------------------|--------|--------|----|
| <b>FY 2006</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |                                             |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| Application Number 11/303,458                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Filed 12/16/2005    |                                             |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| For DOOLIN et al.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |                                             |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| Art Unit 2632                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Examiner Unassigned |                                             |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <p>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.</p> <p>The requested extension and appropriate non-small-entity fee are as follows (check time period desired):</p> <table><thead><tr><th></th><th>Fee</th><th>Small Entity Fee</th><th></th></tr></thead><tbody><tr><td><input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))</td><td>\$120</td><td>\$60</td><td>\$ 60</td></tr><tr><td><input type="checkbox"/> Two months (37 CFR 1.17(a)(2))</td><td>\$450</td><td>\$225</td><td>\$</td></tr><tr><td><input type="checkbox"/> Three months (37 CFR 1.17(a)(3))</td><td>\$1020</td><td>\$510</td><td>\$</td></tr><tr><td><input type="checkbox"/> Four months (37 CFR 1.17(a)(4))</td><td>\$1590</td><td>\$795</td><td>\$</td></tr><tr><td><input type="checkbox"/> Five months (37 CFR 1.17(a)(5))</td><td>\$2160</td><td>\$1080</td><td>\$</td></tr></tbody></table> <p><input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.</p> <p><input checked="" type="checkbox"/> A check in the amount of the fee is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director has already been authorized to charge fees in this application to a Deposit Account.</p> <p><input checked="" type="checkbox"/> The Director is hereby authorized to charge any other fees which may be required, or credit any overpayment, to Deposit Account Number 50-3000. I have enclosed a duplicate copy of this sheet.</p> <p><b>WARNING: Information on this form may become public. Credit card information should not be included on this form. Proved credit card information and authorization on PTO-2038.</b></p> <p>I am the <input type="checkbox"/> applicant/inventor.</p> <p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71<br/>Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).</p> <p><input checked="" type="checkbox"/> attorney or agent of record.. Registration No. 35,809</p> <p><input type="checkbox"/> attorney or agent under 37 CFR 1.34(a).<br/>Registration number if acting under 37 CFR 1.34(a). _____</p> <p><br/>Signature<br/>Charles J. Kulas<br/>Typed or printed name</p> <p>April 4, 2006<br/>Date<br/>650-842-0300<br/>Telephone Number</p> <p>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*.</p> <p><input checked="" type="checkbox"/> *Total of 1 forms are submitted.</p> |                     |                                             |       | Fee | Small Entity Fee |  | <input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1)) | \$120 | \$60 | \$ 60 | <input type="checkbox"/> Two months (37 CFR 1.17(a)(2)) | \$450 | \$225 | \$ | <input type="checkbox"/> Three months (37 CFR 1.17(a)(3)) | \$1020 | \$510 | \$ | <input type="checkbox"/> Four months (37 CFR 1.17(a)(4)) | \$1590 | \$795 | \$ | <input type="checkbox"/> Five months (37 CFR 1.17(a)(5)) | \$2160 | \$1080 | \$ |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Fee                 | Small Entity Fee                            |       |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | \$120               | \$60                                        | \$ 60 |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input type="checkbox"/> Two months (37 CFR 1.17(a)(2))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | \$450               | \$225                                       | \$    |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input type="checkbox"/> Three months (37 CFR 1.17(a)(3))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | \$1020              | \$510                                       | \$    |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input type="checkbox"/> Four months (37 CFR 1.17(a)(4))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | \$1590              | \$795                                       | \$    |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |
| <input type="checkbox"/> Five months (37 CFR 1.17(a)(5))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | \$2160              | \$1080                                      | \$    |     |                  |  |                                                                   |       |      |       |                                                         |       |       |    |                                                           |        |       |    |                                                          |        |       |    |                                                          |        |        |    |

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## 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 |
|--------------------|------------------------|-----------------------|------------------------|
| 11/303,458         | 12/16/2005             | David M. Doolin       | 010030-000910US        |

37490  
 Trellis Intellectual Property Law Group, PC  
 1900 EMBARCADERO ROAD  
 SUITE 109  
 PALO ALTO, CA 94303

CONFIRMATION NO. 6302

FORMALITIES  
 LETTER

Date Mailed: 02/02/2006

## 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 \$ 150 to complete the basic filing fee for a small entity.*
- 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 **\$1225** as a 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 \$65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

**SUMMARY OF FEES DUE:**

Total additional fee(s) required for this application is **\$1790** for a Small Entity

- **\$150** Statutory basic filing fee.

- **\$65** Surcharge.
- The application search fee has not been paid. Applicant must submit **\$250** to complete the search fee.
- The application examination fee has not been paid. Applicant must submit **\$100** to complete the examination fee for a small entity in compliance with 37 CFR 1.27
- Total additional claim fee(s) for this application is **\$1225**
  - **\$500** for **5** independent claims over 3.
  - **\$725** for **29** total claims over 20.

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

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*A copy of this notice **MUST** be returned with the reply.*



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Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382  
PART 3 - OFFICE COPY

121605  
183/9 U.S. PTO

PTO/SB/05 (09-04)  
Approved for use through 07/31/2006. OMB 0651-0032  
U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE  
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|                                                                                                                              |                        |                                  |
|------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| <b>UTILITY<br/>PATENT APPLICATION<br/>TRANSMITTAL</b><br><br>(Only for new nonprovisional applications under 37 CFR 1.53(b)) | Attorney Docket No.    | 010030-000910US                  |
|                                                                                                                              | First Inventor         | DOOLIN et al.                    |
|                                                                                                                              | Title                  | SYSTEM FOR SENSING ENVIROMENTAL. |
|                                                                                                                              | Express Mail Label No. | EV 652794863 US                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>APPLICATION ELEMENTS</b><br>See MPEP chapter 600 concerning utility patent application contents.                                                                                                                                                                                                                                                                                                                                                                       | <b>ADDRESS TO:</b><br>Commissioner for Patents<br>P.O. Box 1450<br>Alexandria VA 22313-1450                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| <b>1.</b> <input type="checkbox"/> <b>Fee Transmittal Form</b> (e.g., PTO/SB/17)<br>(Submit an original and a duplicate for fee processing)                                                                                                                                                                                                                                                                                                                               | <b>ACCOMPANYING APPLICATION PARTS</b><br><br><b>9.</b> <input type="checkbox"/> <b>Assignment Papers</b> (cover sheet & document(s))<br>Name of Assignee _____<br><br><b>10.</b> <input type="checkbox"/> <b>37 CFR 3.73(b) Statement</b> (when there is an assignee) <input type="checkbox"/> <b>Power of Attorney</b><br><br><b>11.</b> <input type="checkbox"/> <b>English Translation Document</b> (if applicable)<br><br><b>12.</b> <input checked="" type="checkbox"/> <b>Information Disclosure Statement</b> (PTO/SB/08 or PTO-1449)<br><input type="checkbox"/> Copies of citations attached<br><br><b>13.</b> <input type="checkbox"/> <b>Preliminary Amendment</b><br><br><b>14.</b> <input type="checkbox"/> <b>Return Receipt Postcard</b> (MPEP 503)<br>(Should be specifically itemized)<br><br><b>15.</b> <input type="checkbox"/> <b>Certified Copy of Priority Document(s)</b><br>(if foreign priority is claimed)<br><br><b>16.</b> <input type="checkbox"/> <b>Nonpublication Request</b> under 35 U.S.C. 122(b)(2)(B)(i).<br>Applicant must attach form PTO/SB/35 or equivalent.<br><br><b>17.</b> <input checked="" type="checkbox"/> <b>Other: Postcard</b> |  |
| <b>2.</b> <input checked="" type="checkbox"/> <b>Applicant claims small entity status.</b><br>See 37 CFR 1.27.                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <b>3.</b> <input checked="" type="checkbox"/> <b>Specification</b> [Total Pages <u>31</u> ]<br>Both the claims and abstract must start on a new page<br>(For information on the preferred arrangement, see MPEP 608.01(a))                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <b>4.</b> <input checked="" type="checkbox"/> <b>Drawing(s)</b> (35 U.S.C. 113) [Total Sheets <u>4</u> ]                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <b>5. Oath or Declaration</b> [Total Sheets _____]<br>a. <input type="checkbox"/> Newly executed (original or copy)<br>b. <input type="checkbox"/> A copy from a prior application (37 CFR 1.63(d))<br>(for continuation/divisional with Box 18 completed)<br>i. <input type="checkbox"/> <b>DELETION OF INVENTOR(S)</b><br>Signed statement attached deleting inventor(s)<br>name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <b>6.</b> <input checked="" type="checkbox"/> <b>Application Data Sheet.</b> See 37 CFR 1.76                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <b>7.</b> <input type="checkbox"/> <b>CD-ROM or CD-R</b> in duplicate, large table or<br>Computer Program (Appendix)<br><input type="checkbox"/> Landscape Table on CD                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <b>8. Nucleotide and/or Amino Acid Sequence Submission</b><br>(if applicable, items a. - c. are required)<br>a. <input type="checkbox"/> Computer Readable Form (CRF)<br>b. <input type="checkbox"/> Specification Sequence Listing on:<br>i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or<br>ii. <input type="checkbox"/> Paper<br>c. <input type="checkbox"/> Statements verifying identity of above copies                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <b>18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:</b><br><input type="checkbox"/> Continuation <input type="checkbox"/> Divisional <input type="checkbox"/> Continuation-in-part (CIP) of prior application No.: _____<br>Prior application information: _____ Examiner: _____ Art Unit: _____ |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <b>19. CORRESPONDENCE ADDRESS</b><br><input checked="" type="checkbox"/> The address associated with Customer Number: <u>37490</u> OR <input type="checkbox"/> Correspondence address below<br>Name _____<br>Address _____<br>City _____ State _____ Zip Code _____<br>Country _____ Telephone _____ Fax _____<br>Signature _____ Date December 16, 2005<br>Name (Print/Type) Charles J. Kulas Registration No. (Attorney/Agent) 35,809                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |

This collection of information is required by 37 CFR 1.53(b). 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. 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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## **Patent Application**

# **SYSTEM FOR SENSING ENVIRONMENTAL CONDITIONS**

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# **PATENT APPLICATION**

## **SYSTEM FOR SENSING ENVIRONMENTAL CONDITIONS**

### Claim of Priority

[01] This invention claims priority from U.S. Provisional Patent Application Serial No. 60/637,279, entitled WILDFIRE MONITORING SYSTEM USING WIRELESS NETWORK, filed on December 17, 2004, which is hereby incorporated by reference as if set forth in full in this specification.

### Acknowledgment of Government Support

[02] This invention was made with Government support under Contract No. EAR-0121693 awarded by the National Science Foundation. The Government has certain rights to this invention.

### Background Of The Invention

[03] This invention is related in general to wireless networks and more specifically to a wireless network used to sense environmental conditions for situational awareness and response, especially where positionally accurate data are necessary.

[04] Systems for detecting and observing the environment can be used to provide a way to monitor, predict or control events such as fires, hazardous conditions, potential threats to people or property, etc. One type of event that can benefit from accurate monitoring is a wildfire such as a brush fire, forest fire, and building fire, etc. Other applications include threat evaluation and control, such as to guard against or responding to illicit acts by human perpetrators, hazardous conditions (e.g., chemical, gas, mechanical, natural, etc., and other events that are localized to an area. Such applications

often demand versatile systems and methods to provide positionally accurate and timely data about the environmental conditions of an event, and the locations and environmental conditions associated with the personnel and equipment responding to the event.

[05] In some cases it may not be possible to position sensing equipment ahead of an event because the location of the event is too unpredictable over a very large area. In such cases, it is usually important that any sensing system be rapidly deployable in addition to providing accurate, current data; and that the system be robust enough to handle changing conditions, such as damage to devices, loss of power, etc., that might occur in the face of an environmental condition or threat.

### Summary of Embodiments of the Invention

[06] Embodiments of the invention provide a system and method for obtaining measurements of environmental conditions such as temperature, humidity, air pressure, position, elevation, ozone, CO<sub>2</sub>, etc and the locations at which those data were collected. In general, any type of environmental condition can be measured and located. In one embodiment, the method includes creating a network of dispersed sensors. The network can be selectively controlled to configure and/or prioritize data that is sent to a processing system. The processing system can present the data in a user interface to human controllers for situational awareness applications. Data can also be provided to a simulation or model to predict behavior of an event or entity such as a wildfire, toxic spill, human mob, etc.

[07] Sensors can be placed, dropped or targeted in an ordered arrangement or arbitrarily over locations or items in an area. In one embodiment, sensors are included upon “mobiles” such as people (e.g., firefighters, police, emergency workers, victims or injured parties, reporters, rescue or detection animals, etc.), vehicles, equipment or other targets. This allows individual and group tracking of the mobiles, or “assets,” that can be valuable to observer, respond to or control a situation or event.

[08] One embodiment includes dispersing plural self-networking nodes in proximity to an event. Each self-networking node is in communication with one or more sensors and is able to transfer sensed data to other sensors for eventual relay to a destination, such as a processing system. The sensed data includes position information corresponding to one

or more sensors of the sensor network. The position information is associated with sensed data corresponding to one or more measured environment conditions or measurements.

[09] The sensed data may be selectively prioritized based on bandwidth, sensor communication capabilities, or other factors associated with the sensors. Power to each of the spatially dispersed sensors may be selectively adjusted according to one or more priority values associated with each of the spatially dispersed sensors.

### Brief Description of the Drawings

[10] Fig. 1 is a diagram illustrating a wireless sensor network for monitoring environmental conditions associated with a fire according to a first embodiment of the present invention.

[11] Fig. 2 is a more detailed diagram of a node of the wireless sensor network of Fig. 1.

[12] Fig. 3 is a diagram illustrating use of the wireless sensor network of Fig. 1 to sense the location of each sensor and the environmental conditions at the sensor location for situational awareness and response.

[13] Fig. 4 is a flow diagram of a first method adapted for use with the wireless sensor network of Fig. 1.

### Description of Embodiments of the Invention

[14] For clarity, various well-known components, such as server operating systems, communications ports, Internet Service Providers (ISPs), and so on have been omitted from the figures. However, those skilled in the art with access to the present teachings will know which components to implement and how to implement them to meet the needs of a given application.

[15] Fig. 1 is a diagram illustrating a wireless sensor network 10 according to a first embodiment of the present invention. In the present specific embodiment, the wireless sensor network 10 includes plural self-networking, self-locating environmental sensor nodes 12 in communication with a base station 14 running a sensor-network controller 16 for facilitating controlling the sensor nodes 12.

[16] For illustrative purposes, the sensor nodes 12 are shown including a first sensor node 18, a second sensor node 20, a third sensor node 22, a fourth sensor node 24, a fifth sensor node 26, and a sixth mobile sensor node 28. The sensor nodes 18-28 are shown including sensor suites 30-40, respectively, for selectively wirelessly communicating sensed data to the base station 14 via respective sensor antennas 42-52 and a base station antenna 54. A fire front 56 is shown approaching the first sensor node 18 and the second sensor node 20 after having passed the third sensor node 22, the fourth sensor node 24, the fifth sensor node 26, and the sixth sensor node 28.

[17] In the present specific embodiment, the base station 14 is a mobile base station, exhibiting base station wheels 58. Similarly, the sixth mobile node 28 exhibits node wheels 60. While only two network nodes 14, 28 are equipped with wheels, more or fewer nodes of the network 10 may be made mobile without departing from the scope of the present invention. Furthermore, the mobility mechanisms other than wheels may be employed without departing from the scope of the present invention. In addition, the antennas 42-54 may represent Radio Frequency (RF) transceivers, laser transceivers, or other types of wireless communications mechanisms.

[18] The base station 14 further communicates with one or more servers 62 running a database 64 for maintaining sensor data, also called sensed data. The sensed data is output by the sensor suites 32-52. Examples of sensed data include temperature data, humidity data, blackbody radiation data, and Global Positioning System (GPS) position data. The position data may include elevation data. Sensed data may further include various conditions pertaining to a fire, such as fire movement or temperature. Fire movement and velocity may be calculated by software, such as the database 64, by analyzing reported temperature data from the various sensor nodes 12 at specific times.

[19] The database 64 may maintain other types of data other than just sensor data without departing from the scope of the present invention. For example, the database 64 may be employed to facilitate implementing an algorithm for predicting movement, temperature, and other characteristics of the fire front 56 based on the sensed data. Data pertaining to the predicted fire movement and behavior may be stored in the database 64 along with sensed data.

[20] Sensed data maintained by the database 64, which may be implemented via a My SQL<sup>(R)</sup> or another type of database, is accessible via one or more browser clients 66 in communication with the one or more servers 62. The browser client 66 includes a user interface 68 for facilitating user access to the sensed data.

[21] In operation, the self-networking sensor nodes 12 are pre-dispersed in fire-prone regions. Alternatively, the sensor nodes 12 may be dispersed in or in proximity to the fire 56 in real time as the fire front 56 progresses. Pre-dispersed sensor nodes may be augmented with newly dispersed sensor nodes as needed to meet the needs of a given situation. Additionally dispersed sensor nodes are adapted to automatically self-network with pre-dispersed nodes upon dispersal. The sensor nodes 12 may be dropped by air, foot, vehicle, or by other mechanisms. The sensor nodes 12 may be implemented via miniature disposable devices. Additional mechanisms, such as special stands and/or parachutes (not shown), may be employed to ensure that the sensor suites 12 deploy in optimum positions relative to the terrain.

[22] The base station 14 may be dispersed similarly to the sensor nodes 12 without departing from the scope of the present invention. Furthermore, while only one base station 14 is shown, plural base stations may be employed.

[23] For the purposes of the present discussion, a self-networking node may be any device that begins communicating with surrounding devices upon dispersal to facilitate implementing a network. A self-networking node may automatically begin communicating with proximate nodes upon dispersal or may be triggered to begin networking in response to certain events, such as in response to a remote control signal. The use of self-networking nodes may facilitate rapid sensor-network deployment, organization, and operation.

[24] Upon dispersal, the self-networking nodes 12 employ a self-networking protocol to detect signals from neighboring nodes and to establish communications therewith. For example, the fourth node 24 may detect a strong signal from the third node 22 and visa versa, and then automatically establish a wireless connection with the third node 22. The third node 22 may detect signals from the first node 18 and visa versa, and then automatically establish communications with the first node 18 in addition to the fourth node 24. Similarly, the first node 18 may detect signals from the base station 14 and visa

versa, and then subsequently establish communications between the base station 14 and the first node 18. Upon establishing communications between the base station 14, the first node 18, the third node 22, and the fourth node 24, data sensed by the various nodes 18, 22, 24 may be relayed to the base station 14. For example, sensed data from the fourth sensor node 24 may be relayed to the base station 14 via the first node 18 and the third node 22. However, if the fourth node 24 successfully establishes suitable communications with the first node 18, the fourth node 24 may choose to relay data to the base station 14 via the first node 18 instead of via the third node 22 and the first node 18.

[25] The communications-link bypassing of the third node 22 by the fourth node 24 to communicate with the first node 18 is called sensor-position hopping. Position information in addition to signal-strength information associated with each node 18-28 may be employed to facilitate communications decisions made by each of the nodes 18-28. Hence, hopping may be based on sensor position, signal strength, or other parameters.

[26] Relay nodes can be used. A relay node is used to re-broadcast a received signal to one or more other nodes in order to extend the range, or provide needed continuity, in the wireless network. Any number of nodes can send to a relay node. The relay ability can be used in a node with or without sensing ability. Nodes can also be provided with the ability to aggregate and store results from other nodes. In one embodiment, sensor nodes report to one or more relays located remotely from the base station. Each relay may store and aggregate sensor data to forward to a base station using long range communication such as radio or cell phone. Nodes such as relays may also have the capability to perform processing of sensed data for analysis and automated control of the sensors in the network. Relays may be placed dynamically as the network is deployed, may be pre-positioned in advance of the network, or deployed in some other manner congruent with establishing communication with one or more base stations so that the sensor data may ultimately be processed and examined.

[27] Various mechanisms for implementing self-networking nodes are known in the art and may be employed for the purposes of implementing embodiments of the present invention without departing from the scope thereof.

[28] After the following has occurred: the sensor nodes 12 are dispersed; the base station 14 begins communicating with one or more of the sensor nodes 12; and the server 62 has established communications with the base station 14, then data collection begins. In practice, when the server 62 begins communicating with the base station 14, the browser client 66 will have access to the server 62. For the purposes of the present discussion, the server 62 and accompanying browser client 66 represent a processing system for receiving data from the sensor suites 30-40 via the base station 14 based on priority values associated with each sensor suite 30-40 and/or priority values associated with each individual sensor of the sensor suites 30-40.

[29] As the fire front 56 progresses, various measurements are made by the sensors of the sensor suites 30-40 as discussed more fully below. Such measurements may include measurements of temperature, humidity, radiation, and so on, which represent environmental conditions.

[30] Various aspects of the embodiment 10 of Fig. 1 are application-specific. Examples of such aspects include numbers and types of sensors employed in each sensor suite 30-40; the positions of the sensor suites 30-40, such as positions relative to the flame front 56 and positions relative to themselves; the time at which the sensor suites 30-40 are dispersed relative to the start of the fire 56, and so on.

[31] The sensors of the sensor suites 30-40 may periodically take measurements and forward the resulting measurements, i.e., sensed data, to the base station 14 via one or more intervening nodes. Alternatively, the sensors of the sensor suites 30-40 take measurements and forward the results to the base station 14 in response to queries from the sensor-network controller 16 running on the base station 14. Alternatively, the sensor nodes 12 may be configured so that sensors of the sensor suites 30-40 continuously provide measurements to the base station controller 14.

[32] The exact configuration of the sensor suites 20-30 and accompanying nodes 18-28 specifying how sensed-data is handled is application-specific and may be different for different applications. In the present specific embodiment, the sensed-data-reporting behavior of the nodes 12 is configurable via the user interface 68 of the browser client 66, which may be employed to access and configure the sensor-network controller 16. The sensor-network controller 16 running on the base station 14 implements one or more

routines that enable users to selectively prioritize which types of data are being reported from the sensors of the sensor suites 30-40 and how the selected types of data are reported, such as continuously, periodically, and/or selectively. Software and modules required to implement various aspects of the present embodiment may be readily constructed or purchased.

[33] In an exemplary operative scenario, as the flame front 56 advances past the nodes 22-28, sensed-data reported by the nodes 22-28 reflects an increase in temperature as the flame front advances; a peak temperature when the flame front arrives at each node 22-28; and a settling temperature that is higher than the initial temperature before the approach of the flame front 56. Similarly, the sensor suites 34-40 of the nodes 22-28, respectively, may detect variations in humidity, radiation levels, and so on.

[34] The sensor-network controller 16 runs one or more routines that associate the sensed data output from each sensor suite 30-40 with the corresponding position of the sensor suite 30-40 as reported by GPS receivers accompanying the sensor suites 30-40. GPS receivers are considered sensors for the purposes of the present discussion. Furthermore, position data, including sensor-elevation information associated with each sensor suite 20-40 is considered to be a type of sensed data.

[35] Alternatively, one or more routines running on the sensor nodes 12 combine sensor position information with sensed data output from sensors that are associated with the position information. The combined data is then periodically forwarded to the sensor-network controller 16 of the base station controller 14. When sensed data, such as temperature data, is combined or associated with position information, the temperature data is said to be geocoded, and the combination of the temperature data and position data represents geocoded data. For the purposes of the present discussion, the term geocode may be the act of coupling position or location information with other types of data.

[36] One or more fire-analysis programs, which may be implemented by the database 64, employ the sensed data in combination with positions associated with the sensed data to perform fire analysis. The fire analysis may include predicting where the flame front 56 will move and whether the flame front will be hot enough to burn certain structures, such as a building (not shown) housing the fifth node 26. Furthermore, sensor data output from the sensors of the in-building sensor suite 38 may be coupled with sensed

data output from surrounding nodes, such as the sixth node 28, to facilitate determining modes of building failure. For example, sensors of the sensor suite 38 may be positioned along certain beams to enable temperature measurements, which might indicate that the temperature was hot enough to melt certain beams.

[37] The system 10 for facilitating for measuring environmental conditions provides various significant advantages over conventional fire monitoring systems. Advantages include the ability to implement rapidly deployable inexpensive networks; the ability to implement disposable self-networking networks; the ability to obtain accurate position and elevation information correlated with environmental measurements to facilitate fire analysis; the ability to selectively prioritize the reporting of sensed data to optimize network usefulness for performing desired fire analysis; and so on. The ability to rapidly deploy sensors in difficult and adverse environmental conditions, and the capability of having such rapidly deployable sensors self-organize into networks and then automatically interact with pre-existing support infrastructure may facilitate providing critical information for property and life-safety management during wildfire evolution.

[38] Conventional systems are often adapted to observe the flame front 56 from a distance from a single point, and consequently are limited in their ability to facilitate fire analysis. Unlike with embodiments of the present invention, various measurements of environmental conditions taken as the flame front passes 56, such as soil moisture, wind, humidity, and terrain distribution, cannot generally be accurately determined via conventional fire-observation and measurement systems, which generally observe fires from afar and do not employ nodes that can withstand the heat of a fire or that are otherwise disposable. For the purposes of the present discussion, environmental conditions may be characterized by any parameters, values, or other data that may be sensed by a sensor. Additional examples of environmental conditions include ultraviolet light flux, sound, and microwave energy.

[39] In one embodiment, sensor nodes 12 are deployed in an area of interest, such as an area that might be susceptible to a fire, or in the path of the advancing wildfire 56. The sensor nodes 12 may be deployed via air or by attaching the sensors to a person, ground vehicle, structure, etc. In some cases, it may be necessary or convenient to pre-install sensors, sensor networks and supporting network infrastructure such as base

stations for satellite or cell communication. Deployment can be systematic, such as by regular, patterned placement by humans or machines; or arbitrary such as by thrown or dropped batches of sensors by land or air. Other types of deployment are possible.

[40] The base station 14 and accompanying sensor-network controller 16 can be configured, via the browser client 16, to perform different function, such as aggregating and correlating data, filtering data, monitoring nodes, etc. In the present specific embodiment, a primary function of the base station 14 is to act as a central radio-frequency receiver/transmitter and relay to server 62 which, in turn, provides data from the nodes 12 to the client 66. The client 66 can operate automatically or in interaction with human operators to analyze data, monitor and report on conditions, make predictions and issue commands to the nodes 12 via the server 62 and base station 14. Note that in practice several or many base stations 14 can be used, each with an associated plurality of node 12. Base station coverage can overlap to provide robustness via redundancy. Such overlapping coverage can also improve overall bandwidth of communications from and to nodes.

[41] Sensors 30-40 on the sensor nodes 18-28 can be prioritized so that if there is a lack of resources (e.g., limited bandwidth), the sensor readings with higher priority can be communicated first. Data of sensor types with lower priority can be buffered and transmitted when there is free bandwidth at a later time, or discarded and not sent at all. If a node starts to become low on power, sensors with higher priority can remain active while lower priority sensors are shut down.

[42] Note that the specific number and arrangement of devices, such as the sensor nodes 12 of Fig. 1, is only for purposes of illustration. In general, features of embodiments of the invention can work with any suitable types of network devices and network topology, protocol, communication links, etc. For example, communications among the sensor nodes 12 and the base station 14 can be by radio frequency, infrared, laser, hardwired or other arrangement. Protocols such as session initiation protocol (SIP), Internet protocol (IP), hypertext transfer protocol (HTTP), etc., can be used. Processing performed by server 62 and client 66 can be by any suitable one or more processors that can work in real-time or non-real-time (e.g., batch, offline, etc.) modes; parallel or distributed processing, etc.

[43] One embodiment (not shown) of the invention uses fire equipment such as fire engines to provide base station support for nodes deployed in the terrain, on the fire fighters, and on fire fighting vehicle. The nodes may be used to collect environmental data at each fire fighter's location, and report data collect from sensors measuring physical condition of fire fighters, such as body temp, etc. Base stations can also be made mobile as where base station functionality is carried in a vehicle, remotely operated vehicle (i.e., "drone"), physically carried by personnel, etc.

[44] Another embodiment of the invention uses a mobile base station attached to a fire fighter or soldier as discussed more fully below with reference to Fig. 3. The firefighter, soldier, or other personnel may employ the base station to communicate via long distance radio, satellite etc. as a relay to back end servers. Base stations can be pre-deployed to collect data from mobile nodes mounted on fire fighters or other personnel, which interact with previously or concurrently deployed stationary nodes.

[45] Personal sensor nodes can be useful in situations where environmental conditions are highly localized and can vary critically across small distances. For example, where hazardous materials or chemicals, especially in a gas state, are of concern to humans it is useful to monitor environmental conditions in the immediate vicinity of each human. Personal or animal sensor nodes can include the ability to interface with biometric sensors for pulse, respiratory, body temperature, etc. Or to detect other biometrics in creatures that come near someone wearing the personal sensor. Note that any features of personal sensors may equally be applied to static or vehicle-mounted sensors and vice versa.

[46] One application includes personal ozone monitoring sensors (Or CO or CO<sub>2</sub> or methane or any other volatile or poisonous gas). Ozone is an air pollutant and can be harmful to humans. It is used in various industrial applications as, for example, in wineries as a sanitization agent for barrels and other wine fermentation and storage vessels as a replacement for chlorinated cleaning agents.

[47] An ozone monitoring sensor node can be a personal wireless monitoring device capable of determining the amount of ozone in the environments. The ozone sensor can compute hourly and daily average exposures to ozone. The sensor can transmit current instantaneous measurements of ozone, average measurements over time, or other values

or computations to other receivers or a central processor. In a preferred embodiment, each sensor node includes an integrated visual and audio alarm system. An alarm is triggered when a threshold value of a predetermined level is exceeded. An alarm can include a light and/or audible alarm so that an individual within range of a dangerous concentration of ozone can hear the sound. exceeding a safe threshold can also result in transmission of electronic indications of an alarm to all wireless client devices and to a central processing station.

[48] In a preferred embodiment, a node includes one or more separate sensors mounted on a printed circuit board with a control system. However, any other node design is possible including designs without printed circuit board mounting, microelectromechanical (MEMS) approaches, use of biological or quantum processors, etc. The sensors and control system can be operated by a microcomputer which may be located on the same or on a different device. Nodes may have capability for storing finite sample data on board the node itself. Node tracking of positions can be enabled by onboard GPS positioning, what relative to a fixed network of ambient environment monitoring nodes using technologies such as RFID. The sensor includes integrated wireless communication radios for sending electronic alarms, and allows the sensor to be integrated into an existing center network using standard or compatible data transmission protocols. Data collected and processed by the ozone sense or may be transmitted to clients on a predetermined time interval or by demand.

[49] Another application includes infantry and equipment tracking in combative applications such as Military Operations in Urban Terrain (MOUT). Sensors including location detectors (locators) may be attached to personnel such as infantry, medical, or other people associated with operations in urban or rural environments. Data reported from these locators could also include local environmental conditions such as temperature, light conditions, humidity, and could also interface with biometric sensors to report pulse, body temperature, respiratory rate, etc.

[50] Sensors can advantageously be attached to equipment such as a gun, mine, rescue flare, etc. to report on where the equipment is (location coordinates), whether the device has gone off or is being used, etc. Another approach includes loosely mounting sensors to equipment in a non-permanent mode so that the sensors can be deployed or dispersed

incidentally while a person, animal, device or vehicle is moving such as by vibration due to shaking or jostling, scraping forces of rubbing against buildings or bushes, etc. Other effects such as wind, rain, moisture, etc. can also act to deploy the loosely mounted sensors or nodes.

[51] The system could be effectively deployed during MOUT operations similarly to deployments during fire, flood or terrorist responses etc. With appropriate relay mounted on vehicles such as helicopters or reconnaissance drones, the locator and personal sensor system could be deployed for supporting remote operations in rural areas.

[52] Other types of military, para-military, combative or law enforcement applications can include widely distributed police or anti-guerrilla activity can use an airborne base station such as in a plane, helicopter, drone, etc. Such applications can also use sensors attached to enemies, suspects, perpetrators, or “neutrals” such as bystanders, friendly or neutral troops, etc. Sensors can be applied unbeknownst to a person such as where stationary sensors on fences, vegetation, etc. latch onto a person trying to enter a restricted area, such as in a border crossing.

[53] Latching sensors or nodes onto a person or animal can be by mechanical means such as where tiny barbs are used to catch clothing, hair or other body parts or physical artifacts. Other latching can include obvious but non-removable methods such as putting nodes into handcuffs, flexible bracelets, identification necklaces, ankle bracelets, etc. These approaches can be used for prisoners, prisoners of war, injured persons (who may inadvertently remove a node, for example), illegal immigrants, etc. Nodes can be fixed to a person so that they cannot be easily removed except by an authorized person. Nodes can be made robust enough to survive significant abuse such as by embedding the node in touch material or making the node difficult to access.

In some cases, recording the location and environmental conditions of personnel and equipment associated with an incidence or event is as important or more important than statically monitoring conditions in selected locations. In such cases, each entity to which sensors are attached must registered to the host identity and function, for example, a named person filling a certain role in the incidence response. The system handles registering these identities and providing data associated with each registered entity on a timely and situational-relevant basis.

[54] Although embodiments of the invention may be presented herein primarily with respect to specific applications, many other suitable applications are possible.

[55] Additional sensor-network details that may be employed to facilitate implementing embodiments of the present invention are described in various papers, including:

[56] "Wireless Sensors for Wildfire Monitoring," (8 pages) D. Doolin, N. Sitar, May 2005;

[57] "Rapid Prototyping and Deployment Chassis for Wireless Sensor Devices," (3 pages) D. Doolin, N. Sitar, May 17, 2004; and

[58] "Design and Construction of a Wildfire Instrumentation System Using Networked Sensors," (1 page) M. Chen, C. Majidi, D. Doolin, S. Glaser, N. Sitar, June 17, 2003.

[59] Hence, with reference to Figs. 1 and 2, the sensor network 10 implements a network wherein a processing system 14, 62, 66 receives data from the sensors 104-110, one or more of which are assigned one or more priority values via the browser client 66. The server 62 and client 66 of the processing system 14, 62, 66 receive sensed data 124 from the base station 14 of the processing system 14, 62, 66, which was relayed to the base station 14 via one or more of the sensors 104-110. The processing system 14, 62, 66 receives the sensed data 124 according to the one or more priority values.

[60] In the present specific embodiment, a process 94 executes at a device, such as the first sensor node 18, for preventing operation of a sensor, such as pressure sensor 110, depending on a criterion. The criterion may include a determination of a low-power condition or a restricted-bandwidth condition by the local controller 94, which would result in prohibitive degradations in the sensed data output by the sensor if transmitted. The local controller 90 implements one or more processes for organizing a flow of data, such as sensed data, from the sensor nodes 18-28 to the base station 14 after deployment of the sensor nodes 18-28.

[61] The wheels 58, 60 in the base station 14, and sixth node 60 represent mechanisms for pre-deploying the sensor nodes 12 in an area and/or for deploying the sensor-nodes during a fire event. Other mechanisms, for selectively deploying sensors, such as aircraft, are not shown. The browser client 66 and server 62 of Fig. 1 implement a

mechanism for facilitating modifying data-collection priorities according to a data type, a data collection rate, fire conditions, and/or values of data collected.

[62] The sensor nodes 12, also called *motes*, may include various types of sensors. For example, position, temperature, moisture or humidity, air pressure, force, light, and other sensors can all be used. A single node can have multiple sensors and different nodes can use different numbers and types of sensors than other nodes. Depending on the type of application, different types of sensing may be more desirable than others, and sensor characteristics such as sensitivity, ruggedness, sample rate, power consumption, transmit/receive range, etc., may be more critical than others.

[63] Nodes can have pre-programmed behavior so that the need for transmitting commands to a node is reduced. Another option is to allow each node to be programmable so that node behavior, such as sensor sampling rate, transmit range, communications relay ability, etc., can be adjusted from a control center. Node firmware and software can be downloaded to each node from a control center, such as the base station 14, server 62, and/or other device.

[64] Fig. 2 is a more detailed diagram of a node 18 of the wireless sensor network 10 of Fig. 1. The exemplary sensor node 18 includes a node platform 80 upon which is mounted sensor-node electronics 82, which are powered via a battery 84. For clarity, various battery connections and traces are not shown in Fig. 2 with the exception of a power signal 86 to a power-control switch 88 mounted on the node platform 80.

[65] In the present specific embodiment, the sensor-node electronics 82 include a local controller 90, which runs a programmable control module 94 via a TinyOS operating system 96. The local controller 90 communicates with a node transceiver 92 and accompanying antenna 42. The local controller 90 also communicates with the power-control switch 88, the sensor-suite 30, and a GPS receiver system 98 via a bus 100. The GPS receive system 98 includes an accompanying GPS receiver antenna 102.

[66] For illustrative purposes, the sensor suite 30 is shown including a temperature sensor 104, a humidity sensor 106, a radiation sensor 108, and a barometric pressure sensor 110, which selectively receive power 112 from the power-control switch 88 based on power-control signals 114 received from the local controller 90. The sensor suite 30 is

implemented via a modular sensor board that may be easily unplugged from the node platform 80 and replaced.

[67] While the present specific embodiment employs the bus 100 to facilitate connections between various sensor-node modules 30, 88, 90, 98, other mechanisms and architectures may be employed without departing from the scope of the present invention. For example, the controller 90 may connect directly to the various modules 30, 88, 98. Furthermore, one or more of the modules 30, 88, 90, 98 may be omitted or implemented elsewhere without departing from the scope of the present invention.

[68] In operation, with reference to Figs. 1 and 2, the sensors 104-110 selectively take environmental measurements and forward resulting sensed data 116 to the local controller 90. The local controller 90 may include or communicate with additional memory, such as an Electrically Erasable Programmable ROM (EEPROM) (not shown), to perform various functions, such as to facilitate temporarily storing sensed data in preparation for transfer to the base station 14 of Fig. 1.

[69] The sensor suite 30 receives control signals and queries 118 from the controller 90 via the bus 100. The control signals and queries 118 facilitate establishing sensor behavior, such as measurement frequency. Sensor behavior may be automatically controlled via one or more routines running on the local controller 90 and based on predetermined sensor priorities. Alternatively, sensor behavior is configured via control signals forwarded to the local controller 90 from the browser client 66, server 62, and sensor-network controller 16 of the base station 14 of Fig. 1.

[70] The GPS receiver system 98 selectively provides position data 120, 124 such as latitude and longitude coordinates in addition to elevation information, to the local controller 90 in response to GPS queries and/or control signals 122, 126. The local controller 90 may run one or more routines for selectively powering-off or powering-on the GPS receiver system 98 via the control signals 122, 126. Alternatively, the GPS receiver system 98 is pre-configured to automatically power-off after an initial position data is determined and forwarded to the local controller 90, thereby saving energy. In the present specific embodiment, the local controller 90 may power-up and query the GPS receiver system 98 as needed, such as in response to a request from the browser client 62 of Fig. 1 as relayed to the sensor node 18 via the server 62 and base station 14.

[71] The local controller 90 employs the node transceiver 92 to selectively transmit sensed data 116, 124 from the sensor suite 30 and GPS receiver system 98 and to receive data, such as control signals, from other nodes, such as the base-station node 14 and the third node 22 of Fig. 1. After the node 18 is dispersed in a fire region or a fire-prone region, such as by aerial drop, the node 18 automatically powers-on.

[72] Subsequently, the GPS receiver system 98 forwards position information to the local controller 90 and powers off. The sensed data output from the sensors 104-110 of the sensor suite 30 is then combined, i.e., geocoded with the position data output from the GPS receiver system 98 via the local-controller 90 before the resulting geocoded data is forwarded to the server 62 via the base station 14 of Fig. 1. Alternatively, the position data 120 is associated with the sensor node 18, such as via a tag, and then forwarded to the server 62. Similarly, sensed data output from the sensor suite 30 may be tagged and forwarded to the server 62, which then geocodes the data to facilitate fire analysis and prediction operations.

[73] Control signals received by the local controller 90 from the base station 14 of Fig. 1 may specify priority values to each of the sensors 104-110, thereby effectively prioritizing sensed data output from the sensors 104-110. In the present specific embodiment, power input to each of the sensors 104-110 is selectively modulated in response to control signals 114 received by the power-control switch 88 via the local controller 90. The control signals 114 may be automatically generated by one or more routines running on the local controller 90 in response to external control signals received by the local controller 90 from the base station 14. Alternatively, the local controller 90 automatically controls power levels to the sensors 104-110 based on pre-fixed priority values.

[74] The local controller 90 may include an Input/Output (I/O) switch (not shown) that is responsive to control signals from a central controller, such as the central sensor-network controller 16 positioned to the base station 14 of Fig. 1. Controllable I/O switches may be used to facilitate data flow to and from the sensor nodes 12.

[75] Those skilled in the art may employ various well-known modules to facilitate implementing the sensor node 18 without undue experimentation. For example, nodes made by Moteiv may be employed to implement embodiments of the present invention

without departing from the scope thereof. An exemplary Moteiv node, called a sky mote, employs an IEEE 802.15.4-compliant Chipcon CC2420 wireless transceiver that can achieve data rates of upto 250kbps and communicates at 2.4 GHz. The sky mote purportedly can provide a range of 50 meters indoors and 125 meters outdoors with an integrated onboard antenna. The sky mote further includes a Sensirion AG relative humidity sensor, a Sensirion temperature sensor, a Hamamatsu Photosynthetically active radiation (PAR) sensor, a Hamamatsu Total Solar Radiation (TSR) sensor, a TI MSP430-controller internal temperature sensor, a TI MSP430-controller internal voltage sensor, and an Intersema pressure sensor.

[76] Fig. 3 is a diagram illustrating use of the wireless sensor network 10 of Fig. 1 to sense the location of each sensor and environmental conditions at or near a node for situational awareness and response in a battle scene 130. With reference to Figs. 1 and 2, the base station 14, server 62, and browser client 66 are implemented via a single unit 14, 62, 66 carried by a first soldier 132, which may be a firefighter or other type of personnel without departing from the scope of the present invention. The first node 18 is shown carried by a second soldier 136 and used to monitor vital signs, such as blood pressure, in addition to external environmental conditions, such as carbon monoxide levels, biological weapons residues, and so on, in combination with the position of the soldier 136. For the purposes of the present discussion, vital signs represent a type of biological information. Biological information may be any information pertaining to a living system, such as blood pressure, pulse rate, body temperature, and so on. Such additional sensors for measuring biological information pertaining to a person may be readily implemented by replacing the modular sensor board 30 of Fig. 2 with a sensor board or flex circuit that includes additional biological sensors.

[77] The second node 20 is shown mounted on a mobile truck 134. The third node is mounted on a first tank 138. The fourth node is shown mounted on a second tank 140. The fifth node 26 is shown mounted on a helicopter 142. Note that nodes implemented according to the teachings of the present embodiment may be placed on first responders, casualties, and other parties on scene, as well as equipment.

[78] Hence, for the purposes of the present embodiments, sensing can be triggered or controlled or modified in reaction to events or other criteria. For example, where a

concentration of a toxic or dangerous gas 144 such as carbon monoxide is being sensed, a node, such as the second node 20, can be programmed to report infrequently on concentrations below a predetermined level. If concentration exceeds a threshold (e.g., maximum safe exposure time is 2 hours or less) then the node 20 can send the sampling or an alert message at a high priority. The node 20 can begin sampling the carbon monoxide level more frequently and give the appropriate sensor a higher priority. When the condition becomes safe (i.e., does not exceed the threshold) the node 20 and sensing operation can go back to the previous state. One sensor reading can be used to modify the operation and reporting of other sensors. For example, if temperature increases then harmful gas monitoring can be increased in frequency, reporting, priority, etc.

[79] Nodes and sensors can be applied to movable objects other than tanks 138, 140, trucks 134, helicopters 142, or soldiers 136, 132. For example nodes and sensors can be applied to movable objects such as robotic rovers, firefighters and other vehicles.

[80] Fig. 4 is a flow diagram of a first method 150 adapted for use with the wireless sensor network 10 of Fig. 1. The method 150 includes an initial base-station establishing step 152, wherein a network base station, such as the base station 14 is established. A base station is established by positioning the base station in a desired region and powering-on the base station.

[81] In a subsequent node-dispersing step 154, various self-networking nodes, such as the nodes 12 of Fig. 1, which are coupled to sensors and or GPS receivers, are dispersed in the desired region. Subsequently, communications between the nodes and the base station are established in a node-organizing step 156.

[82] After the nodes of the network are sufficiently connected in a network, then an environment-observing step 160 is performed. The environment-observing step 160 includes employing a client, such as the browser client 66 of Fig. 1, to communicate with one or more servers in communication with the base station. The environment-observing step 160 further includes receiving sensed data, such as temperature and sensor position information, including elevation information, from the sensors via the network according to predetermined priority values associated with each sensor.

[83] In a subsequent data-analysis step 162, one or more environment-analysis, such as fire-analysis routines, are employed to ascertain fire or other scene characteristics and

behavior via the sensed data. Subsequently, one or more prediction routines are employed to predict the future fire characteristics and behavior, such as movement. The routines to implement sensed-data analysis and fire prediction may be implemented via software, such as the database software 64 running on the server 62 of Fig. 1.

[84] An alternative implementation of the method 150 involves dispersing several self-networking nodes in a region exhibiting a fire or susceptible to a fire, the self-networking nodes being coupled to one or more sensors; and employing the one or more sensors to provide sensed data based on one or more environmental conditions.

[85] In accordance with the method, the controller, such as the sensor-network controller 16 of Fig. 1 and/or the local controller 90 of Fig. 2, implements a first mechanism for associating the position information with sensed environmental conditions output from one or more sensors associated with the position information. The controller further implements a second mechanism for selectively prioritizing sensed environmental conditions. The second mechanism includes a power-control switch, such as the switch 88 of Fig. 2, that is adapted to selectively adjust power to sensors in accordance with priority values associated with sensed environmental conditions output via the sensors.

[86] Another alternative implementation of the method 150 involves dispersing plural self-networking nodes in proximity to a fire or in a region where future fire-detection and/or measurement is desired, the plural self-networking nodes being coupled to one or more sensors; forming a network via the self-networking nodes; and then extracting data from the self-networking nodes, and providing extracted data to a database in response thereto.

[87] While the present embodiments are discussed with reference to obtaining measurements pertaining to environmental conditions, embodiments of the present invention are not limited thereto. For example, many types of environments are susceptible to events that may affect environmental-sensor output and that would benefit from a sensor network and accompanying sensed-data collection method implemented according to an embodiment of the present invention. The terms “sensor” and “node” can be used interchangeably. A node is generally intended to include one or more sensing devices along with control and other circuitry. However, the term “sensor” should also be construed to include one or more sensors and optional additional control or other circuitry

as described herein for either sensors or nodes. Similarly, descriptions or discussion or use of either of the terms “node” or “sensor” is intended to imply the use of the other term unless otherwise stated.

[88] Sensors and nodes do not need to have any specific ability to sense more than one number or certain type of environmental condition. For example, some nodes may report a condition without also providing location data. Some types of nodes, such as the relay nodes, are not required to sense any environmental condition at all.

[89] Although a process or module of the present invention may be presented as a single entity, such as software executing on a single machine, such software and/or modules can readily be executed on multiple machines. Furthermore, multiple different modules and/or programs of embodiments of the present invention may be implemented on one or more machines without departing from the scope thereof.

[90] Any suitable programming language can be used to implement the routines or other instructions employed by various network entities. Exemplary programming languages include nesC, C++, Java, assembly language, etc. Different programming techniques can be employed such as procedural or object oriented. The routines can execute on a single processing device or multiple processors. Although the steps, operations or computations may be presented in a specific order, this order may be changed in different embodiments. In some embodiments, multiple steps shown as sequential in this specification can be performed simultaneously.

[91] In the description herein, numerous specific details are provided, such as examples of components and/or methods, to provide a thorough understanding of embodiments of the present invention. One skilled in the relevant art will recognize, however, that an embodiment of the invention can be practiced without one or more of the specific details, or with other apparatus, systems, assemblies, methods, components, materials, parts, and/or the like. In other instances, well-known structures, materials, or operations are not specifically shown or described in detail to avoid obscuring aspects of embodiments of the present invention.

[92] A “machine-readable medium” or “computer-readable medium” for purposes of embodiments of the present invention may be any medium that can contain, store, communicate, propagate, or transport the program for use by or in connection with the

instruction execution system, apparatus, system or device. The computer readable medium can be, by way of example only but not by limitation, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, system, device, propagation medium, or computer memory.

[93] A “processor” or “process” includes any human, hardware and/or software system, mechanism or component that processes data, signals or other information. A processor can include a system with a general-purpose central processing unit, multiple processing units, dedicated circuitry for achieving functionality, or other systems. Processing need not be limited to a geographic location, or have temporal limitations. For example, a processor can perform its functions in “real time,” “offline,” in a “batch mode,” etc. Portions of processing can be performed at different times and at different locations, by different (or the same) processing systems. A computer may be any processor in communication with a memory.

[94] Reference throughout this specification to “one embodiment”, “an embodiment”, or “a specific embodiment” means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention and not necessarily in all embodiments. Thus, respective appearances of the phrases “in one embodiment”, “in an embodiment”, or “in a specific embodiment” in various places throughout this specification are not necessarily referring to the same embodiment. Furthermore, the particular features, structures, or characteristics of any specific embodiment of the present invention may be combined in any suitable manner with one or more other embodiments. It is to be understood that other variations and modifications of the embodiments of the present invention described and illustrated herein are possible in light of the teachings herein and are to be considered as part of the spirit and scope of the present invention.

[95] It will also be appreciated that one or more of the elements depicted in the drawings/figures can also be implemented in a more separated or integrated manner, or even removed or rendered as inoperable in certain cases, as is useful in accordance with a particular application.

[96] Additionally, any signal arrows in the drawings/figures should be considered only as exemplary, and not limiting, unless otherwise specifically noted. Furthermore, the

term “or” as used herein is generally intended to mean “and/or” unless otherwise indicated. Combinations of components or steps will also be considered as being noted, where terminology is foreseen as rendering the ability to separate or combine is unclear.

[97] As used in the description herein and throughout the claims that follow “a”, “an”, and “the” include plural references unless the context clearly dictates otherwise.

Furthermore, as used in the description herein and throughout the claims that follow, the meaning of “in” includes “in” and “on” unless the context clearly dictates otherwise.

[98] The foregoing description of illustrated embodiments of the present invention, including what is described in the Abstract, is not intended to be exhaustive or to limit the invention to the precise forms disclosed herein. While specific embodiments of, and examples for, the invention are described herein for illustrative purposes only, various equivalent modifications are possible within the spirit and scope of the present invention, as those skilled in the relevant art will recognize and appreciate. As indicated, these modifications may be made to the present invention in light of the foregoing description of illustrated embodiments of the present invention and are to be included within the spirit and scope of the present invention.

[99] Thus, while the present invention has been described herein with reference to particular embodiments thereof, a latitude of modification, various changes and substitutions are intended in the foregoing disclosures, and it will be appreciated that in some instances some features of embodiments of the invention will be employed without a corresponding use of other features without departing from the scope and spirit of the invention as set forth. Therefore, many modifications may be made to adapt a particular situation or material to the essential scope and spirit of the present invention. It is intended that the invention not be limited to the particular terms used in following claims and/or to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include any and all embodiments and equivalents falling within the scope of the appended claims.

**WHAT IS CLAIMED IS:**

1. A system for monitoring a fire, the system comprising:  
a plurality of devices coupled via a network, each with a plurality of sensors;  
a base station for communicating with the devices;  
a processing system for receiving data from the sensors via the base station; and  
a process executing on one or more of the devices for organizing a flow of data  
from the devices to the base station after deployment of the devices.
2. The system of Claim 1 further including:  
first means for pre-deploying the devices in an area.
3. The system of Claim 1 wherein the first means further includes:  
second means for deploying the devices during a fire event.
4. The system of Claim 1 further including:  
third means for facilitating modifying data collection priorities.
5. The system of Claim 4, wherein the third means further includes:  
fourth means for facilitating modifying data collection priorities according to a  
data type, a data collection rate, and/or according to fire conditions.
6. A system for monitoring a plurality of mobile objects, the system comprising:  
a plurality of devices coupled to the mobile objects, wherein each device includes  
a plurality of sensors, wherein the sensors include environmental sensors;  
a base station for communicating with the devices;  
a processing system for receiving data from the sensors via the base station; and  
a process executing on one or more of the devices for organizing a flow of data  
from the devices to the base station after deployment of the devices.
7. The system of Claim 6, wherein a mobile object includes a person or vehicle.

8. The system of Claim 7, wherein the plurality of sensors include one or more sensors for measuring biological information of the user.

9. The system of Claim 6 wherein the base station is mobile.

10. The system of Claim 6 further including  
first means for modifying data collection priorities according to data type, data collection rate, and/or values of data collected.

11. A method for obtaining measurements of environmental conditions comprising:  
dispersing several self-networking nodes in a region, the self-networking nodes being coupled to one or more sensors; and  
employing the one or more sensors to sense one or more environmental conditions, thereby yielding sensed data.

12. The method of Claim 11, wherein the region includes a fire.

13. The method of Claim 12, further including:  
utilizing the sensed data to predict a condition pertaining to a fire.

14. The method of Claim 13, wherein the condition pertaining to a fire includes:  
fire movement.

15. The method of Claim 13, wherein the condition pertaining to a fire includes:  
fire temperature.

16. The method of Claim 11, further including:

selectively controlling power to one or more of the one or more sensors based on a predetermined priority associated with sensed data output from the one or more sensors.

17. A method for obtaining fire measurements comprising:  
creating a sensor network of spatially dispersed self-networking sensors, the sensor network being in proximity to or in the fire and  
selectively controlling the sensor network to configure data received by a processing system from one or more sensors of the spatially dispersed sensor network.

18. The method of Claim 17, further including:  
dispersing plural self-networking nodes in proximity to the fire, each self-networking node in communication with one or more sensors.

19. The method of Claim 17, wherein the data includes:  
position information corresponding to one or more sensors of the sensor network.

20. The method of Claim 19, wherein the position information includes:  
elevation information.

21. The method of Claim 19, further including:  
implementing one or more routines for coupling the position information with sensed data corresponding to one or more environmental conditions.

22. The method of Claim 21, further including:  
employing the sensed data and the position information to predict behavior of the fire.

23. The method of Claim 17, further including:  
selectively prioritizing the data.

24. The method of Claim 23, further including:  
prioritizing the data based on bandwidth and/or communication capabilities of the sensors providing the sensed data.

25. The method of Claim 23, further including:  
selectively adjusting power to each of the spatially dispersed sensors according to a priority associated with priority value associated with each of the spatially dispersed sensors.

26. The method of Claim 25, further comprising:  
a GPS receiver, a humidity sensor, a temperature sensor, and/or a radiation sensor.

27. A system for facilitating fire measurement comprising:  
sensors interconnected via a network, the sensors being adapted to sense environmental conditions;  
one or more Global Positioning System (GPS) receivers adapted to provide position information associated with one or more of the sensors; and  
a sensor controller connected to the network, the sensor controller adapted to selectively retrieve the sensed environmental conditions and the position information.

28. The system of Claim 27, further comprising:  
first means for associating the position information with sensed environmental conditions output from one or more sensors associated with the position information.

29. The system of Claim 27, further comprising:  
second means for selectively prioritizing sensed environmental conditions in response to control signals output from the sensor controller.

30. The system of Claim 29, further comprising:

a power-control mechanism adapted to selectively adjust power to sensors in accordance with priority values associated with sensed environmental conditions output via the sensors.

31. The system of Claim 29, wherein the sensors are connected to network nodes, further comprising:

a sensor-node controller and an accompanying GPS receiver.

32. The system of Claim 31, further comprising:

means for selectively powering off the GPS receiver.

33. The system of Claim 31, further comprising:

one or more routines to facilitate automatically wirelessly networking with proximate sensors and associated nodes.

34. The system of Claim 31, wherein the sensor-node controller is responsive to control signals from the sensor controller.

35. The system of Claim 34, wherein the sensor controller is implemented via a base station.

36. The system of Claim 29, further comprising:

a user interface in communication with the controller.

37. The system of Claim 36, wherein the user interface includes:

a browser-client interface.

38. The system of Claim 36, further including:

a database in communication with the user interface.

39. The system of Claim 38, further including:

one or more servers in communication with the sensor node controller and the database, the one or more servers adapted to selectively provide fire information to the browser-client interface based on the sensed environmental conditions.

40. The system of Claim 27, wherein the position information includes:  
elevation information.

41. A method for characterizing a wildfire comprising:  
dispersing several nodes in a region exhibiting a fire or susceptible to a fire, the nodes being coupled to one or more sensors and being coupled to one or more Global Positioning System (GPS) receivers;  
employing the one or more sensors to sense one or more environmental conditions and providing sensed data in response thereto;  
coupling position and elevation information provided by the GPS receiver to the one or more environmental conditions and providing geocoded data in response thereto; and  
characterizing the fire based on the geocoded data.

42. A method for characterizing a wildfire comprising:  
dispersing plural self-networking nodes in proximity to a fire or in a region where future fire-detection and/or measurement is desired, the plural self-networking nodes being coupled to one or more sensors;  
forming a network via the self-networking nodes; and  
extracting data from the self-networking nodes and providing extracted data to a database in response thereto.

43. The method of Claim 42, wherein dispersing includes aerial dispersal.

44. The method of Claim 42, further including:  
running one or more routines for predicting fire spread based on sensed data from the self-networking nodes.

45. The method of Claim 42, further including:

one or more routines for correlating building structural with a fire behavior and/or characteristics based on sensed data associated with a structure and sensed data associated with the fire.

46. A system for monitoring a fire, the system comprising:

a plurality of devices, each with a plurality of sensors, wherein a priority is assigned to two or more sensors;

a base station for communicating with the devices; and

a processing system for receiving data from the sensors via the base station, wherein the data is received from the sensors according to the priority.

47. The system of Claim 46, further comprising:

a process executing at a device for preventing operation of a sensor depending on a criterion.

48. The system of Claim 47, wherein the criterion includes a determination of a low-power condition.

49. The system of Claim 47, wherein the criterion includes a determination of a restricted bandwidth condition.

## **SYSTEM FOR SENSING ENVIRONMENTAL CONDITIONS**

### **ABSTRACT OF THE DISCLOSURE**

A system and method for facilitating measurement of environmental conditions such as might be used in emergencies or other situational awareness applications. The method includes dispersing several networked nodes in a region, the nodes being coupled to one or more sensors, and then employing the one or more sensors to sense one or more environmental conditions and providing sensed data in response thereto. In a more specific embodiment, the region exhibits a fire, and the method further includes utilizing the sensed data to predict fire conditions, such as fire movement and temperature. A controller may be employed to selectively adjust power to one or more sensors based on predetermined priorities associated with sensed data output from the one or more sensors.

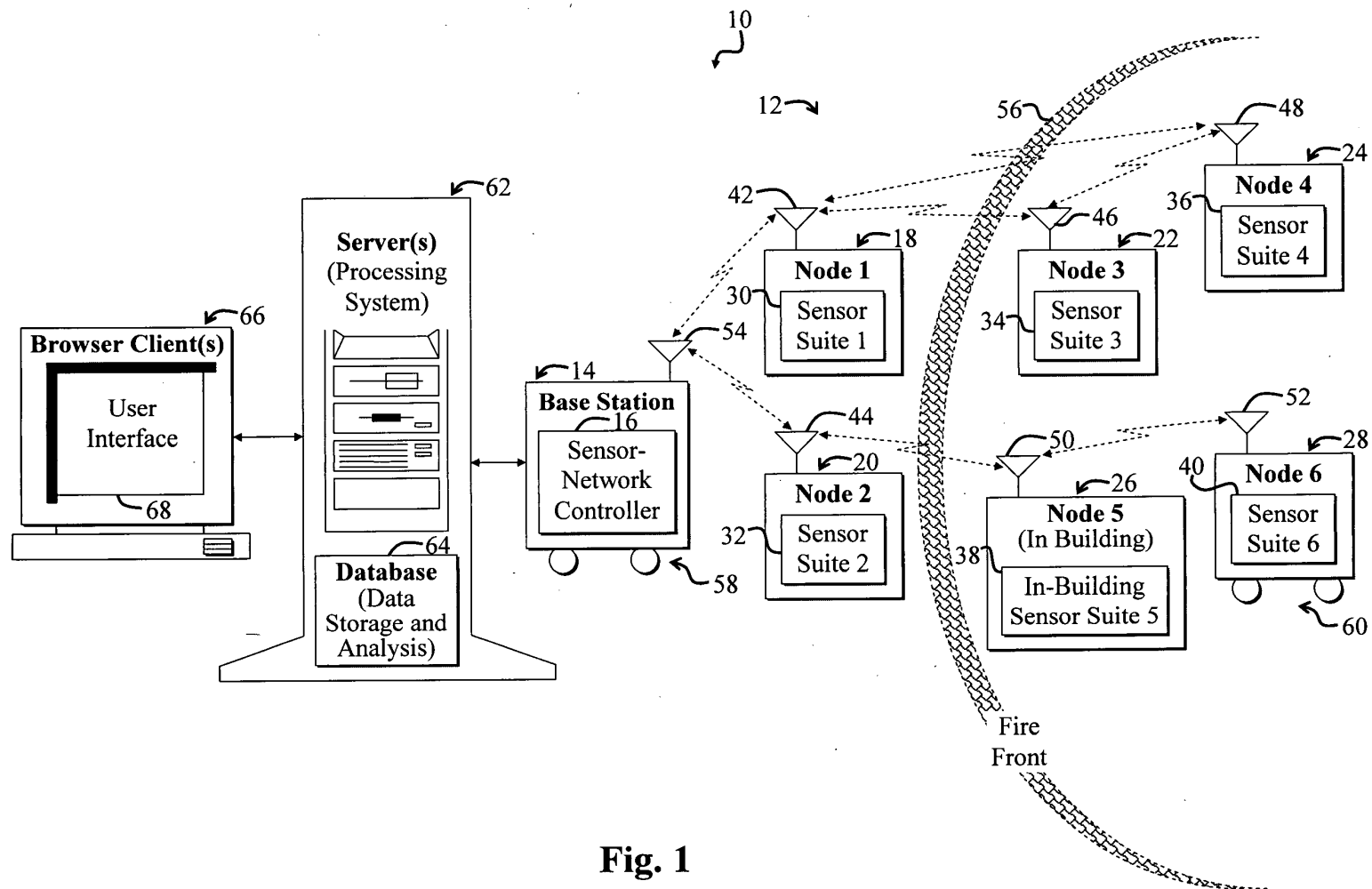


**Fig. 1**

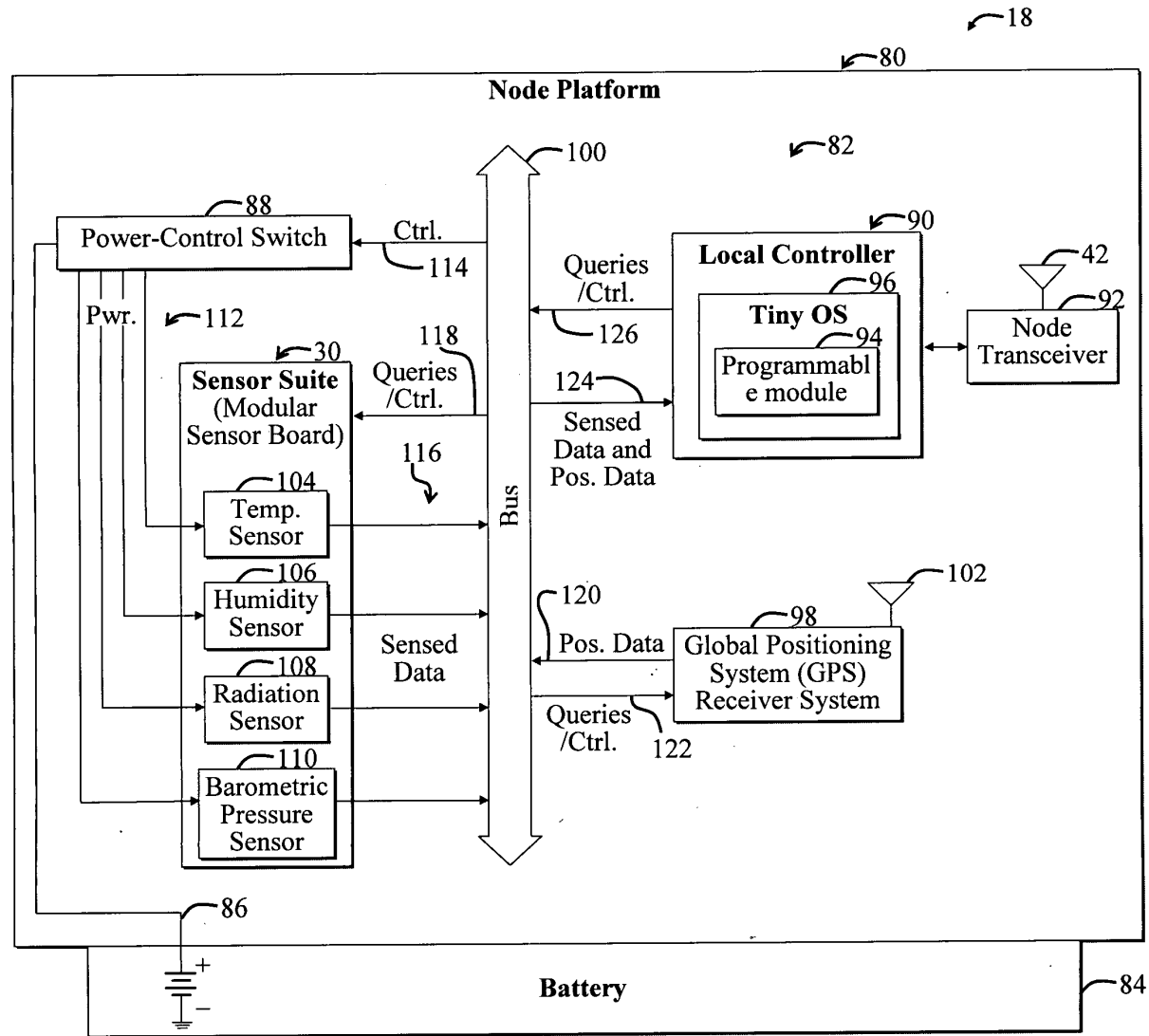


**Fig. 2**

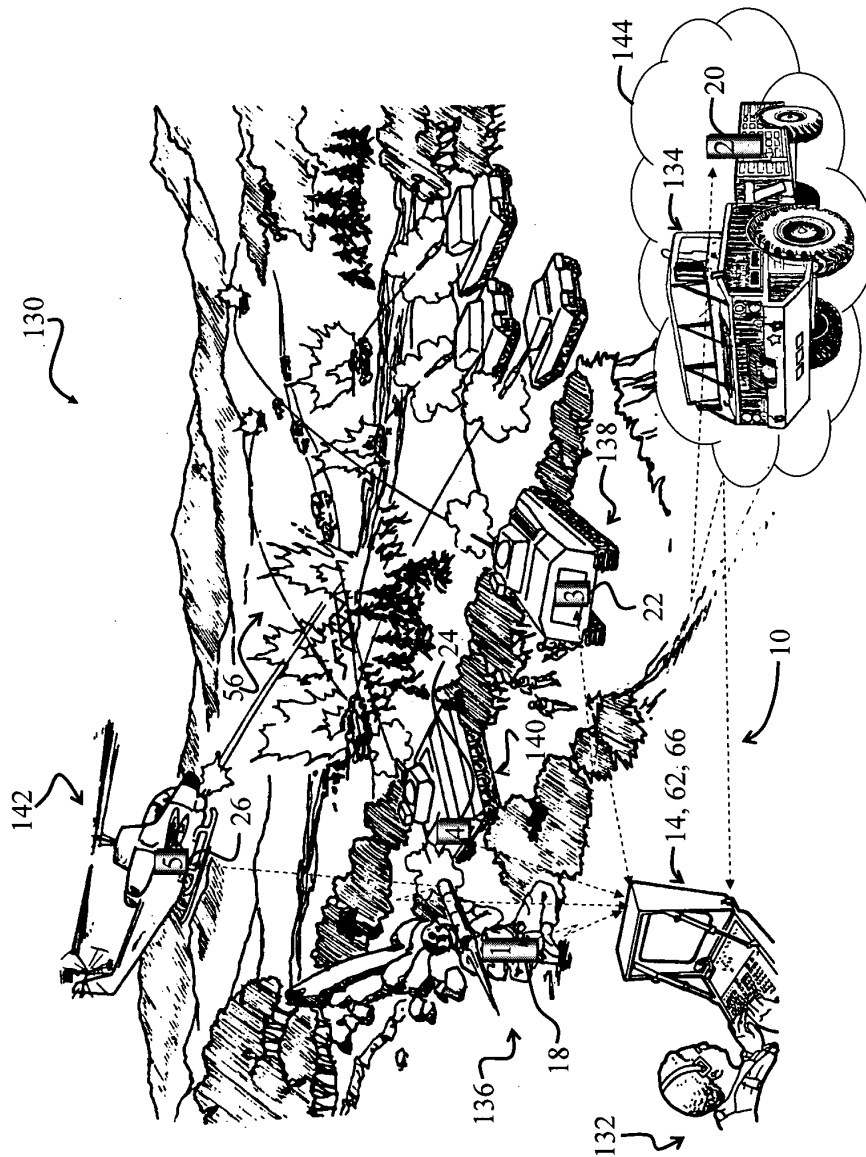


**Fig. 3**

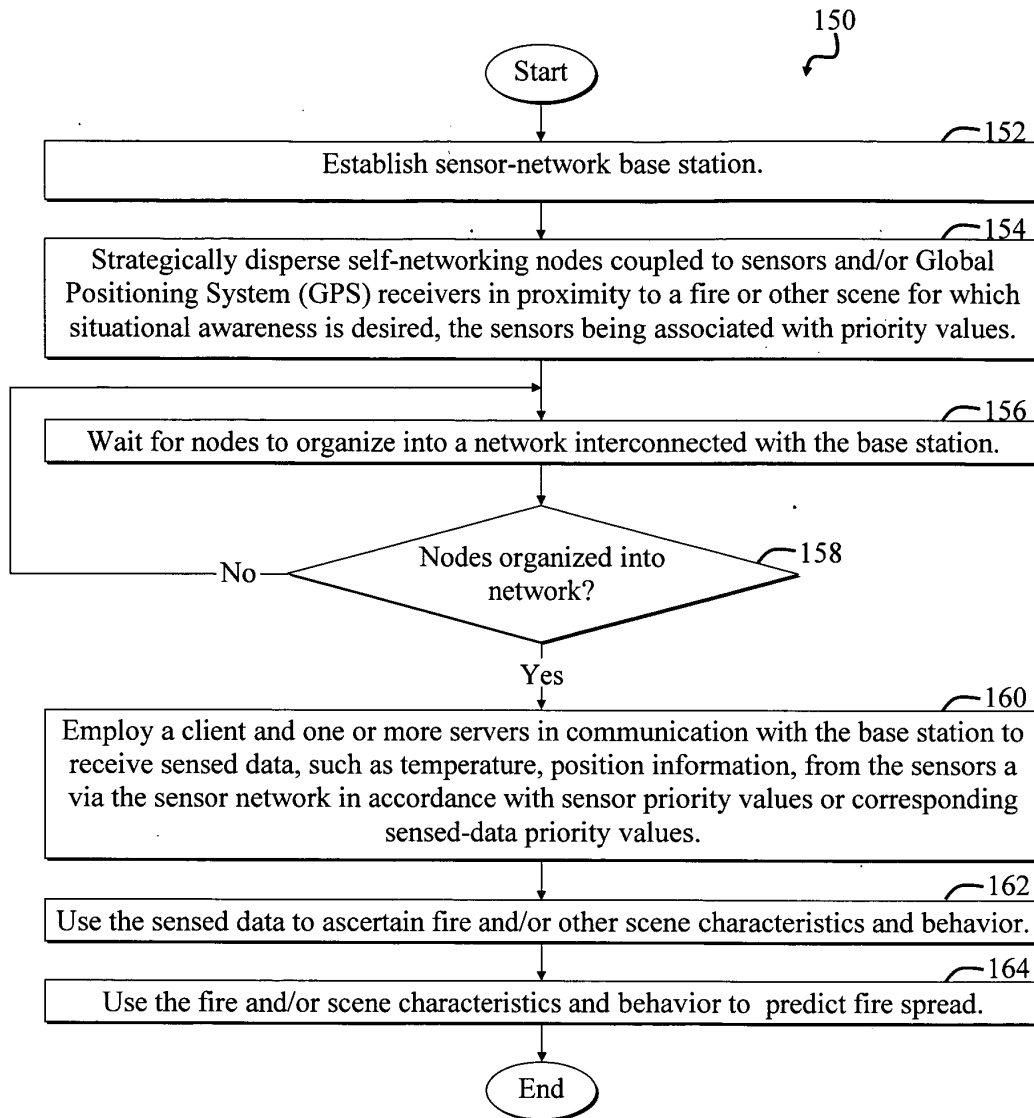


**Fig. 4**

## **Application Data Sheet**

### **Application Information**

|                                 |                                               |
|---------------------------------|-----------------------------------------------|
| Application number::            | Unassigned                                    |
| Filing Date::                   | Herewith                                      |
| Application Type::              | Regular                                       |
| Subject Matter::                | Utility                                       |
| Title::                         | SYSTEM FOR SENSING ENVIROMENTAL<br>CONDITIONS |
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| Small Entity?::                 | Yes                                           |
| Petition included?::            | No                                            |
| Secrecy Order in Parent Appl.:: | No                                            |

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#### **Representative Information**

Representative Customer Number:: 37490

#### **Domestic Priority Information**

|               |                                                            |                      |                      |
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|               | An application claiming the benefit<br>under 35 USC 119(e) | 60/637,279           | December 17, 2004    |

#### **Foreign Priority Information**

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|-----------|----------------------|---------------|
| Country:: | Application number:: | Filing Date:: |
|-----------|----------------------|---------------|

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : DOOLIM et al.                      Art Unit : Unassigned  
Serial No. : Unassigned                      Examiner : Unassigned  
Filed : Herewith  
Title : SYSTEM FOR SENSING ENVIROMENTAL CONDITIONS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Copies of the references listed on the attached form PTO-1449 not are enclosed.  
This filing is being made with the filing of a new application. No fee is required.  
Please apply any appropriate charges or credits to Deposit Account No. 50-3000.

Respectfully submitted,

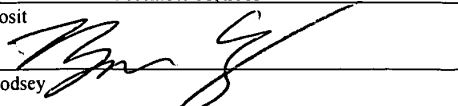
Date: December 16, 2005

  
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I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**PATENT APPLICATION FEE DETERMINATION RECORD**

Substitute for Form PTO-875

**11303458****APPLICATION AS FILED – PART I**

(Column 1) (Column 2)

| FOR                                               | NUMBER FILED                                                                                                                                                                                                         | NUMBER EXTRA |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| BASIC FEE<br>(37 CFR 1.16(a), (b), or (c))        |                                                                                                                                                                                                                      |              |
| SEARCH FEE<br>(37 CFR 1.16(k), (l), or (m))       |                                                                                                                                                                                                                      |              |
| EXAMINATION FEE<br>(37 CFR 1.16(o), (p), or (q))  |                                                                                                                                                                                                                      |              |
| TOTAL CLAIMS<br>(37 CFR 1.16(i))                  | 49                                                                                                                                                                                                                   | 29           |
| INDEPENDENT CLAIMS<br>(37 CFR 1.16(h))            | 8 minus 3 =                                                                                                                                                                                                          | 5            |
| APPLICATION SIZE<br>FEE<br>(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.

**SMALL ENTITY**

| RATE (\$)    | FEE (\$)    |
|--------------|-------------|
|              | <b>150</b>  |
|              | <b>250</b>  |
|              | <b>100</b>  |
| X\$25=       | <b>725</b>  |
| X\$100=      | <b>500</b>  |
| N/A          |             |
| <b>TOTAL</b> | <b>1725</b> |

**OTHER THAN SMALL ENTITY**

| RATE (\$)    | FEE (\$) |
|--------------|----------|
|              |          |
|              |          |
|              |          |
| X\$50        |          |
| X\$200=      |          |
| N/A          |          |
| <b>TOTAL</b> |          |

**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<br>(37 CFR 1.16(i))                                       | *                                | Minus **                           | =             |
| Independent<br>(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)) |                                  |                                    |               |

**SMALL ENTITY**

| RATE (\$)        | ADDITIONAL FEE (\$) |
|------------------|---------------------|
| X =              |                     |
| X =              |                     |
| N/A              |                     |
| <b>TOTAL</b>     |                     |
| <b>ADD'T FEE</b> |                     |

**OTHER THAN SMALL ENTITY**

| RATE (\$)        | ADDITIONAL FEE (\$) |
|------------------|---------------------|
| X =              |                     |
| X =              |                     |
| N/A              |                     |
| <b>TOTAL</b>     |                     |
| <b>ADD'T FEE</b> |                     |

(Column 1) (Column 2) (Column 3)

| AMENDMENT B                                                     | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA |
|-----------------------------------------------------------------|----------------------------------|------------------------------------|---------------|
| Total<br>(37 CFR 1.16(i))                                       | *                                | Minus **                           | =             |
| Independent<br>(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)) |                                  |                                    |               |

| RATE (\$)        | ADDITIONAL FEE (\$) |
|------------------|---------------------|
| X =              |                     |
| X =              |                     |
| N/A              |                     |
| <b>TOTAL</b>     |                     |
| <b>ADD'T FEE</b> |                     |

| RATE (\$)        | ADDITIONAL FEE (\$) |
|------------------|---------------------|
| X =              |                     |
| X =              |                     |
| N/A              |                     |
| <b>TOTAL</b>     |                     |
| <b>ADD'T FEE</b> |                     |

\* 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.

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.