Abbott Laboratories and Abbott Diabetes Care Inc. (Petitioners) v. Altivera LLC (Patent Owner)

IPR2024-00425 (US Patent 7,969,307)

Petitioners' Demonstratives

April 23, 2025

Abbott
Exhibit 1035
Abbott v. Altivera
IPR2024-00425

Demonstrative Exhibit – Not Evidence

Issues

I. The '307 Patent

II. Claim Construction

III. Grounds 1 and 2: The Bandy Grounds

IV. Ground 3: Beck, Heller, and Lovejoy

Issues

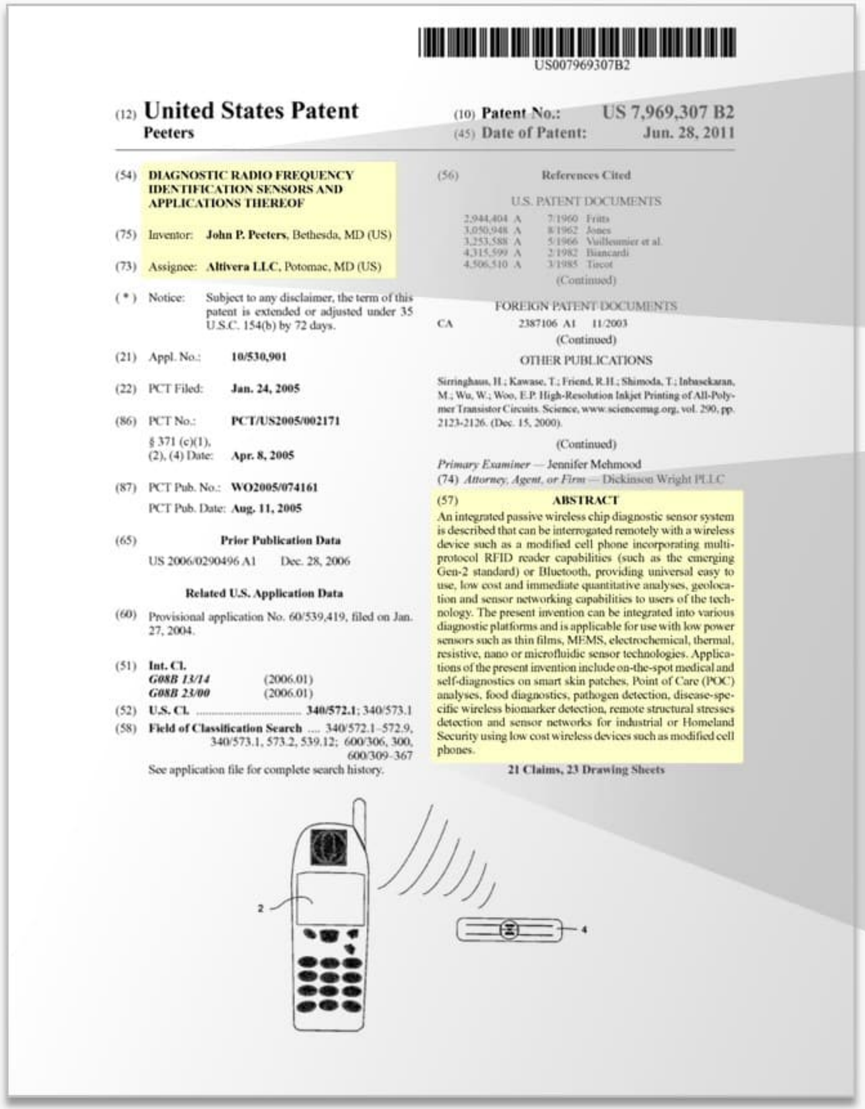
I. The '307 Patent

II. Claim Construction

III. Grounds 1 and 2: The Bandy Grounds

IV. Ground 3: Beck, Heller, and Lovejoy

U.S. Patent No. 7,969,307



US007969307B2

(12) **United States Patent**
Peeters

(10) **Patent No.: US 7,969,307 B2**
(45) **Date of Patent: Jun. 28, 2011**

(54) **DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF**

(75) Inventor: **John P. Peeters**, Bethesda, MD (US)

(73) Assignee: **Altivera LLC**, Potomac, MD (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 72 days.

(21) Appl. No.: **10/530,901**

(22) PCT Filed: **Jan. 24, 2005**

(86) PCT No.: **PCT/US2005/002171**
§ 371 (c)(1),
(2), (4) Date: **Apr. 8, 2005**

(87) PCT Pub. No.: **WO2005/074161**
PCT Pub. Date: **Aug. 11, 2005**

(65) **Prior Publication Data**
US 2006/0290496 A1 Dec. 28, 2006

Related U.S. Application Data
(60) Provisional application No. 60/539,419, filed on Jan. 27, 2004.

(51) **Int. Cl.**
G08B 13/14 (2006.01)
G08B 23/00 (2006.01)
(52) **U.S. Cl.** **340/572.1**; 340/573.1
(58) **Field of Classification Search** 340/572.1–572.9, 340/573.1, 573.2, 539.12; 600/306, 300, 600/309–367
See application file for complete search history.

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(Continued)
Primary Examiner — Jennifer Mehmood
(74) *Attorney, Agent, or Firm* — Dickinson Wright PLLC

(57) **ABSTRACT**
An integrated passive wireless chip diagnostic sensor system is described that can be interrogated remotely with a wireless device such as a modified cell phone incorporating multi-protocol RFID reader capabilities (such as the emerging Gen-2 standard) or Bluetooth, providing universal easy to use, low cost and immediate quantitative analyses, geolocation and sensor networking capabilities to users of the technology. The present invention can be integrated into various diagnostic platforms and is applicable for use with low power sensors such as thin films, MEMS, electrochemical, thermal, resistive, nano or microfluidic sensor technologies. Applications of the present invention include on-the-spot medical and self-diagnostics on smart skin patches, Point of Care (POC) analyses, food diagnostics, pathogen detection, disease-specific wireless biomarker detection, remote structural stresses detection and sensor networks for industrial or Homeland Security using low cost wireless devices such as modified cell phones.

21 Claims, 23 Drawing Sheets

DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF

Inventor: **John P. Peeters**, Bethesda, MD (US)

Assignee: **Altivera LLC**, Potomac, MD (US)

(57) **ABSTRACT**

An integrated passive wireless chip diagnostic sensor system is described that can be interrogated remotely with a wireless device such as a modified cell phone incorporating multi-protocol RFID reader capabilities (such as the emerging Gen-2 standard) or Bluetooth, providing universal easy to use, low cost and immediate quantitative analyses, geolocation and sensor networking capabilities to users of the technology. The present invention can be integrated into various diagnostic platforms and is applicable for use with low power sensors such as thin films, MEMS, electrochemical, thermal, resistive, nano or microfluidic sensor technologies. Applications of the present invention include on-the-spot medical and self-diagnostics on smart skin patches, Point of Care (POC) analyses, food diagnostics, pathogen detection, disease-specific wireless biomarker detection, remote structural stresses detection and sensor networks for industrial or Homeland Security using low cost wireless devices such as modified cell phones.

'307 Patent, Abstract

RFID Sensor Communicates with Wireless Device

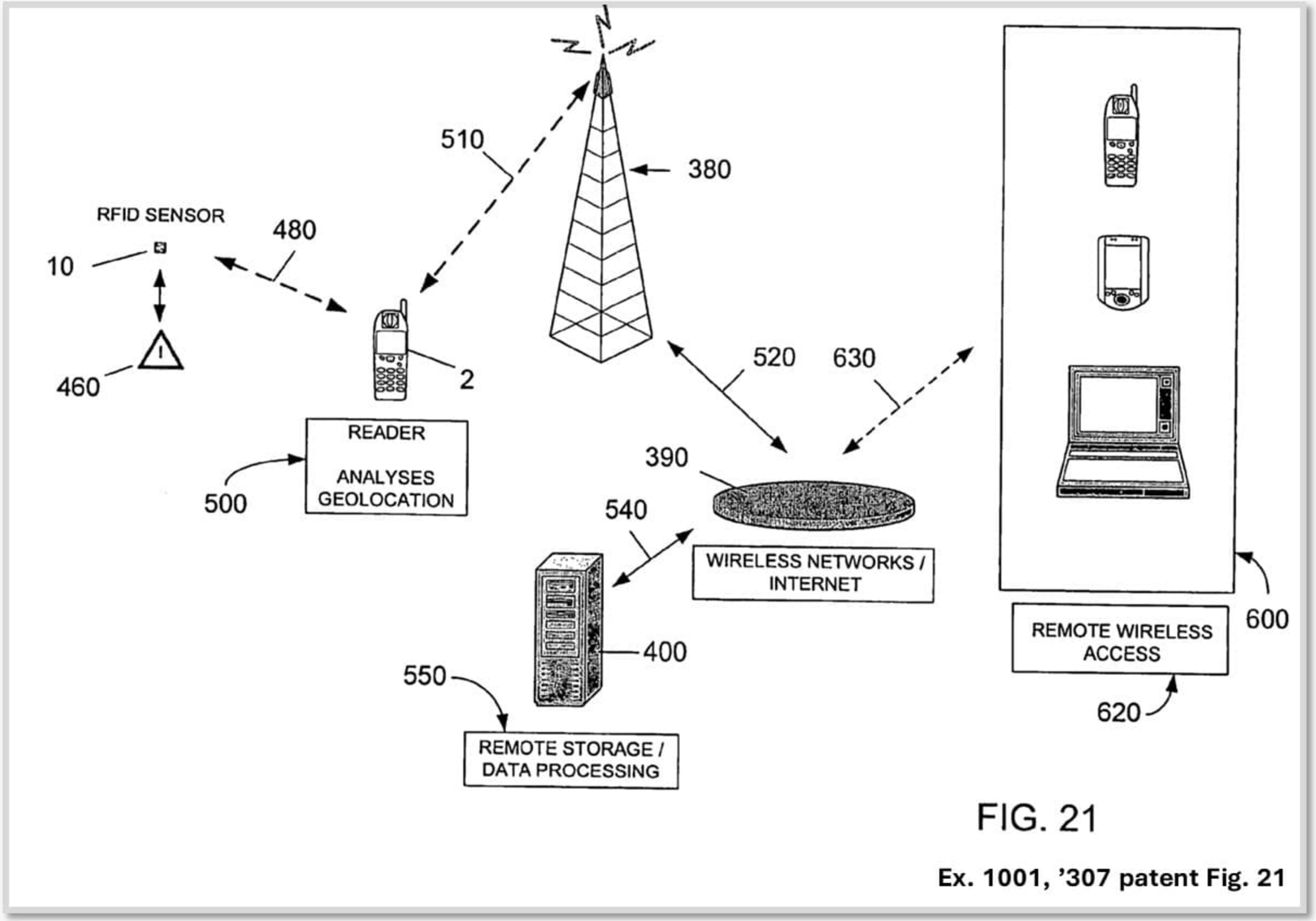


FIG. 21

Ex. 1001, '307 patent Fig. 21

'307 Patent, Claim 1

[1Pre]	A radio frequency (RF) addressable diagnostic sensor unit comprising:
[1a]	at least one sensor element;
[1b]	at least one reference sensor element;
[1c]	a unique identification ID number;
[1d]	a sensor interface having an analog to digital converter coupled to the at least one sensor and reference sensor element;
[1e]	at least one antenna;
[1f]	a substrate:
[1g]	an RF power and communication interface coupled to the at least one antenna and sensor interface;
[1h]	a controller coupled to the RF power and communications interface and the sensor interface; and
[1i]	a memory coupled to the controller and the sensor interface;
[1j]	wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and
[1k]	wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;
[1l]	wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

Issues

I. The '307 Patent

II. Claim Construction

III. Grounds 1 and 2: The Bandy Grounds

IV. Ground 3: Beck, Heller, and Lovejoy

“wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID”

"Wherein the Remote Server Authenticates Said Unique Sensor ID Associated with Said Unique Wireless Device ID"

PO's Proposed Construction

¶54. Thus, as discussed below, Patent Owner proposes the following construction: "the remote server authenticates the unique sensor ID and the associated unique wireless device ID."

POR 18

Undisputed Plain Meaning

The plain meaning of the claim term is that the remote server authenticates the unique sensor ID and that such unique sensor ID is associated with a unique wireless device ID. A POSITA would have understood that the unique sensor ID

POR 18

Dispute:

Does the claim require the remote server to authenticate the unique sensor ID *and the unique wireless device ID* despite the contradictory plain language?

The Board Properly Rejected PO's Proposed Departure From Plain Meaning

Institution Decision

On this record, we determine the plain language and structure of the limitation does not support a construction requiring authentication using *both* the unique sensor ID and the unique wireless ID, as asserted by Patent Owner. The claim recites "the remote server authenticates *said unique sensor ID associated with said unique wireless device ID*," but Patent Owner's construction appears to read out the phrase "associated with" and adds an unrecited requirement to the claim such that the remote server authenticates said unique sensor ID *and* said unique wireless device ID.

ID 10

There Is No Reason to Depart from the Undisputed Plain Meaning

Hill-Rom Servs., Inc. v. Stryker Corp.

Claim terms are generally given their plain and ordinary meanings to one of skill in the art when read in the context of the specification and prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). "There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of the claim term either in the specification or during prosecution." *Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

***Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1371 (Fed. Cir. 2014)**

Claim Differentiation Confirms Plain Meaning Interpretation

18. An addressable quantitative passive radio frequency addressable skin patch comprising:

* * *

wherein the remote server authenticates remotely said unique sensor tag ID and said unique wireless device ID and communicates to said wireless device said processed information relating to said sensor data;

Ex. 1001, '307 Patent Claim 18

Unwired Planet, LLC v. Apple Inc.

Moreover, the patent contains other claims, for example claim 21, that specifically recite "establishing a voice communication channel," a limitation not present in the asserted claims. If the patentee intended to restrict the claims-at-issue to require a voice input to travel over a particular type of channel, it could have included that same limitation.

***Unwired Planet, LLC v. Apple Inc.*, 829 F.3d 1353, 1358-59 (Fed. Cir. 2016)**

PO's File History Argument Is Wrong

Patent Owner's Response Brief

the Applicant distinguished prior art by noting that pending claim 65 (issued as claim 1) "actively recites limitation wherein the remote [wireless] device communicates the unique sensor ID ***and*** unique wireless ID to a remote server…." Ex-1002, 65. In

POR 20, 21

'307 Patent File History

seeks the Examiner's reconsideration. Most notably, the present invention in claim 65 actively recites limitation wherein the remote device communicates the unique sensor ID and unique wireless ID to a remote server which uses this information to send the wireless device the information or software necessary to communicate with the unique sensor ID. This allows the present invention to utilize a wireless device that can be made compatible with a wide plurality of unique sensors by uploading the data or software necessary to interact with them. The cited portions of Evanyk, however, merely recite that software may be located on receiver and that they may be "upgraded or updated". This does not teach the claimed limitations wherein the remote server loads software onto the wireless device relative to a particular sensor id that was relayed to the server from the wireless device as claimed by the present invention. Although the

Ex. 1002, '307 Patent FH 65

PO's Data Privacy Argument Does Not Support Its Construction

Patent Owner's Response Brief

As explained in the accompanying expert declaration, requiring an association between the unique wireless device ID and the unique sensor ID in the claim would have been meaningless unless the unique wireless ID was part of the authentication process, i.e., it would have served no purpose if not needed for authentication. Warren ¶57. A POSITA would have understood that such device information was necessary for security and privacy of the system as well as the integrity of any subsequently stored and processed information/data. *Id.* In the context of the patent,

POR 19

Dr. Sarrafzadeh Declaration

15. Dr. Warren also states that authenticating the wireless device ID is necessary for security and privacy of the system. Warren Decl., ¶¶ 57-58. I disagree because (1) the claim does not recite security or privacy, and (2) security and privacy can be accomplished in other ways. For example, unlike the '307 patent, Beck explicitly discloses a concern for protecting patient data, and allows for authentication based not only on wireless device ID (i.e., "client computing device network address") and sensor ID ("medical device serial number") but also based on "username/password." Beck [0051].

Ex. 1033, Sarrafzadeh Suppl. Decl. ¶ 15

Extrinsic Evidence Does Not Save PO: Its Expert's Opinions Are Directly Copied From The POR

Patent Owners Response

As explained in the accompanying expert declaration, requiring an association between the unique wireless device ID and the unique sensor ID in the claim would have been meaningless unless the unique wireless ID was part of the authentication process, i.e., it would have served no purpose if not needed for authentication. Warren ¶57. A POSITA would have understood that such device information was necessary for security and privacy of the system as well as the integrity of any subsequently stored and processed information/data. *Id.* In the context of the patent, a sensor ID could not be authenticated on its own. Importantly, a POSITA would have understood that the sensor ID could have been read by any RFID reader in range of the sensor (e.g., by a nearby pedestrian's mobile phone) unless both the sensor and the particular wireless reader were authenticated. *Id.*

Indeed, authenticating the sensor ID "associated with" the wireless ID ensures a person's confidential health information is not stolen or misused. A couple of use cases make this clear. Consider a bad actor traversing a crowd, scanning sensors with a wireless device. This is referred to as RFID "skimming," and is a major problem for RFID-enabled credit cards. Warren ¶58. If the claim required only authenticating the sensor ID, this skimming would allow the bad actor to access the health information of the person wearing the sensor, including at least "processed information relating to said sensor data." *Id.* But by requiring—as claim 1 of the '307 patent does—that the authentication is of the sensor ID "associated with" the

POR 19

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Dr. Warren Declaration, PO's Expert

57. Requiring an association between the unique wireless device ID and the unique sensor ID in the claim would have been meaningless unless the unique wireless ID was part of the authentication process, i.e., it would have served no purpose if not needed for authentication. A POSITA would have understood that such device information was necessary for security and privacy of the system as well as the integrity of any subsequently stored and processed information/data. In the context of the patent, a sensor ID could not be authenticated on its own. Importantly, a POSITA would have understood that the sensor ID could have been read by any RFID reader in range of the sensor (e.g., a nearby pedestrian's mobile phone) unless both the sensor and the particular wireless reader were authenticated.

58. Authenticating the sensor ID "associated with" the wireless ID ensures a person's confidential health information is not stolen or misused. A couple of use cases make this clear. Consider a bad actor traversing a crowd, scanning sensors with a wireless device. This is referred to as RFID "skimming," and is a major problem for RFID-enabled credit cards. If the claim required only authenticating the sensor ID, this skimming would allow the bad actor to access the health information of the person wearing a sensor, including at least "processed information relating to said sensor data." But by requiring—as claim 1 of the '307 Patent does—that the authentication is of the sensor ID "associated with" the wireless device ID, only the

Ex. 2009, Warren Decl. ¶¶ 57-58

“associated with”

"Unique Sensor ID *Associated With* Said Unique Wireless Device ID"

Patent Owner Sur-Reply

Petitioner effectively argues that merely because the unique ID of the medical device is *read* by a wireless device, the unique ID of the medical device is "associated with" the device that reads it.

POSR 2

Dr. Sarrafzadeh Declaration

14. The phrase "associated" has no special technical meaning in this context—it does not require authentication or anything beyond conventional association (e.g., relation or connection). *See* '307 patent 12:33-36 (discussing biomarkers "associated with a given condition"), 14:44-47 (discussing "smells associated with the aging or degradation of [] cheese"), 17:30-33 (discussing "storage of RFID tables and associated software").

Ex. 1033, Sarrafzadeh Suppl. Decl. ¶ 14

PO Is Trying to Rewrite the Claim

1. A radio frequency (RF) addressable diagnostic sensor unit comprising:
at least one sensor element;
at least one reference sensor element;
a unique identification ID number;

* * *

wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and
wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;
wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

Ex. 1001, '307 Patent Claim 1

Claim 1 recites two IDs:

1. **A unique identification ID/ unique sensor ID**
2. **Unique wireless device ID**

"associated with said unique wireless ID" describes the unique sensor ID

"Associated With Said Unique Wireless Device ID" Further Describes the Unique Sensor ID

Institution Decision

Ex. 1001, 19:51–52 (emphasis added). The language and structure of the limitation reads that the unique wireless ID is "*associated with*" the unique sensor ID. As such, the last portion of the limitation reciting "associated with said unique wireless device ID" serves to further describe the unique sensor ID, specifically, that the unique sensor ID is associated with the unique wireless device ID.

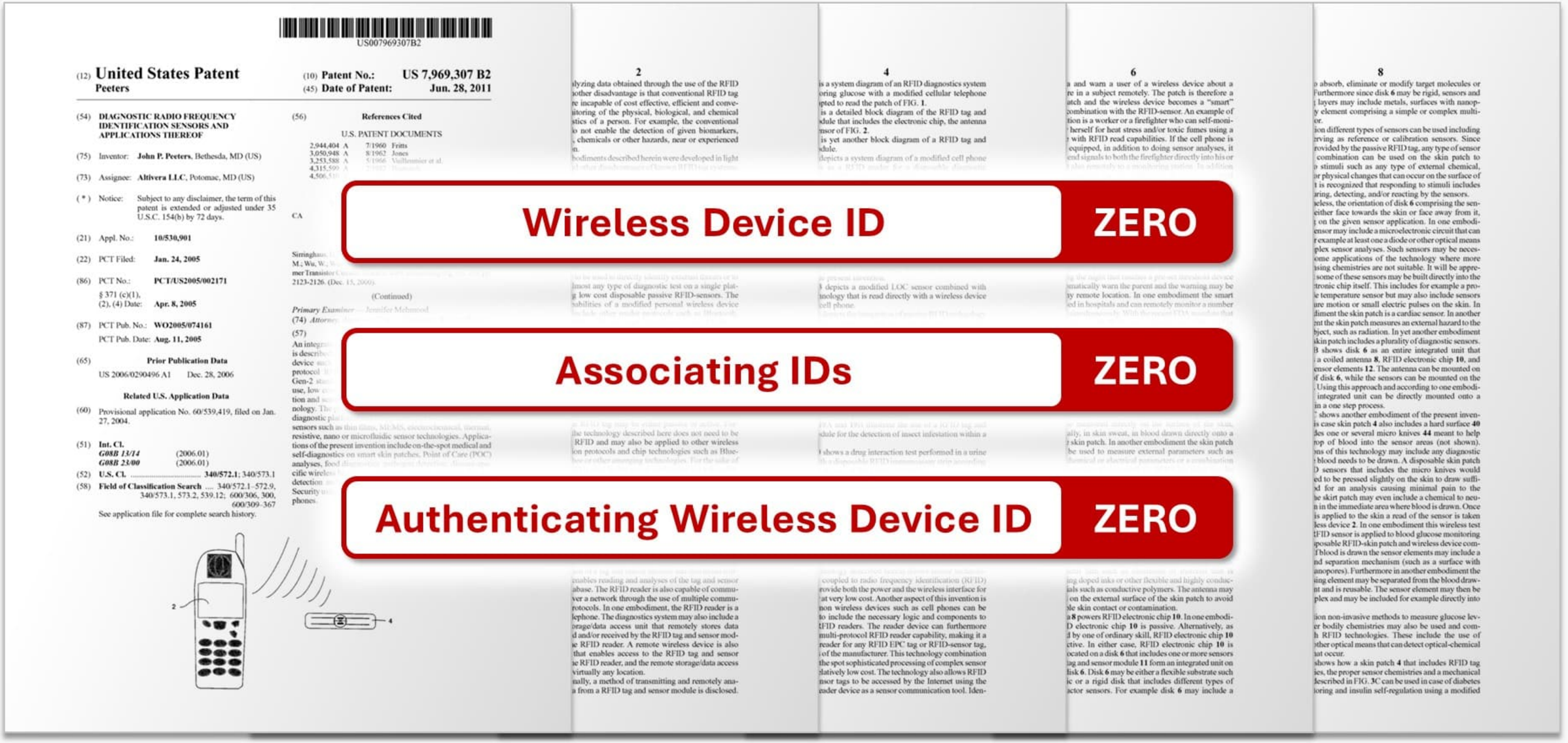
ID 10

Patent Owner Sur-Reply

This is akin to saying that every call you receive on your cell phone somehow causes you to be "associated with" the caller. That defies common sense and finds no

POSR 2

The Specification Never Mentions A Wireless Device ID, Associating IDs, Or Authenticating A Wireless Device ID



US007969307B2

(12) **United States Patent**
Peeters

(10) **Patent No.: US 7,969,307 B2**
(45) **Date of Patent: Jun. 28, 2011**

(54) **DIAGNOSTIC RADIO FREQUENCY IDENTIFICATION SENSORS AND APPLICATIONS THEREOF**

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(73) Assignee: **Altivera LLC**, Potomac, MD (US)

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(65) **Prior Publication Data**
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(60) Provisional application No. 60/539,419, filed on Jan. 27, 2004.

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(52) **U.S. Cl.** **340/572.1**; 340/573.1

(58) **Field of Classification Search** 340/572.1–572.9, 340/573.1, 573.2, 539.12; 600/306, 300, 600/309–367
See application file for complete search history.

(56) **References Cited**
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CA

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M.; Wu, W.;
mer Transistor
2123-2126. (Dec. 15, 2000).

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Primary Examiner — Jennifer Mehmood
(74) *Attorney*

(57)
An integr
is describ
device
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diagnostic
sensors such as thin films, MEMS, electroconformal, thermoresistive, nano or microfluidic sensor technologies. Applications of the present invention include on-the-spot medical and self-diagnostics on smart skin patches, Point of Care (POC) analyses, food
cific wirele
detection
Security
phones.

2
alyzing data obtained through the use of the RFID
nother disadvantage is that conventional RFID tag
re incapable of cost effective, efficient and conve-
itoring of the physical, biological, and chemical
stics of a person. For example, the conventional
o not enable the detection of given biomarkers,
, chemicals or other hazards, near or experienced
n.
bodiments described herein were developed in light

4
is a system diagram of an RFID diagnostics system
oring glucose with a modified cellular telephone
pted to read the patch of FIG. **1**.
is a detailed block diagram of the RFID tag and
dule that includes the electronic chip, the antenna
nsor of FIG. **2**.
is yet another block diagram of a RFID tag and
dule.
depicts a system diagram of a modified cell phone

6
a and warn a user of a wireless device about a
re in a subject remotely. The patch is therefore a
atch and the wireless device becomes a "smart"
combination with the RFID-sensor. An example of
tion is a worker or a firefighter who can self-moni-
herself for heat stress and/or toxic fumes using a
with RFID read capabilities. If the cell phone is
equipped, in addition to doing sensor analyses, it
end signals to both the firefighter directly into his or

8
o absorb, eliminate or modify target molecules or
Furthermore since disk **6** may be rigid, sensors and
layers may include metals, surfaces with nanop-
y element comprising a simple or complex multi-
or.
ion different types of sensors can be used including
rving as reference or calibration sensors. Since
rovided by the passive RFID tag, any type of sensor
combination can be used on the skin patch to
o stimuli such as any type of external chemical,
or physical changes that can occur on the surface of
t is recognized that responding to stimuli includes
ring, detecting, and/or reacting by the sensors.
eless, the orientation of disk **6** comprising the sen-
either face towards the skin or face away from it,
on the given sensor application. In one embodi-
ensor may include a microelectronic circuit that can
example at least one a diode or other optical means
plex sensor analyses. Such sensors may be neces-
ome applications of the technology where more
sing chemistries are not suitable. It will be appre-
some of these sensors may be built directly into the
tronic chip itself. This includes for example a pro-
e temperature sensor but may also include sensors
ure motion or small electric pulses on the skin. In
diment the skin patch is a cardiac sensor. In another
nt the skin patch measures an external hazard to the
bject, such as radiation. In yet another embodiment
kin patch includes a plurality of diagnostic sensors.
B shows disk **6** as an entire integrated unit that
a coiled antenna **8**, RFID electronic chip **10**, and
ensor elements **12**. The antenna can be mounted on
f disk **6**, while the sensors can be mounted on the
. Using this approach and according to one embodi-
integrated unit can be directly mounted onto a
in a one step process.
" shows another embodiment of the present inven-
is case skin patch **4** also includes a hard surface **40**
des one or several micro knives **44** meant to help
op of blood into the sensor areas (not shown).
ns of this technology may include any diagnostic
blood needs to be drawn. A disposable skin patch
D sensors that includes the micro knives would
ed to be pressed slightly on the skin to draw suffi-
d for an analysis causing minimal pain to the
e skirt patch may even include a chemical to neu-
n in the immediate area where blood is drawn. Once
is applied to the skin a read of the sensor is taken
less device **2**. In one embodiment this wireless test
FID sensor is applied to blood glucose monitoring
posable RFID-skin patch and wireless device com-
f blood is drawn the sensor elements may include a
nd separation mechanism (such as a surface with
anopores). Furthermore in another embodiment the
ing element may be separated from the blood draw-
nt and is reusable. The sensor element may then be
plex and may be included for example directly into

ion non-invasive methods to measure glucose lev-
er bodily chemistries may also be used and com-
h RFID technologies. These include the use of
other optical means that can detect optical-chemical
at occur.
shows how a skin patch **4** that includes RFID tag
ies, the proper sensor chemistries and a mechanical
described in FIG. 3C can be used in case of diabetes
oring and insulin self-regulation using a modified

Wireless Device ID **ZERO**

Associating IDs **ZERO**

Authenticating Wireless Device ID **ZERO**

Specification Does Not Discuss A Wireless Device ID Or Associating IDs

Dr. Sarrafzadeh Declaration

51. Dr. Warren asserts that "Petitioner [does not] provide any disclosure in the prior art of" the claim limitation requiring that "the unique sensor ID is 'associated with the unique wireless device ID.'" Ex. 2009 ¶ 150. As I discussed above, this is not true. Dr. Warren seems to imply that the "associated" portion of the claim requires more than what's recited in the claim itself. I disagree. The claim recites a "wireless device having… a unique ID" and "the wireless device communicates with the RF addressable sensor interface to obtain the [sensor] ID." This step of obtaining the sensor ID associates the IDs. Notably, there is no explicit "associating" step in the claim or anywhere else in the '307 patent. Thus, when claim 1 recites "said unique sensor ID associated with said unique wireless device ID" the claim is referencing and encompassing the association made in the previous limitation to specify which sensor ID is being authenticated (i.e., the "said unique sensor ID obtained by the wireless device possessing the wireless device ID).

Ex. 1033, Sarrafzadeh Suppl. Decl. ¶ 51

Issues

I. The '307 Patent

II. Claim Construction

III. Grounds 1 and 2: The Bandy Grounds

IV. Ground 3: Beck, Heller, and Lovejoy

Issues

III. Grounds 1 and 2: The Bandy Grounds

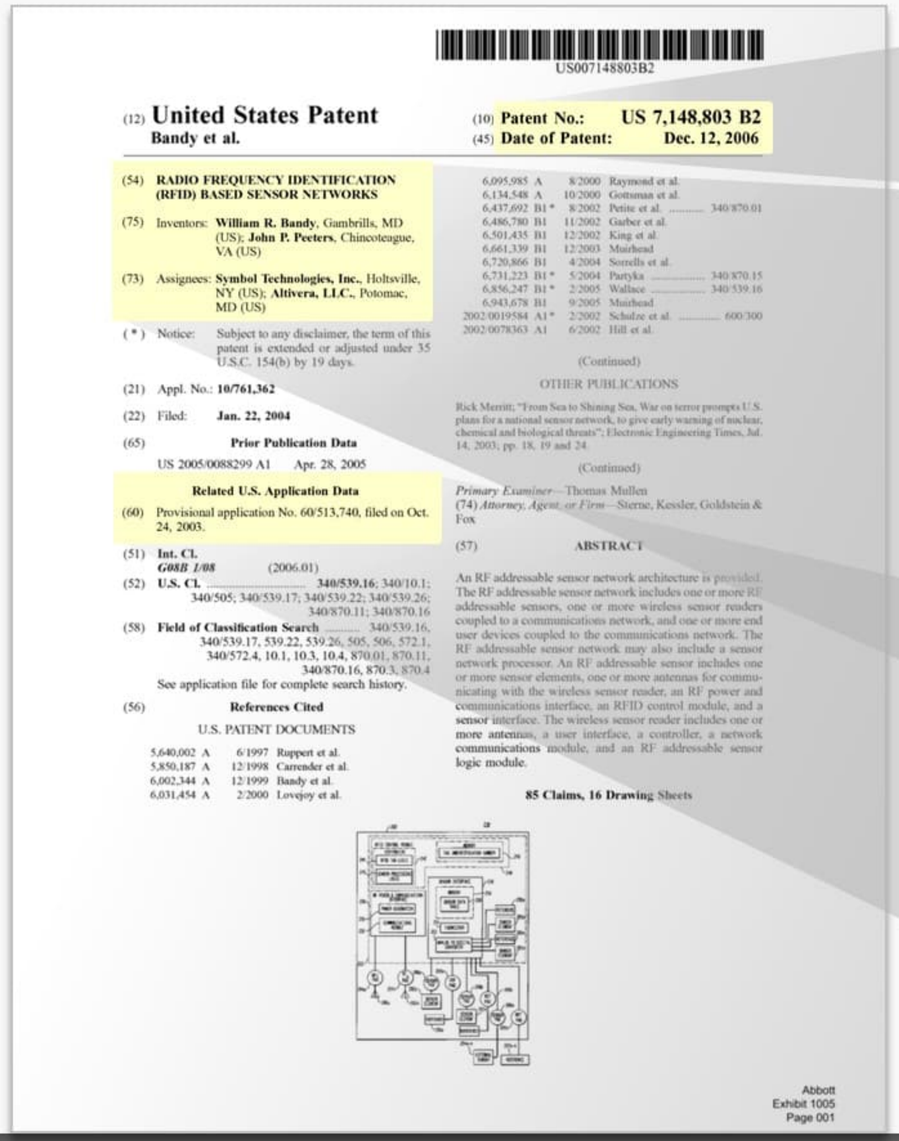
1. Bandy is Prior Art

2. Bandy Renders Obvious the "Wireless Device Unique ID"

3. Bandy Renders Obvious the Authentication Limitation

4. Claim 3 Is Obvious Over Bandy and Heller

Bandy (Ex. 1005)



US007148803B2

(12) **United States Patent**
Bandy et al.

(10) **Patent No.: US 7,148,803 B2**
(45) **Date of Patent: Dec. 12, 2006**

(54) **RADIO FREQUENCY IDENTIFICATION (RFID) BASED SENSOR NETWORKS**

(75) Inventors: **William R. Bandy**, Gambrills, MD (US); **John P. Peeters**, Chincoteague, VA (US)

(73) Assignees: **Symbol Technologies, Inc.**, Holtsville, NY (US); **Altivera, LLC.**, Potomac, MD (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 19 days.

(21) Appl. No.: **10/761,362**

(22) Filed: **Jan. 22, 2004**

(65) **Prior Publication Data**

US 2005/0088299 A1 Apr. 28, 2005

Related U.S. Application Data

(60) Provisional application No. 60/513,740, filed on Oct. 24, 2003.

(51) **Int. Cl.**
G08B 1/08 (2006.01)

(52) **U.S. Cl.** **340/539.16**; 340/10.1; 340/505; 340/539.17; 340/539.22; 340/539.26; 340/870.11; 340/870.16

(58) **Field of Classification Search** 340/539.16, 340/539.17, 539.22, 539.26, 505, 506, 572.1, 340/572.4, 10.1, 10.3, 10.4, 870.01, 870.11, 340/870.16, 870.3, 870.4
See application file for complete search history.

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(Continued)

Primary Examiner—Thomas Mullen
(74) *Attorney, Agent, or Firm*—Sterne, Kessler, Goldstein & Fox

(57) **ABSTRACT**

An RF addressable sensor network architecture is provided. The RF addressable sensor network includes one or more RF addressable sensors, one or more wireless sensor readers coupled to a communications network, and one or more end user devices coupled to the communications network. The RF addressable sensor network may also include a sensor network processor. An RF addressable sensor includes one or more sensor elements, one or more antennas for communicating with the wireless sensor reader, an RF power and communications interface, an RFID control module, and a sensor interface. The wireless sensor reader includes one or more antennas, a user interface, a controller, a network communications module, and an RF addressable sensor logic module.

85 Claims, 16 Drawing Sheets

Abbott
Exhibit 1005
Page 001

Patent No.: US 7,148,803 B2
Date of Patent: Dec. 12, 2006

(54) **RADIO FREQUENCY IDENTIFICATION (RFID) BASED SENSOR NETWORKS**

(75) Inventors: **William R. Bandy**, Gambrills, MD (US); **John P. Peeters**, Chincoteague, VA (US)

(73) Assignees: **Symbol Technologies, Inc.**, Holtsville, NY (US); **Altivera, LLC.**, Potomac, MD (US)

Related U.S. Application Data

(60) Provisional application No. 60/513,740, filed on Oct. 24, 2003.

Bandy Is "By Another"

Duncan Parking Techs., Inc. v. IPS Grp., Inc.

Thus, to decide whether a reference patent is "by another" for the purposes of 35 U.S.C. § 102(e), the Board must (1) determine what portions of the reference patent were relied on as prior art to anticipate the claim limitations at issue, (2) evaluate the degree to which those portions were conceived "by another," and (3) decide whether that other person's contribution is significant enough, when measured against the full anticipating disclosure, to render him a joint inventor of the applied portions of the reference patent.

***Duncan Parking Techs., Inc. v. IPS Grp., Inc.*, 914 F.3d 1347, 1357-58 (Fed. Cir. 2019)**

Duncan Parking Step 1: The Petition Relied On Interrogation Of RFID Sensors In The Bandy Reference

Petition relied on Bandy's interrogation of RFID sensors to anticipate [1k]: "wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data"

Bandy

RFID tag processor **356** includes logic to interrogate and read RFID tag information from RF addressable sensors **110**. As will be appreciated by a person skilled in the relevant art(s), RFID tag processor **356** may be implemented in hardware, software, firmware, or in combination thereof.

Ex. 1005, Bandy 13:1-5

Bandy

In step **780**, the RF addressable sensor **110** communicates the digital sensor data to wireless sensor reader **140/340**. The details of this communication are dependent upon the protocol used for communication between the wireless sensor reader **140/340** and the RF addressable sensor **110**. In an embodiment of the present invention, the protocol used is a binary tree traversal protocol. In this embodiment, the tag identification number signaled by the RF addressable sensor **110** may include both the tag identification number stored in memory **246** and the sensor data obtained by the sensor elements. Alternatively, reader **140/340** may place the RFID

Ex. 1005, Bandy 16:41-51

Duncan Parking Step 1: The Petition Relied On Interrogation Of RFID Sensors In The Bandy Reference

Petition cited to Bandy's air interface protocol to anticipate [1j]: "wherein the RF addressable sensor communicates with a wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID. whereby said wireless device is coupled to at least one communications network linked to [a]t least one remote server"

Bandy

Wireless sensor reader **140** includes logic to interrogate the population of RF addressable sensors **102** and logic to read sensor data and RFID tag data transmitted by the RF addressable sensors **110**. In an embodiment, wireless sensor reader **140** also includes logic to process the received sensor data. Wireless sensor reader **140** can be any wireless device capable of communicating via an air interface protocol with the population of RF addressable sensors **102**. In embodiments of the present invention, wireless sensor reader **140** could be a wireless phone, a personal digital assistant (PDA), a computer having wireless communications capabilities, or other type of mobile, handheld, and/or computing device.

Ex. 1005, Bandy 5:6-18

Bandy

radio frequency (RF) transmissions. In an embodiment of the present invention, reader **140** and the population of sensors **102** communicate via a single protocol for both RFID tag communications and sensor communications. In an alternate embodiment, reader **140** and the population of sensors **102** communicate via a first protocol for RFID tag communications and via a second protocol for sensor communications. Examples of protocols used for RFID tag

Ex. 1005, Bandy 5:24-30

PO's Arguments Are Based On A Misunderstanding Of The Law

Patent Owner Sur-Reply

First, the '307 Patent does not claim a particular communication protocol, much less a binary tree traversal protocol. In fact, a binary tree traversal protocol—

* * *

mentioned in the '307 Patent. Thus, to the extent Dr. Bandy contributed a binary tree traversal protocol to the disclosure of the '803 patent, it is irrelevant to the claims of the '307 Patent. (Further, the binary tree traversal protocol was known in the art well

POSR 15

Duncan Parking Techs., Inc. v. IPS Grp., Inc.

Because the [challenged] patent claims clearly include elements previously disclosed in Figure 8, the question is whether Schwarz conceived those elements as they were disclosed in the [reference] patent. Cf. *In re Carreira*, 532 F.2d 1356, 1358– 59 (CCPA 1976) (holding that a reference patentees' declaration that they did not invent the claimed method is insufficient to remove the reference patent as § 102(e) prior art because "the declarants could be the inventors of the species disclosed in their patents, but at the same time never have conceived of the general or generic use [claimed in the patent at issue]").

***Duncan Parking Techs., Inc. v. IPS Grp., Inc.*, 914 F.3d 1347, 1357-59 (Fed. Cir. 2019)**

Duncan Parking Step 2: Dr. Bandy Contributed To Conception Of The Interrogation Protocol

Dr. Bandy Prior Artist Deposition

A. The other important technology I was involved in developing was our interrogation protocol.

Ex. 1030, Bandy Dep. 21:13-15

Dr. Bandy Prior Artist Deposition

Q. My question was whether that binary tree protocol was your contribution regarding –

A. Oh, yeah. Definitely.

Ex. 1030, Bandy Dep. 86:22-88:18

Dr. Bandy Prior Artist Deposition

Q. And you state that your contributions to the '803 patent related to specific nuanced features of enhancing RFID systems, namely, initialization of an RFID tag, as recited in Claims 65, 81, and 83. Do you see that?

A. Yeah.

Q. And a method of rapidly reading multiple tags. Do you see that?

A. Uh-huh. That's the singulation I've been explaining.

Ex. 1030, Bandy Dep. 72:21-73:8

Duncan Parking Step 2: Dr. Bandy Contributed To Conception Of The Interrogation Protocol

Dr. Peeters Inventor Deposition

Q. Now the sentence -- I'm getting to a point. The next sentence says, "In an embodiment of the present invention, the protocol used is a binary tree traversal protocol" and that's --

A. Yes.

Q. -- what you're referring to as Bandy's contribution; is that right?

A. That is one of the Bandy contributions, yes. One of the areas.

Ex. 1032, Peeters Dep. 45:12-20

Duncan Parking Step 2: Dr. Bandy Contributed To Conception Of The Interrogation Protocol

Dr. Bandy contributed to interrogation of RF-addressable sensors in Bandy

Bandy Claim 65

65. A method in a wireless sensor reader for obtaining sensor data from one or more radio frequency (RF) addressable sensors and for communicating the sensor data over a communications network, comprising:

(a) transmitting signals to the one or more RF addressable sensors wherein the signals initialize the one or more RF addressable sensors;

(b) interrogating the one or more RF addressable sensors to isolate an individual RF addressable sensor;

(c) receiving sensor data from the isolated RF addressable sensor;

(d) determining whether processing of the received sensor data is required;

(e) if it is determined in step (d) that no processing of the received sensor data is required, displaying the sensor data at the wireless sensor reader;

Ex. 1005, Bandy Claim 65

Dr. Bandy, Prior Artist Deposition

Q. Okay. So now we're looking at Claim 65 of the '803 patent. And I think, you know -- please correct me if I'm wrong. But it sounded like you were saying that your contributions related to the first two steps of the method. I know we were referring to Claim 81, but it seems similar to Claim 65.

A. Yeah.

Ex. 1030, Bandy Dep. 77:22-78:7

Duncan Parking Step 2: Dr. Bandy Contributed To Conception Of The Interrogation Protocol

Bandy Claim 65

65. A method in a wireless sensor reader for obtaining sensor data from one or more radio frequency (RF) addressable sensors and for communicating the sensor data over a communications network, comprising:

(a) transmitting signals to the one or more RF addressable sensors wherein the signals initialize the one or more RF addressable sensors;

(b) interrogating the one or more RF addressable sensors to isolate an individual RF addressable sensor;

(c) receiving sensor data from the isolated RF addressable sensor;

(d) determining whether processing of the received sensor data is required;

(e) if it is determined in step (d) that no processing of the received sensor data is required, displaying the sensor data at the wireless sensor reader;

Ex. 1005, Bandy Claim 65

Dr. Peeters Inventor Deposition

Q. Are you able to identify the portions of claim 65 that Bill Bandy contributed to?

* * *

A. . . . The word isolation could be Bill's contribution. The rest is an area that I had detailed knowledge on anyway.

* * *

Q. So the only portion of claim 65 that Dr. Bandy contributed to was the isolation portion of step B and nothing else?

A. I -- I -- I -- again, I don't recall 22 years ago exactly we sat down and wrote this thing together, if it was just written by Stern Kessler.

Ex. 1032, Peeters Dep. 51:6-52:3

Duncan Parking Step 2: Dr. Bandy Contributed To Conception Of The Interrogation Protocol

Bandy Claim 65

65. A method in a wireless sensor reader for obtaining sensor data from one or more radio frequency (RF) addressable sensors and for communicating the sensor data over a communications network, comprising:

(a) transmitting signals to the one or more RF addressable sensors wherein the signals initialize the one or more RF addressable sensors;

(b) interrogating the one or more RF addressable sensors to isolate an individual RF addressable sensor;

(c) receiving sensor data from the isolated RF addressable sensor;

(d) determining whether processing of the received sensor data is required;

(e) if it is determined in step (d) that no processing of the received sensor data is required, displaying the sensor data at the wireless sensor reader;

Ex. 1005, Bandy Claim 65

Dr. Peeters Inventor Declaration

18. Dr. Bandy's contributions to the '803 Patent related to specific features for enhancing RFID systems, namely initialization of an RFID tag (as recited in claims 65, 81, and 83 of the '803 Patent, as originally issued) and a method for rapidly reading multiple tags. As Dr. Bandy did not have any background in medical devices, biomarkers, or diagnostic sensors, he did not contribute to those aspects of the claims.

Ex. 2002, Peeters Decl. ¶ 18

PO's Assertion That The Binary Tree Interrogation Protocol Is "Unrelated to the Claims" Is Wrong

1. A radio frequency (RF) addressable diagnostic sensor unit comprising:

at least one sensor element;

at least one reference sensor element;

a unique identification ID number;

* * *

wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and

wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;

wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

Ex. 1001, '307 Patent Claim 1

(57) **ABSTRACT**

An integrated passive wireless chip diagnostic sensor system is described that can be interrogated remotely with a wireless device such as a modified cell phone incorporating multi-protocol RFID reader capabilities (such as the emerging Gen-2 standard) or Bluetooth, providing universal easy to use, low cost and immediate quantitative analyses, geolocation and sensor networking capabilities to users of the technology. The present invention can be integrated into various

Ex. 1001, '307 Patent Abstract

FIG. **22** shows an identification (ID) and software retrieval method that enables any RFID reader to read/interrogate any RFID tag.

Ex. 1001, '307 Patent 4:46-48

PO Ignores Evidence That Dr. Bandy Contributed To Bandy's Air Interface Protocol

Patent Owner Sur-Reply



or remote server." Petition, 23. Dr. Bandy's purported contribution to this limitation is an "air interface protocol." Reply, 20. Petitioner provides no evidence that Dr. Bandy contributed a generic "air interface protocol." As discussed above,

POSR 20

Dr. Bandy Prior Artist Deposition

Q. … The next sentence, "Wireless sensor reader 140 can be any wireless device capable of communicating via an air interface protocol with the population of RF addressable sensors." Do you see that?

A. Yeah.

Q. So is the binary tree traversal protocol an example of the air interface protocol that's referred to in that last sentence?

A. Uh-huh.

Q. Is that a yes?

A. Yeah. Yes.

Q. If we could go to --

A. It's our implementation of the air interface protocol.

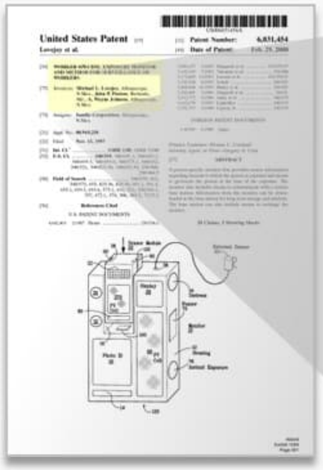
Ex. 1030, Bandy Dep. 87:17-88:9

PO's New Argument Based On Lovejoy Fails

Patent Owner Sur-Reply

Second, as demonstrated by the Lovejoy patent (on which Dr. Peeters, but not Dr. Bandy, is a named inventor), which pre-dates the filing of the application for the '803 patent by several years, and which is incorporated by reference in the '307 Patent, Dr. Peeters was already familiar with techniques for wireless interrogation of tags to identify a particular tag. *See* Ex. 1009, Fig. 5, 10:44-11:12 ("In this method,

POSR 16-17



WORKER-SPECIFIC EXPOSURE MONITOR AND METHOD FOR SURVEILLANCE OF WORKERS

Inventors: **Michael L. Lovejoy**, Albuquerque, N.Mex.; **John P. Peeters**, Bethesda, Md.; **A. Wayne Johnson**, Albuquerque, N.Mex.

Ex. 1009, Lovejoy

Dr. Peeters is one of three inventors on Lovejoy.

No evidence in the record that Dr. Peeters contributed to any disclosed wireless interrogation of tags.

Duncan Parking Step 3: Dr. Bandy's Contribution Is Significant And Renders Him A Joint Inventor

Inventor Dr. Peeters Email

William R. Bandy, Ph.D. 05/07/03
Michael R. Arneson
Founders
Matrics
8850 Stanford Boulevard, Suite 3000
Columbia, MD 21045

Dear Bill and Michael:

I thought a great deal yesterday about matching your RFID tag technology with our cell phone platform technology and the market applications are in fact much larger than we first realized. I am very excited by the prospects.

Ex. 2005, Peeters to Bandy 1

PATENT OUTLINE
Gentag – Matrics Technology

August 19, 2003

Contributors

Prior Art. AWID ?

Gentag patents
Matrics patents

Technologies provided by a cell phone:

- Geolocation
- Two way communication
- Battery / power
- Microprocessing and programming capabilities
- Unique ID
- Access to the Internet / remote data storage / remote data processing capabilities
- Ubiquitous technology

What is lacking ?

On phone sensing abilities (Gentag technology)
Remote sensor analysis capabilities (Gentag – Matrics)
Low cost power up and read capabilities for an RFID chip (Gentag – Matrics)

Technologies provided by an RFID chip:

- ID
- Storage
- Small Size / cost

What is currently lacking (Bill and Michael to complete)

- Sensing ability
- Continuous variable measurement (A/D converter)
- Programmable memory
- Temperature monitoring on chip
- Data processing capabilities
- Multiple sensor ports/ channels

Costs of the Technology:

Ex. 2006 2

Duncan Parking Step 3: Dr. Bandy's Contribution Is Significant And Renders Him A Joint Inventor

Dr. Bandy, Prior Artist Deposition

A. The other important technology I was involved in developing was our interrogation protocol. When you basically power up tags in the reader field, they'll power up, and the real issue is how do you singulate the tag you want to be interrogated.

Ex. 1030, Bandy Dep. 21:13-15

Dr. Sarrafzadeh Declaration

The binary tree traversal protocol appears to be the only interrogation protocol disclosed in Bandy, including in relation to step 780 of Figure 7A. Bandy 16:41-51 ("The details of this communication are dependent upon the protocol…. In an embodiment…, the protocol used is a binary tree traversal protocol."). Interrogation forms a specific step recited in claims 65, 81, and 83 of the Bandy reference, which both inventors stated Dr. Bandy contributed to. Ex. 2001 ¶ 8;

Ex. 1033, Sarrafzadeh Suppl. Decl. ¶ 22

Dr. Bandy's Declaration Is Not Reliable

Dr. Bandy Declaration

11. My contributions to the '803 Patent did not relate to the sensor features recited in claims 1, 2, 3, 5, 9, and 10 of the '307 Patent. Thus, to the extent that any of these features were disclosed in the '803 Patent, they were contributed by Dr. Peeters.

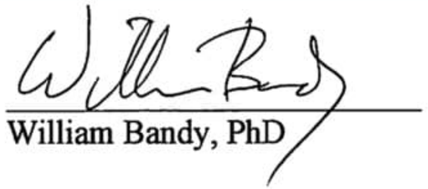
Ex. 2001, Bandy Decl. ¶11

Case No. IPR2024-00425

Patent No. 7,969,307 B2

DECLARATION OF WILLIAM BANDY, PHD

Executed on 3/12/24



William Bandy, PhD

Ex. 2001, Bandy Decl. 5

Dr. Bandy Deposition

Q. The case that we are here today for relates to U.S. Patent 7,969,307. Are you familiar with that?

A. No. Again, specifically, I did not review that particular patent. I did not read it.

Ex. 1030, Bandy Dep. 14:21-15:7

VIDEOTAPED DEPOSITION OF WILLIAM BANDY, Ph.D.

Conducted Virtually

Wednesday, December 18, 2024

7:04 A.M. PST

Ex. 1030, Bandy Dep. Cover Page

Dr. Bandy's Declaration Is Not Reliable

Dr. Bandy Declaration

5. On or about May 5, 2003, Professor John Melngailis of the University of Maryland introduced John Peeters to Michael Arneson and me. At that meeting, we discussed Matrics' RFID chip technology and Dr. Peeters explained his background on sensors, health, threat detection, and geolocation.

6. At the meeting, Dr. Peeters came up with the idea of incorporating an NFC reader into cell phones and then allowing these modified cell phones to read RFID sensors, creating NFC cell phone sensor networks. In light of Matrics' expertise in the nuances of RFID systems, we discussed working together to develop the technology for applications such as threat sensors and food safety. Dr. Peeters prepared the draft of the patent application, which I reviewed.

7. Shortly after the meeting in May 2003, Dr. Peeters came up with the idea that a wireless RFID sensor could be incorporated into a disposable diagnostic skin patch, which people could use to self-test themselves (e.g., they could use a disposable wireless glucose sensor read by a cell phone that would become a glucometer). That invention was part of a separate patent invented solely by Dr. Peeters, U.S. Patent No. 7,969,307 ("'307 Patent") (Ex. 1001). I did not contribute any details recited in the claims of the '307 Patent.

Ex. 2001, Bandy Decl. ¶¶ 5-7

Dr. Bandy Deposition

Q. Do you remember that meeting?

A. Vaguely. I knew John pretty well...

* * *

Q. Who reminded you about when you met John Peeters?

A. Well, I was reading -- oh, it wasn't reading his declaration. I'm trying to remember how we came up with this system. I think John and I talked about it, because John had called me and said that this case was happening and reminded me of the patent and asked me if I would basically testify on his behalf in terms of the details of how we generated the patent. And I think he must have reminded me when we had that meeting and how it all happened, which was good. I think that's how that came about.

Ex. 1030, Bandy Dep. 43:22-45:1

Issues

III. Grounds 1 and 2: The Bandy Grounds

1. Bandy is Prior Art

2. Bandy Renders Obvious the "Wireless Device Unique ID"

3. Bandy Renders Obvious the Authentication Limitation

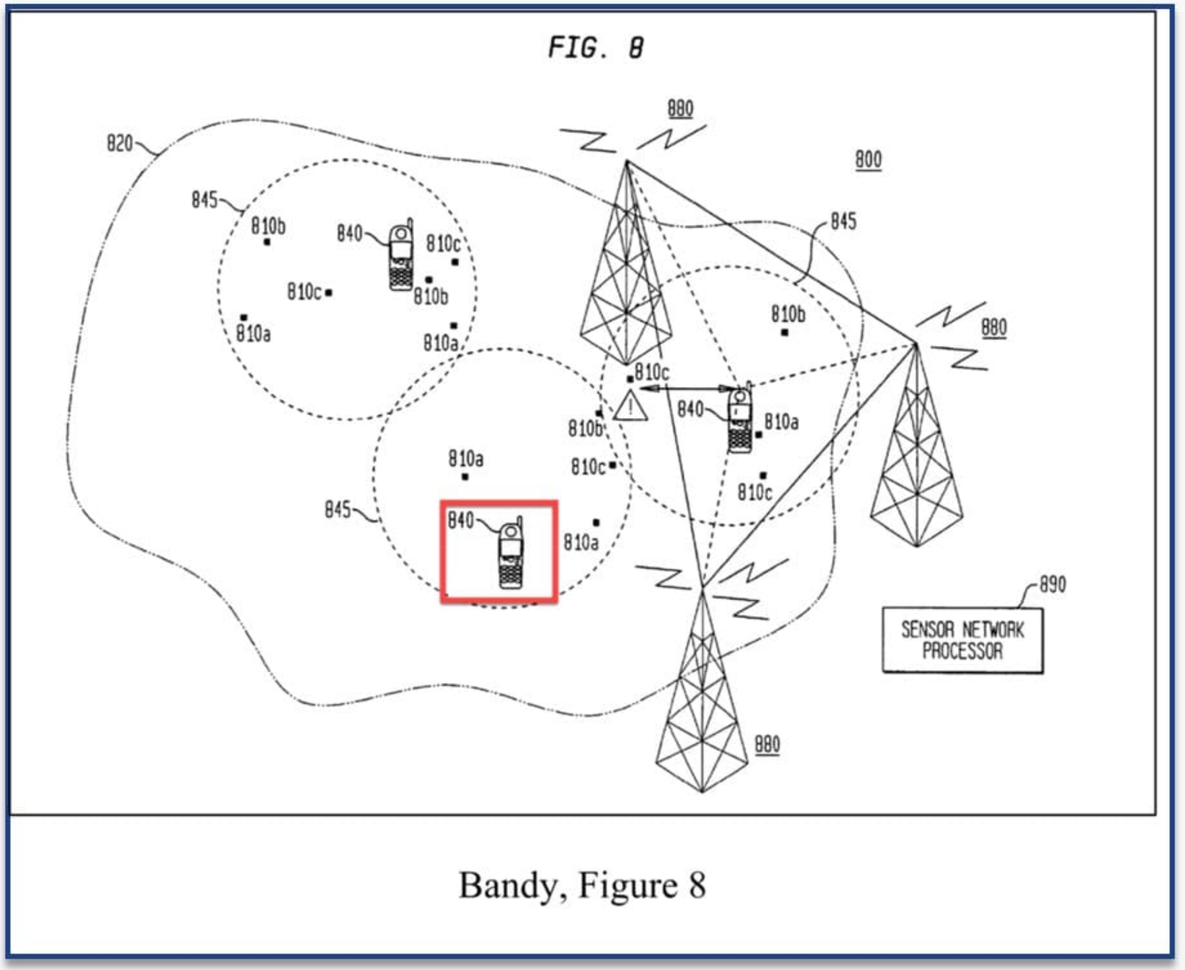
4. Claim 3 Is Obvious Over Bandy and Heller

Bandy Renders Obvious A Wireless Device "Unique ID"

Dr. Sarrafzadeh Declaration

185. A POSITA would recognize that wireless sensor readers such as wireless phones, PDAs, or computers having wireless communication capability, and that can communicate over wireless and data communication networks, such as the Internet, would have a unique ID such as an IP address, Media Access Control (MAC) address, and/or an International Mobile Equipment Identity (IMEI) number. Such identification numbers would allow the wireless sensor reader to uniquely identify itself for authentication to communication networks 170, 180 as well to sensor network processor 190. A MAC address is a unique identifier assigned to devices having network capability. Similarly, an IMEI number is a unique identifier assigned to wireless phones.

Ex. 1003, Sarrafzadeh Decl. ¶ 185



Bandy, Figure 8

Pet. 26 (citing Ex. 1005, Bandy Fig. 8 (annotated))

Bandy Renders Obvious A Wireless Device "Unique ID"

PATENT OUTLINE
Gentag – Matrics Technology

August 19, 2003

Contributors

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Matrics patents

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Technologies provided by an RFID chip:

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- Small Size / cost

What is currently lacking (Bill and Michael to complete)

- Sensing ability
- Continuous variable measurement (A/D converter)
- Programmable memory
- Temperature monitoring on chip
- Data processing capabilities
- Multiple sensor ports/ channels

Costs of the Technology:

Ex. 2006 2

Patent Owner's Expert, Dr. Warren

Q. So international RFID readers would necessarily have unique wireless IDs; is that your testimony?

* * *

A. RFID readers and tags compatible with international standards would inherently incorporate unique identification numbers.

Ex. 1031, Warren Dep. 31:16-32:1

Issues

III. Grounds 1 and 2: The Bandy Grounds

1. Bandy is Prior Art

2. Bandy Renders Obvious the "Wireless Device Unique ID"

3. Bandy Renders Obvious the Authentication Limitation

4. Claim 3 Is Obvious Over Bandy and Heller

Petition Established An Association Between Identifiers

Patent Owner's Response Brief

Assuming, *arguendo*, that a POSITA would have understood Bandy to disclose a wireless device with a unique identifier, Petitioner has failed to assert any association between that identifier and the unique identifier of a sensor. Warren ¶95.

POR 30

Petition for IPR

analyze the sensor is retrieved from processor 190." Bandy at 10:29-32. "[W]hen a sensor 110 having data table 258 is activated by wireless sensor reader 140, the sensor 110 identifies itself (e.g., by providing its identification number) and provides the cell phone reader with the necessary information for analyzing the sensor output." *Id.* at 10:19-24. "Software may also be downloaded directly and transparently into the cell phone or reader 140 to 'train' the wireless device to recognize and analyze that given type of RFID sensor." *Id.* at 10:14-51.

Pet. 30

Dr. Sarrafzadeh Declaration

above, this is not true. Dr. Warren seems to imply that the "associated" portion of the claim requires more than what's recited in the claim itself. I disagree. The claim recites a "wireless device having… a unique ID" and "the wireless device communicates with the RF addressable sensor interface to obtain the [sensor] ID." This step of obtaining the sensor ID associates the IDs. Notably, there is no explicit "associating" step in the claim or anywhere else in the '307 patent. Thus,

Ex. 1033, Sarrafzadeh Suppl. Decl. ¶ 51

Bandy Renders Obvious The "Unique Sensor ID Associated With Said Unique Wireless Device ID"

Bandy

described herein. In an embodiment, when a sensor **110** having data table **258** is activated by wireless sensor reader **140**, the sensor **110** identifies itself (e.g., by providing its identification number) and provides the cell phone reader with the necessary information for analyzing the sensor output. In an embodiment, sensor data table **258** also includes sensor handling information that is communicated to reader **140**. For example, if sensor **110** is to detect a specific allergen in food, a complete step-by-step testing protocol can be provided and can be displayed directly on the screen of the phone or reader device **140**. In another embodiment, some or all of the necessary information to handle and analyze the sensor is retrieved from processor **190**.

Software may also be downloaded directly and transparently into the cell phone or reader **140** to "train" the wireless device to recognize and analyze that given type of RFID-sensor. This information may be stored permanently or temporarily in wireless device **140**. When the necessary processing and analysis information is downloaded from a remote location, only the ID of the RFID-sensor is necessary, providing a highly streamlined solution for universal sensor analyses for wireless devices such as cell phones. In

Ex. 1005, Bandy 10:18-41

Bandy Renders Obvious The "Unique Sensor ID Associated With Said Unique Wireless Device ID"

Patent Owner's Expert, Dr. Warren

A. [A] Bluetooth-enabled device, a cell device -- that wireless reader would inherently incorporate a unique ID that must then be associated with the unique sensor ID in order for this -- for these teachings to be implemented properly.

Ex. 1031, Warren Dep. 51:2-18

Uber Techs., Inc. v. X One, Inc.

The specification of the '593 patent is entirely silent on how to transmit user locations and maps from a server to a user's mobile device, suggesting that a person of ordinary skill in the art was more than capable of selecting between the known methods of accomplishing this.

Uber Techs., Inc. v. X One, Inc., 957 F.3d 1334, 1339 (Fed. Cir. 2020)

Issues

III. Grounds 1 and 2: The Bandy Grounds

1. Bandy is Prior Art

2. Bandy Renders Obvious the "Wireless Device Unique ID"

3. Bandy Renders Obvious the Authentication Limitation

4. Claim 3 Is Obvious Over Bandy and Heller

Claim 3 is Obvious In View Of Bandy And Heller

Claim 3: "The system according to claim 1 wherein said sensor unit is integrated into a disposable wireless skin patch for diagnostic applications."

Bandy

The remote monitoring application can have residential, industrial, commercial, security or medical institution applications. In an embodiment of the present invention, smart card or badge **1103** is affixed to a person (or animal) such that the sensor elements of the RF addressable sensor are proximate to the surface of the skin. RF addressable sensor **1110** may include low power sensors to monitor certain conditions or characteristics such as the individual's vital functions. The smart card or badge **1103** is placed within the

Ex. 1005, Bandy 20:1-9

Heller

In another embodiment, a coupled mounting unit 77 and housing 45 of an on-skin sensor control unit 44 is provided on an adhesive patch 204 with an optional cover 206 to protect and/or confine the housing 45 of the on-skin sensor control unit 44, as illustrated in Figure 28A. The optional cover may contain an adhesive or

Ex. 1016, Heller 54:29-32

Dispute:

Would POSITAs have combined Bandy and Heller where both teach sensors proximate to the surface of the skin?

POSITAs Would Have Combined Bandy And Heller

Dr. Sarrafzadeh Declaration

29. Dr. Warren asserts that "Petitioner fails to demonstrate that a POSITA would have been motivated to use Heller's implantable sensors in Bandy's unrelated system directed to external cards or badges." Ex. 2009 ¶ 103. I disagree that Bandy's system is "unrelated" or the implication that "external cards or badges" prevents or teaches away from combination with Heller's adhesive patch. For example, Bandy discloses that its "RF addressable sensor 1110 may include low power sensors to monitor certain conditions or characteristics such as the *individual's vital functions*." Bandy 20:6-9. Bandy even explicitly contemplates "medical institution application[s]" where a patient's vital function data would be collected. Bandy 20:16-21. Heller's solutions for affixing sensors (which collect patient vital function data) to the skin of patients is perfectly compatible with Bandy, which expresses the goal of affixing sensors to a body to collect vital function data.

Ex. 1033, Sarrafzadeh Suppl. Decl. ¶ 29

Issues

I. The '307 Patent

II. Claim Construction

III. Grounds 1 and 2: The Bandy Grounds

IV. Ground 3: Beck, Heller, and Lovejoy

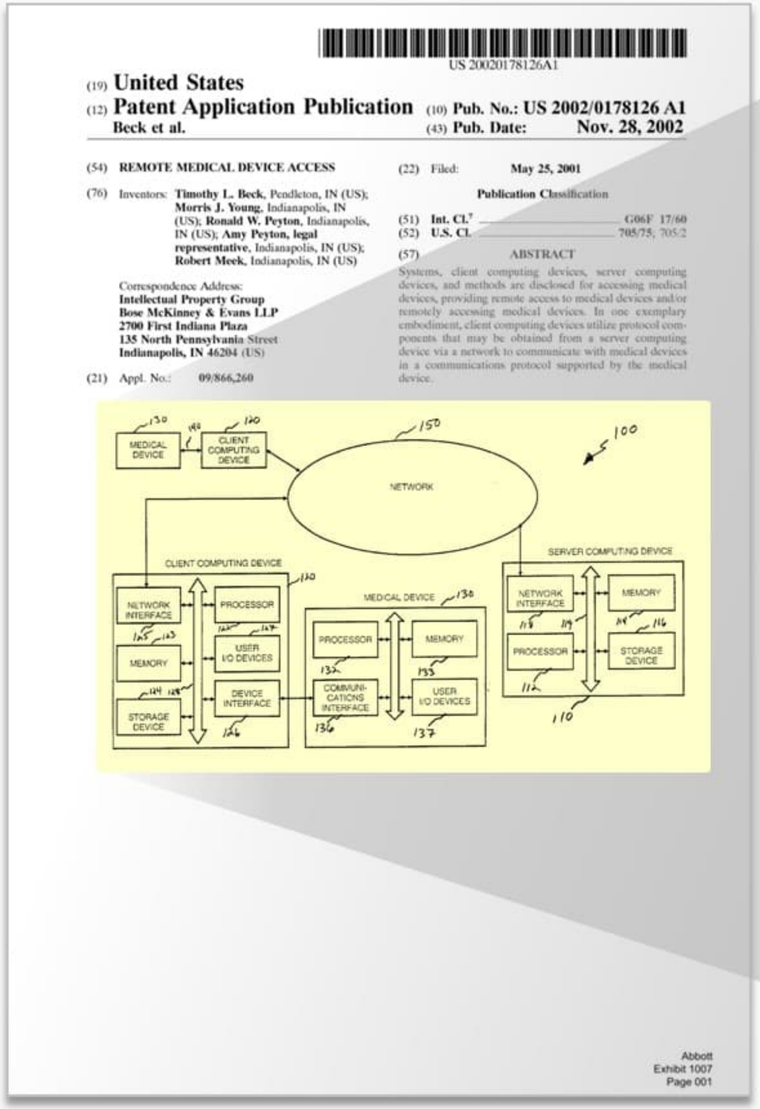
Issues

IV. Ground 3: Beck, Heller, and Lovejoy

1. POSITAs Would Have Combined Beck, Heller, and Lovejoy
2. Unique Identification ID Number Was Obvious
3. Wireless Device Unique ID Was Obvious
4. Authentication Limitation Was Obvious
5. Geolocation Was Obvious
6. Analog/Digital Converter Was Obvious

Beck and Heller

Beck Teaches A Medical Sensing System



US 20020178126A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0178126 A1**

Beck et al. (43) **Pub. Date: Nov. 28, 2002**

(54) **REMOTE MEDICAL DEVICE ACCESS**

(76) Inventors: **Timothy L. Beck**, Pendleton, IN (US); **Morris J. Young**, Indianapolis, IN (US); **Ronald W. Peyton**, Indianapolis, IN (US); **Amy Peyton, legal representative**, Indianapolis, IN (US); **Robert Meek**, Indianapolis, IN (US)

Correspondence Address:
Intellectual Property Group
Bose McKinney & Evans LLP
2700 First Indiana Plaza
135 North Pennsylvania Street
Indianapolis, IN 46204 (US)

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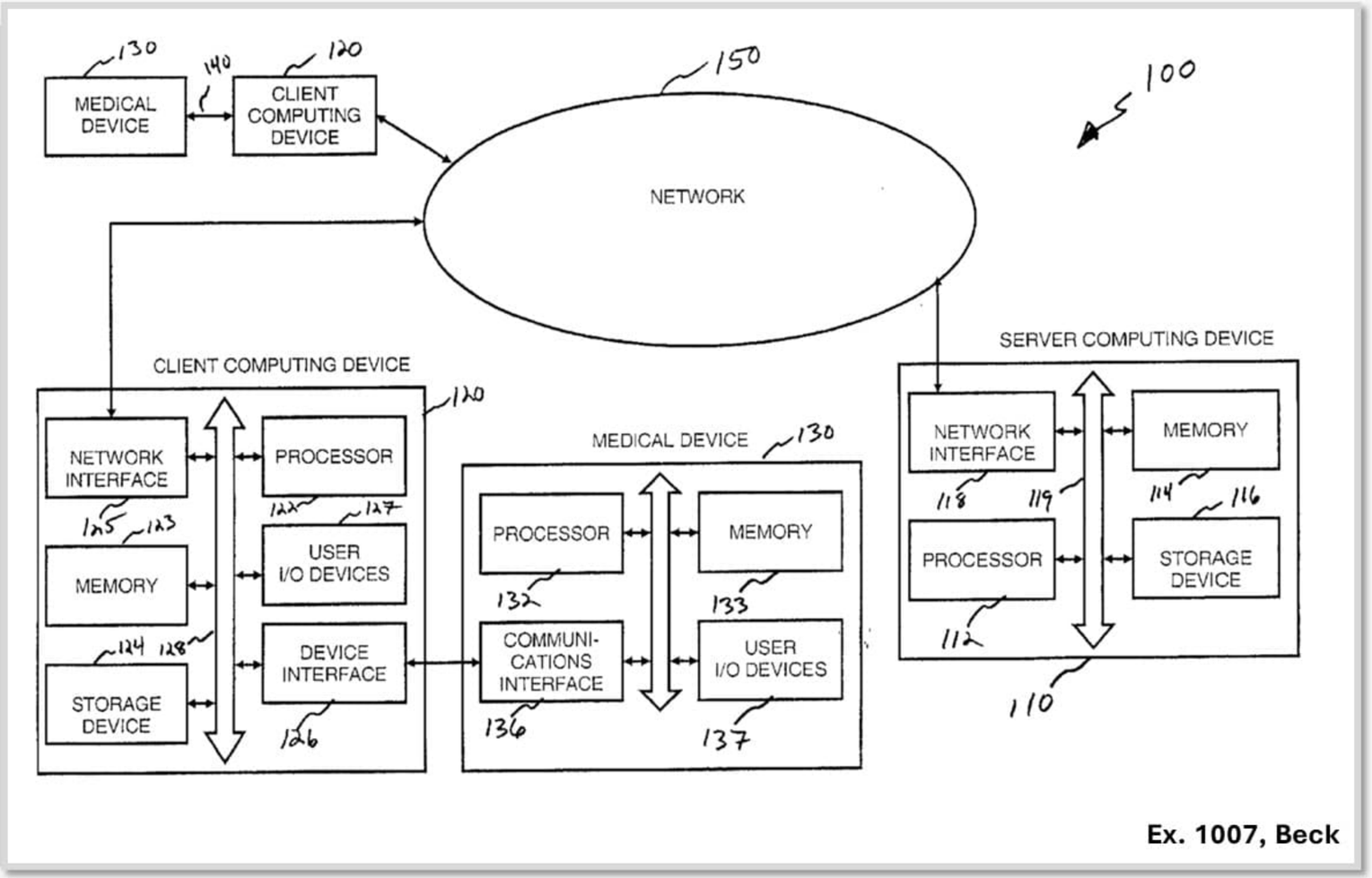
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(52) **U.S. Cl.** 705/75; 705/2

(57) **ABSTRACT**

Systems, client computing devices, server computing devices, and methods are disclosed for accessing medical devices, providing remote access to medical devices and/or remotely accessing medical devices. In one exemplary embodiment, client computing devices utilize protocol components that may be obtained from a server computing device via a network to communicate with medical devices in a communications protocol supported by the medical device.

Abbott
Exhibit 1007
Page 001



Ex. 1007, Beck

Beck's Medical Devices Are Diagnostic Sensing Systems

Beck

[0034] As shown, the system **100** further includes a medical device **130**. The medical device **130** of the system **100** is generally operable to monitor one or more biological/physiological conditions and communicate with the client computing device **120** via the physical communications link **140** established between the client computing device **120** and the medical device **130**. In an exemplary embodiment, the medical device **130** includes a glucose meter such as the glucose meters manufactured by Roche Diagnostics Corporation which are generally operable to measure blood glucose levels of blood applied to test strips. While the medical device **130** of the exemplary embodiment includes a glucose meter, the medical device **130** could be implemented to monitor and/or analyze other biological/physiological parameters or conditions such as body fluids or bodily functions (e.g. blood, urine, saliva), bodily signals (e.g. electrocardio-signals, brain waves, blood pressure waves), and/or other bodily stimuli (e.g. respiration) to obtain measurements of blood pressure, blood gases, blood coagulation, electrolytes, cardiovascular activity, drug levels, respiration rate, stress, etc.

Ex. 1007, Beck [0034]

Like Beck, Heller Also Teaches Medical Sensing Systems

Heller

The present invention is applicable to an analyte monitoring system using an implantable sensor for the *in vivo* determination of a concentration of an analyte, such as glucose or lactate, in a fluid. The sensor can be, for example, subcutaneously implanted in a patient for the continuous or periodic monitoring an analyte in a patient's interstitial fluid. This can then be used to infer the glucose level in the

Ex. 1016, Heller 9:12-16

Heller Teaches Implementation Details for Beck's System

Heller

(54) Title: ANALYTE MONITORING DEVICE AND METHODS OF USE

(57) Abstract: An analyte monitor includes a sensor, a sensor control unit, and a display unit. The sensor has, for example, a substrate, a recessed chanel formed in the substrate, and conductive material disposed in the recessed channel to form a working electrode. The sensor control unit typically has a housing adapted for placement on skin and is adapted to receive a portion of an electrochemical sensor. The sensor control unit also includes two or more conductive contacts disposed on the housing and configured for coupling to two or more contact pads on the sensor. A transmitter is disposed in the housing and coupled to the plurality of conductive contacts for transmitting data obtained using the sensor. The display unit has a receiver for receiving data transmitted by the transmitter of the sensor control unit and a display coupled to the receiver for displaying an indication of a level os an analyte. The enalyte monitor may also be part of a drug delivery system to alter the level of the analyte based on the data obtained using the sensor.

Ex. 1016, Heller, Abstract

A sensing layer 64 (see Figures 3A and 3B) is often formed proximate to or on at least one of the working electrodes 58 to facilitate the electrochemical detection of the analyte and the determination of its level in the sample fluid, particularly if the analyte can not be electrolyzed at a desired rate and/or with a desired specificity on a bare electrode. The sensing layer 64 may include an electron

Ex. 1016, Heller 12:31-13:2

Heller

S_1. In some embodiments of the invention, processing circuit 109 is designed to account for this relationship by using the temperature information from measurement circuit 96 to adjust a known profile for a given temperature in a known manner when the sensed temperature varies from the aforementioned given temperature. For example, in one embodiment, processing circuit 109 comprises a

Ex. 1016, Heller 67:32-68:4

One embodiment of the analyte monitoring system 40 for use with an implantable sensor 42, and particularly for use with a subcutaneously implantable sensor, is illustrated in block diagram form in Figure 1. The analyte monitoring system 40 includes, at minimum, a sensor 42, a portion of which is configured for implantation (e.g., subcutaneous, venous, or arterial implantation) into a patient, and a sensor control unit 44. The sensor 42 is coupled to the sensor control unit 44 which is typically attached to the skin of a patient. The sensor control unit 44

Ex. 1016, Heller 11:24-28

POSITAs Would Have Used Heller's Techniques To Improve Beck

Institution Decision

record, the improvements Petitioner asserts are supported by its declarant and are rational: improving sensor readings using a reference sensor provides better information for medical determinations (Pet. 44, 50–51; Ex. 1003 ¶¶ 233, 267), using a substrate to affix a sensor to a person and maintain the physical integrity of the sensor elements avoids damage during use (Pet. 55; Ex. 1003 ¶ 289), and using inductive coupling eliminates electrical contacts, which reduces noise and allows for water resistance (Pet. 57; Ex. 1003 ¶ 297). Petitioner also sufficiently shows that a POSITA would have been motivated to incorporate the sensor implementation details described in Heller, e.g., an A/D converter and patient attachment systems (Pet. 44–45, 53, 55; Ex. 1003 ¶¶ 228, 234, 236–238, 259, 267, 278, 288), because doing so combines familiar elements according to known methods which do no more than yield predictable results, e.g., converting signals or attaching a sensor to a patient. *See KSR*, 550 U.S. at 401 ("[A] combination

ID 18

POSITAs Would Have Used Heller's Techniques To Improve Beck

POSITAs would have used Heller's substrate to provide structure, facilitate affixing the sensor to a person, and prevent damage to the sensor

Heller

(54) Title: ANALYTE MONITORING DEVICE AND METHODS OF USE

(57) Abstract: An analyte monitor includes a sensor, a sensor control unit, and a display unit. The sensor has, for example, a substrate, a recessed chanel formed in the substrate, and conductive material disposed in the recessed channel to form a working electrode. The sensor control unit typically has a housing adapted for placement on skin and is adapted to receive a portion of an electrochemical sensor. The sensor control unit also includes two or more conductive contacts disposed on the housing and configured for coupling to two or more contact pads on the sensor. A transmitter is disposed in the housing and coupled to the plurality of conductive contacts for transmitting data obtained using the sensor. The display unit has a receiver for receiving data transmitted by the transmitter of the sensor control unit and a display coupled to the receiver for displaying an indication of a level os an analyte. The enalyte monitor may also be part of a drug delivery system to alter the level of the analyte based on the data obtained using the sensor.

Ex. 1016, Heller Abstract

Dr. Sarrafzadeh Declaration

288. Placing sensor circuitry such as electrodes and temperature probes on a substrate was a conventional, well-known method of implementing diagnostic sensor circuitry like that which would be found in sensors in Beck's medical devices. *See* Heller at 13:18-16:15. In addition, placing sensor elements on substrates also provides structure, for example, for affixing the sensor to a person, connecting to an analyte monitor, and preventing damage to the sensor / reference sensor elements. *See* Heller at 13:18-16:15

Ex. 1003, Sarrafzadeh Decl. ¶ 288

POSITAs Would Have Used Heller's Techniques To Improve Beck

POSITAs would have used Heller's reference sensors to provide better information for medical determinations

Heller

S_1. In some embodiments of the invention, processing circuit 109 is designed to account for this relationship by using the temperature information from measurement circuit 96 to adjust a known profile for a given temperature in a known manner when the sensed temperature varies from the aforementioned given temperature. For example, in one embodiment, processing circuit 109 comprises a

Ex. 1016, Heller 67:32-68:4

Dr. Sarrafzadeh Declaration

267. A POSITA would have been motivated to incorporate Heller's reference sensor—such as Heller's temperature sensor—into the medical devices disclosed by Beck—e.g., for monitoring glucose—to account for the effect of varying temperature on its glucose sensor and improve the accuracy of the glucose sensor. Such a combination represents use of a known technique (incorporation of a temperature sensor and implementation of temperature-based adjustments) to improve similar devices (Beck's medical device) in the same way.

Ex. 1003, Sarrafzadeh Decl. ¶ 267

POSITAs Would Have Used Heller's Techniques To Improve Beck

POSITAs would have modified Beck to incorporate Heller's inductive coupling for transmission of power and data to reduce noise and failure

Heller

antennas and/or transmission of the signal via a transmitter on the sensor. The use of inductive coupling can eliminate electrical contacts between the sensor and the on-skin sensor control unit. Such contacts are commonly a source of noise and failure. Moreover, the sensor control unit may then be entirely sealed which may increase the waterproofing of the on-skin sensor control unit.

Ex. 1016, Heller 59:23-27

Dr. Sarrafzadeh Declaration

POSITA would have been motivated to modify Beck's medical device to incorporate inductive coupling for transmission of power and data between one or more components, to eliminate the need for electrical contacts between the medical device and sensor. A POSITA would have been motivated to do so to reduce noise and failure, which Heller points out are commonly caused by electrical contacts and to completely seal the medical device to make it more waterproof. A POSITA

Ex. 1003, Sarrafzadeh Decl. ¶ 297

Beck Is Not Limited To A "Controlled Clinical Setting"

Patent Owner's Response Brief

Beck merely discloses an aggregation of pre-designed, off-the-shelf medical devices for use in a hospital setting (i.e., non-ambulatory devices). Ex-1007 ¶34.

POR 39

Beck

[0002] Patients commonly use medical devices to monitor various biological and/or physiological conditions. For example, patients with diabetes often utilize a blood glucose meter to monitor their blood glucose levels periodically. However, medical devices are also used for monitoring and/or analyzing biological/physiological parameters or conditions such as body fluids or bodily functions (e.g. blood, urine, saliva), bodily signals (e.g. electrocardio-signals, brain waves, blood pressure waves), and/or other bodily stimuli (e.g. respiration) to obtain measurements of blood pressure, blood gases, blood coagulation, electrolytes, cardiovascular activity, drug levels, respiration rate, stress, etc. These medical devices often store measurement data which may be retrieved, archived, and/or analyzed. Physicians, nurses, technicians, and patients typically find such measurement data useful in assessing the patient's health, in assessing the effectiveness of medications and other treatments, and in adjusting a patient's current treatment regime to obtain better health for the patient.

Ex. 1007, Beck [0002]

Beck

[0052] The user interface **210** of the client computing device **120** is generally operable to provide a user (e.g. a patient, nurse, physician, etc.) with a mechanism for controlling operation of the system **100** in regard to the client computing device **120** and the medical device **130**. More specifically, the user interface **210** of the exemplary embodiment is operable to display HTML (hyper-text markup language) documents and HTML forms. However, the user interface **210** could display information in other formats such RTF, PDF, and ASCII Text or other markup language formats such as SGML, XML, Tex, and/or LaTeX.

Ex. 1007, Beck [0052]

PO's Expert Agrees Beck Is Not Limited To A Hospital Setting

PO Expert, Dr. Warren Deposition

Q. So, yes or no, are Beck's medical devices limited to a hospital setting?

* * *

A. No, but that's what the spec teaches.

Ex. 1031, Warren Dep. 68:22-69:4

Patent Owner Mischaracterizes Beck's Disclosure

Patent Owner's Description of Beck	Beck's Actual Disclosure
In addition, Beck describes a networked, wired medical system and makes no reference to RFID (or any other wireless protocol or standard). Warren ¶106. In particular, Beck states "a standard RS-232 serial port" would be used to connect the medical device to the client computing device. Ex-1007 ¶29. The RS-232 standard **POR at 36**	via an appropriate cable or connector. The device interface **126** may alternatively, or in addition, include wireless technologies such as RF and/or IR transmitter/receivers to establish the physical communications link **140** between the client computing device **120** and the medical device **130**. **Beck [0030]**
computing device. Importantly, Beck does not disclose that a client computing device connected to the medical device is mobile, nor does Beck disclose that a medical device is itself mobile. While Beck discloses, in passing, wireless **POR at 43**	123 and the storage device 124. Many special purpose computing devices such as handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones which could be used to implement the client computing device **120** are implemented in such a manner. **Beck [0027]**
Beck merely discloses an aggregation of pre-designed, off-the-shelf medical devices for use in a hospital setting (i.e., non-ambulatory devices). Ex-1007 ¶34. **POR at 39**	[**0002**] Patients commonly use medical devices to monitor various biological and/or physiological conditions. For example, patients with diabetes often utilize a blood glucose meter to monitor their blood glucose levels periodically. **Beck [0002]**

Heller Motivates Combination With, Not Teaches Away From, Beck

Patent Owner's Response Brief

nnection to a bulky device in a hospital setting. *Id.* ¶111. Heller, however, disparages—and therefore explicitly teaches away from—"large, bulky, and/or inflexible" devices. Ex-1016, 2:4-6. The entire purpose of Heller was to provide a

POR 39

Heller

numbers. In addition, these devices are typically large, bulky, and/or inflexible, and many can not be used effectively outside of a controlled medical facility, such as a hospital or a doctor's office, unless the patient is restricted in his activities.

* * *

such as glucose. There is a need for a small, comfortable device which can continuously monitor the level of an analyte, such as glucose, while still permitting the patient to engage in normal activities. Continuous and/or automatic monitoring

Ex. 1016, Heller 2:4-6, 2:19-21

Dr. Sarrafzadeh Declaration

¶ 234. Heller's discussion of "large, bulky, and/or inflexible" devices relates to "devices [that] use electrochemical sensors which are directly implanted into a blood vessel or in the subcutaneous tissue of a patient," and Heller specifically motivates its own solution to such devices. Heller 1:30-2:6. Thus, Heller further motivates its application to Beck with disclosure of "a small, compact device that can operate the sensor and provide signals to an analyzer without substantially restricting the movements and activities of a patient." Heller 2:13-15; *see also*

Ex. 1033, Sarrafzadeh Suppl. Decl. ¶ 33

Beck's Medical Device Is A "Sensor Unit"

Patent Owner's Response Brief

Specifically, a POSITA at the relevant time would not have been motivated to combine the teachings of Beck—which discloses a system concerned with communication between medical devices, not sensors—with the sensor technology disclosed in Heller. Moreover, even if you somehow combined the medical devices

POR 2

The '307 Patent

1. A radio frequency (RF) addressable diagnostic sensor unit comprising:
at least one sensor element;
at least one reference sensor element;
a unique identification ID number;
a sensor interface having an analog to digital converter coupled to the at least one sensor and reference sensor element;
at least one antenna;
a substrate;
an RF power and communication interface coupled to the at least one antenna and sensor interface;
a controller coupled to the RF power and communications interface and the sensor interface; and
a memory coupled to the controller and the sensor interface;

Ex. 1001, '307 Patent Claim 1

Beck

cose levels of blood applied to test strips. While the medical device **130** of the exemplary embodiment includes a glucose meter, the medical device **130** could be implemented to monitor and/or analyze other biological/physiological parameters or conditions such as body fluids or bodily functions (e.g. blood, urine, saliva), bodily signals (e.g. electrocardio-signals, brain waves, blood pressure waves), and/or other bodily stimuli (e.g. respiration) to obtain measurements of blood pressure, blood gases, blood coagulation, electrolytes, cardiovascular activity, drug levels, respiration rate, stress, etc.

Ex. 1007, Beck [0034]

PO's Physical Combinability Arguments Are "Basically Irrelevant"

Patent Owner's Response Brief

as having unique identifiers. Warren ¶112. A POSITA would understand that Heller's "sensor control unit" or "on-skin sensor unit" would have been incompatible with the glucose meter disclosed by Beck, which uses test strips. *Id.*.

POR 40

In re Etter

Etter's assertions that Azure cannot be incorporated in Ambrosio are ***basically irrelevant***, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.

In re Etter, **756 F.2d 852, 859 (Fed. Cir. 1985) (en banc) (emphasis added)**

POSITAs Would Have Modified Assembled, Commercially Available Products

Patent Owner's Response Brief

Rather, a POSITA would have been interested in utilizing the teachings in Beck to implement multi-device systems comprised of already assembled, commercially available products. *Id.* A POSITA would not have been motivated to use the unrelated implantable sensor disclosed by Heller with the system of Beck.

POR 41-42

PO Expert, Dr. Warren Deposition

Q. Is it your opinion that a POSITA would never modify an off-the-shelf product?

A. It's not my opinion they would never modify an off-the-shelf product.

Ex. 1031, Warren Dep. 70:12-16

Beck and Lovejoy

POSITAs Would Have Improved Beck's Device Using Lovejoy

Beck

[0027] The exemplary client computing device **120** may alternatively be implemented such that the same hardware components that implement the memory **123** also implement the storage device **124**. For example, the exemplary client computing device **120** may be implemented with memory chips that implement both the functionality of the memory **123** and the storage device **124**. Many special purpose computing devices such as handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones which could be used to implement the client computing device **120** are implemented in such a manner.

Ex. 1007, Beck [0027]

Lovejoy

the personal monitor system of this invention. The personal monitor itself has several subsystems, including the monitor housing with its various controls and input/output links, the individualized sensors that plug into the monitor housing, geolocating capabilities (GPS or the radar-responsive tags), and the on-board computing capabilities of the monitor. The

Ex. 1009, Lovejoy 4:32-37

Dr. Sarrafzadeh Declaration

242. Given that Beck's client computing device can be implemented as a portable handheld computing device such as a cellular phone and that its system is intended for use in monitoring various biological/physiological parameters and conditions of patients, a POSITA would have been motivated to include geolocation functionality in Beck's system, for example, in its client computing device. Geolocation functionality would provide the ability to dispatch aid to a user in the event that Beck's system determines that a user's monitored biological/physiological parameters are at dangerous or life-threatening levels. Location information can provide vital information about an individual to allow timely responses. For example, it can help in identifying the location of an individual in case of emergency.

Ex. 1003, Sarrafzadeh Decl. ¶ 242

Beck, Like Lovejoy, Teaches Mobile Sensing Systems

Patent Owner's Response Brief

(P[illegible]). Beck does not, however, disclose a mobile sensing system. Instead, Beck discloses only remote access to medical devices, which is not equivalent to either mobile access to sensors or access to mobile sensors. Warren ¶124. Beck achieves

POR 42

computing device. Importantly, Beck does not disclose that a client computing device connected to the medical device is mobile, nor does Beck disclose that a medical device is itself mobile. While Beck discloses, in passing, wireless

POR 43

Beck

[0027] The exemplary client computing device **120** may alternatively be implemented such that the same hardware components that implement the memory **123** also implement the storage device **124**. For example, the exemplary client computing device **120** may be implemented with memory chips that implement both the functionality of the memory **123** and the storage device **124**. Many special purpose computing devices such as handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones which could be used to implement the client computing device **120** are implemented in such a manner.

Ex. 1007, Beck [0027]

Beck

and operating system combinations.) In other words, the server computing device **110** may be efficiently implemented to supported a wide range of client computing devices **110** (e.g. computer systems using the McIntosh, Windows, and/or Linux operating systems, Palm Pilots, Handspring Visors, Internet enabled cellular phones, etc.).

Ex. 1007, Beck [0027]

Lovejoy's Teachings Are Relevant To The Claimed Wireless Device

Patent Owner's Response Brief

badge. *Id.* ¶129. Thus, Lovejoy's location capabilities are completely unrelated to the geolocation limitations recited in the '307 Patent, which are directed to the *remote wireless device*, not to a badge or sensor element. *Id.* (citing Ex-1009, 2:15-

POR 45

Institution Decision

unavailing at this stage. First, Patent Owner argues that "the fact that Lovejoy discloses geolocation of the 'monitor' (i.e., sensor unit) is irrelevant to teaching geolocation of any wireless device reading the monitor." *Id.* at 32. On this record, we disagree. Even if Lovejoy's monitor is more akin to the recited "diagnostic sensor" than to the claimed "wireless device," that does not mean that Lovejoy's teachings are "irrelevant" to the wireless device. Moreover, Petitioner has sufficiently explained why a POSITA would have been motivated to combine Beck and Lovejoy in the manner Petitioner proposes.

ID 21

The '307 Patent Relies On Lovejoy For Its Geolocation Capabilities

'307 Patent

less device 2 via a wireless link 480. The microprocessor and RFID reader within wireless device **2** enable processing functions **500**, which include reading, analysis and geolocation by a global positioning system (GPS) or a non-GPS means. The reading, analysis and geolocation by GPS or non-GPS means is described in U.S. Pat. No. 6,031,454 that is included herein by reference in its entirety. Wireless device 2 can communi-

Ex. 1001, '307 Patent 17:18-24

US006031454A

United States Patent [19]
Lovejoy et al.

[11] **Patent Number: 6,031,454**
[45] **Date of Patent: Feb. 29, 2000**

[54] **WORKER-SPECIFIC EXPOSURE MONITOR AND METHOD FOR SURVEILLANCE OF WORKERS**

[75] Inventors: **Michael L. Lovejoy**, Albuquerque, N.Mex.; **John P. Peeters**, Bethesda, Md.; **A. Wayne Johnson**, Albuquerque, N.Mex.

[73] Assignee: **Sandia Corporation**, Albuquerque, N.Mex.

[21] Appl. No.: **08/969,258**

[22] Filed: **Nov. 13, 1997**

[51] **Int. Cl.**[7] **G08B 1/08**; G08B 23/00

[52] **U.S. Cl.** **340/539**; 340/691.1; 340/693.1; 340/693.5; 340/693.6; 340/573.1; 340/632; 340/521; 340/825.36; 340/825.49; 250/388; 250/484.5

[58] **Field of Search** 340/539, 691, 340/573, 693, 825.36, 825.49, 691.1, 691.4, 693.1, 693.5, 693.6, 573.1, 632, 521; 250/336.1, 337, 472.1, 374, 388, 484.5; 73/23.2

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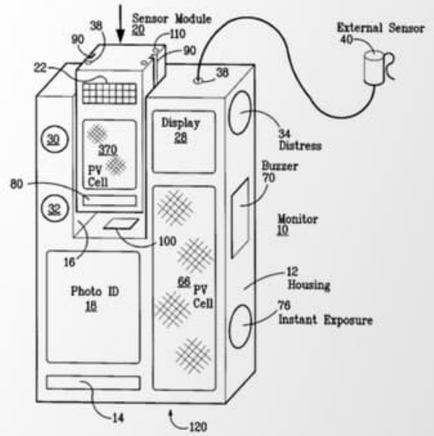
1-45595 6/1989 Japan .

Primary Examiner—Donnie L. Crosland
Attorney, Agent, or Firm—Gregory A. Cone

[57] **ABSTRACT**

A person-specific monitor that provides sensor information regarding hazards to which the person is exposed and means to geolocate the person at the time of the exposure. The monitor also includes means to communicate with a remote base station. Information from the monitor can be downloaded at the base station for long term storage and analysis. The base station can also include means to recharge the monitor.

20 Claims, 5 Drawing Sheets



Abbott
Exhibit 1009
Page 001

Beck's Medical Device and Client Computing Device Can Be Co-Located

Patent Owner's Response Brief

Thus, the location of the client computing device (i.e., where the medical professional is reading the output of the medical device) is irrelevant to sending an emergency response to the location of the medical device (i.e., where the patient is located). *Id.* Hospitals rely on their own networks, IT systems, and record-

POR 47

Institution Decision

Further, Patent Owner's argument that the combination "contravenes" Beck because Beck does not suggest its "medical device and the (purportedly wireless) client computing device could be co-located" (Prelim. Resp. 33) does not address relevant disclosures in Beck. Beck explains that, *inter alia*, "the physical communications link 140 between the client computing device 120 and the medical device 130" is provided via "IR transmitter/receivers." Ex. 1007 ¶ 30. It stands to reason that IR, i.e., infrared light, transmission requires line-of-sight between devices, suggesting co-location. Similarly, other communication mechanisms Beck describes suggest proximity between client computing device 120 and medical device 130, e.g., RS-232 cable, SCSI, USB, and FireWire. *Id.* ¶¶ 29–30. Patent Owner also argues that Beck "makes no mention of an

ID 22

Combination Does Not Incorporate Lovejoy's Wearable Units

Patent Owner's Response Brief

Lovejoy's monitor device is intended to be worn for years. Ex-1009, 2:57-65. The wearability and occupational-hazard applications for this device are different in intent from Beck, which discloses the aggregation of a collection of off-the-shelf medical devices that are static in their application (e.g., bedside devices), not wearable units. Ex-1007 ¶¶ 29-30 (describing physical connections using cables),

POR 49

Institution Decision

Patent Owner also points out that Lovejoy's monitor is a durable, wearable unit whereas Beck's monitor is a bedside device. Prelim. Resp. 32 (citations omitted). Those arguments are unavailing because they discuss features in Lovejoy which Petitioner's combination does not incorporate and is not required to incorporate, e.g., Lovejoy's wearable units. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference."). Moreover, Patent Owner does not explain why durability and wearability are features counseling against the combination.

ID 21-22

PO Misunderstands Petitioner's Use of the FCC Report

Patent Owner's Response Brief

particular, Petitioner fails to show that the disclosure of the FCC Report was inherent in the disclosure of Lovejoy or that a POSITA would have been motivated to combine Lovejoy with the FCC Report. Warren ¶138. Indeed, Petitioner does not make *any* arguments regarding a motivation to combine the FCC Report with any other art. *Id.*

POR 47

Institution Decision

Still further, Patent Owner's discussion of the FCC Report (Ex. 1017) misunderstands Petitioner's use of that report. *See* Prelim. Resp. 34. Petitioner does not use the FCC Report to show that geolocation is inherent or to combine the FCC Report with Beck, Heller, or Lovejoy, as argued by features in Lovejoy which Petitioner's combination does not incorporate and is not required to incorporate, e.g., Lovejoy's wearable units. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference."). Moreover, Patent Owner does not explain why durability and wearability are features counseling against the combination.

ID 22-23

Cell Phones Included Geolocation Features by the Priority Date

- Confidential -

PATENT OUTLINE
Gentag – Matrics Technology

August 19, 2003

Contributors

Prior Art. AWID ?

Gentag patents
Matrics patents

Technologies provided by a cell phone:

- Geolocation
- Two way communication
- Battery / power
- Microprocessing and programming capabilities
- Unique ID
- Access to the Internet / remote data storage / remote data processing capabilities
- Ubiquitous technology

Ex. 2006, Peeters Email 2

Dr. Sarrafzadeh Declaration

42. Dr. Warren asserts that "the FCC Report does not teach 'geolocation' as taught in the '307 Patent." Ex. 2009 ¶ 142. I disagree. As an initial matter, nothing in the '307 patent requires any specific precision for geolocation, let alone greater precision than what was already commercially available or required by the FCC. Further, Dr. Warren's support for his assertion of imprecision seems to relate to situations where either no geolocation is implemented or a Phase I implementation where only "cell site or cell sector information" is provided. *Id.* (quoting Ex. 1017 at 2-3); *see id.* ("technology available to the public… could provide information regarding the general area of a target (e.g., the zip code)…."). In other words, Dr. Warren's assertions ignore disclosure of the FCC Report of implementing GPS and triangulation-based methods. Where he does address the revised precision standard, he simply concludes that they are not "precise geolocation." Ex. 2009 ¶ 142. I disagree—there is no precision requirement in the '307 patent, and the use of GPS and non-GPS geolocation would have been obvious to include in cell phones by 2004.

Ex. 1033, Suppl. Sarrafzadeh Decl. ¶ 42

Issues

IV. Ground 3: Beck, Heller, and Lovejoy

1. POSITAs Would Have Combined Beck, Heller, and Lovejoy
2. Unique Identification ID Number Was Obvious
3. Wireless Device Unique ID Was Obvious
4. Authentication Limitation Was Obvious
5. Geolocation Was Obvious
6. Analog/Digital Converter Was Obvious

Beck Teaches A Unique Identification ID Number

Beck

ported by the system **100**. Several known techniques may be used such as identifying the medical device **130** based upon (i) responses received from the medical device **130** due to stimulus signals applied to the medical device **130**, (ii) identification codes retrieved from the medical device **130**, (iii) serial numbers retrieved from the medical device **130**, and/or (iv) other information retrieved from the medical device **130**. It is understood that device identification component **214** may include a manual device identification such as a drop down box, check box, or other manual entry.

Ex. 1007, Beck [0055]

Beck

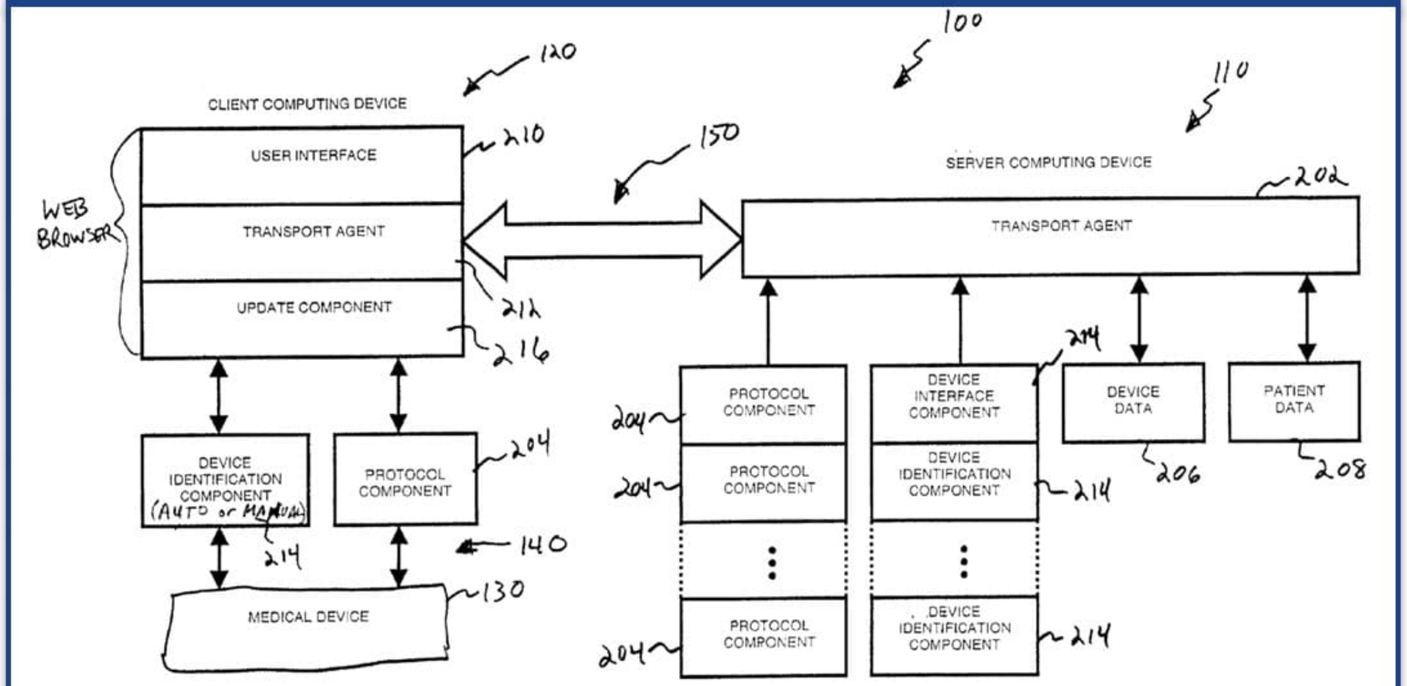


FIG. 2

Ex. 1007, Beck Fig. 2

"Unique Identification ID Number" Uniquely Identifies the *Type* of Sensor

Patent Owner Sur-Reply

th[illegible]ype of the strips that is to be used."). A serial number identifying the *type* of strip, however, is not the same as a unique identifier for a particular, individual strip (sensor). Nor could Petitioner's expert explain how the serial number of the glucose

POSR 7

'307 Patent

1. A radio frequency (RF) addressable diagnostic sensor unit comprising:

at least one sensor element;

at least one reference sensor element;

a unique identification ID number;

* * *

wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;

wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

Ex. 1001, '307 Patent Claim 1

instructions to a user for each given type of sensor. Since the RFID tag provides a unique ID to the wireless device this ID identifies uniquely the type of sensor used. New classes of

Ex. 1001, '307 Patent 7:43-45

400 via function 720. This may be a centralized database for RFID tags or a diagnostics database that is accessed only by paying an access fee. Subsequently, the ID of the RFID sensor is matched to a given class of sensor (e.g. a glucose sensor) and the software and/or instructions for the analyses are downloaded into the reader **2** as shown in function **738**. The

Ex. 1001, '307 Patent 18:18-23

"Unique Identification ID Number" Identifies The "Sensor Unit" Not The "Sensor Element"

Patent Owner Sur-Reply

number to identify a 'sensor unit'."). This is plainly incorrect. The claim requires the diagnostic *sensor* unit to have a unique identification ID number. Ex. 1001, claim 1 ("A radio frequency (RF) addressable diagnostic sensor unit comprising: … a unique identification ID number"). Petitioner's expert confirmed as much. Ex. 2024, 80:22-

POSR 9

Patent Owner's Expert, Dr. Warren, Deposition

Q. Is a sensor element the same thing as a sensor unit?

A. Clearly not, because the sensor unit comprises at least one sensor element.

Ex. 1031, Warren Dep. 54:17-20

Q. The sensor unit in Claim 1 is defined in the body of the claim; is that right?

* * *

A. My answer to the prior question was the claim 1 describes the sensor unit.

Ex. 1031, Warren Dep. 20:1-5 (objections omitted)

Beck's Medical Device Is a "Sensor Unit"

Beck

(57) **ABSTRACT**

Systems, client computing devices, server computing devices, and methods are disclosed for accessing medical devices, providing remote access to medical devices and/or remotely accessing medical devices. In one exemplary embodiment, client computing devices utilize protocol components that may be obtained from a server computing device via a network to communicate with medical devices in a communications protocol supported by the medical device.

Ex. 1007, Beck, Abstract

Beck

cose levels of blood applied to test strips. While the medical device **130** of the exemplary embodiment includes a glucose meter, the medical device **130** could be implemented to monitor and/or analyze other biological/physiological parameters or conditions such as body fluids or bodily functions (e.g. blood, urine, saliva), bodily signals (e.g. electrocardio-signals, brain waves, blood pressure waves), and/or other bodily stimuli (e.g. respiration) to obtain measurements of blood pressure, blood gases, blood coagulation, electrolytes, cardiovascular activity, drug levels, respiration rate, stress, etc.

Ex. 1007, Beck [0034]

Beck Teaches The Claimed "Unique Identification ID Number"

Beck

[0067] The device identification component **214** of the client computing device **120** in step **312** provides the server computing device **110** with device information from which the server computing device **110** determines the proper protocol component **204** to be used with the medical device **130**. As indicated above, the device identification component **214** generally interrogates the medical device **130** via a series of signals, receives signals from the medical device **130** in response to the interrogation, and discerns the type of medical device **130** connected to the client computing device **120** based upon the signals received from the medical device **130**. The signals received from the medical device **130** may include ACK signals or other signals indicative of information such as a serial number, model number, device type, version number, etc. At any rate, the device identification component **214** provides the server computing device **110** with device information via the client transport agent **212** from which the server computing device **110** ascertains the type of medical device **130** operably coupled to the client computing device **120**.

Ex. 1007, Beck [0067]

Issues

IV. Ground 3: Beck, Heller, and Lovejoy

1. POSITAs Would Have Combined Beck, Heller, and Lovejoy
2. Unique Identification ID Number Was Obvious
3. Wireless Device Unique ID Was Obvious
4. Authentication Limitation Was Obvious
5. Geolocation Was Obvious
6. Analog/Digital Converter Was Obvious

Beck Renders Obvious A Wireless Device Having A Unique ID

Beck

120, and/or the medical device **130**. It should be appreciated that other authentication methods are also suitable. For example, authentication may be based further upon or alternatively upon the network address of client computing device **120**, the serial number of the medical device **130**, stored authentication keys (e.g. PGP keys), etc.

Ex. 1007, Beck [0065]

Dr. Sarrafzadeh Declaration

319. In addition, Beck states that client computing devices 120 can include "handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones." Beck at [0027]. A POSITA would also recognize that an Internet enabled cellular phone would have an IP address, Media Access Control (MAC) address, and/or an International Mobile Equipment Identity (IMEI) number for uniquely identifying the respective device. A MAC address is a unique identifier assigned to devices having network capability. Similarly, an IMEI number is a unique identifier assigned to wireless phones.

Ex. 1003, Sarrafzadeh Decl. ¶ 319

Beck Renders Obvious A Wireless Device Having A Unique ID

Dr. Sarrafzadeh Declaration

318. For example, Beck discloses that server 110 authenticates client computing device 120 based on "the network address of the client computing device, the serial number of the medical device, stored authentication keys (e.g., PGP keys), etc." Beck at [0065]. Accordingly, a POSITA would have understood that because the network address of the client computing device can be used to authenticate the client computing device, such network address is or is equivalent to a unique ID.

Ex. 1003, Sarrafzadeh Decl. ¶ 318

Issues

IV. Ground 3: Beck, Heller, and Lovejoy

1. POSITAs Would Have Combined Beck, Heller, and Lovejoy
2. Unique Identification ID Number Was Obvious
3. Wireless Device Unique ID Was Obvious
4. Authentication Limitation Was Obvious
5. Geolocation Was Obvious
6. Analog/Digital Converter Was Obvious

Beck Teaches the Authentication Limitation Under Either the Plain Meaning or PO's Construction

PO's Proposed Construction

¶54. Thus, as discussed below, Patent Owner proposes the following construction:

"the remote server authenticates the unique sensor ID and the associated unique wireless device ID."

POR 18

Beck

[0051] The patient data **208** generally includes biological and/or physiological data collected from patients being monitored by the system **100**. Moreover, the patient data **208** may further include patient identification information (e.g. name, date of birth, address, etc) and authentication information (e.g. username/password, web cookie text, client computing device address, medical device serial number, client computing device network address, etc.) which may be used to verify the identify of a given patient and/or correlate a given patient with prior biological/physiological data collected by the server computing device **110**. The

Ex. 1007, Beck [0051]

Beck

[0065] The server computing device **110** in step **306** attempts to authenticate the user, the client computing device **120**, and/or the medical device **130**. In an exemplary embodiment, the server computing device **110** attempts to authenticate the user, the client computing device **120**, and/or the medical device **130** via various authentication schemes in order to enable a user to retrieve previously collected biological/physiological data, and/or ensure that collected biological/physiological data is kept private. In an

* * *

that other authentication methods are also suitable. For example, authentication may be based further upon or alternatively upon the network address of client computing device **120**, the serial number of the medical device **130**, stored authentication keys (e.g. PGP keys), etc.

Ex. 1007, Beck [0065]

Beck Teaches The Authentication Limitation Under Either The Plain Meaning Or PO's Construction

Undisputed Plain Meaning

The plain meaning of the claim term is that the remote server authenticates the unique sensor ID and that such unique sensor ID is associated with a unique wireless device ID. A POSITA would have understood that the unique sensor ID

POR 18

Beck

120. For example, the server computing device **110** in an exemplary embodiment stores measurement data received from the client computing device **120** with the patient data **208** such that the measurement data is associated with the user, client computing device **120**, and/or medical device **130** authenticated in step **306**. In this manner, the sever computing device **110** maintains historic measurement data for an authenticated user, client computing device **120**, and/or medical device **130**. In response to a request received

Ex. 1007, Beck [0076]

Dr. Warren, Patent Owner's Expert Deposition

A. So a Bluetooth-enabled device, a cell device -- that wireless reader would inherently incorporate a unique ID that must then be associated with the unique sensor ID in order for this -- for these teachings to be implemented properly.

Ex. 1031, Warren Dep. 51:14-18

Petition Addressed The Authentication Limitation

Patent Owner's Response Brief

wireless device ID" (Ex. 1001, claim 1) (emphasis added). Warren ¶150. Under Patent Owner's proposed claim construction, that limitation requires receipt by the remote server of the unique wireless device ID. Even under the Board's preliminary claim construction, Petitioner must show that the unique sensor ID is "associated with the unique wireless device ID." Nowhere does Petitioner provide any disclosure in the prior art of either requirement. *Id.*

POR 57

Petition for IPR

computing device 120." Beck [0076]. "In response to a request received from the client computing device 120, the server computing device 110 at later date retrieves and/or analyzes the historic data for the authenticated user, the client computing device 120, and/or the medical device 130. Further, the server computing device 110 provides the client computing device 120 with results data in the form of a HTML document that includes tables, charts, graphs, explanations, etc. to aid in assessing the meaning of the current measurement data and/or the historic measurement data." Beck [0076]. Accordingly, a POSITA would have understood that Beck discloses that only in response to authenticating the unique sensor ID associated with the unique wireless device ID will the remote server (Beck's server computing device) communicate to the wireless device (e.g., Beck's client computing device) (1) processed information relating to the sensor data and (2) software related to the unique sensor ID necessary for the wireless device to interpret the sensor anywhere worldwide. Sarrafzadeh Decl. ¶¶331-332. Thus, Beck discloses a system that meets Petitioner's construction for this limitation.

Pet. 64-65

Petition Addressed The Authentication Limitation

Petition for IPR

13. [1l]: Remote Server Authenticates Sensor ID and Communications Information and Software for the Sensor to the Wireless Device

Beck discloses this limitation. Sarrafzadeh Decl. ¶325. For example, Beck discloses that "server computing device 110 attempts to authenticate the user, the client computing device 120, and/or the medical device 130 via various authentication schemes." Beck [0065]. Beck explains that the server computing

Pet. 62

Dr. Sarrafzadeh Declaration

326. For example, Beck teaches that "the server computing device 110 attempts to authenticate the user, the client computing device 120, and/or the medical device 130 via various authentication schemes." Beck at [0065]. Beck explains that authentication is bason "upon the network address of the client computing device 120, the serial number of the medical device 130, stored authentication keys (e.g. PGP keys), etc. Beck at [0065]. Beck thus explains that the server computing device 110 authenticates the unique sensor ID (e.g., serial number of the medical device 130) to determine whether to grant access to software and processed information related to said sensor data. Beck at [0065]. If the authentication attempt fails, the server computing device can take actions including "logging the network address of the client computing device 120, blocking connections from the client computing device 120 if a threshold number of attempts is exceeded, etc." Beck at [0066]. The server can "reattempt to authenticate the user, the client computing device 120, and/or the medical device 130." Beck at [0066].

Ex. 1003, Sarrafzadeh Decl. ¶ 326

Petitioner's Authentication Arguments Are Not New And Are Properly Responsive

Patent Owner's Sur-reply To Petitioner's Reply

Petition, 62. Petitioner now tries to expand that argument, citing—for the first time—a different section of Beck to argue that Beck discloses authenticating the wireless device ID. Reply, 15 (citing Ex. 1007, [0051]). That untimely argument should be ignored.

POSR 12-13

Axonics, Inc. v. Medtronic, Inc.

Barring argument and evidence in a reply directed to a new claim construction proposed by the patent owner would create opportunities for sandbagging by the patent owner in order to create an estoppel. . . . [I]f . . . a patent owner sits on its strongest claim construction arguments before institution and then raises them in response after institution, a patent owner could obtain a favorable final IPR decision and an estoppel without the Board's reaching the merits of any invalidity arguments under the newly adopted claim construction. Indeed, Medtronic admitted in this appeal that the Board's approach below would allow for such sandbagging. We are reluctant to adopt a construction of the APA and the Board's rules that would permit such gamesmanship. ***Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1384 (Fed. Cir. 2023)**

Beck Renders Obvious The Authentication Limitation

Beck teaches a "unique sensor ID associated with said unique wireless device ID"

Dr. Sarrafzadeh Declaration

50. The passages I quoted in my first declaration (and above) demonstrate that Beck discloses this limitation under Dr. Warren's (incorrect) construction, which requires authenticating both sensor ID and wireless device ID. Specifically, paragraph 65 of Beck explicitly discloses authenticating both IDs. Ex. 1003 ¶ 326. Beck's authentication of both IDs is further enabled by Beck's server storing (and thus associating in another way) "authentication information" including "client computing device network address" and "medical device serial number." Beck [0051]. These disclosures of Beck are well beyond what the '307 patent discloses in relation to authentication. For example, the '307 patent does not explicitly disclose a wireless device ID, let alone authenticating a wireless device ID. Dr. Warren asserted that these disclosures are inherent and necessary in the '307 patent. Ex. 1031 49:17-51:18.

Ex. 1033, Suppl. Sarrafzadeh Decl. ¶ 50

Dr. Sarrafzadeh Declaration

51. Dr. Warren asserts that "Petitioner [does not] provide any disclosure in the prior art of" the claim limitation requiring that "the unique sensor ID is 'associated with the unique wireless device ID.'" Ex. 2009 ¶ 150. As I discussed above, this is not true. Dr. Warren seems to imply that the "associated" portion of the claim requires more than what's recited in the claim itself. I disagree. The claim recites a "wireless device having… a unique ID" and "the wireless device communicates with the RF addressable sensor interface to obtain the [sensor] ID." This step of obtaining the sensor ID associates the IDs. Notably, there is no explicit "associating" step in the claim or anywhere else in the '307 patent. Thus, when claim 1 recites "said unique sensor ID associated with said unique wireless device ID" the claim is referencing and encompassing the association made in the previous limitation to specify which sensor ID is being authenticated (i.e., the "said unique sensor ID obtained by the wireless device possessing the wireless device ID).

Ex. 1033, Suppl. Sarrafzadeh Decl. ¶ 51

Issues

IV. Ground 3: Beck, Heller, and Lovejoy

1. POSITAs Would Have Combined Beck, Heller, and Lovejoy
2. Unique Identification ID Number Was Obvious
3. Wireless Device Unique ID Was Obvious
4. Authentication Limitation Was Obvious
5. **Geolocation Was Obvious**
6. Analog/Digital Converter Was Obvious

Beck And Lovejoy Render Geolocation Means Obvious

Beck

[0027] The exemplary client computing device **120** may alternatively be implemented such that the same hardware components that implement the memory **123** also implement the storage device **124**. For example, the exemplary client computing device **120** may be implemented with memory chips that implement both the functionality of the memory **123** and the storage device **124**. Many special purpose computing devices such as handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones which could be used to implement the client computing device **120** are implemented in such a manner.

Ex. 1007, Beck [0027]

Lovejoy

the personal monitor system of this invention. The personal monitor itself has several subsystems, including the monitor housing with its various controls and input/output links, the individualized sensors that plug into the monitor housing, geolocating capabilities (GPS or the radar-responsive tags), and the on-board computing capabilities of the monitor. The

Ex. 1009, Lovejoy 4:32-37

The '307 Patent Inventor Did Not Invent Geolocation

- Confidential -

PATENT OUTLINE
Gentag – Matrics Technology

August 19, 2003

Contributors

Prior Art. AWID ?

Gentag patents
Matrics patents

Technologies provided by a cell phone:

- Geolocation
- Two way communication
- Battery / power
- Microprocessing and programming capabilities
- Unique ID
- Access to the Internet / remote data storage / remote data processing capabilities
- Ubiquitous technology

Ex. 2006, Peeters Email 2

Dr. Warren Patent Owner Expert Deposition

A. So, no, he did not invent geolocation in cellular phones, but the use of such geolocation.

Ex. 1031, Warren Dep. 71:22-72:1

A. Clearly the idea was stated in the industry prior to that date…

Ex. 1031, Warren Dep. 72:19-20

Dr. Peeters Inventor Deposition

Q. So is it your testimony that you are the first person to conceive of geolocation in cell phones?

A. No. What we -- the -- the geolocation part was inherited from the earlier work that was done with Mike Lotrin (phonetic) in the six years before. I would say these were -- at the time of the finding these were standard things that were available out there that we referenced because we knew that geolocation was very important.

Ex. 1032, Peeters Dep. 83:15-24

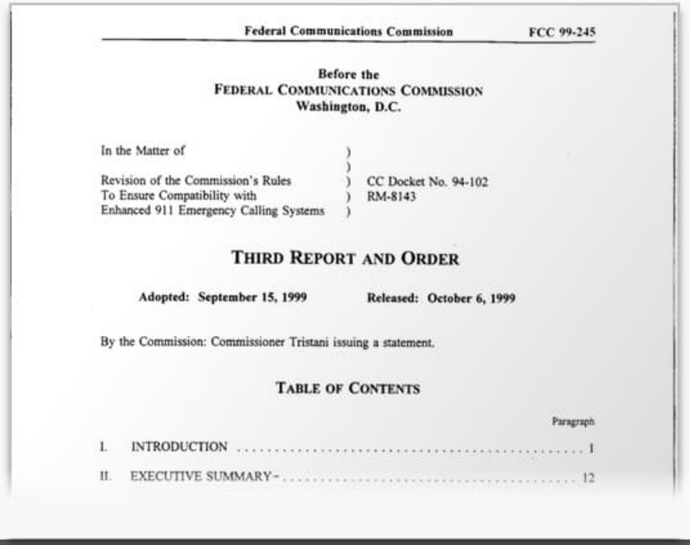
Geolocation In Cell Phones Was Known

FCC Report

(2) Once a PSAP request is received, the licensee shall, in the area served by the PSAP:

(A) Within six months or by October 1, 2001, whichever is later:
(i) Ensure that 100 percent of all new handsets activated are location-capable;
(ii) Install any hardware and/or software in the CMRS network and/or other fixed infrastructure, as needed, to enable the provision of Phase II enhanced 911 service; and
(iii) Begin delivering Phase II enhanced 911 service to the PSAP.

Ex. 1017, FCC Report 48-49



Federal Communications Commission FCC 99-245

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

In the Matter of)
)
Revision of the Commission's Rules) CC Docket No. 94-102
To Ensure Compatibility with) RM-8143
Enhanced 911 Emergency Calling Systems)

THIRD REPORT AND ORDER

Adopted: September 15, 1999 Released: October 6, 1999

By the Commission: Commissioner Tristani issuing a statement.

TABLE OF CONTENTS

Paragraph

I. INTRODUCTION 1
II. EXECUTIVE SUMMARY 12

Institution Decision

Still further, Patent Owner's discussion of the FCC Report (Ex. 1017) misunderstands Petitioner's use of that report. *See* Prelim. Resp. 34. Petitioner does not use the FCC Report to show that geolocation is inherent or to combine the FCC Report with Beck, Heller, or Lovejoy, as argued by features in Lovejoy which Petitioner's combination does not incorporate and is not required to incorporate, e.g., Lovejoy's wearable units. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference."). Moreover, Patent Owner does not explain why durability and wearability are features counseling against the combination.

ID 22-23

Like The Combination, The '307 Patent Relies On Lovejoy For Geolocation

'307 Patent

her ear but also remotely to a monitoring station. In addition as explained in U.S. Pat. No. 6,031,454, that is incorporated herein in its entirety real time precise geolocation of the firefighter is possible.

Ex. 1001, '307 Patent 6:10-13

a global positioning system (GPS) or a non-GPS means. The reading, analysis and geolocation by GPS or non-GPS means is described in U.S. Pat. No. 6,031,454 that is included herein by reference in its entirety. Wireless device 2 can communi-

Ex. 1001, '307 Patent 17:21-24

US006031454A

United States Patent [19]
Lovejoy et al.

[11] **Patent Number: 6,031,454**
[45] **Date of Patent: Feb. 29, 2000**

[54] **WORKER-SPECIFIC EXPOSURE MONITOR AND METHOD FOR SURVEILLANCE OF WORKERS**

[75] Inventors: **Michael L. Lovejoy**, Albuquerque, N.Mex.; **John P. Peeters**, Bethesda, Md.; **A. Wayne Johnson**, Albuquerque, N.Mex.

[73] Assignee: **Sandia Corporation**, Albuquerque, N.Mex.

[21] Appl. No.: **08/969,258**

[22] Filed: **Nov. 13, 1997**

[51] **Int. Cl.**[7] **G08B 1/08**; G08B 23/00

[52] **U.S. Cl.** **340/539**; 340/691.1; 340/693.1; 340/693.5; 340/693.6; 340/573.1; 340/632; 340/521; 340/825.36; 340/825.49; 250/388; 250/484.5

[58] **Field of Search** 340/539, 691, 340/573, 693, 825.36, 825.49, 691.1, 691.4, 693.1, 693.5, 693.6, 573.1, 632, 521; 250/336.1, 337, 472.1, 374, 388, 484.5; 73/23.2

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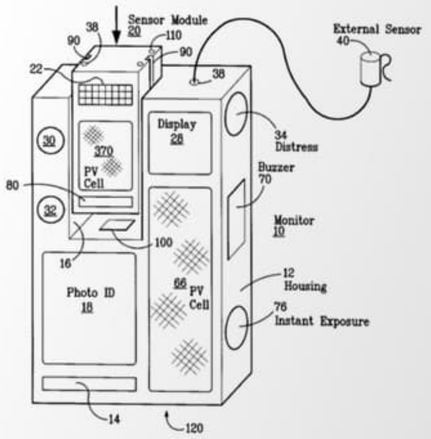
1-45595 6/1989 Japan .

Primary Examiner—Donnie L. Crosland
Attorney, Agent, or Firm—Gregory A. Cone

[57] **ABSTRACT**

A person-specific monitor that provides sensor information regarding hazards to which the person is exposed and means to geolocate the person at the time of the exposure. The monitor also includes means to communicate with a remote base station. Information from the monitor can be downloaded at the base station for long term storage and analysis. The base station can also include means to recharge the monitor.

20 Claims, 5 Drawing Sheets



Abbott
Exhibit 1009
Page 001

Petition Relies On Obviousness For Geolocation Means

Patent Owner's Response Brief

Second, Petitioner has failed to show how the existence of a cellular phone necessarily includes the particular structure (or an equivalent structure) disclosed by the '307 Patent for performing geolocation. While Petitioner asserts that an "internet

POR 58

Patent Owner's Response Brief

Petitioner is relying on a disclosure from Lovejoy related to geolocation of Lovejoy's *personal monitors*—the components, worn by the subjects, that measure the exposure to hazards of those subjects. This maps—if at all—to the diagnostic *sensor* of claim 1. But it is the claimed *wireless device* that includes the geolocation means, not the sensor. Petitioner does not even attempt to show that any portion of

POR 60

Institution Decision

425. Second, Patent Owner argues that Beck's cellular phone does not inherently include geolocation means (Prelim. Resp. 37), but as discussed above, Petitioner relies on obviousness, not inherency, for this feature (*see* Pet. 58–61).

ID 30

Institution Decision

First, Patent Owner asserts that Lovejoy's monitor device, which includes geolocation features, "maps—if at all—to the sensor of claim 1. But it is the wireless device of the claim that has the geolocation means." Prelim. Resp. 36. As discussed in § II.D.4.a.2, Petitioner's combination incorporates Lovejoy's geolocation techniques—not Lovejoy's monitor device. Petitioner's case for obviousness does not require the bodily incorporation of Lovejoy's monitor or some hypothetical situation where Beck's cellular phone is supplanted by Lovejoy's monitor. *See In re Keller*, 642 F.2d at 425. Second, Patent Owner argues that Beck's cellular phone does not

ID 30

POSITAs Would Have Added Geolocation Means To Enable Emergency Response

Patent Owner's Response Brief

While Beck includes an embodiment where an "Internet enabled cellular phone" is used as a reader, adding a geolocation means to Beck's reader would have been nonsensical, as such means would only indicate where the reader (or person performing the reading, such as a nurse) is located—not where the sensor (or the patient wearing such a sensor who may be remote from the reader) is located. Warren ¶157. In the case of an emergency, this would result in routing a crash cart to the nurse, not the patient. *Id.* Including the geolocation means in the claimed wireless

POR 60-61

Dr. Sarrafzadeh Declaration

54. Dr. Warren argues, however, that "adding a geolocation means to Beck's reader would have been nonsensical, as such means would only indicate where the reader (or person performing the reading…) is located—not where the sensor (or the patient wearing such a sensor who may be remote from the reader) is located." Ex. 2009 ¶ 157. I disagree. First, as I discussed above, Beck explicitly identifies a patient as a user of the reader (e.g., client computing device). Beck [0052]. At least in that scenario the location of the reader is the location of the patient. Second, Dr. Warren's hypothetical seems to imply reading of the sensors from a significant distance from the patient. But in most if not all cases, a reader will be proximate to the sensor, such that the reader's location provides sufficient information about the patient's location, and Dr. Warren does not cite to anything in Beck that supports his assertion. Regardless, such a scenario would not teach away from incorporating "completely standard" components in a cell phone. Ex. 1032 84:5-9.

Ex. 1033, Suppl. Sarrafzadeh Decl. ¶ 54

Issues

IV. Ground 3: Beck, Heller, and Lovejoy

1. POSITAs Would Have Combined Beck, Heller, and Lovejoy
2. Unique Identification ID Number Was Obvious
3. Wireless Device Unique ID Was Obvious
4. Authentication Limitation Was Obvious
5. Geolocation Was Obvious
6. Analog/Digital Converter Was Obvious

Beck And Heller Render Obvious A "Sensor Interface Having An Analog To Digital Converter"

Beck

[0035] As can be seen from **FIG. 1**, the exemplary medical device **130** includes a processor **132**, memory **133**, a communications interface **136**, one or more user I/O devices **137**, and a system bus **138**. The processor **122** of the exemplary medical device **130** includes a single microprocessor or microcontroller; however, the processor **122** may alternatively include more than one processor. As a result of executing the software and/or firmware routines of the memory **133**, the processor **132** controls the general operation of the medical device **130**. More specifically, the processor **132** as a result of executing software and/or firmware routines of the memory **133** is generally operable to configure the medical device **130** to obtain measurement data indicative of a biological/physiological condition.

Ex. 1007, Beck [0035]

Heller

As an example of the operation of these components, the sensor circuit 97 and the optional temperature probe circuit 99 provide raw signals from the sensor 42 to the measurement circuit 96. The measurement circuit 96 converts the raw signals to a desired format, using for example, a current-to-voltage converter, current-to-frequency converter, and/or a binary counter or other indicator that produces a signal proportional to the absolute value of the raw signal. This may be used, for example, to convert the raw signal to a format that can be used by digital logic circuits. The processing circuit 109 may then, optionally, evaluate the data and provide commands to operate the electronics.

Ex. 1016, Heller 62:10-16

39. The method of claim 37, further comprising:

collecting an analog signal representing a level of an analyte in a bodily fluid;

converting the analog signal into a digital signal representing a level of an analyte in a bodily fluid.

Ex. 1016, Heller Claim 39

Beck and Heller Render Obvious A "Sensor Interface Having An Analog To Digital Converter"

Petition

Heller at 104-105 (claim 39). A POSITA would have understood that Heller's sensor circuit is a sensor interface and that the measurement circuit, which converts an analog signal to a digital signal, incorporates an analog to digital converter coupled to the glucose sensor (sensor element) and the temperature sensor (reference sensor element). Sarrafzadeh Decl. ¶277.

Pet. 53

Dr. Sarrafzadeh Declaration

277. A POSITA would have understood that Heller's sensor circuit is a sensor interface (e.g., because it provides raw signals from the sensor to the measurement circuit.) A POSITA would have further understood Heller's measurement circuit, which converts an analog signal to a digital signal, incorporates an analog to digital converter for each of the glucose sensor (sensor element) and the temperature sensor (reference sensor element).

Ex. 1003, Sarrafzadeh Decl. ¶ 277

278. To the extent not already part of Beck's system, a POSITA would have been motivated to further modify Beck's system to incorporate a sensor interface having an analog to digital converter coupled to at least the glucose sensor (sensor element) and the temperature sensor (reference sensor element) to enable processing of the glucose and temperature signals. Such a modification represents use of known technique to improve similar devices in the same way. Such a modification would have also been obvious to try as analog to digital converters and their functions were well-known before the priority date of the '307 patent.

Ex. 1003, Sarrafzadeh Decl. ¶ 278

PO Improperly Attacks Beck In Isolation

Patent Owner's Response Brief

Beck's lack of disclosure of this limitation is unsurprising. As discussed above, Beck discloses a system that connects to commercially available medical devices. Beck does not disclose the internal operation of any of those medical devices. Warren ¶159.

POR 62

Bradium Techs. LLC v. Iancu

The remainder of Bradium's arguments concerning this claim limitation lack merit because they attack the disclosures of the two references individually. A finding of obviousness, however, cannot be overcome "by attacking references individually where the rejection is based upon the teachings of a combination of references." *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (citing *In re Keller*, 642 F.2d 413, 425 (CCPA 1981)).

***Bradium Techs. LLC v. Iancu,* 923 F.3d 1032, 1050 (Fed. Cir. 2019)**

POSITAs Would Have Known Beck Included An A/D Converter

Dr. Sarrafzadeh Declaration

56. Dr. Warren does not address my discussion and reliance on Heller. Instead, he asserts that A/D converters were not inherent in Beck. Ex. 2009 ¶ 160. However, Dr. Peeters (the named inventor of the '307 patent) described that an analog to digital converter is "an essential component" and such that it is "just part of any, you know, any sensor component because you need to convert a continuous variable signal into a digital signal." Ex. 1032 73:5-21. I agree with this portion of Dr. Peeters's testimony. Dr. Warren asserts "there are ways to calculate a value based on… two sensors without first converting them to digital values" but provides no explanation and does not cite any evidence. Even though my analysis does not require inherency in Beck (due to my additional reliance on Heller), A/D converters are inherent to Beck.

Ex. 1033, Suppl. Sarrafzadeh Decl. ¶ 56

Dr. Peeters Inventor Deposition

Q. What about an analog digital converter?

A. That is a completely standard thing. If you know how a sensor works, that's an essential component of taking a thing that, you know, continuously variable thing like a sensor and converting it to digital form. It's absolutely standard in any asic that has ports to sensors. Completely. That is standard -- these are -- these are standard components that are -- that have been known for -- forever. Not forever but, you know, it's -- it's -- these are completely basic components of electronics.

Ex. 1032, Peeters Dep. 73:5-16

Appendix

Ground I: Claims 1, 2, 5, 9, 10 Are Unpatentable Over Bandy

'307 Patent, Claim 1 Preamble

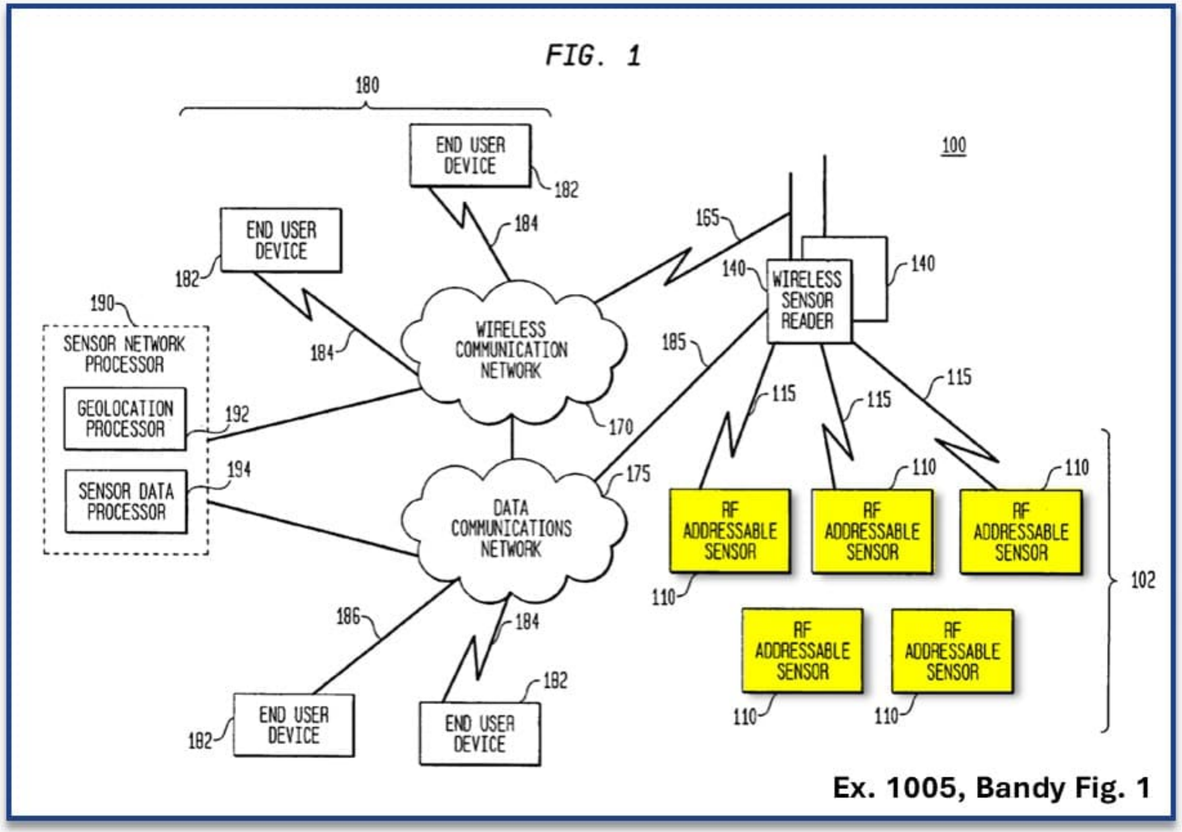
[1Pre] A radio frequency (RF) addressable diagnostic sensor unit comprising:

Bandy

1.1 RF Addressable Sensor Network

FIG. **1** is a block diagram of an illustrative RF addressable sensor network **100** for monitoring, detecting, and geolocating RF addressable sensors, according to an embodiment of the present invention. Network **100** includes a population of RF addressable sensors **102**, one or more wireless addressable sensor readers **140**, and a communications network **180**. In an embodiment of the present invention, communi-

Ex. 1005, Bandy 4:33-39



Ex. 1005, Bandy Fig. 1

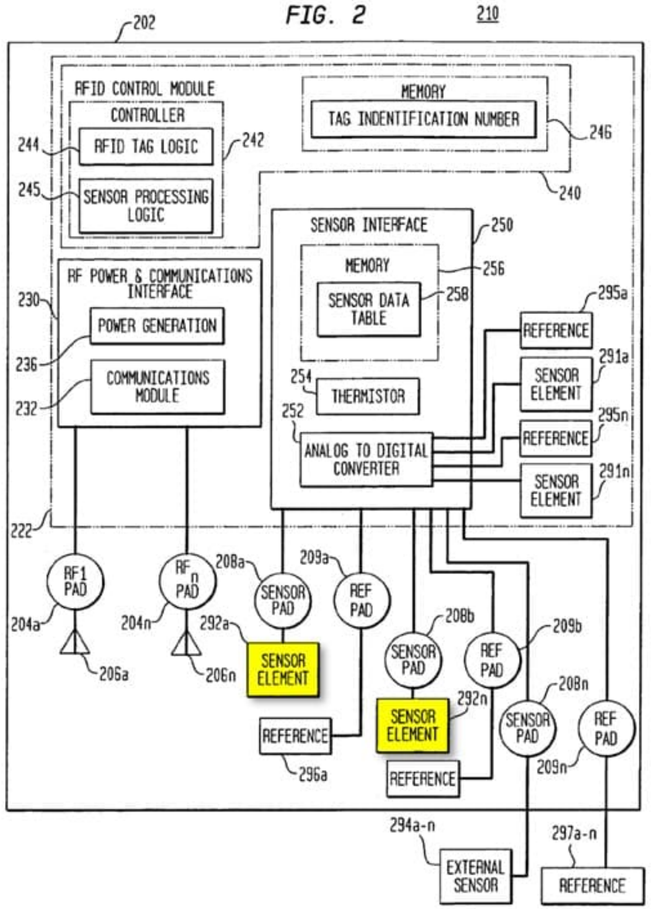
'307 Patent, Claim 1a

[1a] at least one sensor element;

Bandy

and a plurality of antennas **206***a* through **206***n*. These components are mounted or formed on a substrate **202**. RF addressable sensor **210** also includes a plurality of sensor elements **291***a*–**291***n*, **292***a*–**292***n*, and **294***a*–**294***n*.

Ex. 1005, Bandy 6:58-60



Ex. 1005, Bandy Fig. 2

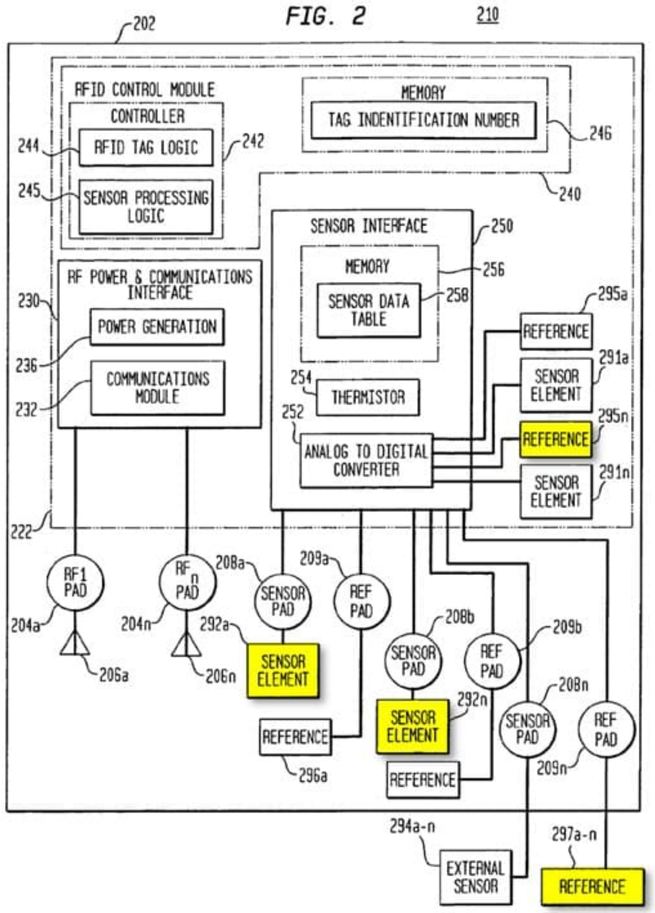
'307 Patent, Claim 1b

[1b] at least one reference sensor element;

Bandy

In an embodiment of the present invention, as shown in FIG. **2**, RF addressable sensor **210** optionally includes a plurality of reference elements **295***a*–**295***n*, **296***a*–**296***n*, and **297***a*–**297***n*. Similar to the sensor elements, reference elements may be included in integrated circuit **222**, on substrate **202**, external to substrate **202**, or in any combination of the above. As shown in FIG. **2**, reference elements **295***a*–**295***n* are included in integrated circuit **222**; reference elements **296***a*–**296***n* are included on substrate **202**; and reference elements **297***a*–**297***n* are external to substrate **202**. A sensor element need not have a reference element. If the reference element is located on the substrate (collectively reference elements **296**) or external to the substrate (collectively reference elements **297**), the reference element will be coupled to one or more of the plurality of reference pads **209***a* through **209***n* (collectively reference pads **209**).

Ex. 1005, Bandy 8:59-9:7



Ex. 1005, Bandy Fig. 2

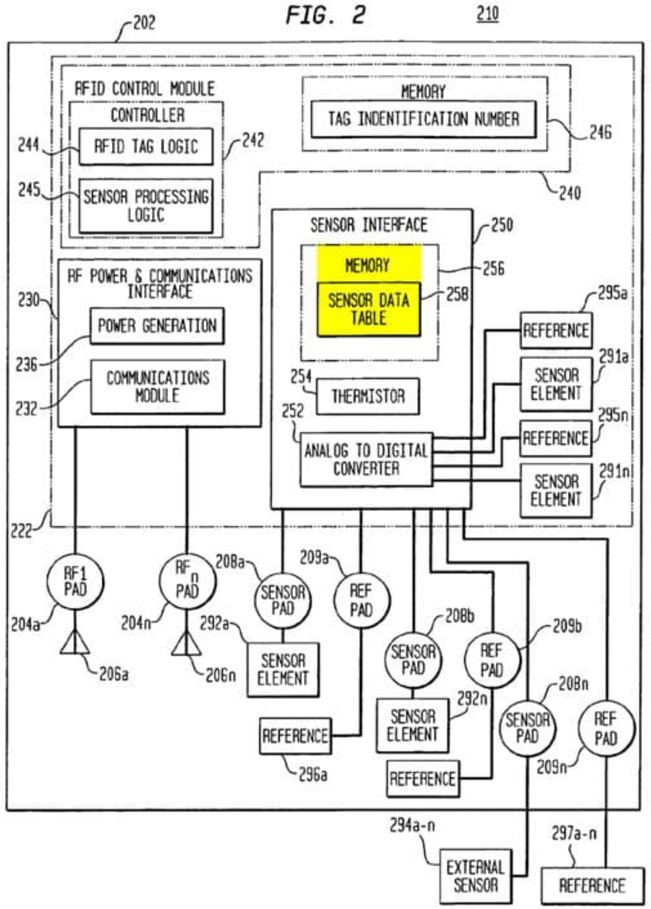
'307 Patent, Claim 1c

[1c] a unique identification ID number;

Bandy

In an embodiment, memory **256** stores a sensor data table **258**. The sensor data table **258** is configured to store data related to all or a subset of sensor elements supported by the RF addressable sensor **210**. For example, the sensor data table may store a sensor element identification number, a preferred read time, spacing interval between reads, and/or sensor element specific data for all or a subset of sensor elements.

Ex. 1005, Bandy 10:6-13



Ex. 1005, Bandy Fig. 2

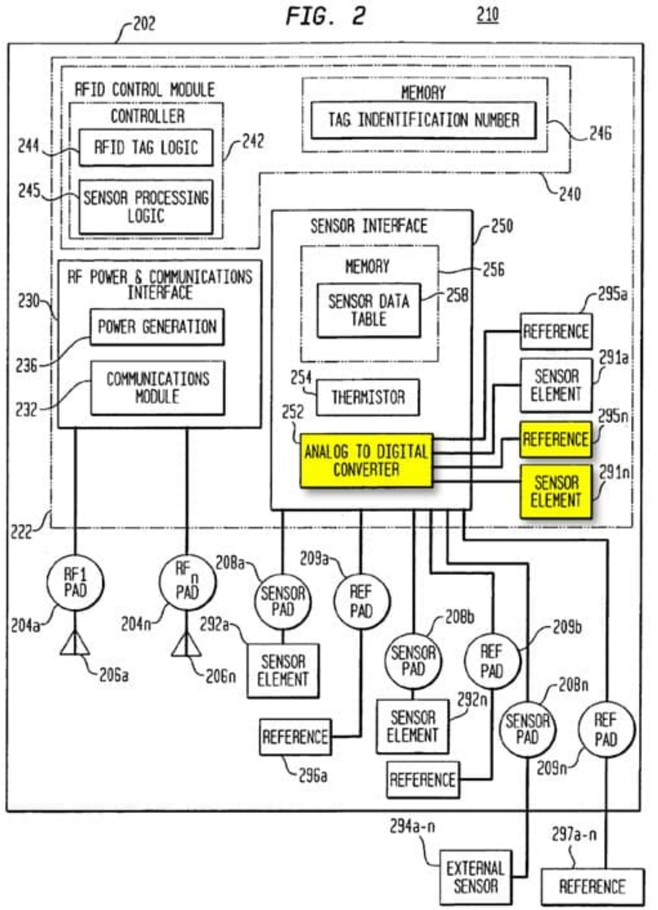
'307 Patent, Claim 1d

[1d] a sensor interface having an analog to digital converter coupled to the at least one sensor and reference sensor element;

Bandy

As shown in the embodiment of FIG. **2**, integrated circuit **222** includes a RF power and communications interface **230**, a sensor interface **250**, and an RFID control module **240**. Sensor interface **250** includes a digitizer or an analog to digital converter (ADC) **252**. ADC **252** receives analog signals from sensor elements and converts the analog signal into a corresponding digital signal. ADC **252** can be coupled directly to sensor elements implemented in integrated circuit **222** and is coupled to other sensor elements **292** and **294** via sensor pads **208**. In an embodiment, a filter (not shown) may be used between the sensor element and ADC **252**.

Ex. 1005, Bandy 9:23-32



Ex. 1005, Bandy Fig. 2

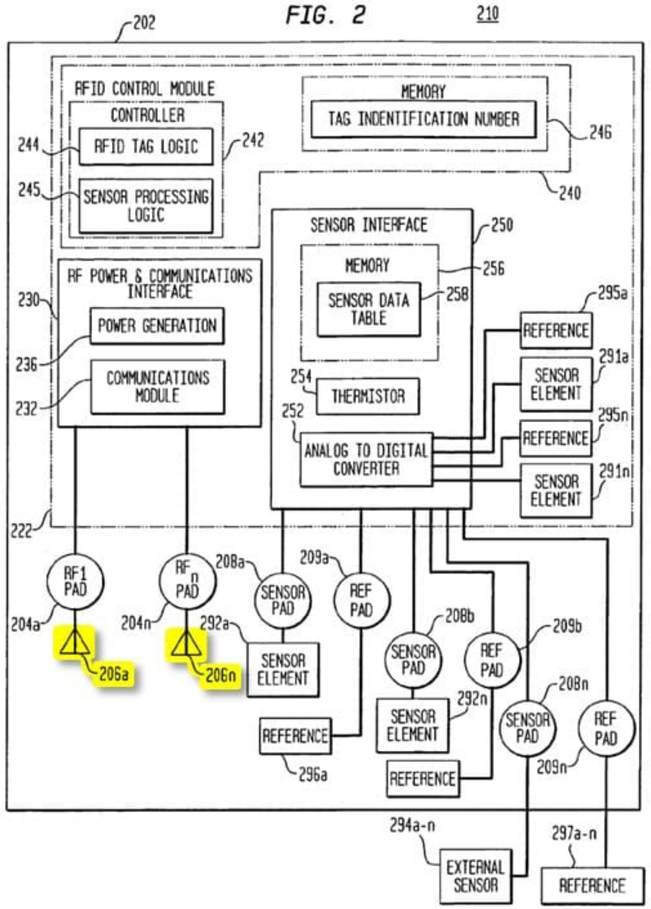
'307 Patent, Claim 1e

[1e] at least one antenna;

Bandy

Radio frequency addressable sensor **210** includes an integrated circuit **222**, a plurality of RF pads **204***a* through **204***n*, and a plurality of antennas **206***a* through **206***n*. These

Ex. 1005, Bandy 6:55-57



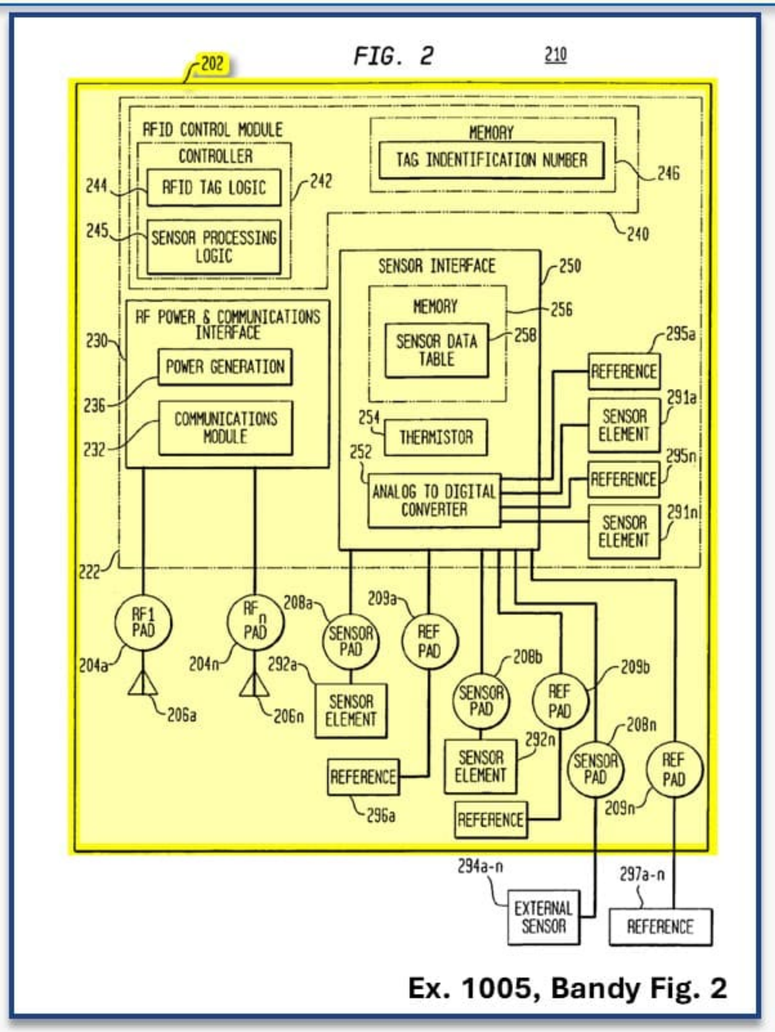
Ex. 1005, Bandy Fig. 2

'307 Patent, Claim 1f

[1f] a substrate;

Bandy

Sensor elements may be included in integrated circuit **222**, on substrate **202**, external to substrate **202**, or in any combination of the above. As shown in FIG. **2**, sensor elements **291***a–n* are included as a component in integrated circuit **222**. Sensor elements **292***a–n* are included on the substrate **202**. Any sensor element that is compatible with the fabrication of RF addressable sensor **210** can be used. In an embodiment of the invention, sensor elements **292***a–n* can be thin film sensor elements that are deposited, printed, or directly assembled onto substrate **202**. Sensor elements **294***a–n* are external to the substrate **202**. If the sensor element is located on the substrate (collectively sensor elements **292**) or external to the substrate (collectively sensor elements **294**), the sensor element will be coupled to one or more of the plurality of sensor pads **208***a* through **208***n* (collectively sensor pads **208**). **Ex. 1005, Bandy 6:55-57**



Ex. 1005, Bandy Fig. 2

'307 Patent, Claim 1g

[1g] an RF power and communication interface coupled to the at least one antenna and sensor interface;

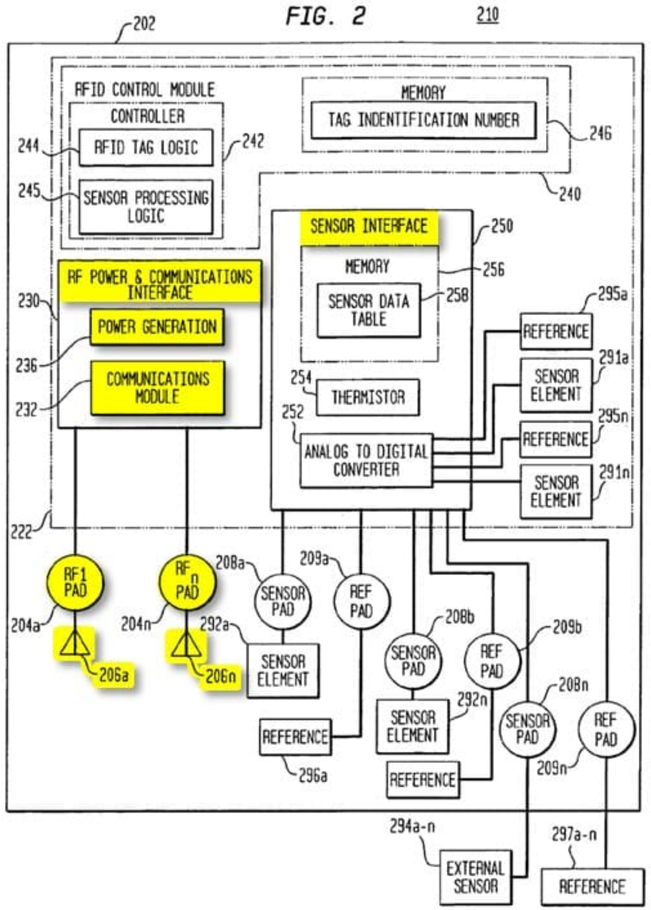
Bandy

RF Power and Communications Interface **230** includes a communications module **232** and a power generation module **236**. Communications module **232** is coupled to antennas **206** to provide bi-direction communication with a wireless RF addressable sensor reader. In an alternate

Ex. 1005, Bandy 11:30-34

and a sensor pad **208**. In an alternate embodiment, RF pads **204** are coupled to both the RF power and communications interface **240** and the sensor interface **250**.

Ex. 1005, Bandy 8:11-13



Ex. 1005, Bandy Fig. 2

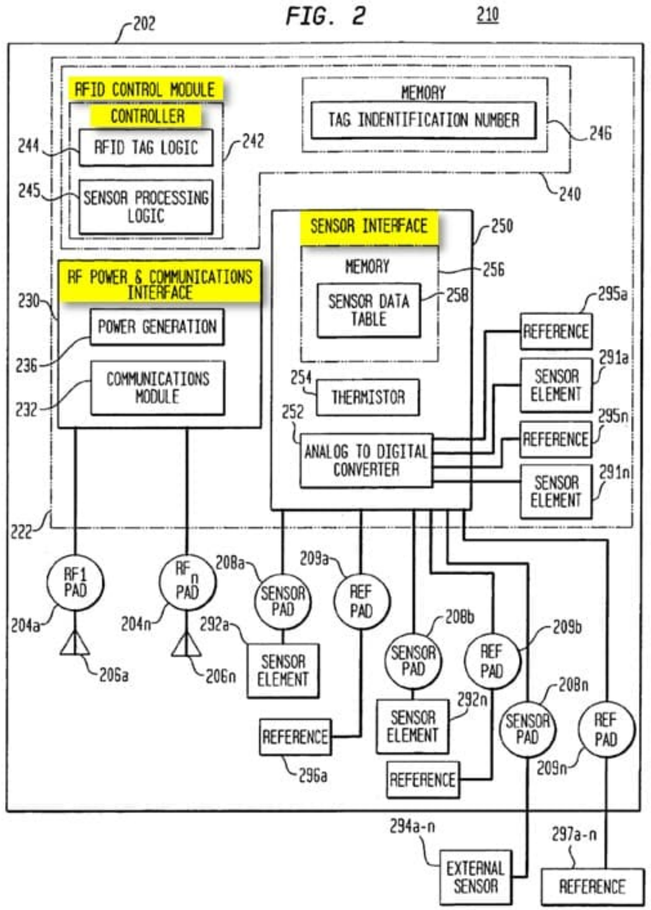
'307 Patent, Claim 1h

[1h] a controller coupled to the RF power and communications interface and the sensor interface; and

Bandy

The RFID control module **240** controls RF communications between the RF addressable sensor **210** and wireless sensor reader **140**. RFID control module includes a controller **242** and a memory **246**. Controller **242** includes RFID tag logic **244** to respond to RFID tag interrogation and read communications by the wireless sensor reader **140** or another tag reader and logic to control the operating state of the RFID tag components of the RF addressable sensor. For

Ex. 1005, Bandy 10:62-11:2



Ex. 1005, Bandy Fig. 2

'307 Patent, Claim 1i

[1i] a memory coupled to the controller and the sensor interface;

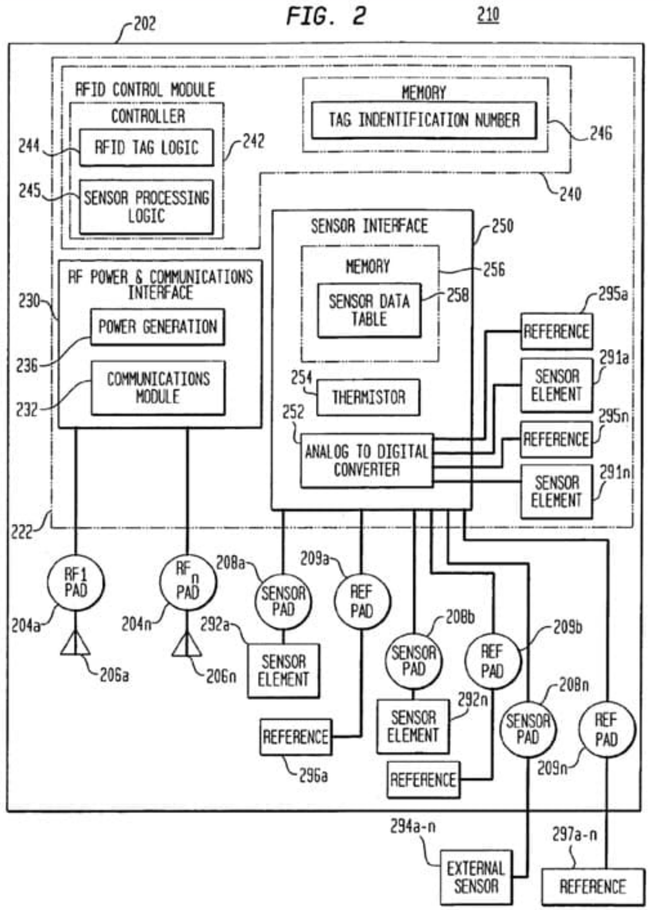
Bandy

ments. Memory **246** stores information used by the RF addressable sensor when operating as a RFID tag. Memory **246** may be separate or integrated with memory **256** of the sensor interface. The information may be stored permanently or temporarily. Memory **246** stores the tag identification number for the RF addressable sensor **210**. In an embodiment of the present invention, the tag identification number indicates the type of sensor elements included in the RF addressable sensor **210**.

Ex. 1005, Bandy 11:21-29

In an embodiment, sensor interface **250** may optionally include a memory **256**. Memory **256** stores information used by RF addressable sensor **210** to process sensor data received from sensor elements. The information may be stored permanently or temporarily. In an embodiment of the

Ex. 1005, Bandy 9:63-66



Ex. 1005, Bandy Fig. 2

'307 Patent, Claim 1j

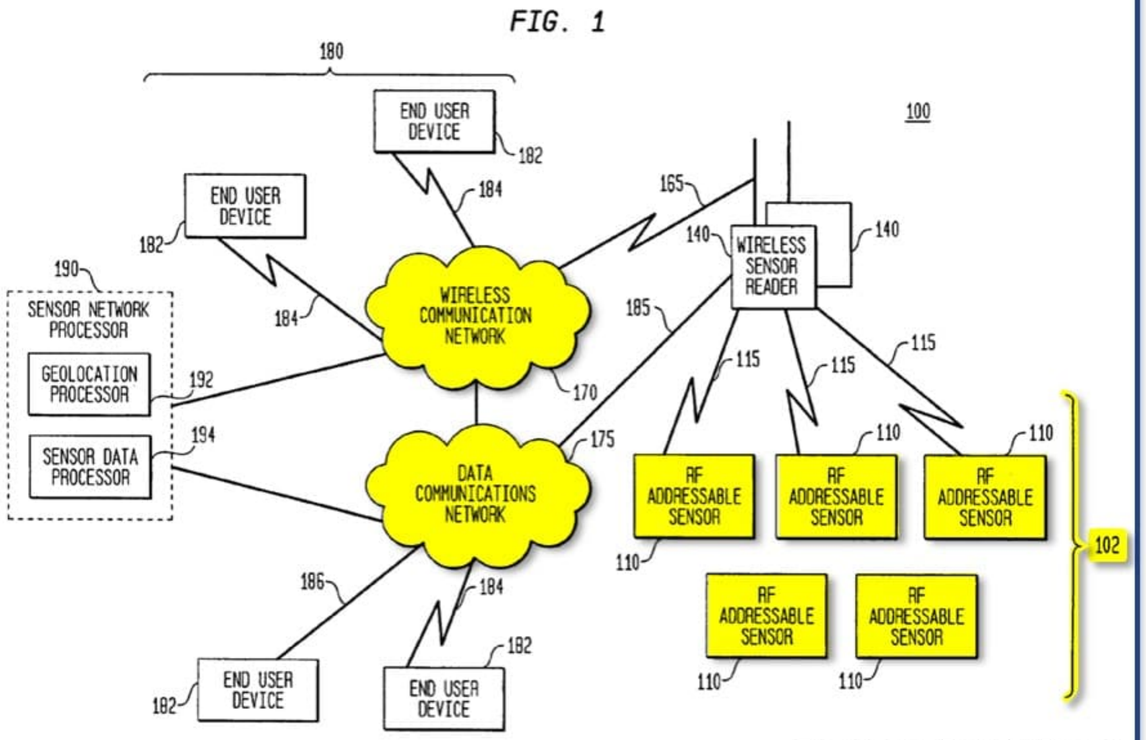
[1j] wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and

Bandy

Wireless sensor reader **140** includes logic to interrogate the population of RF addressable sensors **102** and logic to read sensor data and RFID tag data transmitted by the RF addressable sensors **110**. In an embodiment, wireless sensor reader **140** also includes logic to process the received sensor data. Wireless sensor reader **140** can be any wireless device capable of communicating via an air interface protocol with the population of RF addressable sensors **102**. In embodiments of the present invention, wireless sensor reader **140** could be a wireless phone, a personal digital assistant (PDA), a computer having wireless communications capabilities, or other type of mobile, handheld, and/or computing device.

Ex. 1005, Bandy 5:6-18

Bandy



Ex. 1005, Bandy Fig. 1

'307 Patent, Claim 1j

[1j] wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and

Bandy

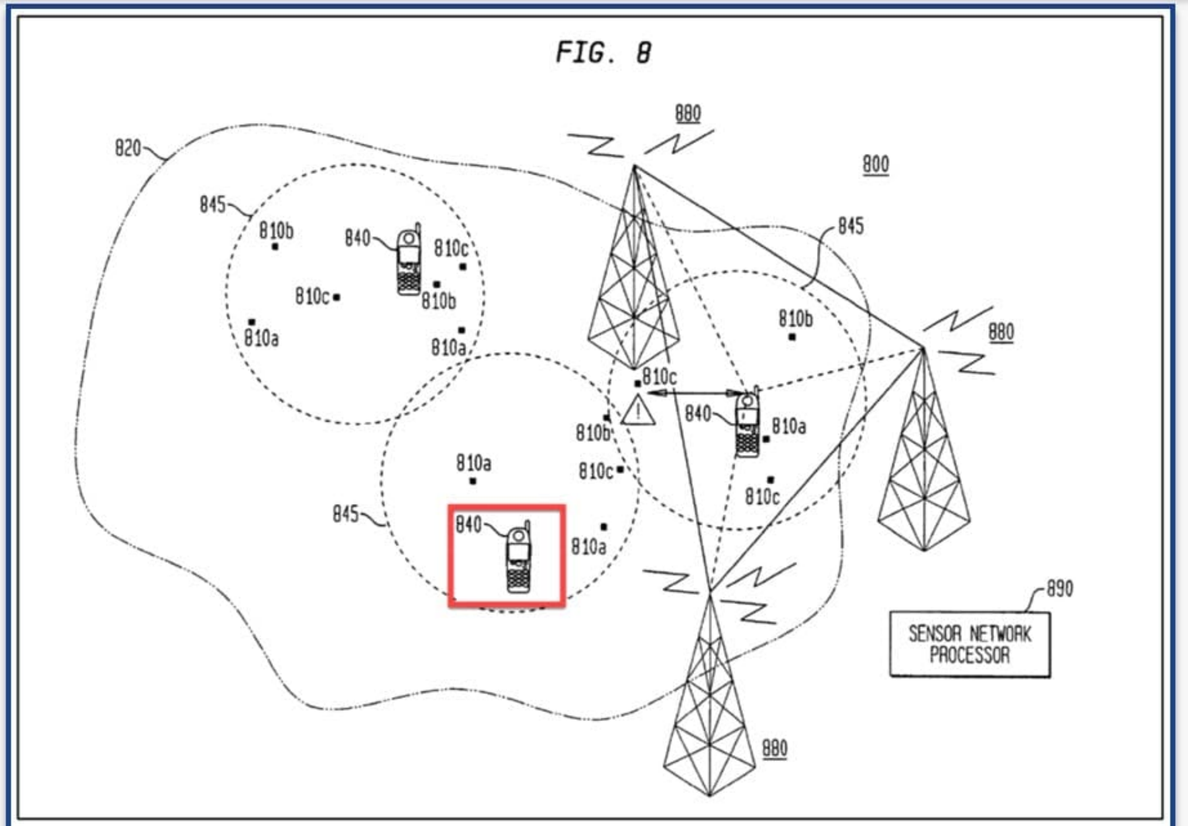
In step **950**, the wireless sensor reader **840** performs geolocation processing to determine the exact location of the RF addressable sensor associated with data indicating the presence of a dangerous agent. The geolocation processing could use GPS-based or non-GPS based techniques.

Ex. 1005, Bandy 17:62-67

Dr. Sarrafzadeh Declaration

185. A POSITA would recognize that wireless sensor readers such as wireless phones, PDAs, or computers having wireless communication capability, and that can communicate over wireless and data communication networks, such as the Internet, would have a unique ID such as an IP address, Media Access Control (MAC) address, and/or an International Mobile Equipment Identity (IMEI) number. Such identification numbers would allow the wireless sensor reader to uniquely identify itself for authentication to communication networks 170, 180 as well to sensor network processor 190. A MAC address is a unique identifier assigned to devices having network capability. Similarly, an IMEI number is a unique identifier assigned to wireless phones.

Ex. 1003, Sarrafzadeh Decl. ¶ 185



Bandy, Figure 8

Pet. 26 (citing Ex. 1005 Bandy Fig. 8)

'307 Patent, Claim 1j

[1j] wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and

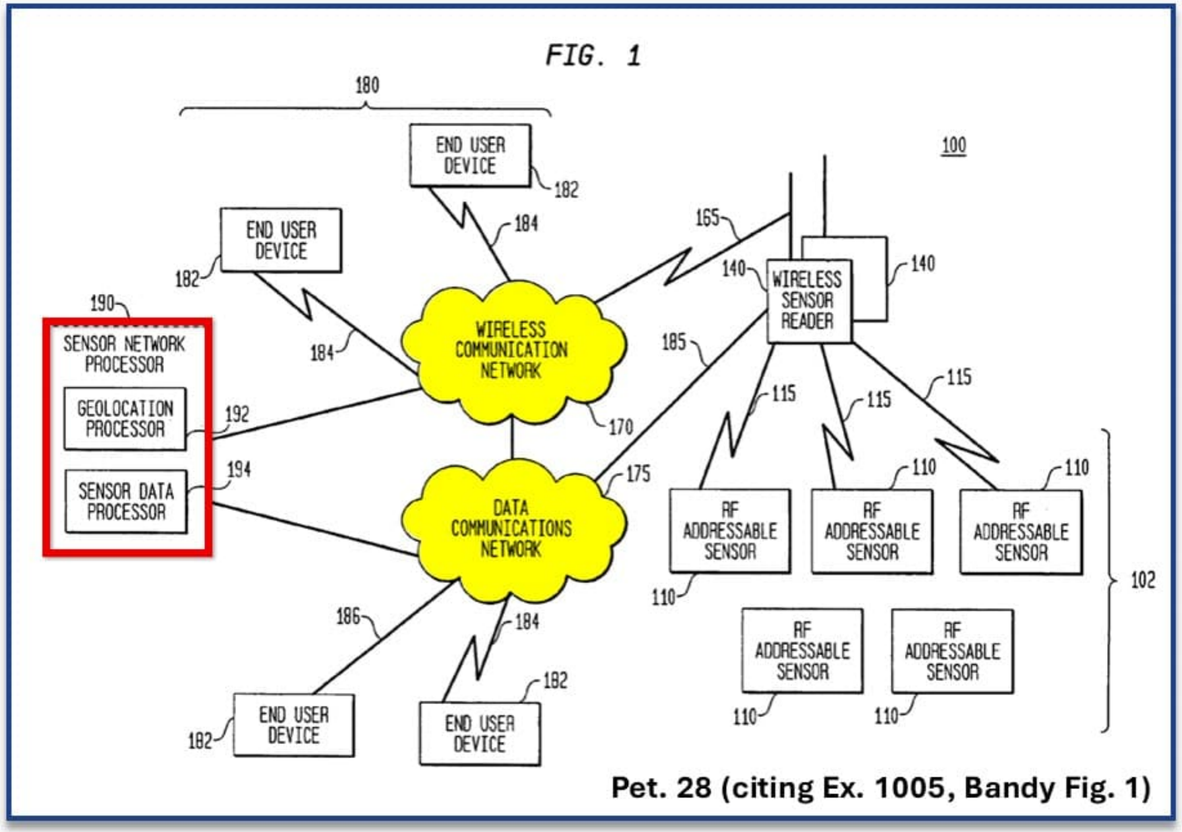
Bandy

In an embodiment of the present invention, wireless network **170** is a publicly accessible network, such as a switched telephone network supporting wireless communications. In an alternate embodiment, wireless network **170** may be a private network. Wireless network **170** may be coupled to a publicly accessible data communications network **175**. Publicly accessible data communications network **175** can be a public switched telephone network or a public data network such as the Internet. In addition, data commu-

Ex. 1005, Bandy 5:67-6:5

Sensor data processor **194** includes logic to receive sensor data from one or more RF addressable sensors **110**, perform processing on the received data, and communicate information based on the processing to wireless reader **140** or an end user device **182**. Sensor network processor **190** is coupled to the wireless communications network **170** and/or the data communications network **175**.

Ex. 1005, Bandy 6:42-46



Pet. 28 (citing Ex. 1005, Bandy Fig. 1)

'307 Patent, Claim 1j

[1k] wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;

Bandy

In step **780**, the RF addressable sensor **110** communicates the digital sensor data to wireless sensor reader **140/340**. The details of this communication are dependent upon the protocol used for communication between the wireless sensor reader **140/340** and the RF addressable sensor **110**. In an embodiment of the present invention, the protocol used is a binary tree traversal protocol. In this embodiment, the tag identification number signaled by the RF addressable sensor **110** may include both the tag identification number stored in memory **246** and the sensor data obtained by the sensor elements. Alternatively, reader **140/340** may place the RFID

Ex. 1005, Bandy 16:41-51

'307 Patent, Claim 1j

[1j] wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

Bandy

In an embodiment, memory **256** stores a sensor data table **258**. The sensor data table **258** is configured to store data related to all or a subset of sensor elements supported by the RF addressable sensor **210**. For example, the sensor data table may store a sensor element identification number, a preferred read time, spacing interval between reads, and/or sensor element specific data for all or a subset of sensor elements.

Using this approach a universal sensor platform is created based on RFID technology by allowing wireless devices such as phones to become "smart" sensor reader devices. In an embodiment, a wireless device such as a phone is modified to include RFID-sensor tag reader functionality, as described herein. In an embodiment, when a sensor **110**

Ex. 1005, Bandy 10:6-19

Bandy

described herein. In an embodiment, when a sensor **110** having data table **258** is activated by wireless sensor reader **140**, the sensor **110** identifies itself (e.g., by providing its identification number) and provides the cell phone reader with the necessary information for analyzing the sensor output. In an embodiment, sensor data table **258** also includes sensor handling information that is communicated to reader **140**. For example, if sensor **110** is to detect a specific allergen in food, a complete step-by-step testing protocol can be provided and can be displayed directly on the screen of the phone or reader device **140**. In another embodiment, some or all of the necessary information to handle and analyze the sensor is retrieved from processor **190**.

Software may also be downloaded directly and transparently into the cell phone or reader **140** to "train" the wireless device to recognize and analyze that given type of RFID-sensor. This information may be stored permanently or temporarily in wireless device **140**. When the necessary processing and analysis information is downloaded from a remote location, only the ID of the RFID-sensor is necessary, providing a highly streamlined solution for universal sensor analyses for wireless devices such as cell phones. In

Ex. 1005, Bandy 10:18-41

'307 Patent, Claim 2

[2] The system according to claim 1 wherein said wireless device is a cell phone.

Bandy

Wireless sensor reader **140** includes logic to interrogate the population of RF addressable sensors **102** and logic to read sensor data and RFID tag data transmitted by the RF addressable sensors **110**. In an embodiment, wireless sensor reader **140** also includes logic to process the received sensor data. Wireless sensor reader **140** can be any wireless device capable of communicating via an air interface protocol with the population of RF addressable sensors **102**. In embodiments of the present invention, wireless sensor reader **140** could be a wireless phone, a personal digital assistant (PDA), a computer having wireless communications capabilities, or other type of mobile, handheld, and/or computing device.

Ex. 1005, Bandy 5:6-18

Bandy

Software may also be downloaded directly and transparently into the cell phone or reader **140** to "train" the wireless device to recognize and analyze that given type of RFID-sensor. This information may be stored permanently or temporarily in wireless device **140**. When the necessary processing and analysis information is downloaded from a remote location, only the ID of the RFID-sensor is necessary, providing a highly streamlined solution for universal sensor analyses for wireless devices such as cell phones. In

Ex. 1005, Bandy 10:33-41

'307 Patent, Claim 5

[5] The system according to claim 1 wherein said sensor is a chemical sensor.

Bandy

motion. Sensor elements **292***a* to **292***n* may be a number of different sensor types such as a chemical sensors, biological sensors, etc. In an embodiment, sensor element **292***a* may include of a plurality of special thin film elements such as polymers. For example, in chemical sensor elements, chemicals present in the air are absorbed differently by each of the thin film elements, changing the resistance of each and creating a characteristic electronic signature. Because many types of detectors can be added, this technology can be designed to recognize a wide range of chemicals. It should be noted that hybrid systems are also possible. For example,

Ex. 1005, Bandy 7:56-67

'307 Patent, Claims 9 and 10

[9] The system according to claim 1 wherein the system further includes a GPS means for geolocating said system.

[10] The system according to claim 1 further including a non-GPS geolocation means for geolocating said system.

Bandy

For more information concerning geolocation, see U.S. Pat. No. 6,031,454, filed Nov. 13, 1997, entitled "Worker-Specific Exposure Monitor and Method for Surveillance of Workers," which is incorporated herein by reference in its entirety.

Ex. 1005, Bandy 6:37-41

'307 Patent

a global positioning system (GPS) or a non-GPS means. The reading, analysis and geolocation by GPS or non-GPS means is described in U.S. Pat. No. 6,031,454 that is included herein by reference in its entirety. Wireless device 2 can communi-

Ex. 1001, '307 Patent 17:21-24

'307 Patent, Claims 9 and 10

[9] The system according to claim 1 wherein the system further includes a GPS means for geolocating said system.

[10] The system according to claim 1 further including a non-GPS geolocation means for geolocating said system.

Bandy

In step **950**, the wireless sensor reader **840** performs geolocation processing to determine the exact location of the RF addressable sensor associated with data indicating the presence of a dangerous agent. The geolocation processing could use GPS-based or non-GPS based techniques.

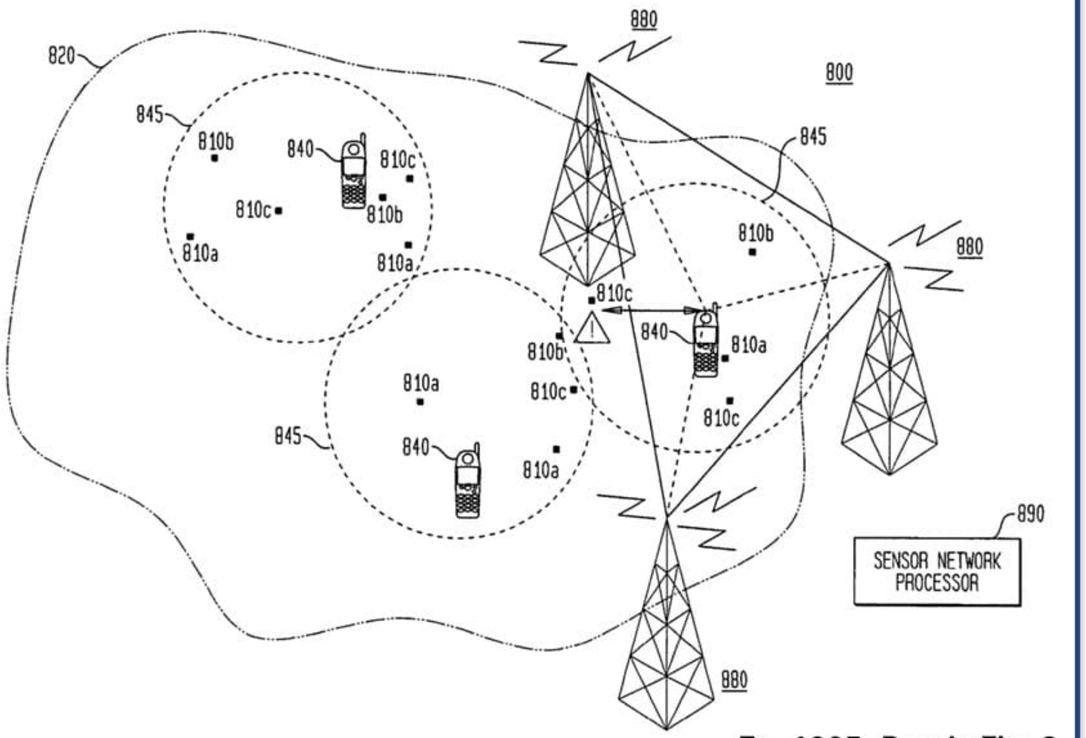
Ex. 1005, Bandy 17:62-67

across multiple systems. Geolocation processor **192** includes logic to receive data from one or more RF addressable sensors **110** and to perform GPS and/or non-GPS geolocation of the RF addressable sensors **110** based on the received data and/or signals. In GPS based geolocation, location is determined using signals provided to wireless sensor readers **140** via geo-stationary satellites. A limitation of GPS based geolocation is that signals are not available if the device is shielded (e.g., underground, in a building, etc.). In non-GPS based geolocation, location is determined by triangulation based on transmission systems as reference points (e.g., mobile base stations) and time to signal calculations. In this manner, cell phone towers can geolocate wireless sensor readers **140** through calculations done by processor **190**. Similarly, wireless sensors readers **140** may be used as a basis to identify the precise location of individual sensors **110** by triangulation and synchronization of internal clocks. Since either the location of cell phone towers and/or wireless sensor readers is usually known and can include GPS coordinates, precise geolocation of sensors can be achieved using either GPS, non-GPS or hybrid systems.

Ex. 1005, Bandy 6:16-36

Bandy

FIG. 8



Ex. 1005, Bandy Fig. 8

Ground II: Claim 3 Is Unpatentable Over Bandy and Heller

'307 Patent, Claim 3

[3] The system according to claim 1 wherein said sensor unit is integrated into a disposable wireless skin patch for diagnostic applications.

Bandy

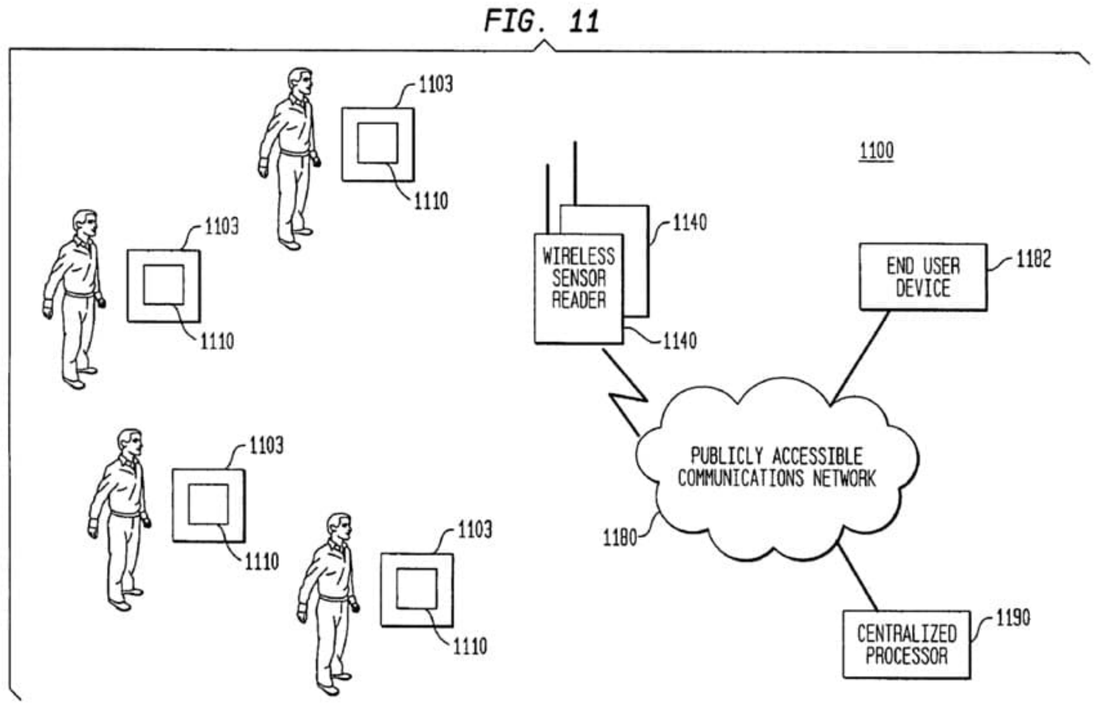
The present invention can also be used for remote diagnostics monitoring, according to an example embodiment of the present invention. An example of this use is presented in the block diagram of FIG. **11**. As shown in FIG. **11**, remote individual-specific monitoring network **1100** includes one or more smart cards or badges **1103** having at least one RF addressable sensor **1110**, a wireless sensor reader **1140**, a communications network **1180**, and an end user device **1182**.

The RF addressable sensor **1110** may have sensor elements for monitoring temperature, chemical composition, biological composition, or a combination of the above for an individual.

The remote monitoring application can have residential, industrial, commercial, security or medical institution applications. In an embodiment of the present invention, smart card or badge **1103** is affixed to a person (or animal) such that the sensor elements of the RF addressable sensor are proximate to the surface of the skin. RF addressable sensor **1110** may include low power sensors to monitor certain conditions or characteristics such as the individual's vital functions. The smart card or badge **1103** is placed within the read range of the wireless sensor reader **1140**.

Ex. 1005, Bandy 19:56-20:10

Bandy



Ex. 1005, Bandy Fig. 11

'307 Patent, Claim 3

[3] The system according to claim 1 wherein said sensor unit is integrated into a disposable wireless skin patch for diagnostic applications.

Heller

In another embodiment, a coupled mounting unit 77 and housing 45 of an on-skin sensor control unit 44 is provided on an adhesive patch 204 with an optional cover 206 to protect and/or confine the housing 45 of the on-skin sensor control unit 44, as illustrated in Figure 28A. The optional cover may contain an adhesive or

Ex. 1016, Heller 54:29-32

One embodiment of the on-skin sensor control unit 44 is a disposable unit complete with a battery for operating the unit. There are no portions of the unit that

Ex. 1016, Heller 50:18-19

Ground III: Claims 1-3, 5, 9, 10 Are Unpatentable Over Beck, Heller, and Lovejoy

'307 Patent, Claim 1 Preamble

[1pre] A radio frequency (RF) addressable diagnostic sensor unit comprising:

Beck

(57) **ABSTRACT**

Systems, client computing devices, server computing devices, and methods are disclosed for accessing medical devices, providing remote access to medical devices and/or remotely accessing medical devices. In one exemplary embodiment, client computing devices utilize protocol components that may be obtained from a server computing device via a network to communicate with medical devices in a communications protocol supported by the medical device.

Ex. 1007, Beck Abstract

via an appropriate cable or connector. The device interface **126** may alternatively, or in addition, include wireless technologies such as RF and/or IR transmitter/receivers to establish the physical communications link **140** between the client computing device **120** and the medical device **130**.

Ex. 1007, Beck [0030]

Beck

cose levels of blood applied to test strips. While the medical device **130** of the exemplary embodiment includes a glucose meter, the medical device **130** could be implemented to monitor and/or analyze other biological/physiological parameters or conditions such as body fluids or bodily functions (e.g. blood, urine, saliva), bodily signals (e.g. electrocardio-signals, brain waves, blood pressure waves), and/or other bodily stimuli (e.g. respiration) to obtain measurements of blood pressure, blood gases, blood coagulation, electrolytes, cardiovascular activity, drug levels, respiration rate, stress, etc.

Ex. 1007, Beck [0034]

device **120** via an appropriate cable or connector. The communications interface **136** may alternatively, or in addition, include wireless technologies such as RF and/or IR transmitter/receivers to establish the physical communications link **140** between the client computing device **120** and the medical device **130**.

Ex. 1005, Beck [0039]

'307 Patent, Claim 1a

[1a] at least one sensor element;

Beck

[0034] As shown, the system **100** further includes a medical device **130**. The medical device **130** of the system **100** is generally operable to monitor one or more biological/physiological conditions and communicate with the client computing device **120** via the physical communications link **140** established between the client computing device **120** and the medical device **130**. In an exemplary embodiment, the medical device **130** includes a glucose meter such as the glucose meters manufactured by Roche Diagnostics Corporation which are generally operable to measure blood glucose levels of blood applied to test strips. While the medical device **130** of the exemplary embodiment includes a glucose meter, the medical device **130** could be implemented to monitor and/or analyze other biological/physiological parameters or conditions such as body fluids or bodily functions (e.g. blood, urine, saliva), bodily signals (e.g. electrocardio-signals, brain waves, blood pressure waves), and/or other bodily stimuli (e.g. respiration) to obtain measurements of blood pressure, blood gases, blood coagulation, electrolytes, cardiovascular activity, drug levels, respiration rate, stress, etc.

Ex. 1007, Beck [0034]

Heller

(57) Abstract: An analyte monitor includes a sensor, a sensor control unit, and a display unit. The sensor has, for example, a substrate, a recessed chanel formed in the substrate, and conductive material disposed in the recessed channel to form a working electrode. The sensor control unit typically has a housing adapted for placement on skin and is adapted to receive a portion of an electrochemical sensor. The sensor control unit also includes two or more conductive contacts disposed on the housing and configured for coupling to two or more contact pads on the sensor. A transmitter is disposed in the housing and coupled to the plurality of conductive contacts for transmitting data obtained using the sensor. The display unit has a receiver for receiving data transmitted by the transmitter of the sensor control unit and a display coupled to the receiver for displaying an indication of a level os an analyte. The enalyte monitor may also be part of a drug delivery system to alter the level of the analyte based on the data obtained using the sensor.

Ex. 1016, Heller Abstract

A sensing layer 64 (see Figures 3A and 3B) is often formed proximate to or on at least one of the working electrodes 58 to facilitate the electrochemical detection of the analyte and the determination of its level in the sample fluid, particularly if the analyte can not be electrolyzed at a desired rate and/or with a desired specificity on a bare electrode. The sensing layer 64 may include an electron

Ex. 1016, Heller 12:31-13:2

'307 Patent, Claim 1b

[1b] at least one reference sensor element;

Dr. Sarrafzadeh Declaration

266. Heller goes on to explain that the relationship between analyte level and sensor current changes based on temperature, as shown in Figure 29, reproduced below. *See* Heller at 67:20-68:5. And the processor of the sensor control unit "is designed to account for this relationship by using the temperature information from measurement 96 to adjust a known profile for a given temperature in a known manner when the sensed temperature varies from the aforementioned temperature." Heller at 67:32-68:4. Thus, Heller's temperature probe/sensor is a reference sensor because the data it generates is used to adjust data generated by Heller's glucose sensor.

Ex. 1003, Sarrafzadeh Decl. ¶ 266

Dr. Sarrafzadeh Declaration

267. A POSITA would have been motivated to incorporate Heller's reference sensor—such as Heller's temperature sensor—into the medical devices disclosed by Beck—e.g., for monitoring glucose—to account for the effect of varying temperature on its glucose sensor and improve the accuracy of the glucose sensor. Such a combination represents use of a known technique (incorporation of a temperature sensor and implementation of temperature-based adjustments) to improve similar devices (Beck's medical device) in the same way.

Ex. 1003, Sarrafzadeh Decl. ¶ 267

'307 Patent, Claim 1c

[1c] a unique identification ID number;

Beck

[0055] The device identification component **214** of the exemplary client computing device **120** generally causes the client computing device **120** to identify the medical device **130** without the need for the user to enter identifying information for the medical device **130**. To this end, the device identification component **214** in an exemplary embodiment scans a predetermined port of the client computing device **120** to determine the type of medical device **130** operably coupled to the predetermined port. The exact procedure that the device identification component **214** utilizes to identify the medical device **130** operably coupled to the client computing device **120** depends upon the communications protocols utilized by the medical devices supported by the system **100**. Several known techniques may be used such as identifying the medical device **130** based upon (i) responses received from the medical device **130** due to stimulus signals applied to the medical device **130**, (ii) identification codes retrieved from the medical device **130**, (iii) serial numbers retrieved from the medical device **130**, and/or (iv) other information retrieved from the medical device **130**. It is understood that device identification component **214** may include a manual device identification such as a drop down box, check box, or other manual entry.

Ex. 1007, Beck [0055]

Beck

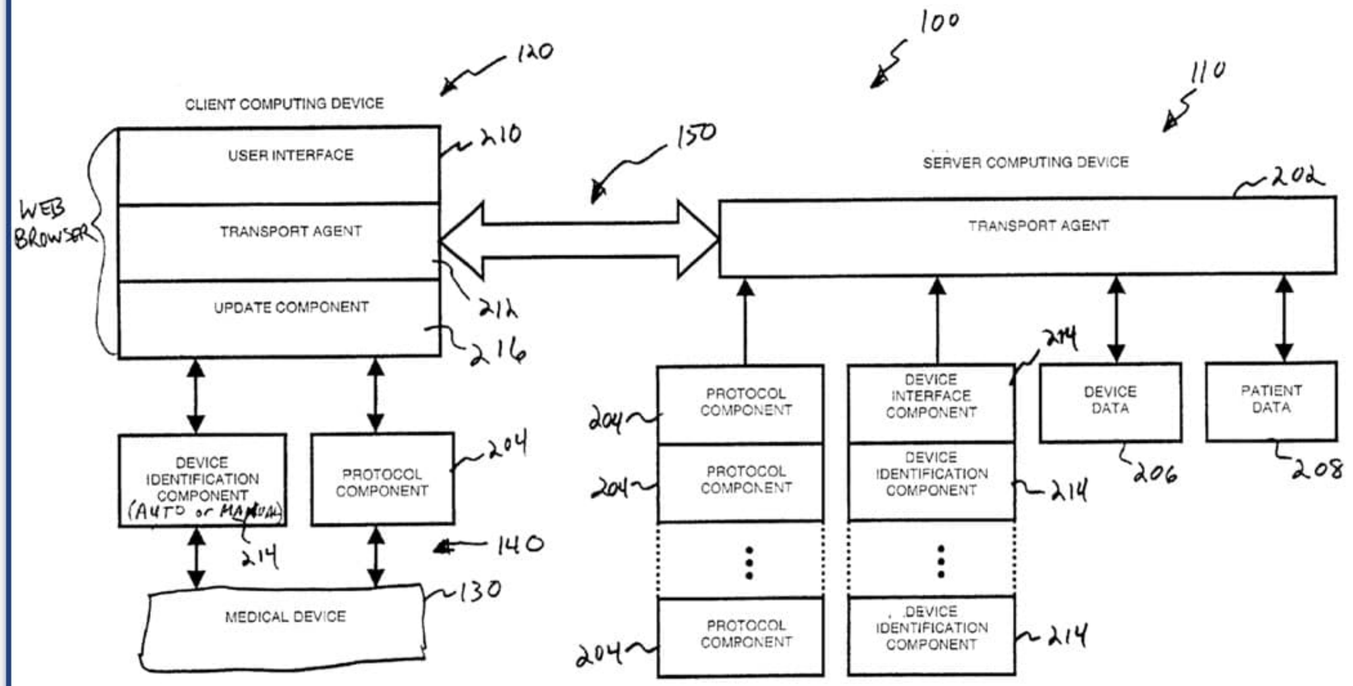


FIG. 2

Ex. 1007, Beck Fig. 2

'307 Patent, Claim 1d

[1d] a sensor interface having an analog to digital converter coupled to the at least one sensor and reference sensor element;

Beck

[0035] As can be seen from **FIG. 1**, the exemplary medical device **130** includes a processor **132**, memory **133**, a communications interface **136**, one or more user I/O devices **137**, and a system bus **138**. The processor **122** of the exemplary medical device **130** includes a single microprocessor or microcontroller; however, the processor **122** may alternatively include more than one processor. As a result of executing the software and/or firmware routines of the memory **133**, the processor **132** controls the general operation of the medical device **130**. More specifically, the processor **132** as a result of executing software and/or firmware routines of the memory **133** is generally operable to configure the medical device **130** to obtain measurement data indicative of a biological/physiological condition.

Ex. 1007, Beck [0035]

Heller

As an example of the operation of these components, the sensor circuit 97 and the optional temperature probe circuit 99 provide raw signals from the sensor 42 to the measurement circuit 96. The measurement circuit 96 converts the raw signals to a desired format, using for example, a current-to-voltage converter, current-to-frequency converter, and/or a binary counter or other indicator that produces a signal proportional to the absolute value of the raw signal. This may be used, for example, to convert the raw signal to a format that can be used by digital logic circuits. The processing circuit 109 may then, optionally, evaluate the data and provide commands to operate the electronics.

Ex. 1016, Heller 62:10-16

39. The method of claim 37, further comprising:

collecting an analog signal representing a level of an analyte in a bodily fluid;

converting the analog signal into a digital signal representing a level of an analyte in a bodily fluid.

Ex. 1016, Heller Claim 39

'307 Patent, Claim 1e

[1e] at least one antenna;

Beck

[0039] The communications interface **136**, however, may alternatively, or in addition, include other communications mechanisms such as a parallel port, a SCSI port, a USB port, a 1394 port (i.e. FireWire or I-Link port), a Fibre Channel port, a network interface controller, or some other type of communications port to which a user may couple a corresponding communications port of the client computing device **120** via an appropriate cable or connector. The communications interface **136** may alternatively, or in addition, include wireless technologies such as RF and/or IR transmitter/receivers to establish the physical communications link **140** between the client computing device **120** and the medical device **130**.

Ex. 1007, Beck [0039]

'307 Patent, Claim 1f

[1f] a substrate;

Heller

(57) Abstract: An analyte monitor includes a sensor, a sensor control unit, and a display unit. The sensor has, for example, a substrate, a recessed chanel formed in the substrate, and conductive material disposed in the recessed channel to form a working electrode. The sensor control unit typically has a housing adapted for placement on skin and is adapted to receive a portion of an electrochemical sensor. The sensor control unit also includes two or more conductive contacts disposed on the housing and configured for coupling to two or more contact pads on the sensor. A transmitter is disposed in the housing and coupled to the plurality of conductive contacts for transmitting data obtained using the sensor. The display unit has a receiver for receiving data transmitted by the transmitter of the sensor control unit and a display coupled to the receiver for displaying an indication of a level os an analyte. The enalyte monitor may also be part of a drug delivery system to alter the level of the analyte based on the data obtained using the sensor.

Ex. 1016, Heller Abstract

'307 Patent, Claim 1g

[1g] an RF power and communication interface coupled to the at least one antenna and sensor interface;

Beck

[0035] As can be seen from **FIG. 1**, the exemplary medical device **130** includes a processor **132**, memory **133**, a communications interface **136**, one or more user I/O devices **137**, and a system bus **138**. The processor **122** of the exemplary medical device **130** includes a single microprocessor or microcontroller; however, the processor **122** may

Ex. 1007, Beck [0035]

of the client computing device **120**. However, even a medical device **130** that highly leverages the user I/O devices **127** of the client computing device **120** will usually still have a few user I/O devices **137** such as an LED that provides visual feedback that the medical device **130** is powered, an LED that provides visual feedback that the physical communications link **140** has been established, and/or a button or switch to power the medical device **130** on or off.

Ex. 1007, Beck [0041]

Heller

electronic components built into the sensor structure. Data is transmitted back to the sensor control unit, using, for example, inductive coupling via the same or different antennas and/or transmission of the signal via a transmitter on the sensor. The use of inductive coupling can eliminate electrical contacts between the sensor and the on-skin sensor control unit. Such contacts are commonly a source of noise and failure. Moreover, the sensor control unit may then be entirely sealed which may increase the waterproofing of the on-skin sensor control unit.

Ex. 1016, Heller 59:21-27

'307 Patent, Claim 1h

[1h] a controller coupled to the RF power and communications interface and the sensor interface; and

Beck

[0035] As can be seen from **FIG. 1**, the exemplary medical device **130** includes a processor **132**, memory **133**, a communications interface **136**, one or more user I/O devices **137**, and a system bus **138**. The processor **122** of the exemplary medical device **130** includes a single microprocessor or microcontroller; however, the processor **122** may alternatively include more than one processor. As a result of executing the software and/or firmware routines of the memory **133**, the processor **132** controls the general operation of the medical device **130**. More specifically, the processor **132** as a result of executing software and/or firmware routines of the memory **133** is generally operable to configure the medical device **130** to obtain measurement data indicative of a biological/physiological condition.

Ex. 1007, Beck [0035]

Dr. Sarrafzadeh Declaration

302. To the extent Beck alone does not disclose this limitation, the combination of Beck in view of Heller (to incorporate Heller's inductive coupling approach to transfer power and data) as described in the preceding element render this limitation obvious. In that combination, inductive coupling—which as I describe in the preceding element provides an RF power and communication interface—is used to transfer data from the sensor to the medical device for processing. Accordingly, the combination results in processor 132 of Beck (a controller) coupled to the RF power and communication interface and the sensor interface.

Ex. 1003, Sarrafzadeh Decl. ¶ 302

'307 Patent, Claim 1i

[1i] a memory coupled to the controller and the sensor interface;

Beck

[0035] As can be seen from **FIG. 1**, the exemplary medical device **130** includes a processor **132**, memory **133**, a communications interface **136**, one or more user I/O devices **137**, and a system bus **138**. The processor **122** of the exemplary medical device **130** includes a single microprocessor or microcontroller; however, the processor **122** may alternatively include more than one processor. As a result of executing the software and/or firmware routines of the memory **133**, the processor **132** controls the general operation of the medical device **130**. More specifically, the processor **132** as a result of executing software and/or firmware routines of the memory **133** is generally operable to configure the medical device **130** to obtain measurement data indicative of a biological/physiological condition.

Ex. 1007, Beck [0035]

'307 Patent, Claim 1j

[1j] wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and

Beck

[0014] A system **100** is shown in **FIG. 1** and **FIG. 2** which incorporates various features of the present invention. As illustrated, the system **100** includes a server computing device **110**, a client computing device **120**, a medical device **130** operable coupled to the client computing device **120** via a communications link **140**, and a network **150** which operably couples the client computing device **120** to the server computing device **110**. In general, the system **100** automatically or semi-automatically configures the client computing devices **120** for communication with medical devices **130** that utilize different communications protocols, and provides the server computing device **110** remote access to the medical devices **130** via the client computing devices **120** and the network **150**.

Ex. 1007, Beck [0014]

Beck

[0030] However, the device interface **126** may alternatively, or in addition, include other communications mechanisms such as a parallel port, a SCSI port, a USB port, a 1394 port (i.e. FireWire or I-Link port), a Fibre Channel port, a network interface controller, or some other type of communications port to which a user may couple a corresponding communications port of the medical device **130** via an appropriate cable or connector. The device interface **126** may alternatively, or in addition, include wireless technologies such as RF and/or IR transmitter/receivers to establish the physical communications link **140** between the client computing device **120** and the medical device **130**.

Ex. 1007, Beck [0030]

[0027] The exemplary client computing device **120** may alternatively be implemented such that the same hardware components that implement the memory **123** also implement the storage device **124**. For example, the exemplary client computing device **120** may be implemented with memory chips that implement both the functionality of the memory **123** and the storage device **124**. Many special purpose computing devices such as handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones which could be used to implement the client computing device **120** are implemented in such a manner.

Ex. 1007, Beck [0027]

'307 Patent, Claim 1j

[1j] wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and

Beck

[0065] The server computing device **110** in step **306** attempts to authenticate the user, the client computing device **120**, and/or the medical device **130**. In an exemplary embodiment, the server computing device **110** attempts to authenticate the user, the client computing device **120**, and/or the medical device **130** via various authentication schemes in order to enable a user to retrieve previously collected biological/physiological data, and/or ensure that collected biological/physiological data is kept private. In an exemplary embodiment, the user via the user interface **210** enters a username and password which the server computing device **110** compares to username/password pair of the maintained patient data **208** to determine whether the user has entered a valid username/password pair. However, in environments where security/privacy is not a concern, an alternative embodiment of the server computing device **110** does not authenticate the user, the client computing device **120**, and/or the medical device **130**. It should be appreciated that other authentication methods are also suitable. For example, authentication may be based further upon or alternatively upon the network address of client computing device **120**, the serial number of the medical device **130**, stored authentication keys (e.g. PGP keys), etc.

Ex. 1007, Beck [0065]

Dr. Sarrafzadeh Declaration

319. In addition, Beck states that client computing devices 120 can include "handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones." Beck at [0027]. A POSITA would also recognize that an Internet enabled cellular phone would have an IP address, Media Access Control (MAC) address, and/or an International Mobile Equipment Identity (IMEI) number for uniquely identifying the respective device. A MAC address is a unique identifier assigned to devices having network capability. Similarly, an IMEI number is a unique identifier assigned to wireless phones.

Ex. 1003, Sarrafzadeh Decl. ¶ 319

'307 Patent, Claim 1j

[1j] wherein the RF addressable sensor communicates with a remote wireless device, said wireless device having multiple wireless communication means, geolocation means and a unique ID, whereby said wireless device is coupled to at least one communications network linked to t least one remote server; and

Beck

[0027] The exemplary client computing device **120** may alternatively be implemented such that the same hardware components that implement the memory **123** also implement the storage device **124**. For example, the exemplary client computing device **120** may be implemented with memory chips that implement both the functionality of the memory **123** and the storage device **124**. Many special purpose computing devices such as handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones which could be used to implement the client computing device **120** are implemented in such a manner.

Ex. 1007, Beck [0027]

Lovejoy

the personal monitor system of this invention. The personal monitor itself has several subsystems, including the monitor housing with its various controls and input/output links, the individualized sensors that plug into the monitor housing, geolocating capabilities (GPS or the radar-responsive tags), and the on-board computing capabilities of the monitor. The

Ex. 1009, Lovejoy 4:32-37

'307 Patent, Claim 1k

[1k] wherein the wireless device communicates with the RF addressable sensor interface to obtain the ID and sensor data;

Beck

[0055] The device identification component **214** of the exemplary client computing device **120** generally causes the client computing device **120** to identify the medical device **130** without the need for the user to enter identifying information for the medical device **130**. To this end, the device identification component **214** in an exemplary embodiment scans a predetermined port of the client computing device **120** to determine the type of medical device **130** operably coupled to the predetermined port. The exact procedure that the device identification component **214** utilizes to identify the medical device **130** operably coupled to the client computing device **120** depends upon the communications protocols utilized by the medical devices supported by the system **100**. Several known techniques may be used such as identifying the medical device **130** based upon (i) responses received from the medical device **130** due to stimulus signals applied to the medical device **130**, (ii) identification codes retrieved from the medical device **130**, (iii) serial numbers retrieved from the medical device **130**, and/or (iv) other information retrieved from the medical device **130**. It is understood that device identification component **214** may include a manual device identification such as a drop down box, check box, or other manual entry.

Ex. 1007, Beck [0055]

Beck

[0074] As a result of executing the proper protocol component **204**, the client computing device **120** performs various operations in regard to communicating with the medical device **130** on the behalf of the client computing device **120** and/or the server computing device **110**. For example, the server computing device **110** may cause client computing device **120** to issue commands to the medical device **130** via the protocol component **204** which cause the medical device **130** to adjust an internal clock, clear stored measurement data, retrieve stored measurement data, update calibration or other parameters used to obtain measurement data, perform a test to obtain measurement data, or other tasks.

[0075] Similarly, the server computing device **110** may cause the client computing device **120** to transfer measurement data, device status data, etc. from the medical device **130** to the server computing device **110**. More specifically, the client computing device **120** obtains the data from the medical device **130** via the protocol component **204**, and after completing the transfer of data from the medical device **130** to the client computing device **120**, the client computing device **120** transfers the data to the server computing device **110**. However, the client computing device **120** may alternatively begin the transfer of received data to the server computing device **110** before receiving all of the requested data from the medical device **130**.

Ex. 1007, Beck [0074-0075]

'307 Patent, Claim 1l

[1l] wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

Beck

[0065] The server computing device **110** in step **306** attempts to authenticate the user, the client computing device **120**, and/or the medical device **130**. In an exemplary embodiment, the server computing device **110** attempts to authenticate the user, the client computing device **120**, and/or the medical device **130** via various authentication schemes in order to enable a user to retrieve previously collected biological/physiological data, and/or ensure that collected biological/physiological data is kept private. In an exemplary embodiment, the user via the user interface **210** enters a username and password which the server computing device **110** compares to username/password pair of the maintained patient data **208** to determine whether the user has entered a valid username/password pair. However, in environments where security/privacy is not a concern, an alternative embodiment of the server computing device **110** does not authenticate the user, the client computing device **120**, and/or the medical device **130**. It should be appreciated that other authentication methods are also suitable. For example, authentication may be based further upon or alternatively upon the network address of client computing device **120**, the serial number of the medical device **130**, stored authentication keys (e.g. PGP keys), etc.

Ex. 1007, Beck [0065]

Beck

[0069] The server computing device **110** in step **316** provides the update component **216** of the client computing device **120** with protocol component information that identifies the proper protocol component **204** to be used with the identified medical device **130**. In an exemplary embodiment, the server computing device **110** merely transfers to the client computing device **120** an HTML document that includes a reference to the proper ActiveX Control for the client computing device **120** to execute in order to communicate with the medical device **130**.

Ex. 1007, Beck [0069]

'307 Patent, Claim 1l

[1l] wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

Beck

[0067] The device identification component **214** of the client computing device **120** in step **312** provides the server computing device **110** with device information from which the server computing device **110** determines the proper protocol component **204** to be used with the medical device **130**. As indicated above, the device identification component **214** generally interrogates the medical device **130** via a series of signals, receives signals from the medical device **130** in response to the interrogation, and discerns the type of medical device **130** connected to the client computing device **120** based upon the signals received from the medical device **130**. The signals received from the medical device **130** may include ACK signals or other signals indicative of information such as a serial number, model number, device type, version number, etc. At any rate, the device identification component **214** provides the server computing device **110** with device information via the client transport agent **212** from which the server computing device **110** ascertains the type of medical device **130** operably coupled to the client computing device **120**.

Ex. 1007, Beck [0067]

Beck

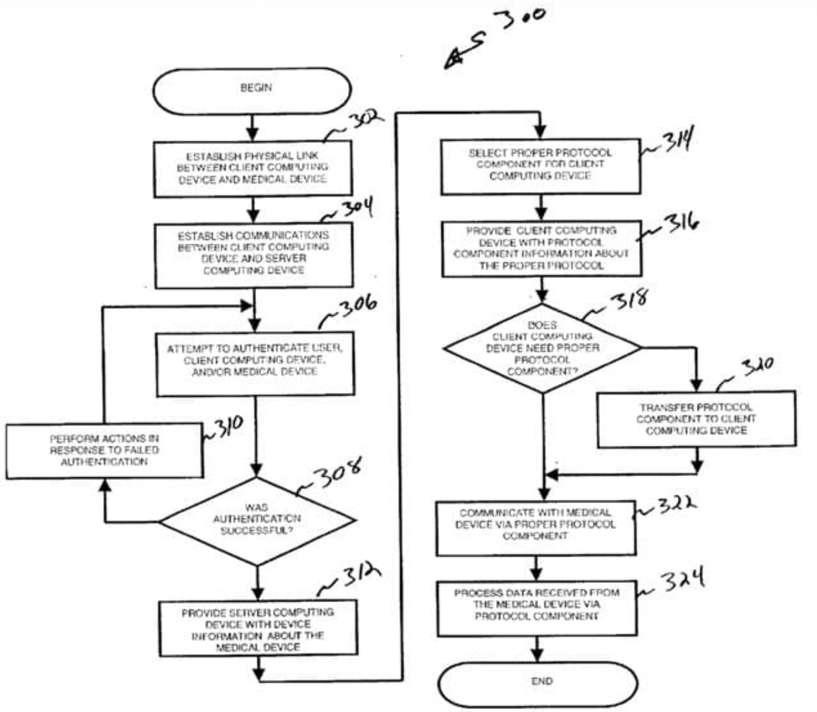


FIG. 3 **Ex. 1007, Beck Fig. 3**

'307 Patent, Claim 1l

[1l] wherein the remote server authenticates said unique sensor ID associated with said unique wireless device ID and communicates to said wireless device processed information relating to said sensor data and software related to the unique sensor ID, thereby allowing said wireless device to interpret said sensor anywhere worldwide.

Beck

[0076] As indicated above, some of the operations performed on behalf of the server computing device **110** cause the client computing device **120** to provide the server computing device **110** with data such as measurement data, device status data, etc. Accordingly, the server computing device **110** in step **322** processes data received from the measurement device **130** via the client computing device **120**. For example, the server computing device **110** in an exemplary embodiment stores measurement data received from the client computing device **120** with the patient data **208** such that the measurement data is associated with the user, client computing device **120**, and/or medical device **130** authenticated in step **306**. In this manner, the sever computing device **110** maintains historic measurement data for an authenticated user, client computing device **120**, and/or medical device **130**. In response to a request received from the client computing device **120**, the server computing device **110** at later date retrieves and/or analyzes the historic data for the authenticated user, the client computing device **120**, and/or the medical device **130**. Further, the server computing device **110** provides the client computing device **120** with results data in the form of a HTML document that includes tables, charts, graphs, explanations, etc. to aid in assessing the meaning of the current measurement data and/or the historic measurement data.

Ex. 1007, Beck [0076]

Beck

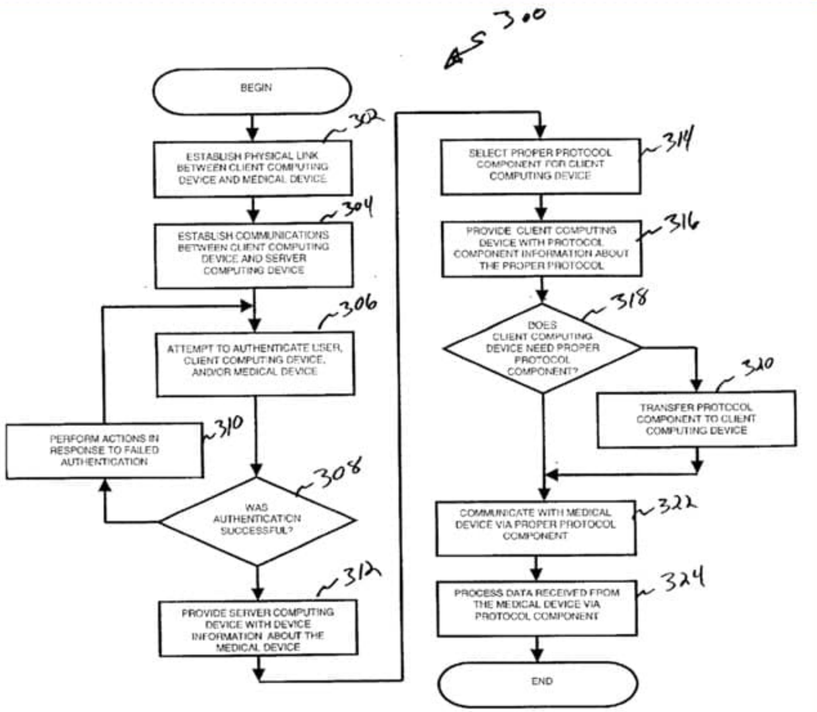


FIG. 3 **Ex. 1007, Beck Fig. 3**

'307 Patent, Claim 2

[2] The system according to claim 1 wherein said wireless device is a cell phone.

Beck

[0027] The exemplary client computing device **120** may alternatively be implemented such that the same hardware components that implement the memory **123** also implement the storage device **124**. For example, the exemplary client computing device **120** may be implemented with memory chips that implement both the functionality of the memory **123** and the storage device **124**. Many special purpose computing devices such as handheld computing devices (e.g. Palm Pilots) and Internet enabled cellular phones which could be used to implement the client computing device **120** are implemented in such a manner.

Ex. 1007, Beck [0027]

'307 Patent, Claim 3

[3] The system according to claim 1 wherein said sensor unit is integrated into a disposable wireless skin patch for diagnostic applications.

Beck

[0034] As shown, the system **100** further includes a medical device **130**. The medical device **130** of the system **100** is generally operable to monitor one or more biological/physiological conditions and communicate with the client computing device **120** via the physical communications link **140** established between the client computing device **120** and the medical device **130**. In an exemplary embodiment, the medical device **130** includes a glucose meter such as the glucose meters manufactured by Roche Diagnostics Corporation which are generally operable to measure blood glucose levels of blood applied to test strips. While the medical device **130** of the exemplary embodiment includes a glucose meter, the medical device **130** could be implemented to monitor and/or analyze other biological/physiological parameters or conditions such as body fluids or bodily functions (e.g. blood, urine, saliva), bodily signals (e.g. electrocardio-signals, brain waves, blood pressure waves), and/or other bodily stimuli (e.g. respiration) to obtain measurements of blood pressure, blood gases, blood coagulation, electrolytes, cardiovascular activity, drug levels, respiration rate, stress, etc.

Ex. 1007, Beck [0034]

Beck

[0039] The communications interface **136**, however, may alternatively, or in addition, include other communications mechanisms such as a parallel port, a SCSI port, a USB port, a 1394 port (i.e. FireWire or I-Link port), a Fibre Channel port, a network interface controller, or some other type of communications port to which a user may couple a corresponding communications port of the client computing device **120** via an appropriate cable or connector. The communications interface **136** may alternatively, or in addition, include wireless technologies such as RF and/or IR transmitter/receivers to establish the physical communications link **140** between the client computing device **120** and the medical device **130**.

Ex. 1007, Beck [0039]

'307 Patent, Claim 3

[3] The system according to claim 1 wherein said sensor unit is integrated into a disposable wireless skin patch for diagnostic applications.

Heller

In another embodiment, a coupled mounting unit 77 and housing 45 of an on-skin sensor control unit 44 is provided on an adhesive patch 204 with an optional cover 206 to protect and/or confine the housing 45 of the on-skin sensor control unit 44, as illustrated in Figure 28A. The optional cover may contain an adhesive or

Ex. 1016, Heller 53:29-32

Heller

One embodiment of the on-skin sensor control unit 44 is a disposable unit complete with a battery for operating the unit. There are no portions of the unit that

Ex. 1016, Heller 49:18-19

'307 Patent, Claim 5

[5] The system according to claim 1 wherein said sensor is a chemical sensor.

Beck

[0034] As shown, the system **100** further includes a medical device **130**. The medical device **130** of the system **100** is generally operable to monitor one or more biological/physiological conditions and communicate with the client computing device **120** via the physical communications link **140** established between the client computing device **120** and the medical device **130**. In an exemplary embodiment, the medical device **130** includes a glucose meter such as the glucose meters manufactured by Roche Diagnostics Corporation which are generally operable to measure blood glucose levels of blood applied to test strips. While the medical device **130** of the exemplary embodiment includes a glucose meter, the medical device **130** could be implemented to monitor and/or analyze other biological/physiological parameters or conditions such as body fluids or bodily functions (e.g. blood, urine, saliva), bodily signals (e.g. electrocardio-signals, brain waves, blood pressure waves), and/or other bodily stimuli (e.g. respiration) to obtain measurements of blood pressure, blood gases, blood coagulation, electrolytes, cardiovascular activity, drug levels, respiration rate, stress, etc.

Ex. 1007, Beck [0034]

Heller

As an example, an electrochemical sensor may be based on the reaction of a glucose molecule with two non-leachable ferricyanide anions in the presence of glucose oxidase to produce two non-leachable ferrocyanide anions, two hydrogen ions, and gluconolactone. The amount of glucose present is assayed by

Ex. 1016, Heller 35:24-26

'307 Patent, Claims 9 and 10

[5] The system according to claim 1 wherein the system further includes a GPS means for geolocating said system.

Lovejoy

the personal monitor system of this invention. The personal monitor itself has several subsystems, including the monitor housing with its various controls and input/output links, the individualized sensors that plug into the monitor housing, geolocating capabilities (GPS or the radar-responsive tags), and the on-board computing capabilities of the monitor. The

Ex. 1009, Lovejoy 4:32-37

Dr. Sarrafzadeh Declaration

352. Therefore, Beck in view of Lovejoy discloses structure that is the same or equivalent to the corresponding structure disclosed in the '307 patent for performing GPS geolocation. Indeed, the '307 patent incorporates by reference Lovejoy for disclosure relating to geolocation by GPS or non-GPS means. *See* '307 patent at 17:21-24 ("The reading, analysis and geolocation by GPS or non-GPS means is described in U.S. Patent No. 6,031,454 that is included herein by reference in its entirety."). Thus, the combination of Beck and Lovejoy renders obvious structure that is identical to the corresponding structure disclosed in the '307 patent for performing GPS-based geolocation.

Ex. 1003, Sarrafzadeh Decl. ¶ 352.

'307 Patent, Claims 9 and 10

[5] The system according to claim 1 further including a non-GPS geolocation means for geolocating said system.

Lovejoy

the personal monitor system of this invention. The personal monitor itself has several subsystems, including the monitor housing with its various controls and input/output links, the individualized sensors that plug into the monitor housing, geolocating capabilities (GPS or the radar-responsive tags), and the on-board computing capabilities of the monitor. The

Ex. 1009, Lovejoy 4:32-37

Dr. Sarrafzadeh Declaration

357. Therefore, Beck in view of Lovejoy discloses structure that is the same or equivalent to the corresponding structure disclosed in the '307 patent for performing non-GPS geolocation. Indeed, the '307 patent incorporates by reference Lovejoy for disclosure relating to geolocation by GPS or non-GPS means. *See* '307 patent at 17:21-24 ("The reading, analysis and geolocation by GPS or non-GPS means is described in U.S. Patent No. 6,031,454 that is included herein by reference in its entirety."). Thus, the combination of Beck and Lovejoy discloses structure that is identical to the corresponding structure disclosed in the '307 patent for performing non-GPS-based geolocation.

Ex. 1003, Sarrafzadeh Decl. ¶ 357